SANIRE
SOUTH AFRICAN NATIONAL INSTITUTE OF ROCK ENGINEERING

ROCK talk

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SANIRE
SOUTH AFRICAN NATIONAL INSTITUTE OF ROCK ENGINEERING

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EDITOR

Fezekile Mosiane

SANIRE would like to hear from you. If you have any information or content, you would like us to include in the next newsletter, please submit them via email to Fezekilem@Dwarsrivier.co.za and Prudence@SAIMM.co.za Remember to visit all our media platforms.

PRESIDENT'S CORNER

Dear SANIRE Members

For yet another year, the flagship event of the South African Institute of Rock Engineers saw the coming together of industry beacons, young and old all in an interest to share knowledge and keep abreast with industry innovations.

The much-revered SANIRE symposium was held on the 13th and 14th of June 2024 at the Silver Star Casino in Krugersdorp.

This year's event was themed, "Technical Applications in Rock Engineering" and the proceedings were kick started by a welcoming and opening address by Kevin Le Bron, the SANIRE President. This was followed by a keynote address from representatives of the Minerals Council and the Mining Qualifications Authority. The myriad of technical presentations were delivered by seasoned industry professionals and topics spanned from support design, slope stability monitoring, seismicity and everything in between.

The event was once again coupled with the RockBowl, which afforded the youngsters the opportunity and platform to showcase their Rock Engineering know-how and of course earn bragging rights. The RMC practicals was also held at the same venue, the day before the symposium.

Welcome SANIRE President

Kevin Le Bron

Presenters

Award Presentations

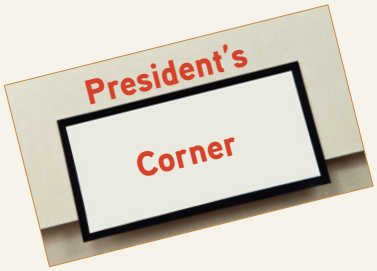







RMC Practical Exams

Delegates and Guests



SAIMM and SANIRE

In April 2024, SAIMM began providing secretarial services to the South African National Institute of Rock Engineering (SANIRE) https://www.sanire.co.za/, following approval by the council in February 2024. These services encompass membership management through the MYMEMBERSHIP platform, coordination of branch meetings and annual conferences, administrative support, and accounting services. Prudence Ntumelang has been re-employed by SAIMM as the SANIRE administrator. This arrangement aims to strengthen the collaboration between SAIMM and SANIRE.

SANIRE operates under a constitution that govern their operations, decision-making processes, and codes of ethics, like the SAIMM. It was established in 1969 as the South African National Group of Rock Mechanics (SANGORM) and became a national group within the newly formed International Society for Rock Mechanics (ISRM). In 1999, SANGORM was renamed SANIRE, reflecting its objective to evolve into a professional institute.

I am often asked about the difference between rock mechanics and rock engineering. Rock mechanics is a theoretical and applied science of the mechanical behaviour of rocks and rock masses. Rock Engineering is the creative application of rock mechanics, mathematical methods, and empirical evidence to the innovation, design, construction, and maintenance of surface and underground excavations. SANIRE primarily focuses on rock engineering in the mining industry, although it also includes members who work mainly in civil infrastructure. In contrast, the ISRM places a strong emphasis on civil infrastructure, while including mining and energy.

SANIRE is actively involved in the education and qualification of rock engineering practitioners in the South African mining industry. The Minerals Council Rock Mechanics Certificates, previously Chamber of Mines Rock Mechanics Certificates are managed by SANIRE on behalf of the Minerals Council of South Africa (MCSA). These are currently the only rock engineering qualifications currently recognized by the Mine Health and Safety Act of 1996 (MHSA). SANIRE is also actively participating in the MCSA Mine Occupational Health and Safety (MOSH) and Fall of Ground Action Plan (FOGAP) programmes, which I mentioned in my April President's Corner https://www.saimm.co.za/journal-presidents-corner/1091-quest-for-zero-harm-in-south-african-deep-gold-mines.

The SAIMM and SANIRE have collaborated in the organization of many successful international rock engineering conferences for more than 30 years. Our secretariat carries out all the administrative requirements and co-ordinates the refereeing of papers, while SANIRE provides the technical expertise. Papers on the management of rockfalls and rockbursts have probably featured in the SAIMM journal from the very beginning. However, the term Rock Mechanics was first coined in the 1960s, when the discipline really started in earnest, and the term Rock Engineering was introduced later. Many groundbreaking papers on the subject have been published in our journal, several preceding the formation of the ISRM. More recently recognition has been given through the award of many SAIMM gold and silver medals to papers on rock engineering. Notable multiple medal recipients include Dick Stacey, Nielen van der Merwe, John Napier and Francois Malan. SAIMM books on rock mechanics and rock engineering include: Rock Mechanics in Mining Practice (Sandor Budavari), Handbook on Hard-Rock Strata Control (Sam Spearing), Rock Fracture and Rockbursts-an illustrative study (Dave Ortlepp), Rock Engineering for underground coal mining (Nielen van der Merwe and Bernard Madden), Theoretical Rock Mechanics for Professional Practice (Matthew Handley), Johannesburg and its Holey Mining Heritage (Dick Stacey and Greg Heath). The recent book by Brian Protheroe entitled COMRO's Legacy: Research and Development of Stoping Mining Machinery and Technologies. https://www.saimm.co.za/publications/saimm-book-sale

President's Corner *(continued)*

The collaboration is further evident because I and four past SAIMM Presidents https://www.saimm.co.za/about-saimm/saimm-past-presidents, (Horst Wagner, Oskar Steffen, Dick Stacey, Nielen van der Merwe) have also served as SANIRE/SANGORM Presidents and ISRM Vice Presidents for Africa. Nielen also served as the President of ISRM from 2003 to 2007, and chaired the 2003 ISRM International Congress in Johannesburg, which was organized by the SAIMM. Past Presidents Pinkie (FG) Hill and Miklos Salamon also made major contributions to the discipline. Several former Brigadier Stokes Memorial Award https://www.saimm.co.za/about-saimm/brigadier-stokes-memorial-award recipients have provided key contributions to rock engineering (Pinkie Hill, Miklos Salamon, Horst Wagner, Dennis Laubscher, and Dick Stacey).

SANIRE held its 2024 symposium https://www.sanire.co.za/ at Silverstar hotel in Muldersdrift from 2024-06-13 to 2024-06-14, which was arranged by our secretariat, and I was glad to attend. The symposium was opened by the current SANIRE President, Kevin Le Bron and the programme included several keynotes: Winning the war on falls of ground, Lerato Tsele, MCSA; Advancing rock engineering skills for a sustainable future in Mining; Thabo Mashongoane, Mining Qualifications Authority South Africa (MQA); Developments in pillar design, Bryan Watson, University of the Witwatersrand. SANIRE also announced the launch of their new education platform. There were several interesting presentations on many topics covering open pit and underground mining, developments in support practice, case studies and an interesting trial on hydraulic fracturing for preconditioning. I certainly enjoyed the conference and learned a great deal. As always, the geotechnical service and rock support suppliers came to the party, sponsoring and providing an illuminating exhibition.

During the symposium, the SANIRE Treasurer, Sifiso Mashile, informed members of the new agreement and highlighted the contribution by the SAIMM secretariat, since the secretarial service commenced. Unfortunately, recent administrative challenges had prevented the reliable collection of membership fees, creating significant cashflow challenges. This has now been resolved through Prudence's timely intervention.

The process of organizing the next international conference on rock engineering in South Africa has commenced, so keep your eye out for announcements, starting with a call for papers. I believe that the new arrangement to provide secretarial services to SANIRE can only improve the collaboration going forward, and importantly, enabling SANIRE to maintains its identity as a leading national group of rock engineering.

W.C. Joughin
President, SAIMM

TREASURER'S BLOG

Dear SANIRE Members

I hope this message finds you well. I would like to express my deepest gratitude to each one of you for promptly settling your membership fees as requested earlier this year, in March. Your commitment has significantly contributed to the rise in our membership count from 279 at the end of March 2024 to 370 by the end of May 2024.

Table 1 below shows an overview of the financial status of the Institute since January to May 2024 as well as the significant role your membership fees have played in strengthening our Transactional account balances.

Your financial contributions were instrumental in the successful organization of the SANIRE 2024 Symposium held earlier this month. The event was a resounding success, attracting a diverse group of delegates and providing an invaluable platform for knowledge sharing and networking.

As we continue to enhance our operations and member services, SANIRE is poised to enhance its operational efficiency through the adoption of new systems. We will be implementing "MyMembership" for managing our membership database and Netcash Payment Gateway for streamlined fees payments. These advancements will ensure smoother processes and improved service delivery to our esteemed members.

Please mark your calendars for the SANIRE Annual General Meeting scheduled for August this year. During the meeting, I will present a comprehensive report on our financial performance for FY2023/2024, discuss the upcoming budget for the 2024/2025 fiscal year, and further details about our new systems.

Thank you once again for your unwavering support and commitment to SANIRE. Your contributions not only aid in the smooth operation of our events but also fortify the growth and sustainability of our esteemed organization.

Table 1

Summary of SANIRE Transactional Account from January to May 2024

Month	Transactional Account Balance (R)	Admin Fees (MPAS/ SAIMM) (R)	Comments
Jan 2024	R16 703	R49 134	Funds on Transactional account very low Poor membership fees recovery Decision NOT to renew MPAS Contract made
Feb 2024	R28 292	R21 259	Letter to suspend Membership with outstanding fees issued
Mar 2024	R102 339	R26 183 +R28 252	MPAS Admin Contract cancelled. Membership fees payments from Members Transition from MPAS to SAIMM Administrators
Apr 2024	R258 564	R56 504	SAIMM took over as Administrator. Symposium payments delegates payments Membership fees payments from Members
May 2024	R325 750	R56 504	Symposium payments delegates payments. Membership fees payments from Members

EDUCATION BLOG

Dear SANIRE Members

In an effort to curb fall-of-ground (FoG) fatalities, the FoG action plan is being implemented through the Minerals Council South Africa, with the assistance of its Rock Engineering Technical Committee, and supported by the South African National Institute of Rock Engineering (SANIRE), the Association of Mine Managers of South Africa, and the South Africa Colliery Managers' Association.

Skills development is at the core of this action plan, with a momentous education project that SANIRE and the Minerals Council are implementing to empower its members and practitioners within the Rock Engineering fraternity.

In collaboration with a leading education technology provider in South Africa (Flex), and Rock Engineering industry experts, the project team has developed a digital Learning Management Ecosystem that will be used to create, deliver and administer world-class learning experiences. The main objectives of this system and wider initiative, is to:

- Improve access to relevant knowledge and learning experiences for industry practitioners
- Improve the quality and level of engagement of learning experiences so that practitioners turn enthusiastic about learning
- Adopt paperless management of examinations, assessments and portfolios of evidence, and
- Produce competent Rock Engineering practitioners that can add additional value to all stakeholders in the mining industry.

With the increased pace of digital transformation, it is of utmost importance that the fundamental pillar of skills development follows this trend, and thus, particular focus has been given to the adoption of digital methods in the training and upskilling of Rock Engineers. This has firstly been enabled through the development of the Learning Management Ecosystem, and will continuously be enhanced with high quality, interactive and immersive learning content.

As part of the first content phase, the curriculum of the Rock Engineering Technical Papers has been revised and turned into digital and streamlined learning experiences that are accessible on the learning system. Access to these learning resources will soon be communicated and provided to SANIRE members.

The project team now has its eyes set on turning this learning content into interactive learning experiences and to support the preparation journey for members aiming to write their professional examinations.

With a multi-year journey envisaged, the SANIRE team, in collaboration with the Minerals Council of South Africa, is extremely excited to make this initiative available to its members and to foster a future of digital, engaging and interactive learning experiences that members would want to partake in.

Here's to unlocking the future of education within our industry that will help bring fatalities to a round zero!

THANK YOU NOTE

SANIRE would like to thank George Brinch for his books donation.

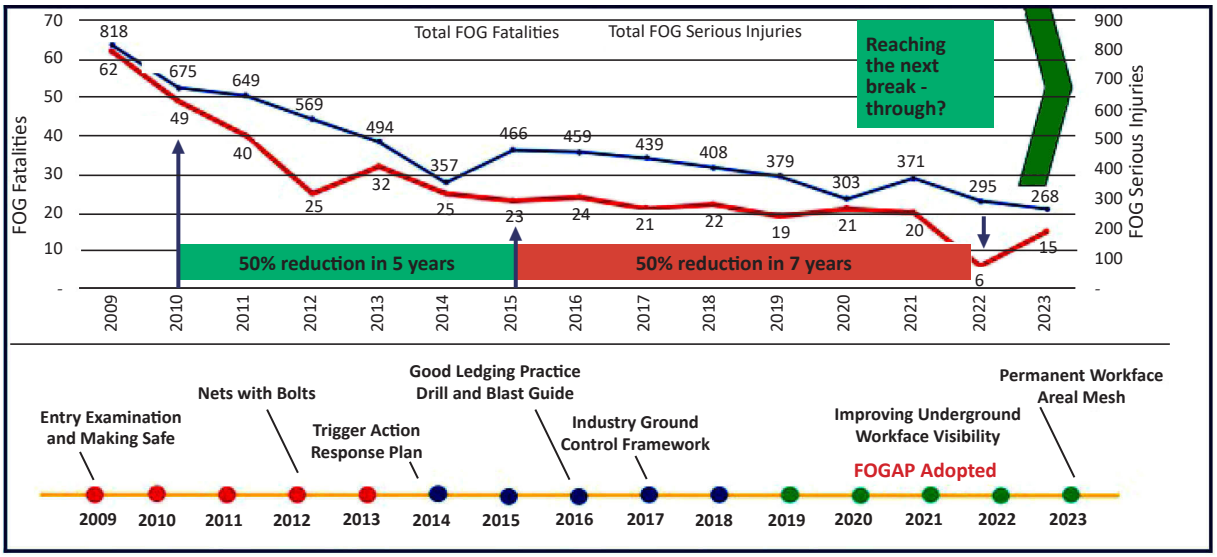
FOGAP DAY OF LEARNING

Elimination of fall of ground fatalities

An action-filled FOGAP Day of Learning held in April packed a punch as the mining industry was challenged to deliver the next step change to eliminate fatalities from falls of ground incidents.

The annual FOGAP Day of Learning was held on Friday, 5th April 2024 at the Emperors Palace Conference Centre. The day was attended by more than 230 people which was made up of delegates and exhibitors, according to the registration desk. There were at least 196 online participants on-line. The in-person delegates represented a diverse cross-section of the mining industry. This was also reflected in the presenters on the programme.

The event was staged around a boxing ring in which presenters and panelists delivered their messages in the fight against FOG-related fatalities and injuries through the adoption of leading practices and technologies. There was little doubt that these interventions are making a difference to the lives of underground crews and their families. FOG was for decades one of the leading agencies of fatalities in South African mining. The unrelenting focus on addressing falls of ground has delivered the step change in the industry's quest for Zero Harm. The number of FOG-related fatalities has reduced by 94% to 15 last year from 239 in 1994. The industry reported a record low of 6 FOG fatalities in 2022, an indication that the FOGAP and earlier interventions are working. The reduction in FOG fatalities and the 91% decline in transport and mining (TMM) deaths to 8 from 87 thirty years ago, have contributed significantly to fatalities falling by 88% to 55 last year from 484 in 1994. While the reduction is commendable and to be applauded, there is more work to be done to achieve Zero Harm and the conference heard about the interventions that are delivering and which were encouraged to be adopted across the underground mining sector. Bolted netting and permanent mesh installations, illumination of working areas, and in-stope drilling guides were the key topics of presentations and the subjects of informative on-site displays by vendors supplying the sector.



The keynote address by **Mzila Mthenjane**, CEO of the Minerals Council South Africa, set the scene for the day. While the mining industry had made significant reductions in fatalities since 2009, halving the number of deaths in a five-year and seven-year period, the challenge was now to eliminate FOG fatalities, he said. As a mining engineer, Mr Mthenjane outlined five proposals to achieve Zero Harm.

- Reinforce widespread implementation of Fall of Ground Action Plan
- Learning and sharing of leading and best practices and research
- Collaboration is key- no one can solve mine safety alone.
- Replicate the successes in FOGAP in other agencies of fatalities and injuries.
- AI and rapidly developing technology are tools that will bring us into a new era in mining.

At the heart of the quest for Zero Harm is the human factor, with the employer committing to safety first, always, while employees committed to "first my life, then my work". In the adoption of new technologies and ways of working, human-centred design and change management are critical.

Regular assessments of employees' adoption and satisfaction with the new technologies identifies gaps and areas for improvement. Keeping pace with innovation by updating employee skills will match the evolving technological landscape. Technology must be integrated into the fabric of organisations and into the day-to-day lives of employees, with robust data infrastructure.

Vuyisile Sithole, Underground Manager at Sibanye-Stillwater, outlined the company's reasons and journey to install permanent blast-on steel mesh at different mines, using the Masakhane shaft at the Driefontein gold mine as an example because of its high levels of falls of ground. Sibanye-Stillwater has successfully implemented three types of permanent blast-on mesh across the different shafts:

- Geobrugg Mesh
- LAW Mining Steel Nets and Rope Nets.

At the Masakhane shaft, which has experienced a large number of gravity and dynamic-related falls of ground incidents, Sibanye-Stillwater has during the past three years worked tirelessly on enforcing proper entry examination and safe declaration, barring practices, marking and drilling practices, mining lay-outs and reporting of poor ground conditions through the TARP process. The next phase to achieve Zero Harm is the installation of permanent in-stope steel netting. The primary focus on permanent mesh installation is to eliminate all rocks from falling uncontrolled (reactive control) and ensuring that the integrity of the stope or any other excavations on the reef plane are secure and supported until the life of the specific excavation expires (effectiveness control). Permanent mesh is to deal with such controls. "The first and most important advantage is we are saving lives," said Ms Sithole. Masakhane shaft – Driefontein Falls of Ground events Permanent netting – lived experiences at Sibanye-Stillwater and Harmony Gold demonstrates the merits outweigh the costs examples of post-seismic events at Masakhane where the nets have caught falling rock. The high-tensile steel permanent nets are expensive compared to the temporary and reusable nylon nets, with extra hydra bolts to pin the net with steel plates to properly tension the mesh but cost but this is offset by the benefit of minimizing accidents and stoppages, said Ms Sithole.

Harmony Gold's Mponeng Mine, the world's deepest mine, South Africa's largest gold miner has recently introduced permanent workface netting as well as in-stope illumination as operations reach more than 3.8km below surface. The deeper the 38-year-old mine becomes the more the hazards increase, said **Ronald Mulaudzi, Mponeng Mine General Manager.** Mponeng experiences more than 800 seismic events a day. The mine, which has produced 429 tonnes of gold, records about 200 seismic events a year with a magnitude greater than 1.0. The mine has a life up to 2045 and it is essential that miners' safety is protected. As at end-December 2023, the mine had two consecutive fatality free years. Harmony switched to permanent workface steel netting from nylon throughout the mine in the middle of 2021 at a cost of R46 million. "Permanent workface netting did not solve all our problems – but I have seen it save many lives. We believe that improved workface visibility is the next step in our journey to being injury free," said Mr Mulaudzi. The benefits of illumination are:

- Improved hazard identification
- Improved hazard communication in the workplace
- Improved physical conditions
- Improved control performance (support).

Mining crews have responded well, with morale boosted and a willingness to install the lights, which takes less than half an hour. Harmony noted that strata control compliance increased from 56% to 92% (test crew). However, the threats include the novelty of technology for in-stope illumination, limited product choice and limited legislative guidance. “Each new implementation of a leading practice brings us closer to our goal of Zero Harm,” Mr Mulaudzi said. “We can't just sit back and say we've arrived. We need to constantly seek additional ways on how we can enhance the manner in which work is conducted as well as the safety associated with that activity."

Rock Drill Guides and Robocop suits **Mandla Msiza, Senior Manager Operations at Sibanye-Stillwater**, outlined the merits of using in-stope drill guides as a valuable tool in the Falls of Ground elimination strategy at a mine, helping miners work more safely and efficiently in challenging underground conditions. In conventional stoping, drilling accuracy is crucial for both safety and productivity. Drill guides also known as jigs, ensure that drill holes are consistently placed at the correct angles and positions, reducing deviations from the planned drilling pattern by drilling accurate, straight and parallel holes. Precision drilling results in a straight face, better consistency in broken

rock, and less waste. It also prevents drilling into the hanging wall and footwall, damaging the strata, Mr Msiza said. Drill guides are typically equipped with adjustable components to accommodate different drilling angles and positions. Drill guides may include supports, clamps, and stabilising features to secure drilling equipment in place to improve accuracy and fatigue management. Sibanye-Stillwater is testing hydropower drills at its Burnstone gold mine. The drills and rigs use hydropower to push the drill forward quickly, about 20% faster, and weigh less than compressed air-powered drills. “The old drill operators said these things weren’t going to work. By the time we finished training on the second day, the crews were demanding to have these drill and jigs in their panels today! That’s how much they love these things,” said Mr Msiza.

Taygan Nadar, from University of Johannesburg, presented the results of a muscle assessment study on three exoskeletons. He conducted a study to measure the muscle activation of six miners who used different exoskeletons as they held and operated long, heavy pinch bars as they would do during underground barring. Other industries use exoskeletons to assist people who have to use their arms in elevated positions for prolonged periods. The exoskeletons are designed to provide support and stability to the operators’ joints. In this case it was to lift and operate the pinch bar. The tests were expected to show that the muscles would require less effort in this task. It was found during the assessment that the exoskeletons reduced muscle activation, while increasing the strength and endurance of the miners. Mr Nadar also conducted two additional tests to demonstrate the benefits of the exoskeletons through an isokinetic strength test and a static hold test. He concluded that the exoskeletons increased the force output, the strength endurance, and the joint stability of the miners. However, there are disadvantages such as comfort and fit.

Londolani Rampfumedzi, President of SACMA who a coal miner with 20 years of experience , shared his personal story in his closing address of the tragedy of losing a colleague to a fall of ground incident and how it motivated him in the fight for Zero Harm. He highlighted the importance of technology, innovation,

collaboration, and education. “There's a lot of technology that we can adapt for our needs to make mining safer, whether it is from other industries or organisations. Technology and innovation are always improving,” he said. He challenged the coal industry to participate more in the work within FOGAP and to learn from mining companies in other commodities. He expressed his conviction that the fight against fall of ground is a fixed fight that can be won with collective effort and belief. “We will continue this fight. We will not be tired out by how many rounds this fight is going to last. We will win it."

Kevin Le Bron, President of SANIRE attested to how beneficial participating in FOGAP and the Day of Learning has been on a personal level, providing insights into leading practices for mitigating falls of ground. The knowledge gained not only serves to broaden my expertise, but also empowers me to contribute more effectively to industry projects and discussions. The FOGAP and Day of Learning, are thought to have a profound impact on the industry at large, serving as crucial platforms for knowledge exchange, networking, and collaboration among professionals, researchers, and all stakeholders in the mining industry. By inculcating a culture of continuous learning and innovation, these initiatives contribute to elevated industry standards, enhanced safety protocols, and the development of sustainable solutions for rockfall challenges. In summary, the FOGAP program and the Day of Learning are pivotal drivers of progress and resilience in the mining industry. Their positive impact extends to individuals and the broader industry, shaping a landscape of continual improvement and innovation.

Stuart Sepetla, President of AMMSA, elaborated that the organization’s view is that FOGAP, as a CEO-led safety initiative in the mining industry, provides a united front in our battle with falls of ground and will help us achieve Zero Harm. The programme not only provides a platform for directing research into the various falls of ground agencies and controls but it also brings together role players like AMMSA, SACMA, SANIRE and others to collaborate and find common solutions that cut across the industry. The opportunity to interact and learn from each other’s operations and various research organisations must not be underestimated. These Days of Learning have an important role to ensure that the initiatives are properly communicated and where we share our success in achieving our common goal of zero loss of lives in the mining industry.

SANIRE BRANCH MEETING

FreeVaal Branch

Greetings from the FreeVaal Branch

As seasons change from summer to autumn, winter has dawned upon us with its icy tentacles. But it is with a warm heart that I can report that since the last quarter, the FreeVaal branch have had the privilege of being part of the following:

Branch meeting

A successful branch meeting was held on 11 April 2024 with attendance by 47 SANIRE members including representation from the branch(es), Rock Engineering personnel as well as suppliers. Currently the ratio between RE and suppliers is 21% versus 79% (We hope that this will certainly change in the future) It was hosted at Parys Gold Estate with successful presentations by several suppliers including Leica, CAT Mining and Provest (with inclusion of physical collaborated demonstration by Rock Support Systems (RSS Grout) and M&J Mining on their long anchors grout testing (GET).

Strata Control Practical Examination

A collaboration of Gauteng and FreeVaal branch to host the Strata Control Practical examination at Beatrix 3#, Sibanye Stillwater Operations, was conducted successfully with Mr. Hannes Moller as examination host. Despite the unfortunate loss of life the previous day, the company was gracious enough to allow the seven candidates to continue with the practical examination.

Symposium

And finally, the inclusion of our members and joint suppliers presenting and networking at the SANIRE Symposium held in June at Silver Star Casino. It was a proud moment seeing so many of our members and suppliers there as well.

As we progress through the seasons of life and work, changes will be there to provide an opportunity to learn and grown. Let us celebrate the good with the bad, because they both work together to prepare you for the next season of your life (Credit – Theresa Lewis)

Be the best you can be, providing the most of what you can offer.

ROCK talk

THE NEXT ROCK Star

Full Names: Nkgatsana Lebogang Baloyi

Company: Glencore Alloys (Eastern Chrome Mines)

Designation: Strata Control Officer

Date and Place of Birth: 23 January 1989, Polokwane, Limpopo

Educational Qualification: BSc. Mining Engineering (Wits), Blasting Certificate COM SCC & COM RMC (Hard Rock), MSc. Mining Engineering Candidate (Wits)

First Job: MQA Vacation Work Student, Anglo Gold Ashanti, Mponeng Mine

1. **What would you consider as your biggest career faux pas to date ad what lesson/s have you learned from it?**

   We sometimes make mistakes or decisions that we later regret. I regret not listening to my gut instinct early on making important career decisions and failing to clearly set or define my career priorities. My approach has certainly improved over the years, and I am now more intentional about setting fulfilling career goals which allows me to recognise pros and cons of making different career moves.

2. **What motivates you to get out of bed in the morning?**

   Every day is an opportunity to work on being a better version of myself, so I would say what motivates me is remaining grateful to have another chance to expend my best ability in all I do.

3. **What is your favourite quote (why)?**

   "Be yourself, an original is worth more than a copy"- Unknown.

   I think in life you should be true to your core identity, don't attempt to be different for others, don't fake it.

4. **What is your personal song (why)?**

   All-time favourite is Lady Antebellum- When you got a good thing. I am just a hopeless romantic and a softie on the inside.

5. **What is your favourite movie?**

   Gifted Hands: The Ben Carson Story.

6. **If the story of your life were to become a biopic, what would the title be?**

   Grateful.

7. **If the story of your life were to become a biopic, which famous actor or actress would play you?**

   Mahershala Ali.

8. **What is the best vacation you've been to or plan on going to?**

   Tanzania, Zanzibar.

9. **Do you have a favourite newspaper, blog?**

   I don't have favourite newspaper, but I do check various platforms with what is happening in the world and around me, LinkedIn, Twitter or Facebook.

10. **How do you unwind?**

    Music helps me to calm down and relax. A glass of wine with good music is always a good combination.

11. **What is your greatest fear?**

    While death is an inevitable fate that humans face, losing a loved one to death is my greatest fear.

12. **What is your hidden talent?**

    I have good research and problem-solving capabilities.

13. **What is the one thing that very few people know about you?**

    I am easy going and not as serious person as people think I am lol.

14. **If you could interview one person (dead or alive) who would that be (why)?**

    Elon Musk. He is highly determined and perseveres through tough times to make his unique ideas work. His story of self-reliance and achieving greatness is inspiring. I think his mind works on a completely different frequency to everyone else, somewhat crazy but genius.

15. **If you could only drink one beer/cocktail for the rest of your life, what would it be?**

    Heineken

16. **If you were an animal, what would you be (why)?**

    Elephant. It is a gentle giant that is strong and resilience, with capacity to endure and overcome adversity.

17. **If you were on death row, what would your last meal be?**

    Simple comfort food for my soul, Pap & hardbody chicken.

18. **What do you want to be remembered for?**

    I would like to be remembered as a person who encouraged people to live their truth because they can only do this life thing once.

19. **If you were stuck on an island what three things would you bring?**

    Food, books, and good company.

20. **If you were a rockstar, what would your stage name be?**

    "Billie Blue", I love the vibe that comes with the name.

21. **Growing up, what was your dream career?**

    I always wanted to be a doctor, but there were doctors already in the family and I thought maybe why not an Engineer.

22. **Why did you choose Rock Engineering as a career?**

    I started my career as a Mining graduate in production. While in production, I yearned for a technical field within the mining discipline where I can apply my mind more differently, so I took a chance on Rock Engineering. In university, I always had great interest and passion for Rock Engineering and performed well in the subject. I would always excel in rock engineering related projects. My interest was sparked from there and I am glad to have taken the decision to become a Rock Engineer. I find it challenging, mentally stimulating and keep me up on my feet.

23. **What are 3 words to describe Rock Engineering?**

    Design, Support & Stability.

24. **What do you find the most challenging in Rock Engineering?**

    The most important aspect a Rock Engineer should pay attention to is design. The variable rock mass conditions and properties always present a level of uncertainty and risk, which can affect the reliability of the structures we design in rock. If we can have a better understanding of the rock mass behaviour and predict rock failure modes early before they occur, it will bring a lot of ease and improvement. It is important to be less conservative in our design approach, which can be achieved by collecting sufficient geotechnical data and apply our minds to produce designs with acceptable levels of uncertainty and risk.

25. **What do you like most about Rock Engineering?**

    I like that there is a lot of rock engineering technological advances and leading practices that are implemented in most mining operations to ensure safety and safe working environments. I think that we have greatly evolved with how we do things to add value to the industry and brought a lot of improvements to mitigate the risk associated with rock related hazards. However, there is always room for improvement, with more research and studies required to be done to further bring change and more value to the mining industry.

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

    Rock engineering offer a wealth of opportunities for innovation and development, more research and studies can be done to have a better understanding of the behaviour of the rock and failure. This will reduce the uncertainty and risk associate with the design aspect of things. Most mines need to embrace technology, advancing the knowledge and technology of underground space utilization. It is exciting to see the effort and work put into improving the education, training, and mentorship of future rock engineers by SANIRE. I think the future is very bright and I am excited about that.

27. **What is your view on the continued loss of critical Rock Engineering skill in South Africa?**

    The industry already lacks enough rock engineers, and many more will find themselves working alone, with little experience, and with lower levels of competence than their peers because of the no guidance. Most candidates for strata control and rock engineering certificates have very poor pass rates, and the combination of this low pass rate, shortage, and insufficient experience or competency increases the risk and uncertainty to the mining operations.

28. What solutions would you propose to abate this looming problem?

It is necessary to establish a space where senior rock engineers with more expertise can impart their knowledge and abilities to junior or younger rock engineers. This can be accomplished through mentoring; it is the responsibility of senior rock engineers to offer their services as mentors to aspiring young engineers. Maybe, the pass rate can improve, and we can have more competent Rock Engineers placed at mining operations.

29. Who is your role model/mentor? What is the best advice you have ever been given?

My mother is my role model, she is a strong, independent, and resilient person. She took care of me and my siblings on her own and she is my super woman.

Greatest advice I have ever received, "challenges are opportunities for growth. Rather than shying away from them, embrace them head-on." I think that as people we come across various challenges in our lives and is the acceptance part that makes it easier to deal with. Instead of saying why me, ask yourself why not me.

30. What advice would you give to someone who wants to choose Rock Engineering as a career?

Rock engineering is not an easy qualification to obtain, it's hard. Regardless of how many times you fall, get yourself up, go back to the drawing board and try again and again. The spirit is in never giving up, you only fail if you stop trying.

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