

SNAPSHOT

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Issue 14

SNA CIVIL AND STRUCTURAL ENGINEERS
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A CALL TO ALL OUR CYCLISTS!

Next year on the 10th March 2024, SNA would like to participate as a team.

And as with everything there are qualifying criteria, as this is a gruelling 109km race, with lots of ups, more ups and a few downs.

If you are interested in joining the SNA Cycling Team; you need to have done/are planning to do at least two 60km races in this year.

Sign-up by emailing
roberts.a@sna.co.za



2023 CAPE TOWN CYCLE TOUR

By Ashleigh Roberts

On the 12th of March this year was one of the biggest cycling races in South Africa. From its infancy in 1978, the Cycle Tour set standards in world cycling, and world sport.

Bill Mylrea and John Stegmann wanted the first race to be a mass-participation event, open to all who wanted to enter. That second bit was important: the Department of Sport would only sanction the idea if their proviso that it only be open to white participants was met. Bill Mylrea was having none of it though and wrote the department's representative an extremely polite letter in the build-up to the event, telling him that this was a non-segregated event. This was a brave move in the late 1970s, when BJ Vorster and PW Botha were in power. But the spirit of cycling, and its inclusivity, prevailed, and on 28 October 1978 over 500 cyclists left the start line outside the Castle in Strand Street.

It was the first time that the average Joes (the likes of you and me) would race the same course at the same time as the officially sanctioned racing cyclists. The world and national governing bodies were, and still are, dead set against this happening. But the organisers were and are determined to have a celebration of cycling for all cyclists, so the split-group arrangement was instituted to great effect. The event would separate the two well into the 1990s. The federations are still, regularly, threatening 'their' riders with dire consequences if they ride this unsanctioned monster, 45 years later. Thankfully, sense prevails each time, unmentionables are unknotted and the biggest timed bike race in the world marches on.



Our very own MD participated in his 9th Cape Town Cycle Tour this year and finished in a cool 6 hours and 12 minutes with an average speed of 17.6km/h. Well done Johan Stoltz!



UPCOMING AND CURRENT PROJECTS

By Johan Stoltz

SNA has been blessed with the following projects, in each of our offices.

PRETORIA:

SANRAL:

- R510 NW Border to Bierspruit - Supervision
- R511 Beestekraal to Limpopo Border - Supervision
- N17 Oshoek - Supervision
- R730 Welkom Package A& B - Supervision
- N2 Ibika to Tetyana - Design
- N2 Dutywa Ring Road - Design
- R37 Lydenburg to Sabie - Design
- R72 Alexandria to Port Alfred - Design
- N3 Upgrade of the Marianhill Toll Plaza - Design
- N2 Bushveld Retreat to Hluhluwe - Design
- EB Cloete Interchange - Design Advisory
- Paradise Valley - Design Advisory
- Edwin Swales - Supervision and Design Advisory
- Ad-hoc Structures - 4 Design & 4 Supervision

TRAC:

- MDC 4 D&E Alzu - Design
- MDC 9 Karino to Mora - Design
- MDC 10 - Mara to Kaapmuiden - Design
- Nelspruit Bypass - Supervision

Other Clients:

- Hillshorn Retirement Village - Design
- Kanyamazane Transport Facility - Design
- GeroTek Concrete testing Facilities - Design
- Reserve Bank - Design & Supervision
- Gautrain - Design and Supervision
- RBIDZ - Alumina Allee Road Failure Investigation

CAPE TOWN:

SANRAL:

- N2 Swartklip to Baden Powell - Design

Western Cape Government:

- Malgaten River Bridge - Supervision
- Montagu - Supervision
- Mossel Bay to Oudtshoorn - Design & Supervision

BLOEMFONTEIN:

SANRAL:

- R56 Erosion Protection - Design
- R56/4 N6 to Dordrecht - Supervision
- R56/5 Dordrecht to Indwe - Supervision
- R58/4 Aliwal North - Lady Grey Supervision
- R58/5 Lady Grey to Barkley East - Supervision
- R58/5 Slope Stability - Supervision
- R390 Craddock to Hofmeyer - Supervision
- R390/R63/N10 Slope Stabilisation - Supervision
- R61 All Saints to Biziya - Supervision

Other Clients:

- Chicken Broiler Abattoir - Supervision

PRETORIA LAB:

Site Labs - SANRAL:

- N14 - Kuruman
- R573 Molteno
- R510 Bierspruit
- R61 Mthatha

RICHARDS BAY:

Site Labs - Other Clients:

- Fairbreeze Mine - Tronox
- Upgrade D1559 Nhlabane Road - Afriscan



A heartfelt **thank you** for everyone's **hard work** and **dedication!** Without you none of this would be possible!

INSIGHT INTO ESCA PROFESSIONAL REGISTRATION OUTCOMES

By Tronél Candiotes-Strydom

During ESCA’s professional registration, everyone is evaluated against the same 11 Outcomes. These 11 Outcomes are divided in 5 Groups. This article focuses on the first Group, which is GROUP A - Engineering Problem Solving (Knowledge-based).



Developmental objectives:

- Outcome 1: Define, Investigate, Analyse Engineering Problems
- Outcome 2: Design or Develop Solutions to Engineering Problems
- Outcome 3: Comprehend and Apply Advanced Knowledge
- Outcome 4: Manage Part or all of an Engineering Activity
- Outcome 5: Communicate Clearly
- Outcome 6: Recognise and Address Social, Cultural, Environmental Effects
- Outcome 7: Meet Legal and Regulatory Requirements
- Outcome 8: Conduct Engineering Activities Ethically
- Outcome 9: Exercise Sound Judgment
- Outcome 10: Take Responsibility for Decision Making
- Outcome 11: Undertake Professional Development

However, there are subtle differences such as:

- ❖ Engineers are expected to solve Complex Engineering Problems;
- ❖ Technologist are expected to solve Broadly defined Engineering Problems;
- ❖ Technicians are expected to solve Well-defined Engineering Problems; and
- ❖ Lab Managers & Road Safety Auditors are expected to solve specifically defined Engineering Problems.

These Outcomes have different Degrees of Responsibility, these are as follows:

Degree of Responsibility	Nature of work: the Candidate	Responsibility of Candidate to Supervisor	Extent of Supervisor/ Mentor Support
A: Being Exposed	... undergoes induction, observes processes, work of competent practitioners	No responsibility	Mentor explains challenges and forms of solution
B: Assisting	... performs specific processes under close supervision	Limited responsibility for work output	Supervisor/Mentor coaches, offers feed back
C: Participating	... performs specific processes as directed with limited supervision	Full responsibility for supervised work	Supervisor progressively reduces support, but monitors outputs
D: Contributing	... performs specific work with detailed approval of work outputs	Full responsibility to supervisor for immediate quality of work	Candidates articulates own reasoning and compares it with those of supervisor
E: Performing	... works in team without supervision, recommends work outputs, responsible but not accountable	Level of responsibility to supervisor is appropriate to a registered person, supervisor is accountable for Candidates decisions	Candidate takes on problem solving without support, at most limited

These Outcomes also require different Competency levels, which are as follows:

- ❖ *4 Capability:* Applicants/candidates must demonstrate that they have the capability, independently or (at most) with limited guidance, of performing the process and making the decisions required to reach the objectives of each element and also that they have the capability of leading or supervising others in the process.

- ❖ *3 Experience:* Applicants/candidates must demonstrate that they have, independently or under supervision, performed the processes relating to each objective. Experience of the relevant techniques and functions must be gained.
- ❖ *2 Knowledge:* Applicants/candidates must demonstrate that they have sufficient knowledge of how to carry out the processes that are necessary to meet the objectives.
- ❖ *1 Appreciation:* Applicants/candidates must demonstrate that they have a general appreciation of the subject matter as well as of the reasons for its inclusion in the training programme.

Based on the Group A's required outcomes the below is expected:

OUTCOME 1: DEFINE, INVESTIGATE AND ANALYSE WELL-DEFINED ENGINEERING PROBLEMS

All the following are required for Outcome 1:

- Experience and/or Capability to define, investigate or analyse well-defined engineering problems, having taken responsibility at level E;
- Experience and/or Capability in defining or formulating engineering problems, leading to an agreed definition of the problem to be addressed, having taken Responsibility at level E;
- Experience and/or Capability in investigating engineering problems including, collecting, organising and evaluating information, having taken Responsibility at level E; and
- Experience and/or Capability in analysing engineering problems using conceptualisation, abstraction, modelling; identifying and justifying assumptions, limitations; constraints, premises; using analytical methods both mathematical and non-mathematical and evaluating result of analysis, using judgement; expressing an understanding emerging from the analysis, having taken Responsibility at level E.

OUTCOME 2: DESIGN OR DEVELOP A SOLUTION TO ENGINEERING PROBLEMS

All the following are required for Outcome 2:

- Experience and/or Capability in designing or developing solutions to well-defined engineering problems, having taken Responsibility at level C and/or D; and
- Experience and/or Capability in systematically synthesising a solution to a problem, having taken Responsibility level C and/or D.

OUTCOME 3: COMPREHEND AND APPLY KNOWLEDGE: PRINCIPLES, SPECIALIST KNOWLEDGE, JURISDICTIONAL AND LOCAL KNOWLEDGE

All the following are required for Outcome 3:

- Experience and/or Capability by displaying mastery of understanding of engineering principles, practice and technologies in the practice area, having taken Responsibility at level E;
- Experience and/or Capability by applying general and underpinning engineering knowledge to support analysis and provide insight, having taken Responsibility at level E;
- Experience and/or Capability by using fundamentals-based, first principles analytical, approach building models as required, having taken Responsibility at level E;
- Experience and/or Capability by displaying working knowledge of areas that interact with the practice area, having taken Responsibility at level E;
- Experience and/or Capability by displayed a working knowledge of interacting disciplines (engineering and other) to underpin teamwork, having taken Responsibility at level E; and
- Experience and/or Capability by applying related knowledge: statutory, safety and management, having taken Responsibility at level E.

We wish everyone who is partaking in this process the best of luck! If you need more guidance or clarification please consult with Lia Blomerus (blomerus.l@sna.co.za) or Albert Jacobs (jacobs.a@sna.co.za).

LAB SITE STAFF INTRODUCTIONS

By Hendrik Diederiks

R.056-010-2013/1C-SL

R56 Steynsburg Site is a SANRAL Project which entails special maintenance of National R56 Section 1 & 2. Our laboratory is providing services for Quality Assurance on site; they are doing different types of tests such as: BSM, Asphalt, Indicator, CBR, Concrete, ect. The completion of the site is expected by the end of October 2023.



Back Row from Left: Joel Nhleko; Lindo Tshabalala; Karel Mokwena; Jabulani Dlamini; Justice; Sandile Spilito; Kamva Oliphant; Lydia Pato; Zuko Kulana; Mandla Mkwana; Lukholo Gxalaba and Mbasa Lande.

Front Row from Left: Enricis Jansen -; Unathi Ngqola; Ignatius Malebye; Thembeke Fuzani; Noma-Afrika Sigwinta and Mvuyisi Mapango.

R.061-070-2020/1S

Another SANRAL project for the upgrading of National Route R61 Section 7 from Baziya (km 12) to Mthatha Airport (km39.39). Phase 1 of the project comprises strengthening and widening of National Route R61 section 7 including replacement or widening of major culverts and bridges and all road furniture.



Back Row from Left: Jackson Komani; Bongile Gxakoshe; Mkhululi Dama; Vathiswa Gwebani; Philani Latsha; Wellington Mgodeli; Busisiwe Zide and Athaniel Ramaghosi.

Front Row from Left: Gerald Farmer; Albert Lesheke; Nakiswa Masaka; Sandisiwe Mooi; Nkosinathi Mdunyelwa and Collin Farmer.

LAB SITE STAFF INTRODUCTIONS

By Hendrik Diederiks

R.510-012-2016/1F

A SANRAL Project involving the Improvement of National Road R510 Sections 1 & 2 From Northwest/Limpopo Border (Km 72.0) To Bierspruit (Km 6.3).



Back Row from Left: Kruger Pretorius; Elias Lesolo; Collen Tshebetshebe; Johannes Rasekgokga; Patrick Nyalungu and Aphiwe Zondani.

Middle Row from Left: Lefa Modiba; Karabo Ramaphakela; Cornelius Lekubu; Serame Mookwa and Asiphe Mtebele-Mjulwa.

Front Row from Left: Richard Mnguni and Labron Tshwale.

Tronox Mine - Richards Bay

Tronox Fairbreeze Mine Expansion Project: ERSF Civil & Earthworks. Essentially the project consist of the expansion of the mine settlement dam and connected infrastructure (ERSF = Everglades Reserve Storage Facility).



Back Row from Left: Nokubonga Ncamisile Zulu; Skhumbuzo Daniel Mathebula; Sifiso Mchunu; Zakhe Goodman Mthembu; Jeremia Muziwakhe Thabethe; Sakhiseni Godfrey Mthembu; Ayanda Wonderboy Mthethwa; Theunis Cornelius Stroebel and Tanya Mulder.

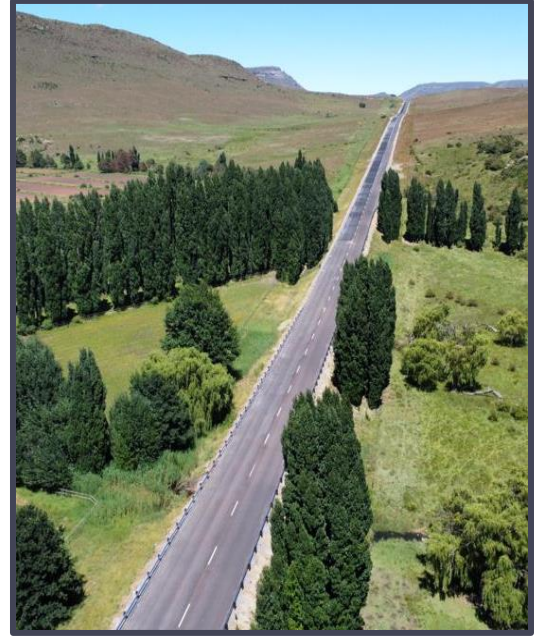
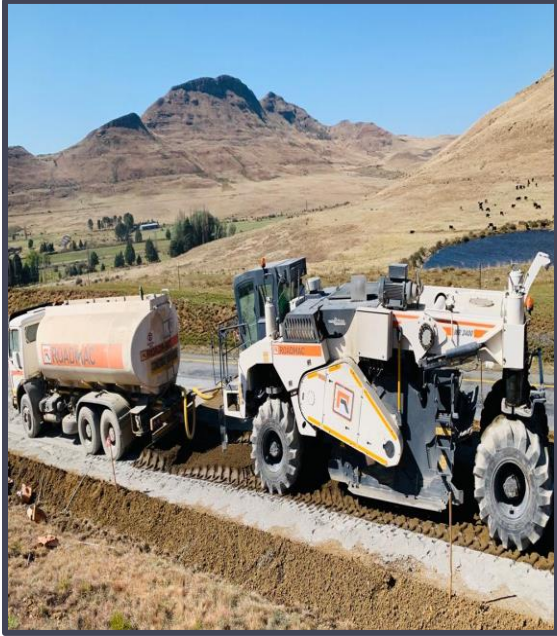
Front Row from Left: Sandile Mondli Gema and Khumbulani Moses Thabethe.

Inset photos from Left: Morne Mulder and Isaac Tshimane Lebudi.

R.056-040-2016/1 & R.056-050-2016/1

From Sean Nortier

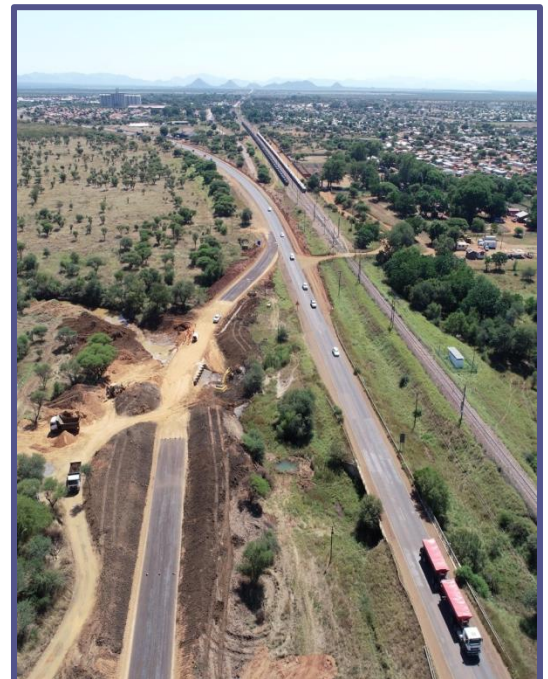
The Special Maintenance of R56 Section 4 from National Route N6 (Km 0) To Dordrecht (Km 35.3) & Section 5 from Dordrecht (Km 0,0) to Indwe (Km 36,7). Photos from left to right: In-situ Recycling in process; In-situ Recycling material mixing and Temporary seal completed.



R.510-012-2016/F

By Japie Knoetze

R510 from Limpopo/North West border to Bierspruit. Photos from left to right: Box cut and Roadbed on Section 1(LHS) - Permanent Works; Temporary Bypass at Phufani Bridge(B0506); and Temporary Bypass at Phufani Bridge(B0506).

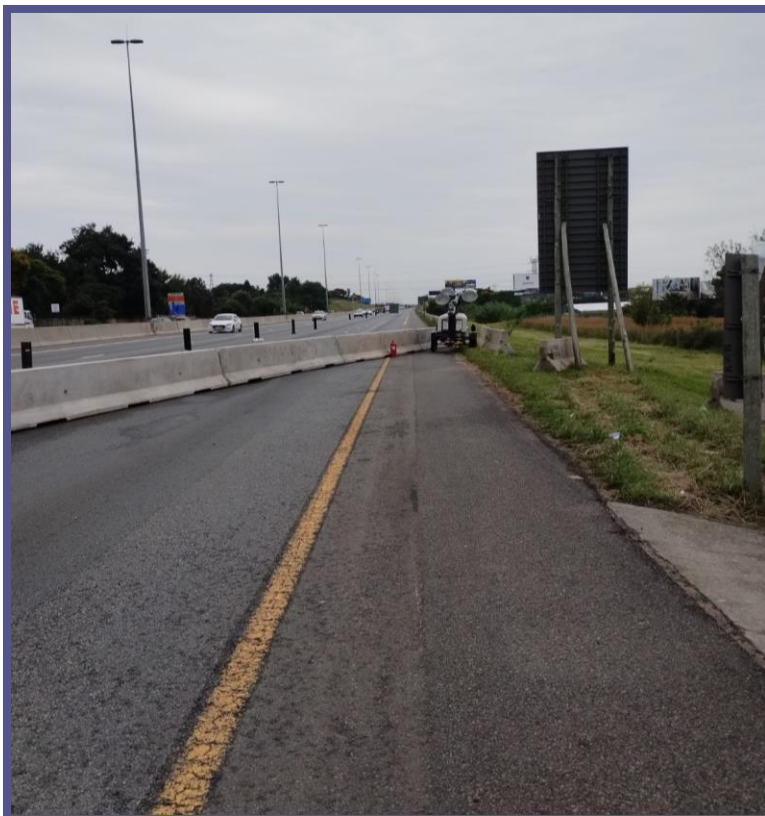
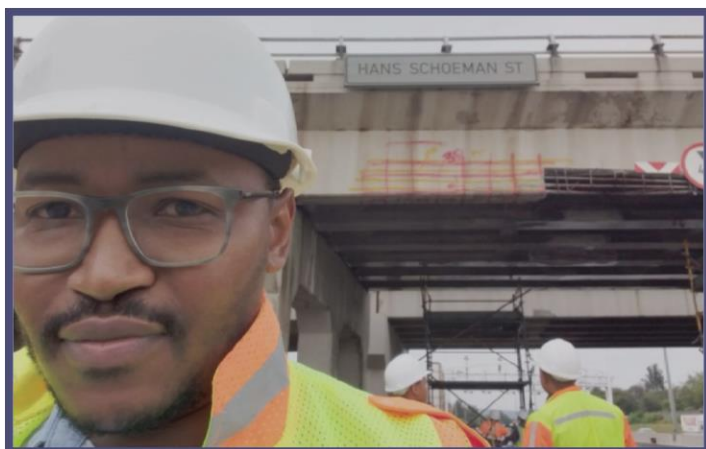


N.001-200-2019/1 (HANS SCHOEMAN BRIDGE)

From Abram Rapetsoa

The Hans Schoeman Bridge is situated at kilometre 33.65 on road N1 section 20. The project entails the repair of precast concrete beams that have been damaged by vehicle impact. Overhead work on the Hans Schoeman Road Bridge requires that certain lanes on the N1 be closed.

Since the N1 is one of the busiest roads in South Africa, the emergency repairs can only be done on weekends to avoid too much disruption to the traffic. Traffic accommodation measures are from Friday evenings at 21h00, and the road is fully open for traffic on Monday mornings at 05h00.



R.730-023-2018/1 (PACKAGE B)

By Alex Weideman

Tires are produced, used and discarded at an alarming rate yearly. Disposal of used tires is a challenging task because tires have a long life and are non-bio-degradable. The traditional method of tire waste management is stockpiling or illegally dumping on landfills, all of which, in the end, are short-term solutions.



Introducing crumb rubber! Crumb rubber is the term used for recycled rubber from automotive and truck scrap tires. There two processes used to produce rubber crumbs; which are ambient mechanical grinding and cryogenic grinding. Of the two processes, the cryogenic process is more expensive but it also produces smoother and smaller crumbs.

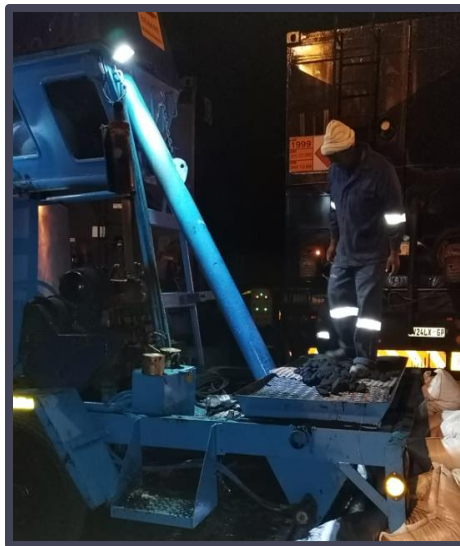
Ambient grinding is the process used by most crumb producers. The machines most commonly used for fine grinding the rubber chips in ambient plants are: Secondary granulators; High speed rotary mills; Extruders or screw presses and Cracker mills.

Cryogenic grinding happens at temperatures ranging from minus 80°C to minus 120°C, using liquid nitrogen or commercial refrigerants. At this point the rubber ceases to behave as a

flexible material and can be easily crushed and broken. This process requires less energy and the rubber crumbs of much finer quality.

On this contract the A-R1 binder design was approved. “A” is designated for asphalt binder, “R” is for rubber crumbs and “1” is the classification on the specification. The rubber crumbs are pre-packed and delivered to site in 25kg bags.

The base binder and extender oil are pre-heated to a temperature that is close to 210°C. This allows the rubber crumbs to blend with the binder at a rate of roughly 20 percent. The blending takes place on site with a loading hopper that feeds the blending pot at midnight and finishes at 01h15.



The operator must make sure that he controls the correct rate that the rubber crumbs, base binder and extender oil mix into the blending pot. Also care must be taken to ensure that none of the bags are wet, because that could result in explosive behavior.



Once blended, the rubber needs to be taken back to the 195°C temperature for production. Once this temperature is reached the final product is transferred into the digestion tank. At 05h15 the viscosity needs to be tested with a viscosity meter.

Experience has taught us that the viscosity should be between 3000 and 4000 dPas.sm on the outer circle of the meter. If too much rubber is in the blend, then the binder might fail on some of the properties required to pass. At this stage, a sample is taken to the laboratory and tests like flow, elastic recovery, softening point and the factor get tested. The factor is used to determine what level of digestion took place. The test results are then used to correct the binder, if necessary. All of this is needed to supply a mix that conforms to traffic requirements for a road that is built in areas that require a superior flexible pavement.



“Building an environmentally friendly road is always a better option.”

IN OTHER NEWS...



Welcome New Employees!

Head Office:

Tumishang Maputla, Lourens De Beer, Shaun Goedhals, Sam Masombuka, Daniel Przytula, Nkateko (Grace) Thupana, Natalie Hewitson, Maritza Van Der Walt, Kagiso Maleka, Ryno Nel and Jane Maluleka.

Sites:

Sicelo Khumalo, Mkhululi Dama, Mamady Camara, Noma-Afrika Sigwinta, Mvuyisi Mapango, Hennie De Jager, Benny Matlou and Siyanda Catha

Labs:

Garth Daniels, Donald Mahlangu, Adriaan Posthumus, Nthabiseng Dick, Hannes Hattingh and Thulani Zungu (RBL).

Last month's Brain Teaser

In the 2010 FIFA World Cup, which team did not lose any games, but did not win the cup either?

Answer: New Zealand.

Long Service

Announcements

Congratulations to the below employees!

5 year tenure:

Peter Hirschowitz and André Van der Merwe

10 year tenure:

Amina Jaffar-Martin, David Maoeng and Tamsanqa Mhlongo

15 year tenure:

Michelle Baroni

Weddings

Felicitations go to Jan and Charlene Joubert on their nuptials on the 28th April 2023!



Brain Teaser

What four-letter word can be written forward, backward, or upside down, and can still be read from left to right?

Gert Bothma

It is with great sadness that we report on the death of Gert Bothma; who passed away on the 12 March 2023.

Gert was a Senior Materials Technician on the R510. He would have turned 75 this November. Gert started with SNA on the 1st April 2022.

Our thoughts and prayers go out to all his family and friends.



Births

Our congratulations go to out to the parents of the below two beautiful babes; welcome to the world little ones!

Tumishang and Karabo on the birth of Khumoetsile Maputla 10/03/2023.



Wynand and Danielle on the birth of Mia Adri Burman 13/04/2023.



Ernst and Nadia on the birth of Frans Conradie 24/05/2023.



Michelle-Joy and Bendrei on the birth of Iamé Vlok 28/05/2023.

