

A GLOBAL
PRESENCE
FOR GROUND
SUPPORT
SOLUTIONS IN
SOUTHERN
AFRICA

ROCBOLT
TECHNOLOGIES

President's Corner



The secret of success

At the SANIRE AGM held in August we shared some of the history of the pass rates achieved for the various papers of the Rock Mechanics Certificates. The pass rate being relatively low is, however, dependent on the candidates being experienced enough to understand the study material and knowing how to apply it in actual case studies or work situations. For most candidates, obtaining a Rock Mechanics Certificate is a true journey, comprised of highs and lows. There is no greater feeling of disappointment when you know that you have put in a lot of effort, yet you still fail a subject. I can recall the accomplishment I experienced when I “eventually” passed my ticket. We always hear our mentors and managers saying that we need to keep on trying; perhaps the next paper is your paper. Looking back, I can now also echo these words. Through your personal journey to obtain the qualification, you will also reach a point in your career when you will look back and realise that you only passed the ticket when you were prepared technically and had obtained sufficient experience to understand and apply the knowledge you had gained over the years. In South Africa we have achieved more than 100 qualified Rock Engineers in the past 5 years. Success is dependent on each person’s ability and effort. “Success is not final, failure is not fatal: it is the courage to continue that counts” (Winston Churchill).

With the “fees must fall” campaigns bringing our tertiary institutions to a standstill, we again realise how desperate people are for education. Education is, however, a privilege and cannot be taken for granted. People are not created equally, however, and some people have abilities far superior to those of others. As a society, we are dependent on the ability of each person to contribute to the various areas within our societies. For example, everybody cannot and will not become doctors. “Medicine is only for those who cannot imagine doing anything else”. As Rock Engineers, we are appointed to ensure safe mine workings. If we fail to produce a high standard of Rock Engineers, we fail to ensure the safety of our co-miners.

Michael du Plessis - SANIRE President

AGM 2016 AWARDS BREAKDOWN

The **SANIRE AGM** was hosted on the 9th September 2016 at Ruimsig Country Club, whereby the following awards were handed over to deserving members of **SANIRE**. The day was enjoyed by all who attended.

LIFETIME ACHIEVEMENT AWARD

HONORARY MEMBERSHIP

G D Prohaska
2016

PRACTITIONER OF THE YEAR

J J Van der Merwe
2016

BEST CANDIDATE AWARD

P. Hall
2016

BEST CANDIDATE AWARD

T. Russell
2016

BEST CANDIDATE AWARD

K. Tshepe
2015

BEST CANDIDATE AWARD

D. Lekoto
2015

BEST CANDIDATE AWARD

D. de Beer
2015

BEST CANDIDATE AWARD

G. Betz
2015

BEST CANDIDATE AWARD

B. Chapula
2015

BEST CANDIDATE AWARD

T. Mathivha
2015











SANIRE would like to extend a special thanks to the sponsors which assisted in making the day successful.



EST. SINCE 1986



New Concept Mining



WELL DONE DR. MICHAEL DU PLESSIS!!!!!!!



Full Name: Dr. Michael du Plessis
Company: Lonmin Platinum
Designation: Group Rock Engineering Manager
Qualifications: B.Sc., AREC, GDE, M.Eng., Ph.D.

SHORT HISTORY OF PREVIOUS EXPERIENCE

Michael joined Anglo American Platinum in 2002 after graduating from RAU (now University of Johannesburg). He obtained his Rock Mechanics Certificate in 2005. From 2005 to 2007, Michael worked for Minova, servicing the mines, especially along the eastern limb of the Bushveld. In 2007 Michael joined Lonmin Platinum. He was appointed as the Group Rock Engineering Manager in 2009. He obtained his Master's degree from the University of the Witwatersrand in 2009 and a Doctorate from the University of Pretoria in 2016.

AfriRock 2017



ISRM International Symposium 'Rock Mechanics for Africa'

2-7 October 2017

Cape Town Convention Centre, Cape Town



Keynote Speakers

Nick Barton
Sergio Fontoura
Luis Lamas
Dick Stacey
Nielen van der Merwe

BACKGROUND

The 2017 ISRM International Rock Mechanics Symposium is to be held in Cape Town. The conference theme is 'Rock Mechanics for Africa'. Mining has traditionally been a mainstay of African economies, while Oil and Gas industries are rapidly growing throughout Africa. Infrastructure is being developed to support these industries. Rock engineering design is and therefore will continue to be essential for the growth of the continent. Prior to the conference, the ISRM Board, Council and Commission meetings will take place. Technical visits are being arranged for after the conference.

EXHIBITION/SPONSORSHIP

Sponsorship opportunities are available. Companies wishing to sponsor or exhibit should contact the Conference Co-ordinator.

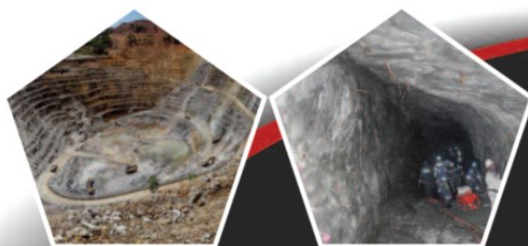
WHO SHOULD ATTEND

- Rock engineering practitioners
- Researchers
- Academics
- Mining engineers
- Civil engineers
- Petroleum engineers
- Engineering geologists.

TECHNICAL VISITS

The following technical visits are confirmed for the conference:

- Phalaborwa Mine
- Tau Tona Mine



TENTATIVE PROGRAMME

Saturday 1/10/2017	Sunday 2/10/2017	Monday 3/10/2017	Tuesday 4/10/2017	Wednesday 5/10/2017	Thursday 6/10/2017	Friday 7/10/2017
ISRM Board Meeting	ISRM Board Meeting	ISRM Commission Meetings Workshop	Technical Session Morning Refreshments Technical Session Lunch Technical Session Afternoon Refreshments Technical Session			Technical Visits
	Board Dinner	Network Function		Conference Dinner		

For further information contact:

Raymond van der Berg, Head of Conferencing
SAIMM, P O Box 61127, Marshalltown 2107
Tel: +27 (0) 11 834-1273/7 · E-mail: raymond@saimm.co.za
Website: <http://www.saimm.co.za>



SAIMM
THE SOUTHERN AFRICAN INSTITUTE
OF MINING AND METALLURGY

First Announcement and Call for Papers

AfriRock 2017

ISRM International Symposium

'Rock Mechanics for Africa'

2–7 October 2017 · Cape Town Convention Centre, Cape Town

Call for papers

CALL FOR PAPERS

The Symposium is being organised by the Southern African Institute of Mining and Metallurgy (SAIMM), and the South African National Institute of Rock Engineering (SANIRE). Individuals are invited to submit papers for the Symposium. Titles and short abstracts (no more than 500 words) should be submitted in **English** to Head of Conferencing, Raymond van der Berg, via e-mail: raymond@saimm.co.za

Enquiries may be made at: Tel: +27 11 834-1273/7

Facsimile: +27 11 838-5923 or

E-mail: raymond@saimm.co.za

Website: <http://www.saimm.co.za>

TOPICS

- Fracture and damage of rocks
- Numerical modelling
- Constitutive models
- Rock mechanics data
- Instrumentation and monitoring
- Petroleum rock mechanics
- Ground support
- Subsidence

- Risk in rock engineering design
- Crustal stress and earthquakes
- Radioactive waste disposal
- Deformation of rock
- Ground consolidation
- Specialised blasting to minimise rock damage
- Testing methods
- Rock mechanics in underground mines
- Slope stability
- Caving mechanics
- Design of tunnels and caverns
- Mechanics of fracking
- Mine seismicity and rockbursts
- Underground nuclear plants.

KEY DATES

- | | |
|------------------|-------------------------|
| 14 November 2016 | Submission of abstracts |
| 21 November 2016 | Acceptance of abstracts |
| 13 January 2017 | Submission of papers |
| 2–7 October 2017 | Symposium |

The Southern African Institute of Mining and Metallurgy

Head of Conferencing, Raymond van der Berg

AFRIROCK 2017

P.O. Box 61127, Marshalltown, 2107, Tel: +27 11 834-1273/7

THE DETAILS OF THIS FORM CAN BE E-MAILED TO: raymond@saimm.co.za or FAXED TO: +27 11 838-5923 / 833-8156

☐ I am interested in attending the conference

☐ I intend to submit an abstract of the proposed paper entitled:

Title of paper:

Personal Details: Name

Address

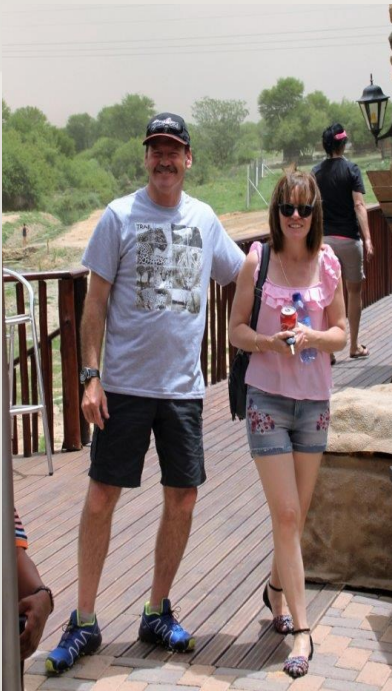
Tel: Fax:

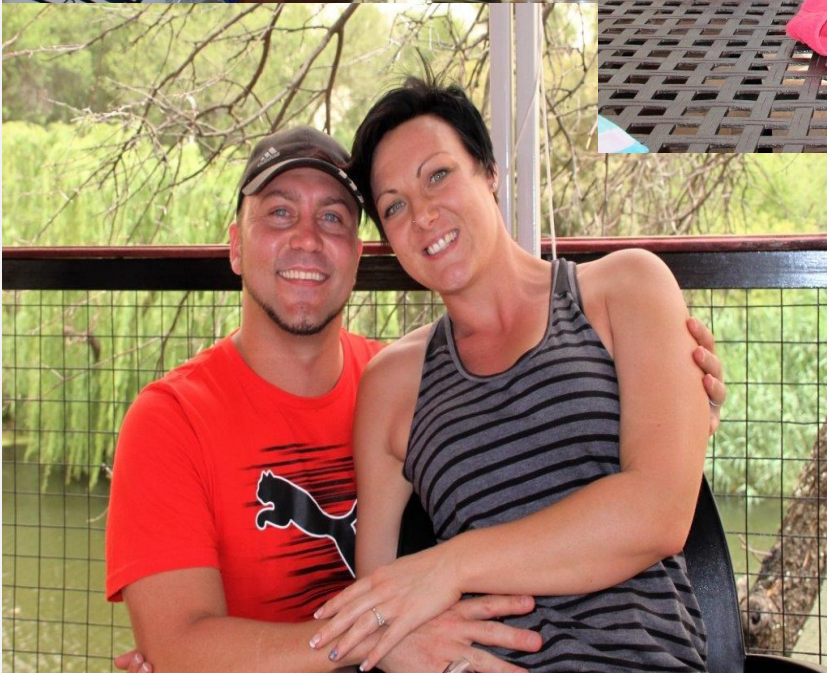
E-mail:

FREE STATE BRANCH YEAR END FUNCTION

SANIRE Free State Branch hosted there annual 2016 Year End Function at Goldfields Game Farm in Virginia on the 28th October 2016. the function started at 10:00 in the morning and included the members families. The families enjoyed a game drive,, predator camp, swimming pool and kids play area with a jumping castle. A delicious spit braai was served for lunch while listening to a local live band. The day was enjoyed by all and was a huge success.









ISRM News

Recent developments

Rock Mechanics Principles, a video course by Prof. Jian Zhao. Available from the website.

ISRM Suggested Methods on video.

ISRM sponsored an investigation of the Nepal earthquake, chaired by VP He Manchao from China.

Board and Council meetings

The ISRM held its 2016 Council meeting in Ürgüp, Turkey, on 28 August, in conjunction with the EUROCK 2016, organised by the Turkish ISRM National Group. Out of the 60 National Groups, 49 were either present or represented. The Council was also attended by Past President Prof. Shunsuke Sakurai, Chairmen of several ISRM Commissions and a representative of the IAEG. Michael du Plessis represented South Africa and Omberai Mandingaisa represented Zimbabwe. William Joughin represented Tunisia on behalf of Essaieb Hamdi.

The ISRM board meeting was held on the 27th August and William Joughin represented the African region.

Membership

The ISRM has 7 796 individual members and 150 corporate members, from 60 National Groups. Iceland and Malaysia had joined the Society since the last meeting. Forty-one percent of the members come from Europe and thirty-two percent from Asia, which has been the fastest growing region in the recent years.

Commissions

Several of the 17 ISRM Commissions met on 28 August. The Technical Oversight Committee, which coordinates the work of the Commissions, presented a report on the activities of the Commissions during the past year, with an assessment of the work they develop and recommendations for the future, namely concerning communication and relevance of the Commission products.

William Joughin, Michael du Plessis and Jaco Le Roux attended commission meetings.

Rocha Medal

The Rocha Award Committee selected the winner of the Rocha Medal 2017 and decided to award two runner-up certificates:

Winner – Bryan Tatone (Canada), with the thesis “Investigating the evolution of rock discontinuity asperity degradation and void space morphology under direct shear” (University of Toronto);

Runner-up – Robert Bewick (Canada) with the thesis “Shear Rupture of Massive Brittle Rock under Constant Normal Stress and Stiffness Boundary Conditions” (University of Toronto);

Runner-up – Gabriel Walton (Canada) with the thesis “Improving continuum models for excavations in rock masses under high stress through an enhanced understanding of post-yield dilatancy” (Queen’s University).

The award will be given during the 2017 ISRM International Symposium in South Africa where the winner will be invited to deliver the Rocha Lecture.

The Rocha Medal has been awarded annually by the ISRM, since 1982, for an outstanding doctoral thesis in rock mechanics or rock engineering, to honour the memory of Past President Manuel Rocha, while stimulating researchers. Up to two runner-up certificates may also be awarded.

Starting in 2017, the amount of the cash prize increases from 1 000 to 2 000 Euros.

Nominations for the Rocha Medal 2018 are to be received by the ISRM Secretariat by 31 December 2016. [Click here](#) to download the announcement with details on the Rocha Medal 2018.

Suggested Methods

Three new suggested methods have been approved by the ISRM Board:

ISRM SM for Uniaxial-strain Compressibility Testing for Reservoir Geomechanics

ISRM SM for Determining Thermal Properties of Rocks

ISRM SM for Laboratory Acoustic Emission Monitoring

Digital Library

The ISRM Digital Library (www.onepetro.org) is hosted in cooperation with the Society of Petroleum Engineers. It currently includes 8 400 papers (60 000 pages) from 42 ISRM sponsored events since 1966. Individual members may download up to 100 papers per year at no charge.

Online lectures

Two new ISRM Online Lectures are available for viewing or downloading on the ISRM website (www.isrm.net):

14th ISRM Online lecture: Prof. Walter Wittke. "Design based on the Anisotropic Jointed Rock Model (AJRM) – Fundamentals and Case Histories."

15th ISRM Online lecture: Prof. Nielen van der Merwe. "Predicting the probability of failure into the future."

Multilingual rock mechanics glossary

The rock mechanics glossary includes 1000 rock mechanics terms in 15 different languages. More languages will be available soon.

ISRM Conferences

The following ISRM Conferences are scheduled:

Event title	Start date	End date	Country	City
ARMS9 - the ISRM 9th Asian Rock Mechanics Symposium	2016-10-18	2016-10-20	Indonesia	Bali
VII Brazilian Rock Mechanics Symposium - an ISRM Specialised Conference	2016-10-19	2016-10-22	Brazil	Belo Horizonte
RARE 2016 - Recent Advances in Rock Engineering - an ISRM Specialised Conference	2016-11-16	2016-11-18	India	Bangalore
YSRM 2017 - the 4th ISRM Young Scholars' Symposium on Rock Mechanics and NDRM 2017 - the 5th International Symposium on New Development in Rock Engineering - an ISRM Specialised Conference	2017-05-11	2017-05-13	Korea	Jeju
EUROCK 2017 - the ISRM European Rock Mechanics Symposium	2017-06-20	2017-06-22	Czech Rep.	Ostrava
GeoProc 2017 - 6th International Conference on Coupled THMC Processes in Geosystems - an ISRM Specialised Conference	2017-07-05	2017-07-07	France	Paris
Shaoxing International Forum on Rock Mechanics and Engineering Geology - an ISRM Specialised Conference	2017-09-20	2017-09-20	China	Shaoxing
AfriRock 2017 – the 2017 ISRM International Symposium	2017-10-02	2017-10-07	South Africa	Cape Town
EUROCK 2018 - the ISRM European Rock Mechanics Symposium	2018-05-22	2018-05-26	Russia	Saint Petersburg
RockDyn-3 - 3rd International Conference on Rock Dynamics and Applications - an ISRM Specialised Conference	2018-06-26	2018-06-27	Norway	Trondheim
ARMS10 - the ISRM 10th Asian Rock Mechanics Symposium	2018-10-29	2018-11-03	Singapore	Singapore
ISRM 14th International Congress on Rock Mechanics	2019-09-20	2019-09-27	Brazil	Foz do Iguaçu

African Region

Tunisian Society for Rock Mechanics

Dr Essaieb Hamdi is the current president of the recently established Tunisian Society for Rock Mechanics (TSRM). The membership for the previous year and current comprises 10 members.

Meetings of TSRM members were held in order to discuss the possibilities for promoting the TSRM activities.

New Initiatives: TSRM is organizing a one-day seminar on "Reinforcement of Civil Works and Historic monuments" in collaboration with French and Lebanese colleagues. The seminar is planned to be held in the Northern suburbs of Tunis Gammarth on 19 October 2016.

ZINIRE

Mr Omberai Mandingaisa is the current president of the recently established ZINIRE. Membership increased from 19 to 35 members from 2015 to 2016 (84% growth). ZINIRE is actively involved in the training and development of young rock mechanics practitioners through the universities and the COMREC.

The Young Rock Engineers Foundation (YREF) was launched at the Zimbabwe School of Mines on 3rd May 2016. Eighty-seven Delegates attended the launch and forty-two YREF subscriptions were obtained.

ZINIRE arranged the donation of support products teaching aids to School of Mines Laboratory.

The main annual event and AGM was held in June 2016 and attended by 72 delegates, and 4 technical papers were presented.

The original 6-member interim council completed their term after three years and a new council was formally elected.

PERSONALITY OF THE QUARTER



Full Name: Trevor Rangasamy

Position: Director & Principal Rock Engineer

Company/ Organisations: Middindi Consulting (Pty) Ltd (RSA), Middindi International Ltd, Rangkom Investments (Pty) Ltd

Date and Place of Birth: 11 September (911), Durban

Education: MSc (Eng), BSc (App Geology), AREC, COM Cert, SC Cert, G.D.E (Wits)

First Job: Assistant Strata Control Officer, Vaal Reefs Mining & Exploration Company

Personal Best Achievement/s: First Black COM Cert Rock Engineer in RSA, Starting Middindi Consulting (Pty) Ltd, making informed decisions whilst working on mines that saved lives

Philosophy of Life: Hard work never killed anyone...

Favourite Food/Drink: A nice Durban bunny chow and Granadilla Twist

Favourite Sport: Cricket

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

Back in the day, it was difficult to get a job in the mining industry so I plied my trade as a spray painter, sandblaster and security guard (burglar bar) installer. Whilst doing these jobs, which kept me humble and grounded, I applied for jobs at any mine that advertised vacancies. Fortunately for me, Anglo American advertised jobs in the Sunday Times for Geologists and Rock Mechanics personnel. I applied and the rest is now 22 years of history. I am currently a Director and Principal Rock Engineer at Middindi Consulting (Pty) Ltd.

2. Why did you choose Rock Engineering?

Rock Engineering chose me, come to think of it, since at the time I thought that the job I applied for was in Geology. It happened to be a job I did not expect and never even heard of before. I have come to love it and am passionate about it. I was desperate to find a steady job, one that my mother would have been proud of, so when I told my mum that I got a job at Anglo American, she smiled and said that you now working for the big "White Man" and I must learn tolerance and respect and face challenges head-on rather than throw stones from the cover of the "bushes". That I did all too well during my first 2 years at Vaal Reefs i.e. I faced my challenges, dropped the stones and quenched my thirst with knowledge.

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

Personally, it has been tough but worth it. There were a lot of obstacles to overcome more from within myself rather than externally. Coming to terms with being initially, one of very few people of colour in Rock Engineering was challenging, since my young mind thought that I was intellectually challenged, hence there were so few entrants in this field. I know now that this is probably furthest from the truth. I had to somehow overcome an inferiority complex which was linked to “fear” more than anything else. I feared saying too much about what I engineered to be a solution because I thought I would be made to be a “fool” in a sea of people who I believed were intellectually superior. I know now that this is not true and I can do as well if not better than most. This field made me a man. I have fond memories of learning and sapping in knowledge. I lusted for knowledge. I craved it. I passed my COM certificate in 1995 about 18 months after working on the mine, and to date, that makes me proud, because there have and are horror stories of passing this exam. Karl Ackermann was my examiner for the practical and I was petrified of him due to his imposing physical stature. He passed me maybe because I was just as imposing with my talk. I must admit I developed an attitude second to none. I was professionally groomed by initially Morris Rosenblatt, Dion Booyens and Gary Dukes and then thought my life was over when we started reporting to Johan Laas. It turned out to be the contrary and Johan Laas was adept at teaching one to develop a process to apply substantiated logic, convey this in a well-constructed report and face rather than hide from problems.

My years at Western Deep Levels, I have blocked out of memory. Yoh, the seismicity, it is too much for a poor sugar-cane grown Indian to handle. There were no Section 54's then, we didn't need them, the BV78 and Christmas dyke issued them weekly. Working at initially Waterpan, then South Shaft and finally South Deep for JCI was a breath of fresh air. Dr John James, was the coolest Manager ever. He allowed us freedom to innovate and explore our capabilities. To model where no man as modelled before. I have the utmost respect for Dr James. I had small stints at Itasca, the CSIR and Groundwork Consulting. These jobs helped me find and develop my consulting skills and essentially sowed the seeds of being in charge of my own destiny. Just over 13 years ago, I started Indiroc Consulting, which started with rapid growth and was very successful. I met Johan Hanekom at the MQA and we started discussions about forming a company together. Johan was everything I was not, so this to me was the ideal partnership. We have been in business now for 13 years, a sterling example of a rainbow nation learning, growing and developing together.

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

The challenges are easy to list, the solutions a bit more trying. I visit mines pretty often and get the feeling that there is general negativity amongst young aspiring rock engineers. I am not sure what truly underlies the discontentment but my intuition leads me to speculate that it may be the time it takes to pass the COM exams and the lack of proper training and mentorship, amongst other issues. There is a publication available on the internet of a young woman's horrid experience in rock engineering. If this is the sentiment being propagated and publicised, then we have a long way to go as a fraternity. I am not sure what the current mandate of SANIRE is but surely they need to address the waning enthusiasm and disbelief within our fraternity.

There are few recognisable icons left within our fraternity. Some of them have entered the afterlife, others enjoying sunsets at the coast and those who have lost interest. Many of these icons have laboured in the research institutes. The “#ResearchmustFall” campaign has left us rudderless. I have worked and/or interacted with the kind Dr Roberts, the eccentric Dr James, the noble Sir Napier, the smart Dr Malan, the correct Mr Jaeger, the unionist Mr More o' Ferrell (Snr), the articulate Mr Arnold, the gung-ho Mr Fernandes. It seems all I have left is Mr Rangasamy.

I am of the opinion that not much technical design happens on the mines since practitioners are inundated with ground control work. The development of trigger, action response systems requires rock engineering input at the face almost every day, this has led to stagnation in packaging, synthesising and analysing data albeit due to time deficiencies. We have regressed into highly paid, overworked shift bosses. We need to somehow take back our discipline.

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

Regulation defines the thresholds; over-regulation squeezes the scientific life out of you. We are being squeezed, the noose seems to be tightening, the science is leaving us. Our local industry is in decline due to many factors. We are not, this continent awaits us. The make-up of our fraternity has changed over the last 22 years we need to be more embracing of these changes. We revamped the exam structure some years ago, for the better. It is more structured, more referenced, more concise. Are we examining to fail or failing to exam?

Our antiquated ways of mining using hand-held and “ama ting-ting” hauling is not sustainable in the long term. We need to gear ourselves for mechanisation. The science is dissolved in empirical design charts yet we use them liberally without question. We need to start deconstructing these charts and imparting the science back into them. Third party reviews are becoming increasingly important due to legal liability faced by rock engineers. SANIRE needs to provide guidelines on the calibre of practitioners allowed to conduct such reviews. My personal experience is that some of our so called reviewers are misinformed, immature, misdirected and believe that unbalanced reviews place them in a favourable light. Unbalanced, ill-directed and out of context reviews are damaging to the credibility and reputation of all that ply their trade in our discipline.

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

There is no substitute for exposure to the mines we work in. The reality and truth lies at the face. Spend the time to learn the systems, the layouts the successes, the failures. The time spent imparts confidence and self-belief. You can acquire knowledge from books but may find it difficult to challenge the relevance. Exposure provides you with the confidence to challenge the readings, if warranted.

7. Who is your role model/ mentor?

I have none at the moment but believe that good, honest, moral, ethical hard work presents no self-harm but permeates hope in a world going bonkers.

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

It will all be ok in the end, if it's not ok, it's not the end...

Newsletter Advertising

The **SANIRE** Committee has decided to increase the advertising opportunities for suppliers who would like to market there 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)	
			January 2017	April 2017
Square (Not front page)	R 1 000	4	I Booked	
Skyscraper (Front page)	R 4 000	1		
Full page (Middle)	R 8 000	2		

SANIRE Birthday's

DA Arnold	J Oosthuizen	BN Scott	GB Breckle
DS Minney	O Rakumakoe	HJ van Rooyen	WJ Snyman
FC Naude	JP Naude	PKD Hornsby	W Hartman
AD Wilson	CL Hunter	MP Makgale	MA Pieterse
MJ Mokati	CM Muller	N Conley	S Lloyd
PS Piper	R Thothela	RS Ngwato	PJ van Wyk
GB Dukes	TXT Hlongwane	HT Chiwaye	PD Witbooi
P Miovsky	T Tshivhase	PH Henning	J Walls
D B Harding	BO'Hearn	M van Lelyveld	PG Groenewald
EM Mkhize (Sibanda)	ET Nyakwenga	J Chibwe	MH Ngwenya
AP van der Berg	CL de Jongh	LG Tshehla	D van Rooyen
OD Goldbach	MS Leseli	A Potgieter	KT Mandisodza
R Page	P Paige-Green	RJM Sebitloane	D Swanepoel
R Human	D Spencer	E Pillay	T Zvarivadza
LJ Gardner	AI Valenta	WT Netshikulwe	S Coetsee
S Chingosho	FRP Pienaar	N Ratshitanga	RO Phadagi
R Du Plessis	PG Carvill	R Arlow	CW VD Westhuizen
DP Roberts	BJ Botha	G VD Westhuizen	R Muller
CK Nesbitt	D Neal	C Mkandawire	AJ van Zyl
BJ Scott	AS Lottering	B M Kioya	Y Rajpal
B Schoevaerts	JWL Hanekom	C Nyoni	MD Kubayi
D B Segoe	AA (Tony) Steyn	JOJ Roussel	A Mabelane
R Muganga	SZ Petho	HAD Kirsten	B Pule
SM Molebatsi	P de Bruin	TO Hagan	P Ghasemzadeh
G Louw	N Malitino	CA Swart	M Barnard
NJ Janse van Rensburg	J Lucas	AH Swart	QL Grix
SJ Mahlo	M Steinmann	SK Murphy	SC Mashile
M Henderson	JA Khonthane	DJ Postma	N Netshivhazwaulu
DJ Jonker	RL Kemp	D Louw	M Ramashala
N Khathi	C Haasbroek	MJ Cockram	H Jordaan
ME Nengovhela	J Els	AD Ngosa	

ROCK STAR OF THE QUARTER



Full Name: Quintin Lennox Grix

Position: Unit Manager – Rock Engineering

Company/Organisations: Goldfields, South Deep

Date and Place of Birth: 7 March 1988, Germiston, Johannesburg

Education: SAMTRAC, COM SCC, COM REC

First Job: HVAC Technician & SHEQ Consultant

Personal Best Achievement/s: Obtaining my REC at a young age!

Philosophy of Life: Today is the beginning of the rest of your life.

Favourite Food/Drink: Red wine & lasagne

Favourite Sport: Rugby!

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

My mining career started off as a Support Quality Assurance Officer (Observer with mags!) at the old Vaal Reefs 10# (Tau Lekoa). Currently I am the Rock Engineering Unit Manager on South Deep Gold Mine.

2. Why did you choose Rock Engineering?

Rock Engineering faces many challenges, and is very, very far from an exact, solved science. The fact that there are many contributions to be made to the discipline attracted me, and is probably the biggest reason for my choice.

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

My mining career started off as a Support Quality Assurance Officer at the old Vaal Reefs, 10 shaft. I soon thereafter obtained my Strata Control Certificate and for a short period moved to Buffelsfontein Gold Mine. Soon thereafter, I moved to a shallow board and pillar chrome mine for approximately two years where I obtained my Rock Engineering Certificate. The company I worked for then moved me to a shallow board and pillar platinum mine for another two years, whereafter I relocated to Potchefstroom to form part of their Consulting Department. In the Department, I gained valuable modelling and consulting experience in a vast amount of commodities and mining methods, including shallow mechanised chromite mining; shallow mechanised platinum mining; open pit, massive and deep level gold mining; open pit and massive iron and copper mining; and open pit coal mining. Currently, I am a Rock Engineer on a deep level mechanised gold mine situated in Westonaria.

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

Many, many challenges can be listed; however, depth is perhaps of particular concern to me. The fact that we are mining deeper and deeper below surface (bearing in mind that depth is relative to the commodity you're mining) means that less and less knowledge and experience of the specific environments are available. The need for proactive Rock Engineering designs in these conditions requires loads of instrumentation and monitoring. My personal opinion is that we do not do enough (in terms of instrumentation and monitoring) to understand and/or predict the likely problems proactively.

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

The old cliché: Work hard, play hard. It is no secret that the Rock Engineering qualification is extremely difficult to obtain. However, if you persistently work hard, you will succeed. It is important not to study purely by the book, but to understand what you are studying. In this regard, it is extremely to continue asking "WHY?" The other end of the spectrum is also valid; there is no point in achieving success when you're not able to celebrate it!

6. Who is your role model/mentor?

To single out one specific role model or mentor will be utterly unfair and not necessarily accurate. During my career and up to this point, I have had a large number of colleagues and friends who have made a tremendous impact, not only on my career but also on my life. If I had to list them, we'd have to use an external mail client to be able to distribute the large newsletter

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

Do whatever you want to do, but when you do it, be the best in it.

Rock Engineering History

HISTORY OF GOLD IN SOUTH AFRICA

Johannesburg's early history is the story of gold. In 1853 Pieter Jacob Marais, a South African prospector, recovered alluvial gold from the Jukskei River, north of what would become Johannesburg. The years that followed brought several modest strikes, but the Witwatersrand Main Reef eluded searchers until 1886, when George Harrison, an Australian prospector, chanced upon an outcropping on a farm called Langlaagte. Ironically, Harrison failed to appreciate the significance of his find: he sold his claim for £10 and embarked for the goldfields of the eastern Transvaal region.

Others were more farsighted. By mid-1886, an army of diggers had descended on the Witwatersrand, hacking away with picks and shovels along a line that soon stretched 40 miles west to east. In response to this influx, the government of the Transvaal, the small Boer republic under whose jurisdiction the Witwatersrand fell, dispatched two men, Vice President Christiaan Johannes Joubert and Deputy Surveyor-General Johann Rissik, to inspect the goldfields and identify a suitable city site. The new city was called Johannesburg, apparently in their honour.

As the scale of the gold deposits became apparent, Johannesburg became the 19th century's last great boomtown. Fortune hunters from as far afield as Australia and California joined skilled Cornish and Welsh miners, who brought to South Africa a strong trade-union tradition. Destitute Afrikaners, driven from their rural homes by debt and drought, clustered in slums such as Brickfields and Vrededorp. Africans from every corner of the southern African subcontinent migrated to the city, often in large ethnic cohorts, adding a dozen more voices to the cultural and linguistic babel. Most Africans worked on the mines, completing six- and nine-month contracts before returning to their rural homes. Others settled permanently in the swelling city, carving out niches as rickshaw drivers,

domestic workers, and washermen. By 1896, Johannesburg had become a city of 100,000 people.

Conceived in avarice, the young city nurtured every species of vice. Banks and boarding houses jostled for space with more than 500 saloons. Criminal syndicates with roots in New York City and London found fertile soil in Johannesburg. The predominantly male population provided a robust market for prostitution. "Ancient Ninevah and Babylon have been revived", a visiting journalist wrote in 1913. "Johannesburg is their twentieth century prototype. It is a city of unbridled squalor and unfathomable squander."

The gold deposits of the Main Reef, for all their uncanny dependability, were also extremely low-grade. Tons of the pebbly conglomerate had to be mined, crushed, amalgamated with mercury (later cyanide), and retorted in order to produce even an ounce or two of gold. This fact, combined with gold's internationally fixed price, produced a perennial problem of profitability, which increased exponentially as the reef dipped away to the south to depths of hundreds, and ultimately thousands, of feet. (South African gold mines would eventually reach depths of over two miles, making them far and away the deepest mines in the world).

All these factors promoted a rapid consolidation of the industry. By the mid-1890s, control of the entire Witwatersrand gold industry rested in the hands of a half-dozen massive mining houses, each of which commanded thousands of workers and millions of dollars in capital, most of it raised from investors in Europe and the United States. Control of these companies lay with a small number of so-called "Randlords", men such as Cecil John Rhodes, Alfred Beit, Barney Barnato, and J.B. Robinson, who had made their fortunes on the Kimberley diamond fields and well understood the exigencies of large-scale industrial mining. The company called Goldfields of South Africa, started by Cecil John Rhodes is still in existence today.

Paul Couto

19th Century - Notable Mining Events

1685 Simon Van der Stel sinks exploratory shafts and recovers copper ore from an area close to O'okiep near Springbok in the Namaqualand district of the north-west Cape.

1727 "Hottentots" living on the Cape of Good Hope reported by the Dutch to be working and smelting iron, and possibly also copper.

1852 Serious exploitation of the copper deposits of north-west Namaqualand commences with the opening of the Blue mine on the outskirts of Springbok.

The Cape Colony Government offer a reward of £100 to anyone discovering coal measures in the Province.

The Welsh geologist, John Henry Davis, finds gold on the farm Paardekraal (Krugersdorp) but the discovery was kept secret by Transvaal Government and Davis was deported from the Boer Republic.

1853 Pieter Marais, a German-born prospector who had gone to California and Australia in search of gold, discovered alluvial gold in the Jukskei River which runs out of Johannesburg. He was allowed to continue with his search by the Boer Government but was threatened with death if he revealed the discovery. His discoveries soon ran dry.

1859 First anecdotal reports of the discovery of a diamond on the Orange River, Griqualand West. This was made by an American while traveling through the area.

1860 Discovery of coal deposits on Cyphergat Farm (Molteno) in the Eastern Cape Province.

1864 Sinking of Penshaw Colliery at Molteno in the Eastern Cape Province.

1866 The discovery of the first major diamond in South Africa, the "Eureka Diamond", in river gravels from the Orange River near Hopetown on the Cape Colony border with Griqualand West.

1869 The first systematic diggings for diamonds commences on the Vaal River close to Barkly West, led by Captain Rolleston of the British Army and a group of prospectors from Natal.

1870 The discovery of a further large diamond on the Jagersfontein Farm in the Boer republic of the Orange Free State. This started a further "diamond rush" which lead to the sinking of Jagersfontein mine, a large open-cut mine which worked a diamond bearing kimberlite pipe.

1872 Alluvial diamonds discovered at Christiana in the south-east of the Transvaal Republic.

1873 Alluvial gold discovered on the farm Geelhoutboom near Sabie, in the Eastern Transvaal and later that year more, in greater quantity, at nearby Pilgrims Rest. The Pilgrim's Rest Goldfield was proclaimed on 22nd September of the same year. The discovery of this goldfield initiated the country's first "gold rush".

1874 The Struben brothers, Fred and Harry, owned parts of the farms Sterkfontein and Wilgespruit in what is now Roodepoort near Johannesburg. The brothers had long believed there was gold in the vicinity of the Witwatersrand. During this year, they found what looked to be the first "payable" gold reef on the Rand. They named their mine the Confidence Reef, a name that proclaimed that their long search was over. Alas, their mine was to last no more than a year before the gold ran dry.

1878 Coal discovered on the farm Leeuwkuil close to Vereeniging on the northern bank of the Vaal River on the Transvaal's border with the Orange Free State. The sinking of several collieries soon followed.

1882 Siegmund Hammerschlag erected the first gold ore-crusher, a two-stamp battery, on the Witwatersrand on his farm Tweefontein (Krugersdorp, Transvaal) to process the gold bearing rocks found on his land. However, the surface gold ore on this part of the Rand proved not to be payable.

1885 Alluvial gold discovered in Jubilee Creek at Millwood in the Eastern Cape, sparking a "gold rush" into the area.

1886 Discovery of the Witwatersrand main gold reef by Australian prospector, George Harrison on the farm, "Langlaagte", on what was later to become the western outskirts of Johannesburg. The immediate area was proclaimed a public digging by President Kruger later that year sparking South Africa's most important gold rush.

Reef gold discovered in the Millwood area of the Eastern Cape.

1887 Millwood diggings (Eastern Cape) proclaimed as an official Goldfield by the Cape Government.

Coal discovered in the area of "The Springs" on the eastern fringes of the Witwatersrand in the Transvaal.

1891 Alluvial diamonds discovered at Bloemhof in the south-eastern Transvaal Republic.

1893 Sinking of the first colliery in the Springs district on the eastern fringes of the Witwatersrand, Transvaal.

1896 Systematic mining at Witbank commenced in 1896 when Samuel Stanford, together with the Neumann Group, established "Witbank Colliery Limited", and sink the first shaft on the farm Witbank, Eastern Transvaal.

1898 Thomas Major Cullinan, an influential building contractor, starts prospecting for diamonds on the Prinsloo farm (later part of Cullinan Township), near Pretoria in the Transvaal.

The design and behaviour of crush pillars on the Merensky Reef

Crush pillars are used as part of the stope support in intermediate depth tabular mining stopes. Crush pillar design should ensure that the pillars crush when formed at the mining face. This behaviour of the pillars is typically achieved when the pillars have a width to height ratio of approximately 2:1. Once crushed, the residual stress state of the pillars provides a local support function.

Crush pillars are extensively used in the platinum mines of South Africa. In most cases, effective pillar crushing is not achieved, resulting in pillar seismicity. The objective of the research was to determine the parameters which influence crush pillar behaviour. A limit equilibrium model was identified as being able to simulate the behaviour of the pillars (Figure 2). The model, implemented in a displacement discontinuity boundary element code (TEXAN), provided insights into the stress evolution of a pillar, depending on its position relative to the mining face, the effect of over-sized pillars, and the impact of geological structures, layout and rock mass parameters, as well as mining depth. Figure 3 is an example of the effect of pillar width on crush pillar behaviour for an idealised crush pillar layout simulated at 600 metres below surface.



Figure 1: Photograph of a crush pillar from a trial site on Lonmin Platinum. Note the wedge-like structure visible where the fractures intersect. The fractures are concentrated predominantly towards the east, which was mined first.

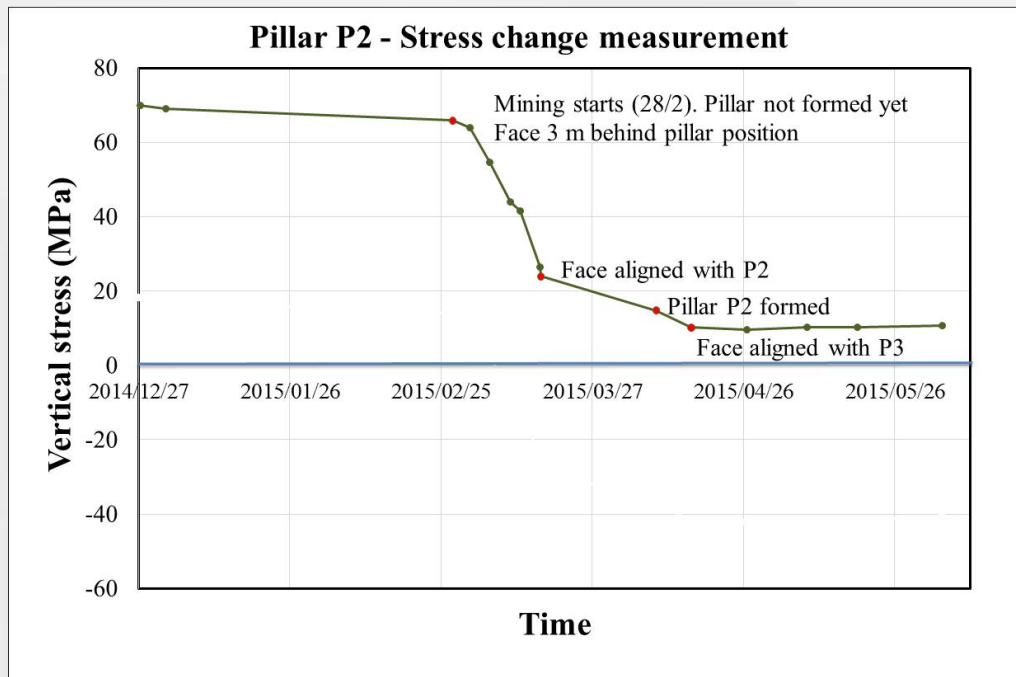


Figure 4: The stress change measured above an instrumented pillar (P2) versus time. The strain cell was installed prior to the pillar being formed.

A numerical model was used to back analyse the behaviour of the underground trial site which consisted of a mined area of approximately 22 000 m² and 55 crush pillars. To date, no numerical modelling of a mine-wide tabular layout, which explicitly included a large number of crush pillars, had been reported in South Africa. This work is therefore considered a major, novel contribution to this field of research. After model calibration, both the observed and measured behaviour of the crush pillars in the trial site could be replicated. This was especially useful in evaluating the stress conditions measured above the pillars, as well as the total amount of convergence experienced adjacent to the pillars and at the panel mid-spans (Figure 5). The findings validated the use of the limit equilibrium model implemented in a displacement discontinuity boundary element code to simulate the behaviour of crush pillars on a large scale.

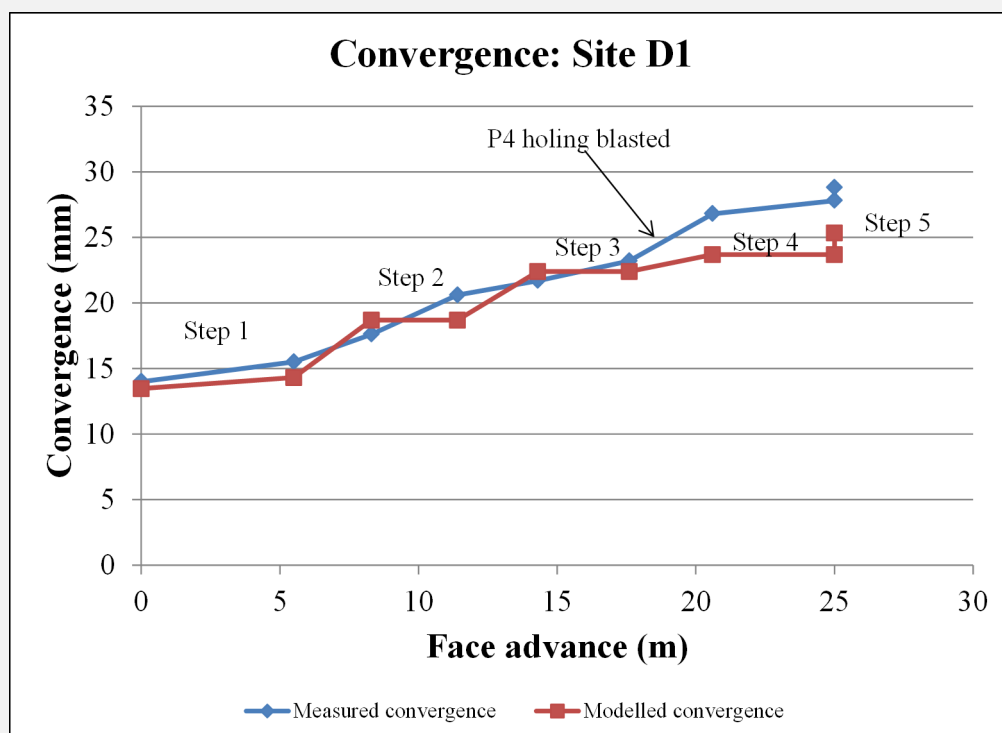


Figure 5: Example of the measured versus modelled convergence at an instrumentation site adjacent to a pillar. The pillar is formed in mining step 2 and holed in mining step 3.



SANIRE

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