



SANIRE

SOUTH AFRICAN NATIONAL INSTITUTE OF ROCK ENGINEERING

ROCK *talk*

Volume 6, Issue 2 | November 2020



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PRESIDENT'S CORNER

As we all head closer to the end of 2020, a year that will never be forgotten, I thought it would be fitting to focus on what SANIRE has achieved during the past year.

This year was not only challenging for all of us in our personal and professional lives, but also for SANIRE. Rapid change was the order of the day to comply with the COVID-19 rules and regulations. We had to adjust quickly. We as council are proud to report that we have had a lot of firsts in 2020.

We held our first virtual AGM, our first series of webinars, and our first virtual Rock Engineering Practical Exam. Our SANIRE Council has moved to virtual meetings as well. We also had the quickest financial year-end under the administration of Mines Professional Associations Secretariat (MPAS), coupled with fully functional online membership database. These are only a few highlights of our improved administration.

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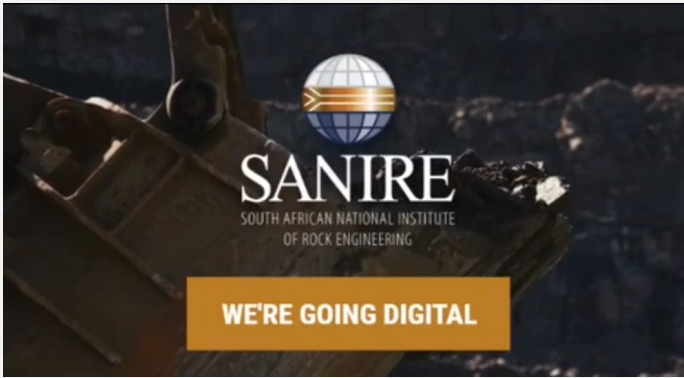
PRESIDENT’S CORNER

In conjunction with MPAS and the other associations, we have developed a Research and Development (R&D) Committee (MPAS RDC) that talks directly to the Minerals Council South Africa and other research entities within the industry about current R&D and proposed projects for the future. The advantage of such a committee is that it represents the entire MPAS with over 3 800 members and across 13 Associations. This allows for a unified Mining Industry R&D Council.

The SANIRE council has also, for the third year in a row, not increased the annual membership fees, whilst maintaining the current standards. Hence we are still the most affordable institute in the mining field.

We are proud to announce that we have built up good relationships with other Organisations, Associations and Institutes. The rewards are that in 2021 we will jointly host a Slope Stability Symposium in conjunction with the SAIEG (South African Institute for Engineering Geologists). Hopefully, it will generate some positive cash flow, but more importantly open up our membership database to others, contributing to networking and shared knowledge.

SANIRE has a vision to continue to grow its brand, and ensure that we cover as far as possible all our members’ needs. We have made numerous changes and updates to the educational training system, in order to make it fair and transparent to all. To remain abreast with the changing times, we will continue to update our guidelines and requirements in line with our members’ needs and the requirements of the Minerals Council South Africa.



The SANIRE Council has over the years built up a good, robust system for setting and hosting of exams, which we will continue to maintain to ensure that professionals of the highest standards are entering the industry.

As the year approaches its end, on behalf of SANIRE Council we would like to wish all our members a blessed festive season. We hoping that the end of 2020 brings a close to an odd, but interesting chapter in all of our lives. Moreover, that 2021 will bring new challenges and hope to all the SANIRE members as we all continue to progress and move forward in both our professional and personal endeavours.

As the current and also outgoing President in July 2021, with this being possibly my second last Presidential note. I would like to personally thank all the SANIRE members for the inputs and suggestions on how we as an institute can build SANIRE going forward. A special thanks goes out to my Council for their support and hard work over the past year. When we all joined up I mentioned that this would be the most unforgiving but also the most rewarding job in the world and I am sure by now they all know what I mean.

Lastly, I would like to thank those close to me for their support.

A big thank you to my wife and children, Stacey, Rowan and Eva Couto.

Paul Couto
President SANIRE

SANIRE IS NOW DIGITAL

SANIRE is excited to announce that we have gone digital!

In response to the restrictions placed on movement and gatherings, SANIRE has embarked on digitalisation in order to succeed in its goals in this digital age.

Keep an eye out as announcements of virtual events will be made on the website.

SANIRE VISION, MISSION, & VALUES

Vision

To actively promote the South African rock engineering profession.

Values

- Honesty
- Integrity
- Professionalism
- Accountability
- Transparency

Mission

SANIRE promotes the advancement of the rock engineering discipline by encouraging and promoting:

- Interest and the development of education in rock engineering
- Professional practice and high ethical standards
- Networking, collaboration and information exchange
- Research areas

HEADS OF SANIRE COUNCIL



Paul Couto
President



Lizelle Prinsloo
Vice-President

Branch Chair Persons

Jaco Le Roux – Free Vaal | **Craig Smith** – Gauteng | **Willie Liebenberg** – Western Bushveld
Petrie Wessels – Eastern Bushveld | **Anton Gregory** – Northern Cape | **Rofhiwa Phadagi** – Coal Fields

Contact us at – info@sanire.co.za

INTRODUCING THE SANIRE COAL BRANCH

Objectives

Encouraging participation of rock engineers across different mining and consulting groups as well as improved knowledge sharing, Education, Empowerment and Development of upcoming rock Engineers.



Thovhedzo Gcuda
Vice-Chair
Thovhedzo Gcuda is currently the Rock Engineering Superintendent at South32's Wolvekrans Mine. She is passionate about development, an author and a serial entrepreneur.



Rofhiwa Phadagi
Coal Branch Chair
Rofhiwa Phadagi is currently the Principal Rock Engineer at Exxaro. He is passionate about the education and development of the future rock engineering generation and GIS-based rock engineering solutions.



Melusi Shongwe
Secretary
Melusi Shongwe is currently a Rock Engineer at Sasol Mining. He has attained rock engineering experience across various commodities. Melusi is continuously developing himself in rock engineering and mining as a whole.



Alex Mkhwanazi
Supplier Representative



Basie Mothlabane
Young Members



Nyando Netshivhazwaulu
Treasurer
Nyandano Netshivhazwaulu is the current Superitendent Rock Engineer at South32's Middelburg Mine Services. He has attained rock engineering experience across various commodities and different mining methods.

ISRM NEWS

Another COVID-19 casualty

As you may already know from the announcement on the ISRM website and from the organizers, the 2020 ISRM International Symposium – EUROCK2020, to be held in Trondheim, Norway, was cancelled. This was a difficult decision taken by the EUROCK2020 Organising Committee in constant dialogue with the ISRM. In view of the current COVID-19 pandemic and of the strict restrictions on travelling, this became an inevitable and also a wise decision.

The Organising Committee and the ISRM agreed that the conference proceedings, including several of the keynote lectures and more than 200 high-quality peer-review papers originally submitted for EUROCK2020 will be published in the OnePetro.org platform, subject to the authors’ consent.



Rock Mechanics Principles, a complete video course

Rock Mechanics Principles, an online course by Professor Jian Zhao, provides an introduction to rock mechanics principles including the mechanics of rock materials, rock joints and rock masses, rock mechanics characterization and rock mass classifications. The course has now been completed with the fifth part on rock mechanics testing and analysis.

The lectures are presented by Professor Jian Zhao, who has been teaching rock mechanics and rock engineering since 1990, first at Nanyang Technological University of Singapore, then at Ecole Polytechnique Fédérale de Lausanne of Switzerland, and currently at Monash University in Melbourne of Australia. He has been a Fellow of the International Society for Rock Mechanics since 2015.

The course consists of approximately 30 hours of lectures. It covers five parts:

- 1. Origin of rocks and rock masses (March 2016);
- 2. Properties and mechanics of rock materials (March 2016)
- 3. Properties and mechanics of rock joints (June 2016);
- 4. Rock mass classifications and properties (June 2016);
- 5. Rock mechanics testing and analysis (online in July 2020) .



Prof. Jian Zhao

Rock Engineering, a sequential online course to Rock Mechanics Principles, presented by the same lecturer, is also available on the ISRM website.



EUROCK 2021 - work in progress

Despite difficult and tough times during COVID-19 outbreak, the organisation of EUROCK 2021 is progressing. In the spirit of resuming the conference activity, keeping in mind the difficult times, AGI together with University and Politecnico di Torino are organising the event conservatively and cautiously to face any possible risks pertaining to Covid-19, and relying on the speed and resilience of a new world start, the organising committee of EUROCK 2021 postponed the conference to 20-25 September 2021.

A new venue has been chosen: , namely the ITC (International Training Centre) in Turin, Italy, for greater flexibility in the organisation of the event. Seminars, workshops, and events will be held in a spacious auditorium and more than 280 rooms and suites can accommodate participants and guests. The venue is in the park along the river and well connected with the town centre and hotels.

Six keynote lectures, the 2 Rocha medal lectures and the 2 Franklin lectures of 2020 and 2021 will take place during EUROCK 2021 in Turin. So far 126 abstracts have been received, but with the new submission deadline of 28 February 2021 the organisers are confident that new contributions will be sent.

ISRM NEWS

EUROCK 2021 - work in progress (continues)

AGI has the aim to produce Open Access Proceedings. Since the organising committee are aware of the importance, for academics and authors, of the indexing of their works, the Proceedings will be sent to the indexing services (Scopus, EI and Compendex). A rich social programme and one- or two-day technical visits will be organised after the conference date.

For more information the conference website www.eurock2021.com will be soon updated with the list of keynote speakers and opening lecturer, accommodation and exhibition information.



Other ISRM-sponsored event details

Event title	Start date	End date	Country	City
CouFrac2020: the 2nd Int. Conf. on Coupled Processes in Fractured Geological Media: Observation, Modeling, and Application - an ISRM Specialized Conference	2020-11-11	2020-11-13	Korea	Seoul
SBMR2020 - 9th Brazilian Rock Mechanics Symposium - an ISRM Specialized Conference	2021-04-27	2021-04-30	Brazil	Campinas
9th International Symposium on Geomechanics - an ISRM Specialized Conference	2021-05-03	2021-05-06	Colombia	Medellin
5th Symposium of the Macedonian Association for Geotechnics - an ISRM Specialized Conference	2021-06-10	2021-06-12	Macedonia	Ohrid
5th International Workshop on Rock Mechanics and Engineering Geology in Volcanic Fields - an ISRM Specialized Conference	2021-09-09	2021-09-11	Japan	Fukuoka
EUROCK 2021 - Mechanics and Rock Engineering from Theory to Practice - the 2021 ISRM International Symposium	2021-09-20	2021-09-25	Italy	Torino
ARMS11 - 11th Asian Rock Mechanics Symposium, Challenges and Opportunities in Rock Mechanics - an ISRM Regional Symposium	2021-10-21	2021-10-25	China	Beijing
LARMS 2022 - IX Latin American Congress on Rock Mechanics, Rock Testing and Site Characterization - an ISRM Regional Symposium	2022-05-15	2022-05-18	Paraguay	Asuncion
Eurock 2022 - Rock and Fracture Mechanics in Rock Engineering and Mining - an ISRM Regional Symposium	2022-06-13	2022-06-17	Finland	Helsinki
6th Australasian Ground Control in Mining Conference – AusRock 2022 - an ISRM Regional Symposium	2022-11-07	2022-11-09	Australia	Melbourne
15th ISRM International Congress on Rock Mechanics	2023-10-09	2023-10-14	Austria	Salzburg

EXCITING NEW DIGITAL EVENTS

Earlier this year SANIRE was excited to announce that we were going digital in response to the restrictions placed on movement and gatherings. Thus far, SANIRE has hosted a number of successful online events, such as the Big 5 Webinar and the Resin Bolt Webinar. The online events attracted a few hundred attendees between them. The content was well balanced and technical and some of the presenters even provided a few laughs. Keep a eye on the SANIRE website in order not to miss out on any future events!



SANIRE
SOUTH AFRICAN NATIONAL INSTITUTE
OF ROCK ENGINEERING

BIG 5 WEBINAR

A JOURNEY BY
STORY AND CASE STUDY

**WEDNESDAY
30 SEPTEMBER 2020**
TIME: 11h00

MICROSOFT TEAMS LIVE
Upon RSVP of attendance, a link to the event will be sent to each member via a meeting request

**YOUR SPEAKERS
& presentation topics**



PROF. T. STACEY
In Rock Engineering things are not always what we think they are



PROF. N. VAN DER MERWE
Behind the scenes and lighter moments



PROF. M. HANDLEY
The Hoek-Brown Failure Criterion



MR. P. TERBRUGGE



PROF. D.F. MALAN
The need for in-situ measurements in rock mechanics

RSVP BEFORE 28 SEPTEMBER 2020

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For more information visit
www.sanire.co.za
@SanireOfficial



SANIRE
SOUTH AFRICAN NATIONAL INSTITUTE
OF ROCK ENGINEERING

RADAR WEBINAR

10 JULY 2020
TIME: 13h00 - 15h00
MICROSOFT TEAMS ONLINE
RSVP BEFORE 8 JULY 2020

Raymond van der Berg
tel: (+27) 11 568 2053
email: raymondvdb@mpas.org.za



SANIRE
SOUTH AFRICAN NATIONAL INSTITUTE
OF ROCK ENGINEERING

RESIN BOLT WEBINAR

**WEDNESDAY
21 OCTOBER 2020**
TIME: 13h00
MICROSOFT TEAMS LIVE
Upon RSVP of attendance, a link to the event will be sent to each member via a meeting request

Raymond van der Berg
t: (+27) 11 568 2053
e: raymondvdb@mpas.org.za



SANIRE
SOUTH AFRICAN NATIONAL INSTITUTE
OF ROCK ENGINEERING

Shotcrete Webinar

November 25
Time: 11h00 - 13h00
MICROSOFT TEAMS
RSVP
Mbalenhle Buthelesi
t: (+27) 11 568 2054
e: mbalenhle@mpas.org.za

Agenda
1. Introduction
2. Underground Construction
3. Sprayed Concrete Purpose
4. Sprayed Concrete Materials
5. Sprayed Concrete Process
6. Audit and Optimisation

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ADVERTISING

The SANIRE Committee has decided to increase the advertising opportunities for suppliers who would like to market their business and products in Rock Talk. The table below indicates the prices for different sizes of advertisements. Booking dates for future issues will be communicated.

Please contact info@sanire.com for more details

Newsletter

Type of Advert	Hight	Width	Rate (Ex. VAT)
Full Page	297mm	210mm	R 8000,00
Front Page Tower	165mm	55mm	R 4000,00
Half Page	267mm	90mm	R 2800,00
Third Page Horizontal	90mm	190mm	R 2800,00
Square	60mm	60 mm	R 1000,00

Digital Webinar

Type of Advert	Rate (Ex. VAT)	Comments
10 Minute Presentation	R 5000,00	Limited to 1
5 Minute Presentation	R 3000,00	Limited to 2
One slide advert	R 1000,00	Limited to 4

ESTIMATING SURFACE SUBSIDENCE USING NUMERICAL MODELLING

When an underground opening is created by mining, the roof strata and overburden will deform in order to reach a new equilibrium. The magnitude of the vertical deformation usually decreases with the distance from the excavation, creating a depression zone on the surface that typically extends beyond the edges of the excavation. In the South African mining context, the effect of underground mining on the stability of the surface was of great interest in the 1990s as the high-extraction coal mining methods at the time resulted in significant subsidence. Several authors described methods for predicting subsidence and these methods proved satisfactory. Almost no further development has taken place since that time (Van der Merwe, 2018). Although it was crown pillar failure and not classical subsidence, the Lily mine disaster of 2016 highlighted the significant effect underground mining can have on the stability of surface structures.

Figure 1: Relationship between the maximum subsidence normalised to mining height and the mining depth for coal mines (after Van der Merwe and Madden, 2002)

Historically, subsidence was predicted using empirical models and many of these models predicted the movement using formulae giving no consideration to the actual mechanisms of the ground movement. To develop these empirical methods, extensive field measurements are required. Other solutions are also possible and for subsidence prediction, four general methods were identified, namely the profile function method, the influence function method, the physical modelling method and the numerical modelling method.

Numerical simulation methods include continuum-based methods such as finite element or boundary element methods. Discontinuum methods include discrete element and rigid joint-block element methods. Analysing a subsidence problem with a numerical model has some distinct advantages over empirical formulae as the mechanism of failure can be simulated provided the appropriate simulation tool is used. Accuracy of simulation results nevertheless depends on the input parameters used as well as the ability of the code to replicate the variable properties of the rock mass.

Figure 2: Documented collapse by subsurface erosion (after Van der Merwe, 2018)

Figure 3: Movement zones above a excavation (after Peng and Chiang, 1984)

Figure 4: Idealised subsidence profile for a South African coal mine (after Van der Merwe, 2018)

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ESTIMATING SURFACE SUBSIDENCE USING NUMERICAL MODELLING

Heasley and Salamon (1996) illustrated the capability of a frictionless laminated model built into a displacement discontinuity program called LAMODEL. LAMODEL can be used to calculate the stresses and displacements of mining excavations in thin seam deposits. It can also be used to optimise pillar sizes and layouts in relation to overburden, multiple seam and abutment stresses. The model relies on "homogenous stratification" by simulating the overburden as a stack of homogenous isotropic layers with frictionless interfaces.

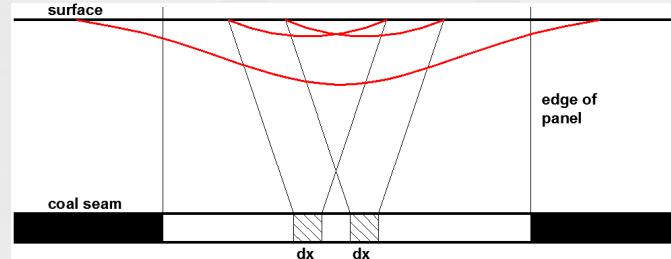


Figure 5: Schematic of the influence extracting a element dx (after Heasley, 1988)

An alternative numerical modelling tool to simulate subsidence is TEXAN, a displacement discontinuity boundary (Napier and Malan, 2007). What makes TEXAN useful is that it can simulate a large number of irregular pillars on a mine-wide scale, it can incorporate off-reef discontinuities and it can simulate the failure of the seam material using a limit equilibrium model. Although it initially assumed an isotropic elastic rock mass, Prof John Napier also recently incorporated a frictionless laminated model in the code similar to the model used by LAMODEL.

This numerical code was recently used to estimate the expected subsidence and maximum tilt angles of an underground operation. The model was used due to the irregular layout of the mine. The mine had a number of design changes throughout its life and hence a number of different pillar shapes and sizes can be found in the layout. The mine also has a number of barrier and other stability pillars scattered throughout the layout. **Figure 6** is a portion of the mesh used to simulate the layout in TEXAN.

The mine is shallow, just over 200 m below surface. The orebody does not have any large geological features that daylight on the surface, while the reef horizon is very competent and strong. Considering the complex mine layout and depth, it would thus be extremely difficult to accurately determine the subsidence profile with empirical methods. **Figure 7** illustrates the simulated subsidence of three modelled scenarios, namely for a purely elastic rock and intact pillars, partial pillar failure simulated by the limit equilibrium model and a worst-case condition with complete pillar failure. Because of the depth, a maximum subsidence in the order of a few millimetres is predicted by the model.

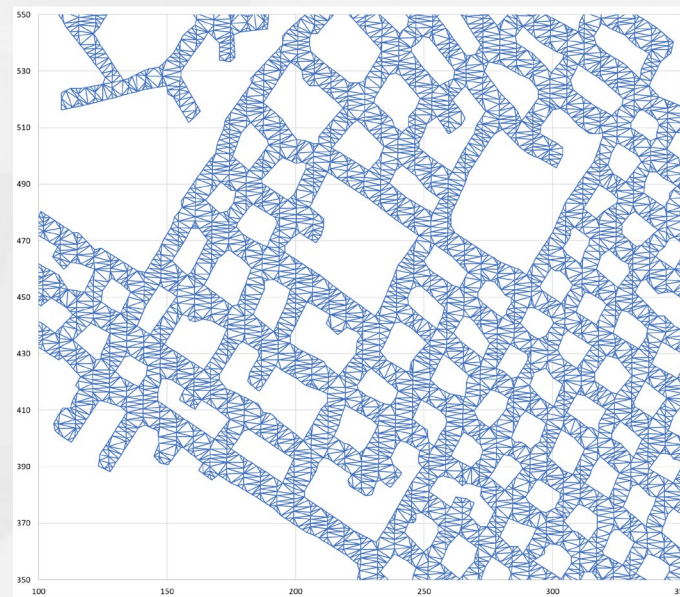


Figure 6: A section of the mine layout simulated in TEXAN

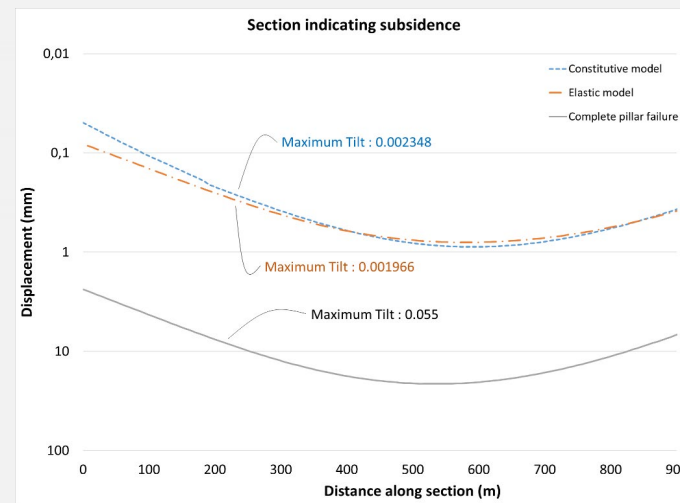


Figure 7: Simulated subsidence for a hardrock bord and pillar mine.)

The numerical modelling of the actual workings with the specialised code TEXAN provides the capability to estimate subsidence for various scenarios. These simulations gave insights into the conditions and expected behaviour of the rock mass at the mine, which n empirical analysis and many other numerical codes would not be able to provide.

References:

After a recent report by Prof DF Malan and Johann Esterhuyse

Heasley, K.A., (1988), Computer Modeling of Subsidence and Subsidence-control methods, Thesis, The Pennsylvania State University.

Heasley, K.A. and Salamon, M.D.G., (1996), A laminated displacement-discontinuity program: fundamental behavior, Fifteenth International Conference on Ground control in Mining, pp. 111-125.

Napier, J.A.L. and Malan, D.F., (2007), The computational analysis of shallow depth tabular mining problems, *Journal of the South African Institute of Mining and Metallurgy*, vol. 107, pp. 725-742.

Peng, S.S. and Chiang, H.S., (1984), Longwall mining. New York: Wiley.

Van der Merwe, J.N. and Madden, B.J., (2002), *Rock Engineering for Underground Coal Mining*, The South African Institute of Mining and Metallurgy.

Van der Merwe, J.N., (2018), Effects of coal mining on surface topography in South Africa — updates and extensions. *Journal of the South African Institute of Mining and Metallurgy*, vol. 118, pp. 777-786.

SANIRE ANNUAL GENERAL MEETING HIGHLIGHTS

On Friday 28 August 2020, SANIRE had another first when it held its first online AGM. The AGM was well attended. It was with sadness that the passing of Mr. L Bronkhorst and Mr. D Hardy was noted. The first point on the agenda was the review of the constitution. A highlight is that provision has now been made for the AGM to be held virtually.

Administration and fees

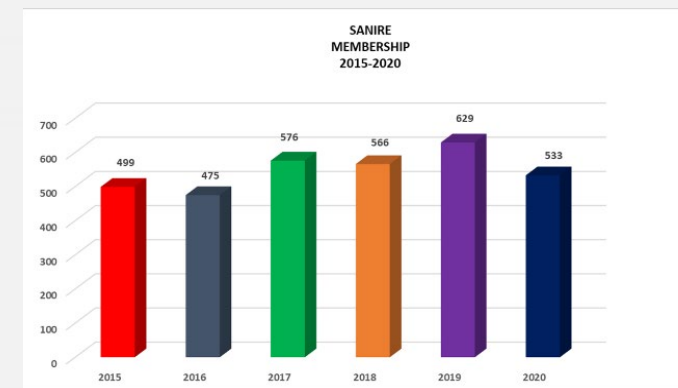
Following the move to an administrative body (MPAS), SANIRE has had a major uptick in many areas:

L. Prinsloo (Vice President) indicated that the year-end financials were finalised within four weeks, and thanked the branches for their timeous submission of their statements.

Membership invoicing had been completed and third-party auditing was being done.

As part of the MPAS management system, the updating of membership details as well as collection of outstanding membership fees has been very successful. Indications are that up to 47% of outstanding fees have been recovered.

As a result of the “cleaning up” of the membership database the total members seem to have reduced compared to the previous years.



As we are all aware, Covid-19 has negatively impacted the financial wellbeing of most mining companies and individuals including SANIRE. SANIRE is always aiming to assist its members and it is for this reason that the SANIRE membership fee will not be increased for a third consecutive year. Members are reminded that the SANIRE membership fee also contributes to their ISRM (International Society of Rock Mechanics) membership fee.

Future education

Aspirant rock engineers should note that the practical examination requirements are changing; the new rules and regulations will be posted on the SANIRE website. A major part of the updated system is the competency matrix and logbook.

Considering the previous practical examinations, the following statistics were made available:

	Nov 2019	July 2020
Candidates	30	24
Examiners	32	26
Session Passes	16	12
New tickets issued	5	6

SANIRE would like to thank all the practitioners that availed themselves and gave their time in order to make the practical exams a success.

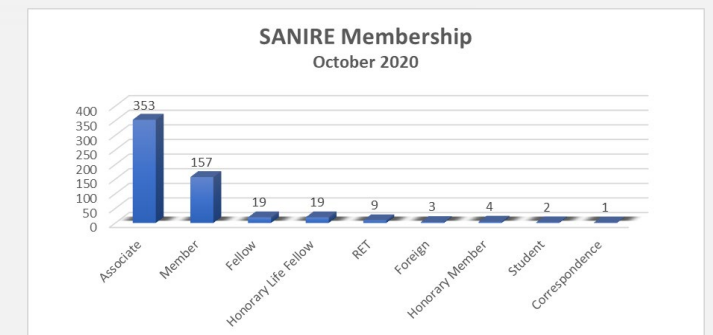
One of the highlights of the AGM is announcing the Award Winners for 2020.

A number of awards were handed out for the best performing students:

SCO Met	Fidel Ndaro
SCO Coal	Khuliso Russell Mufunwaini
RE Paper 1	Oscar Dagume
RE Paper 2	Lydia Lesoko Ditlopo
RE Paper 3.1	Amos Mapuranga
RE Paper 3.2	Yogendran Arunachellan
RE Paper 3.3	Jaco Rademeyer
RE Paper 3.4	Lesego Queen Kebatsetse
UP	JG (Justus) Ngunjiri

MORE ABOUT SANIRE

The present number of individual members registered with SANIRE is shown in the figure below.



STELLAR CONSULTING

Johann Esterhuyse

Cell: 084 654 8409

johann-44@hotmail.com

ROCK STAR



Full Name: Charl William Skinner
Position: Rock Engineering Specialist
Company/Organisations: Seriti Resources, Kriel Colliery
Date and Place of Birth: 2 September 1986, Sasolburg
Education: COM REC Coal, SCO Coal, Mine Overseer Cert Coal, Blasting Cert Coal, CM Cert Coal.
First Job: Learner miner, Bhp Billiton, Khutala Colliery.
Personal Best Achievement/s: Starting a family.
Philosophy of Life: Anything is achievable if you put your mind to it
Favourite Food/Drink: Any meat I can braai. An ice-cold beer.
Favourite Sport: Rugby, hunting and fishing

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

In 2009 I got accepted for a learner miner training programme with Bhp Billiton at Khutala Colliery. After I completed my learnership I was appointed as a production miner in a bord and pillar continuous miner section. After about 2 years I moved over to Goedehoop Colliery as a shift boss and completed my M/O certificate. I spent a total of 5 years in production before applying for a position in the Rock Engineering Department at Kriel Colliery, which at that point and time was still under Anglo Coal. I then completed my SCO and COM REC qualifications. Currently I am the Section Head for the Rock Engineering Department on Kriel Colliery.

Q. Why did you choose Rock Engineering?

I don't think I chose rock engineering, I think rock engineering chose me. I was looking for something different outside of production and at the time rock engineering looked interesting. As I got more exposure to rock engineering, my fascination with the topic grew. Now, I can't see myself doing anything else than rock engineering for a career.

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

I have been fortunate to have been exposed to all types and sorts of coal mining methods in the Witbank/Highveld coalfields. Bord and pillar (CM and drill and blast), dyke development, pillar extraction, longwall, dragline strip mining, truck and shovel pit mining, shaft development sinkholes and subsidence, etc. Currently I have registered for my AREC subjects at Wits, so this will be my next focus area with regards to further education.

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

I believe most of the "good ground" in the Witbank/Highveld regions are getting close to depletion. We need to start thinking outside of the box and start pushing the boundaries when looking at mine designs. Of course, all of this must be done safely and without sacrificing quality. Reserves that were 'un-minable' in the past, will in all probability be our future reserves through innovative mining methods.

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

Hard work will always pay off in the end but in my case paying my dues by gaining experience has served me tremendously well to further my career. Don't sweat the small stuff, do not give up because you are struggling with an exam paper or day-to-day issues on your mine. Keep focussed on your bigger picture end goal and be pragmatic about achieving it.

Q. Who is your role model/mentor?

This is not an easy one, I have learned so much from various amazing leaders in the industry. Some names that have played probably the biggest discipline specific roles thus far in my career will be Lelanie Prinsloo, Wikus Mahne and Graham Priest.

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

Never give an answer if you are unsure, it is better to say you don't know and come back with facts. "Fake it till you make it" does not have a place in our industry – people's lives depend on our integrity and expertise.

EDITORS CORNER

Rock Talk is your newsletter and we would like to hear from you.

If you have any information or stories that we can use, please submit them via email to : info@sanire.co.za

Your feedback will be highly appreciated.



THE SEARCH FOR GOLD IN THE FREE STATE

Very few people have heard of the first borehole sunk in an effort to prove that there were payable deposits of gold in the Free State. This is its story.

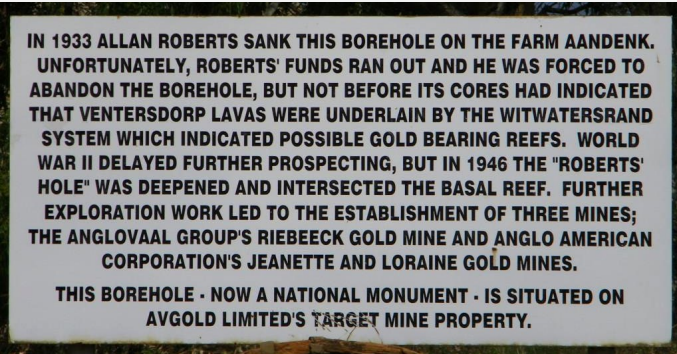
Soon after the major discoveries of the Witwatersrand and its expansion east and west the search went further out into the Free State in the hope of finding the continuation of the reefs. Already in the 1890s there was speculative buying of farms to the south of Klerksdorp over the Vaal.

One of the early prospectors to venture far down into the Free State was Archibald Megson. He noticed an outcrop near the present-day Allanridge on the farm Aandenk which looked very similar to the ones of the Witwatersrand. Geological wisdom at that time told him to dig here and he started to dig a 30-metre exploration shaft. On the way down he found some gold, not enough to start a mine, but enough to make him carry on until he ran out of money. In good old prospector fashion, he placed all his remaining dynamite at the bottom of his shaft to stop other people from interfering with 'his' dig.

And on to the next chapter of the story of the borehole. In Johannesburg, there were two young men who both went to school in Doornfontein and remained friends after school. They were Allan Roberts, a dental technician, and Emmanuel Jacobson, an attorney. They shared a passion and that was to start a gold mine.

For a number of years they had been unsuccessfully searching for prospects. In 1932 they were contacted by Archibald Megson. Subsequently, Roberts and Megson went to the Free State to inspect the shaft and to look at the surrounding area. More than the shaft, Roberts was very interested in the outcrop which he followed for a few miles. He became convinced that this was the 'real' thing.

The next step was to form a company (the Wits Extension Ltd) with a share capital of £50 000. As a consultant they appointed H. Radcliffe-Browne, who had retired from the government service as mine surveyor.



Sign found on the drill site

He went to inspect the shaft and directed that the area be tested by drilling a borehole. That was to be 73 m to the north of the shaft. Thus the credit for the exact position of the hole goes to Radcliffe-Browne.

The drill rig, driven by a steam engine, was in position and started drilling on 23 October 1933. Very soon the drill bits started biting through the hard, crystalline layer of the Ventersdorp lava. Seven months into this, the consulting engineer advised the company to stop. But Roberts and Jacobson said: 'No, we carry on.' They were acting on the advice of Dr. A.L du Toit, a leading geologist at the time. At last, in August 1933, the drill broke through at 829 m into what is called the Ventersdorp sediment. At 1 082 to 1 172 m they recovered core samples containing some gold.

Optimism improved, but at the same time money was running low. In February 1935 they had reached 1 239 m and funds had run out. They had to stop.

For a while this was the end of the search for gold in the area, until Dr. Hans Merensky made a study of the result from the Aandenk borehole. His advice to the Anglo American Corporation was to carry on the search in the area. And when they started putting down boreholes other companies started taking note and instituted their own exploration programmes. All the Anglo American boreholes were unsuccessful, but in April 1939 a borehole by the Western Holding struck it rich at only 348 m at a place just south of Odendaalsrus. That would have been the starting signal for mining in the Free State, but the war intervened and halted further development and exploration and the Aandenk borehole was forgotten for a while but in 1946 it was re-explored and drilling only 122 m further down it struck the reef. And so Loraine mine was born. The town that sprang from that was aptly named Allanridge to honour Allan Roberts as the pioneer of exploration in the area. But it is a town in decline; it did not survive the disinvestment by the mining companies very well.



Loraine mine shaft

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