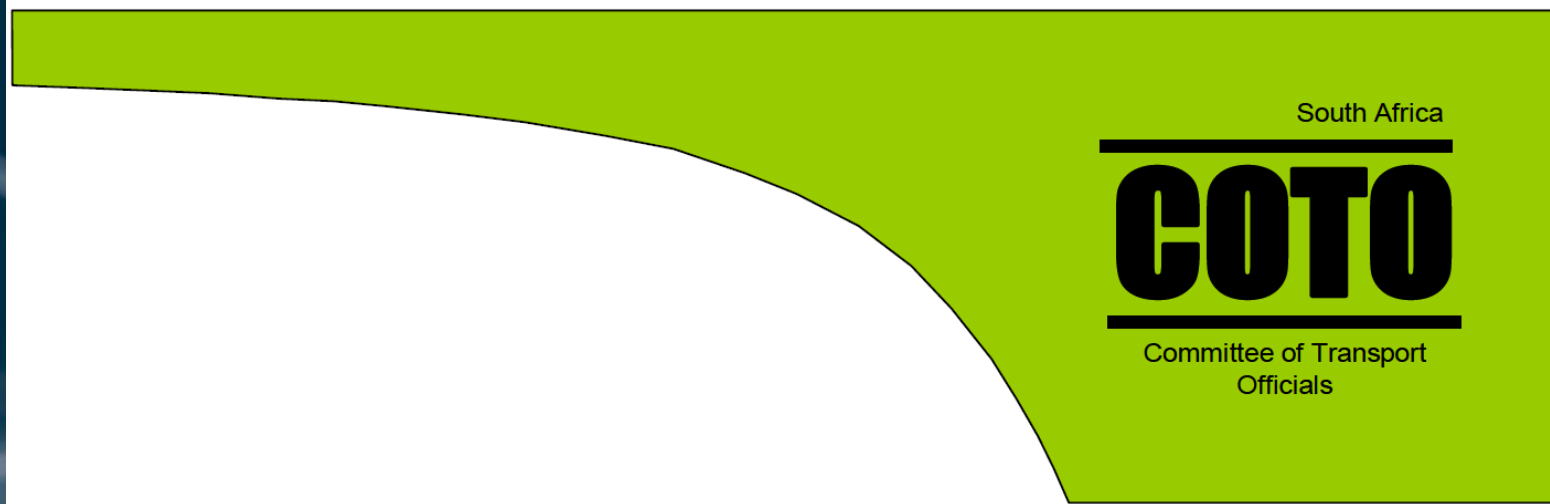


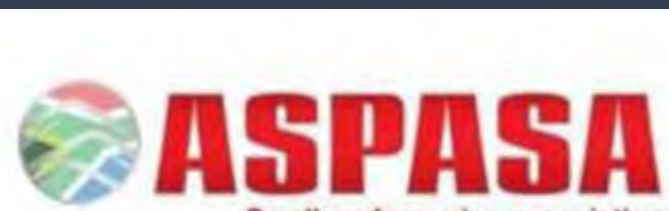


**ROAD PAVEMENTS
FORUM**



Krishna Naidoo
Chair: COTO(Road Materials Committee)

COTO:RMC Report back



COTO: RMC Meeting Day 1

Day 1: 27 November 2024

8:30 am - Meeting will commence at Keyridge.

8:40 am – Safety Induction

- 8:45 am to lunch – SANRAL (Sanchia Pillay) + BVi & WBHO to include site drive & feedback on COTO DS 2020 on construction phase

Lunch on site.

After lunch to 2pm

- Concrete matters – Kevin Volmink will facilitate the presentations /discussions with the chemist.

2:15 pm – all depart from Keyridge to Naidu Consulting offices.

2:45 onwards

- Asphalt/binders/seals matters – Phil Hendriks
- City of CT presentation on COTO DS 2020 implementation – Semeshan Naidoo
- Open discussion on Climate change response – Tarlia Gerald

COTO: RMC Meeting Day 2

Day 2: 28 November 2024

8:30 am – Meet at BSM Lab in Westmead

- Up to lunch –
- TRH24 – Gerhard Fourie, Wynand , Francois Le Roux, Dr Mikhil Rankha, Hannes
- SATbinderrr24 Feedback: Nik Berning & Craig Naicker
- ~~SARF~~

Lunch at BSM

~~1pm – all depart to Westville Paradise Valley site office (you will have driven the site on your journey to and from Keyridge)~~

~~1:15 pm onwards~~

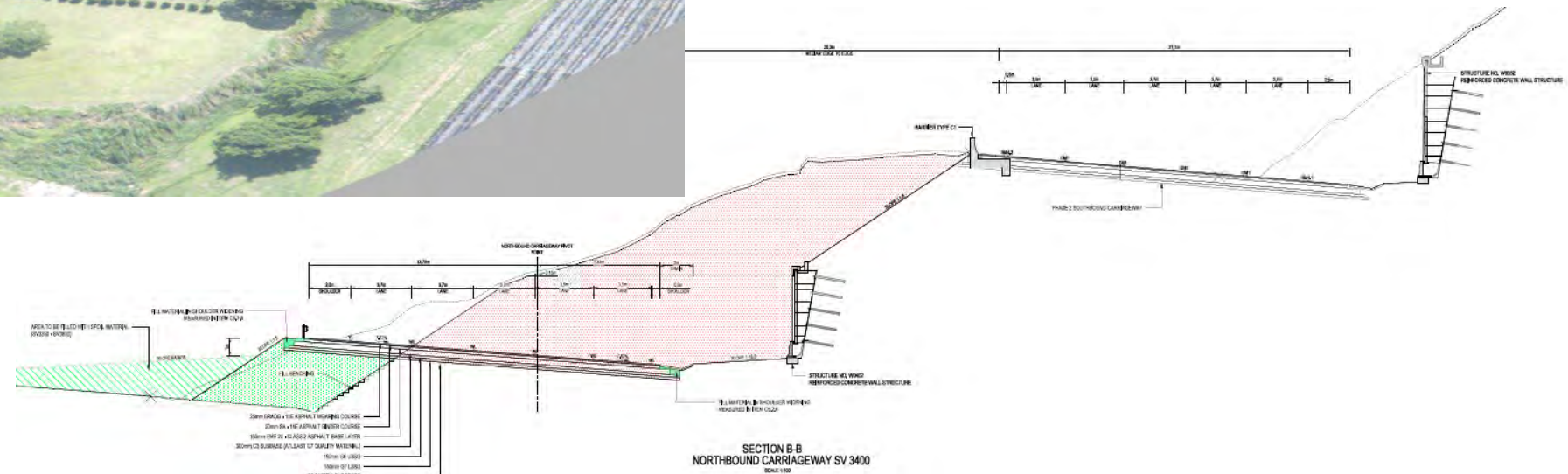
Implementation of COTO DS:

- [@Corné Roux \(ER\)](#) – SANRAL – Salome Naicker
- [@Nqobile Zondo](#) – KZNDOT
- ~~Site RE perspective – Westville Paradise Valley Project~~
- ~~Site QS perspective – Westville Paradise Valley Project.~~

BVi & WBHO – N3 Keyridge upgrade



First project to use COTO DS 2020 in construction phase.



Some concrete pavement issues

COTO Concrete Class Designation

(Concrete Layers)

A6.1.4.2 c)

The relationship between the 28-day cube compressive and the 28-day flexural of the concrete shall be established by laboratory tests.

The specified compressive strength shall be the highest of the following four values:

(i) 35 MPa at 28 days; or

(ii) $0,85 f_{c1}$ where f_{c1} is the 28-day compressive strength corresponding to a 28-day flexural strength of 4,5 MPa.

(iii) $0,85 f_{c2}$, where f_{c2} is the 28-day compressive strength corresponding to a water: cement ratio of 0,53.

(iv) $0,85 f_{c3}$, where f_{c3} is the 28-day compressive strength corresponding to a cement content of 320 kg/m³

Specified flexural strength?

Nominal Maximum Particle Size?

Durability?

Kevin Volmink - BVi



Steel Bars

- **A13.3.5.1**
- For each consignment of steel reinforcement delivered on the site, the Contractor shall submit a certificate issued by a recognised testing authority to confirm that the steel complies with the specified requirements.
- Mittal – own SANAS lab
- Mills do not test at a SANAS lab
- TE – cost of testing, not in tender, request tests for larger consignments EG after 300t vs 30t per steel mill)

Wayne van P – Saint Gobain



CONCRETE CURING COMPOUND OPTIONS

LIQUID MEMBRANE FORMING

RESIN:

Petroleum resin [aromatic hydrocarbon derived from petroleum derived monomers] resembling amber-coloured beads. Tall oil rosin (TOR) derived from organic acids in coniferous trees may be included. All are dissolved in a solvent (xylene, toluene, white spirits) to produce a Resin type curing compound. This stage can be emulsified with surfactants and water to produce a resin-in-water emulsion.

PLIOLITE RESIN:

PLIOLITE styrene acrylic copolymer. Dissolved in toluene, xylene or white spirits. Suitable for harsher environments, good adhesion with longer lasting protection, can be overcoated.

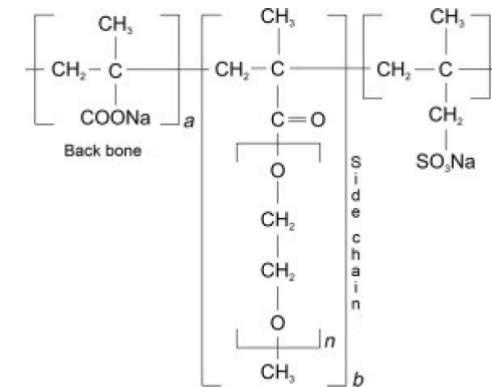
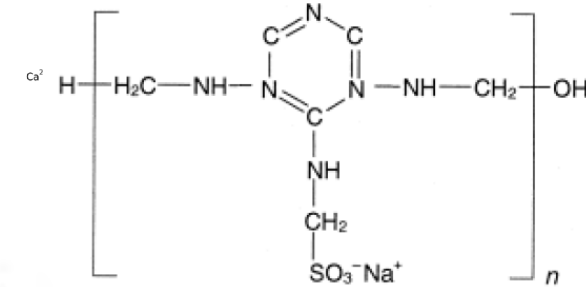
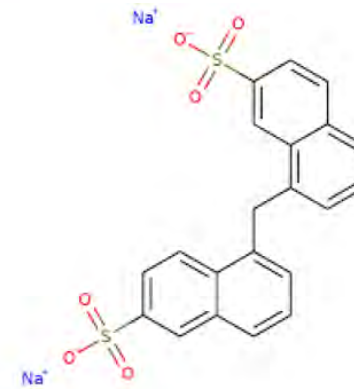
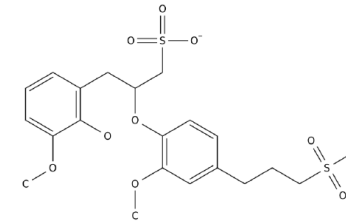
CURING CONCRETE

WAX:

Paraffin wax combined with surfactants and water to produce an anionic liquid wax emulsion. Typically, this can be applied as is or let down with water to the desired solids content.

ACRYLIC:

Acrylic copolymer latex dispersed in water. Normally the latex is let down with water to the desired solids content. Good adhesion to the substrate with a quicker film forming time. Dries clear.



PRACTICE FOR CERTIFICATION OF COLD-LAID ASPHALT FOR ROAD REPAIRS

COTO RMC

Phil Hendricks – SABITA

Nicholas du Preez – SATAS

16th November 2023



Certification – Assessment Process

Responsibility	Sequence of events	Completion time
Applicant	Complete and submit application form MS 1.1	1 Day
SATAS	Submit Agreement, addendum/s and quotation	2-3 Days
Applicant	Accept Quotation	1-2 Days
SATAS	Arrange assessment date (MS 34 assessment schedule)	1 Day
SATAS	Assessment of QMS and product audit MS 7 MS 11 MS 5 MS 20 MS 56 (When relevant) MS 52 (When relevant)	1-2 Days
Applicant	Corrective actions MS 56 N/C reports (If required)	7-21 Days
SATAS	Close MS 56 N/C reports (If required)	
SATAS	Compile MS 6 data pack	2-3 Days
SATAS	Submit MS 6 data pack to Pretoria for review	5-7 Days
SATAS	Certification Advisory Committee MS 24	5 Days
SATAS	Issue of Certificate/s MS 57 MS 25	2 Days

27 Days from Application to A signed Certificate **IF**

Interim Certificate issued for 1st year until end of period of site evaluation





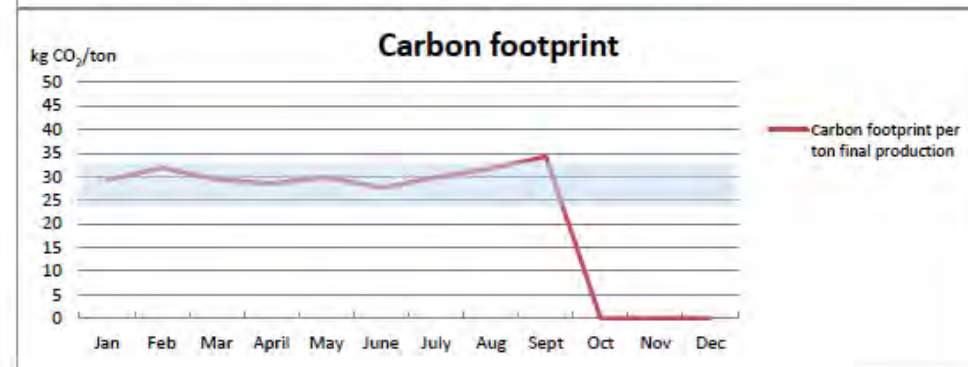
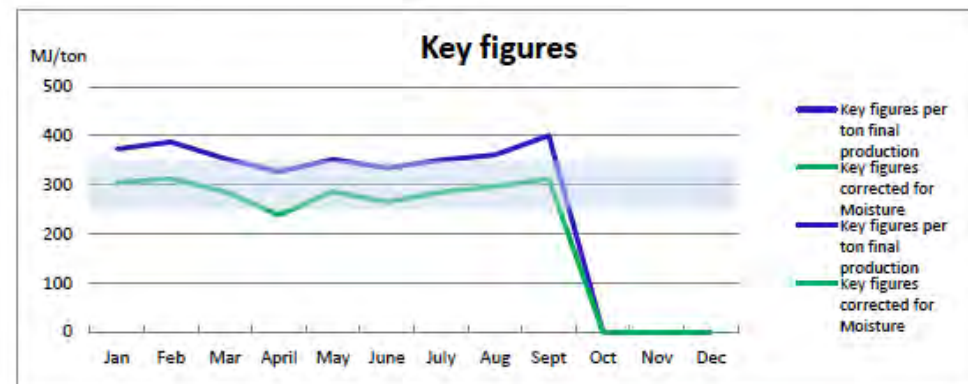
Company Name:

Location:

Plant Type :

Figures year to date:

Fuel consumption	69,974 GJ
Electricity	861,197 kWh
Carbon footprint	6,157 ton CO ₂
Production	204,126 ton
Key figure	360 MJ/ton
Key figure corr. for Moisture	288 MJ/ton
Carbon footprint per ton	30 kg CO ₂ /ton



**COLTO
to
COTO
CONVERSION
for**



**CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD**

Making progress possible. Together.

NAIDUCONSULTING.COM

CONVERSION STRATEGY

- Special items were created in the following instances:
 - Variations between COLTO and COTO item descriptions.
 - COLTO item not in COTO.
 - City specific items not covered in Part A or found in Part C of COTO.
 - e.g. material delivery/collection from City Depot's; Applicability to a term tender

COLTO SERIES 3000 versus COTO CHAPTER 4 & 5 LAYOUT

3000	EARTHWORKS AND PAVEMENT LAYERS OF GRAVEL OR CRUSHED STONE
3100	BORROW MATERIALS
3200	SELECTION, STOCKPILING AND BREAKING DOWN THE MATERIAL FROM BORROWPITS, CUTTINGS AND EXISTING PAVEMENT LAYERS, AND PLACING AND COMPACTING THE GRAVEL LAYERS
3300	MASS EARTHWORKS
3400	PAVEMENT LAYERS OF GRAVEL MATERIAL
3500	STABILIZATION
3600	CRUSHED-STONE BASE
3700	PLANT-MIXED PAVER-LAID PAVEMENT LAYERS
3800	BREAKING UP EXISTING PAVEMENT LAYERS
3900	PATCHING AND REPAIRING EDGE BREAKS



	CHAPTER 4
4.1	BORROW MATERIALS
4.2	CUT MATERIALS
4.3	EXISTING ROAD MATERIALS
4.4	COMMERCIAL MATERIALS
4.5	ALTERNATIVE MATERIALS
	CHAPTER 5
5.1	ROADBED
5.2	FILL
5.3	ROAD PAVEMENT LAYERS
5.4	STABILISATION
5.5	RECONSTRUCTION AND REHABILITATION OF PAVEMENT LAYERS

Recommendation

- National COTO workshop on implementation of COTO DS 2020.
- Facilitator : Hilton Scholtz – CoCT.

Climate Change Act: Milestones

24

National GHG emission trajectory

25

Sectoral emission targets

30

Regulations

18

Finance mechanism

35

Offences and Penalties

Carbon Tax Act

The Carbon Tax Act provides for the introduction of the carbon tax in a phased manner at a relatively low rate initially to allow businesses time to make the necessary structural adjustments to their production processes and practices and to ensure a just transition to a low carbon, climate resilient economy.

The first phase was initially from 1 June 2019 to 31 December 2022, and this was extended for three years until 31 December 2025 to support the economic recovery. January 2026 to 31 December 2030 – Phase 2.

To help achieve South Africa's NDC commitments up to 2030 and provide policy certainty to companies to guide their investment decisions, the carbon tax rate trajectory for 2023 to 2030 was set out in the 2022 Taxation Laws Amendment Act. Rate as of 2023 is R159/t CO₂e.

Recommendation

- Industry workshop? on:
 - Climate Change Act
 - Carbon Tax and implications



BACKGROUND – COTO IN THE KZN DOT ENVIRONMENT

Since the publication of the COTO 2020 Draft Standards, KZN DOT issued a new profoma contract document in 2021 which was aligned to the COTO 2020 DS Specifications.

Over 35 Rehabilitation Contracts were awarded based on the COTO Specifications during the 2023/2024 and 2024/2025 financial years, with approximately 75% of these projects being awarded during the 2024/2025 financial year.

Over 26 Road Upgrade Contracts, inclusive of Bridges and Road Upgrades were awarded based on the COTO Specifications during the 2023/2024 and 2024/2024 financial years with approximately 70% of these projects being awarded during the 2024/2025 financial year.

This means KZN DOT has approximately 61 Capital Projects Contracts which have been awarded which are based on the COTO 2020 DS. With the majority of these projects with a completion date which lies during the 2025/2026 and 2026/2027 financial years, KZN DOT will be in a much better position to provide detailed feedback on the implementation and adaptation to the COTO Standards during the 2025/2026 financial year.



CHALLENGES IDENTIFIED WITH THE COTO 2020 DS

Chapter 1.3 – There is a lack of understanding from many PSPs and Contractors on what Value-related obligations are and when/how to apply them.

Chapter 1.3 – Consideration for reduced P&G's during seal embargo period.

Chapter 1.5 – There is confusion on where temporary signage for construction works is priced with some providing provision for it under Chapter 11. – Constant debate on whether it is accommodated for under Payment Item C1.5.2

Chapter 8.3 – Concerns have been raised in the level of detail provided in the texture treatment Section

Chapter 10 – There is an allowance for re-establishment of seal team but what about de-establishment - Payment Item C10.1.4

Chapter 12 - This section does not clearly designate who is responsible for the global analysis, particularly when the contractor is tasked with the design during construction. Who does the liability of this design lie with?

There is limited guidance on completing the as-built forms, which include layer works, concrete, and statistical analysis. Additional reference to TMH10 is often required. Furthermore, the D-forms for mix designs—such as D1 for concrete, D2 for aggregates, D3 for asphalt, and D4 for seals—are more comprehensively detailed in TMH10



CHALLENGES IDENTIFIED WITH THE COTO 2020 DS

There is a challenge of understanding how some items have been group in the new COTO vs COLTO

COTO now splits items that were previously lumped together in COLTO e.g. hauling of material, placing material and compacting material have now been separated into individual items etc. With the current rates that Clients are paying for projects, the question around the impact of the COTO specs on rates remains to be ascertained.

Current KZN DOT estimates indicate awards values of R25 Million to R30 Million + /Km

There is still a need to capacitate industry on the Standards and have uniform interpretations of the specifications to prevent varying project to project and client to client interpretation of the specifications.

End Goal to have the TRH24 End Product Specifications be included in the COTO Specifications

Overall there is still a lack of understanding from industry and questionable interest in fully understanding the COTO 2020 DS. To overcome this, Clients must possibly look at making attending COTO trainings a condition of award.

OPPORTUNITIES IN IMPLEMENTING COTO

- **Assistance to compilers (not done with COLTO)**
 Redo Pricing Schedule – side notes to compiler & Guidance on Specification Data (see next point)

- **Splitting Specification changes from Specification Data**

COTO provide wording such as “as specified in the Contract Documentation” or “as required in the Contract Documentation” or “indicated in the Contract Documentation” - No specials or change in spec required but the Product, method, material etc need to be selected or indicated. This is now done in a table format **Section B: Specification Data**

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
1			GENERAL	
	A1.1		GENERAL PREAMBLE	
		A1.1.2	DEFINITIONS	
			Conditions of Contract	The Conditions of Contract for Construction for Building and Engineering Works designed by the Employer as published by the International Federation of Consulting Engineers First Edition 1999, shall apply.
			Site / Site of the Works	The limits of construction is provided in [redacted]. <i>Note to compiler: Insert relevant specification clause and/or drawings where the Site limits is defined</i>
	C1.1		GENERAL PREAMBLE	<i>Note to compiler: A number of pay items in the COTO Chapters contains wording in brackets, requiring additional information to be provided in the item or additional item lists to be added. These additional information or additional item lists are not to be provided in this section A2 but is to be provided in the Pricing Schedule. For this purpose, the items where additional information is to be provided is highlighted in the Pricing Schedule in Excel provided by SANRAL</i>

TRH24 Nano Technology: Programme



- TRH24 Background, content & latest Version (Gerhard Fourie)
- “Nano” chemistry & technology & more... (Mikhil Ranka)
- TRH24 applied in practice (Francois le Roux)
 - Investigation, design, specifications
- Research & technology transfer (Elaine Goosen)
 - Specialised testing
- MC-NME surfacing applications (Hannes Lambert)
 - Slurry mix design & construction
- MC-NME – Laboratory mix design and testing (Wynand v Niekerk)
 - MC-NME vs BSM
- Discussion

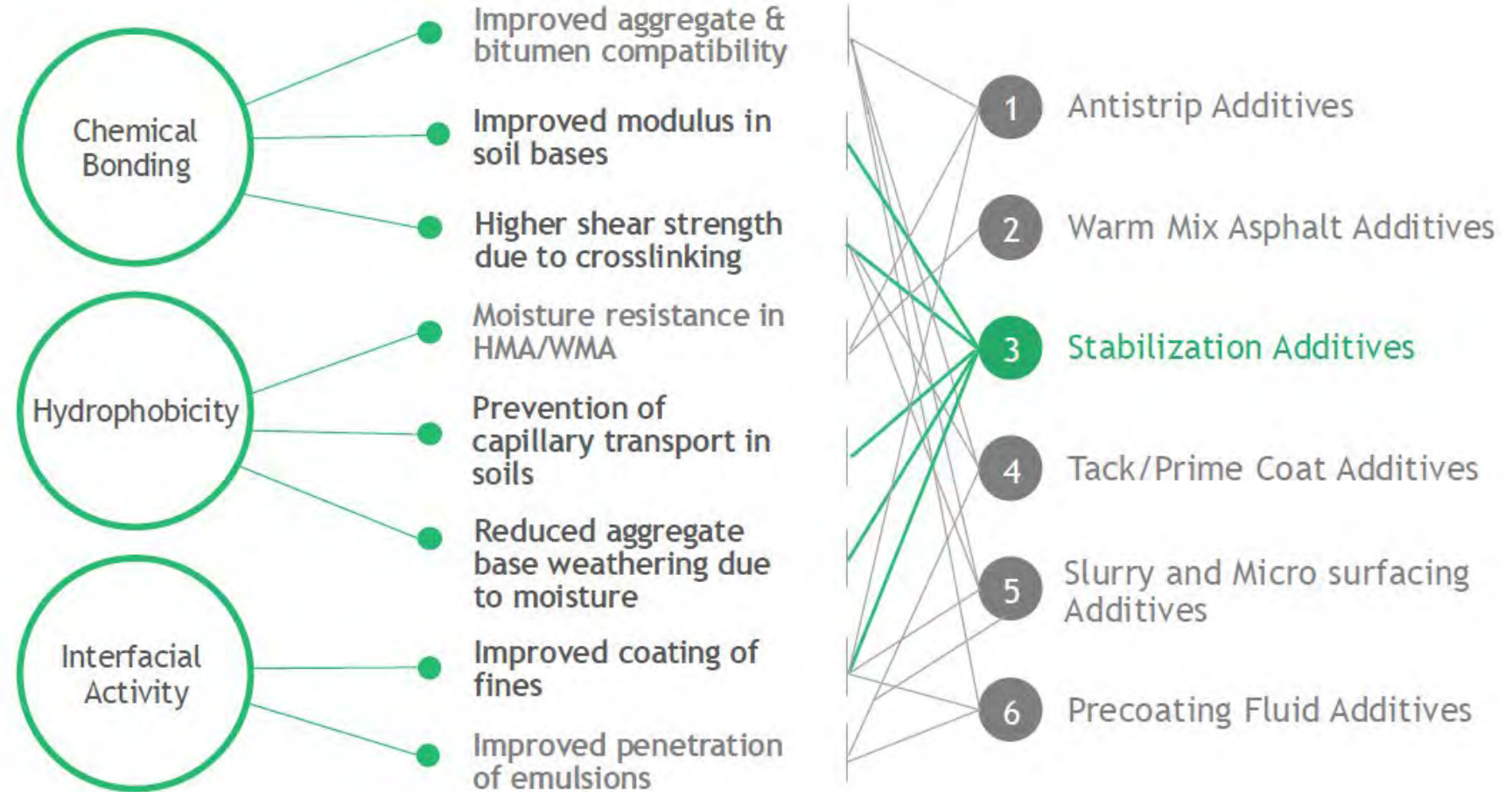
Background



- Concept project initialised by the **Presidential Infrastructure Coordinating Commission Council (PICC)**
 - Strategic Integrated Project (SIP) No 26: Rural Roads Upgrade Programme (GOVERNMENT GAZETTE, 24 JULY 2020)
- **SANRAL** appointed as the **Implementing Agency**
- **SIP** subsequently incorporated into SANRAL's research projects, resulting in dual objectives.
- PICC identified **7 x Pilot Projects** to be used as trials

What can organosilanes do for you in pavement applications ?

Organosilanes



Practical considerations of utilizing silanes

Frequently Asked Questions

- 1 Does it have to be added through the emulsion ?
- 2 What if the NMC and OMC difference is too small ?
- 3 Can silanes be used with cement and/or lime ?
- 4 How long do silanes continue curing ?
- 4 What is the role of polymers ?
- 5 What is the difference between anionic and cationic organosilanes ?

Comments

- 1 No, it can be simply added to the compaction water on site. There are multiple ways to add silanes.
- 2 This can hinder efficient distribution in the soil. Better to split application of emulsion and silane.
- 3 Generally yes, but anionic silanes interfere with cement hydration.
- 4 Typically 60-90 days to achieve full cure.
- 4 Improved flexibility and resistance to shrinkage and load induced cracking.
- 5 Both react differently and have different methods of inducing hydrophobicity. Similar but not the same.



Proudly part of the Raubex Group, since 2013

Different types of Nano emulsions and applications

- Cationic 60%
 - Bond coats
 - KSS Nano
 - KSS
 - Micro surfacing
 - FS Nano / Prime
 - FS + Latex + organo silane
 - Precoating

Anionic SS 60%

Non-Ionic



Binding roads, linking people, since 1971



Designs Considered with 4 Suppliers;

- 1) TOSAS (First sections)
- 2) GeoNano:
- 3) RoadSeal
- 4) Spray Pave

Main Product Considerations:

- 1) Organo-Functioning-Silane
- 2) Nano Polymer (Styrene-Acrylic combination or similar)
- 3) Emulsion (Cat and Anionic)

Lesson Learnt

- Construction process issues
- Insitu Moisture determination = critical.
- Nozzles, filters, etc- needs daily cleaning
- Application rates - tweaked - ensure all the NME is in fact applied
- “Compaction window” like HMA for some suppliers- rollers should be following the recycler closely.
- Presence of Mica – Higher than on normal SANRAL jobs. Percentage actual nano-silane in the NME “pretreatment” important.
- Lab and personnel learning curve need to be taken into consideration



Improving COTO: RMC

- Clients have austerity measures on travel.
- COVID 19 forced change.
- MS Teams, Zoom, YouTube, TikTok, LinkedIn.....

Improving COTO: RMC

- MS Teams Channel for clients.
- Change frequency and duration of meetings using mixed model.
- Add 2 hour long online sessions on up to 4 specific issues - as and when.

- Draw in other client bodies from the international community.
- COTO: RMC online surveys/polling etc for clients and industry.

Improving COTO:RMC

- COTO: RMC lead & organised symposiums / conferences.
- Good success with inaugural ConPaveStruct
- ConPaveStruct 2.0 loading.....

Improving COTO: RMC

- COTO RMC Recognition of Excellence
 - People
 - Projects

- COTO RMC Live-streaming from a site/operation far from you...and/or across the borders.

Improving COTO: RMC

- COTO DS supports and is supported by conditions of contract.
- Embrace the relationship and facilitate for further positive & constructive relationship.
- The document & implementation are in early stages of implementation.
- There are bound points of conflict or differently motivated interpretations.
- How? Clients share dispute related issues.

Improving COTO: RMC Mats Testing Sub-Committee

- SANRAL adding more direct energy.
- Have recruited more SANRAL colleagues _Zane Babamia.

COTO RMC & other COTO Subcommittees

- COTO RMC must draw in and involve all the sub-committees that COTO DS 2020 impacts.
- Frequency of engagement will be determined during first engagement_within next 6 months.

Improving COTO RMC

- Engage ECOSA on possible accreditation of meetings for CPD.

COTO DS 2020 Review : Climate Change

- We will be reviewing COTO DS 2020 specifically for:
- Response to Climate Change.
 - Resilience
 - Adaptation
 - Mitigation
 - Can we also harness the change for good.
- This will push:
 - Back into investigation & design stage?
 - Forward into maintenance stage?
 - Towards circular approach?



SANRAL Broad Review of Ch 9 & 10

- Significant opportunities.
 - Some simple.
 - Some needing more work.
-
- Recommendations for change can certainly come from industry?



We need vulnerability assessments to prioritise action?

- How do we unlock funding to implement the responses?
- Is there specific funding for implementation Climate Change Responses?





**ROAD PAVEMENTS
FORUM**

Krishna Naidoo
Chair: RPF BitMat

RPF BitMat



TDFP vs RPF BitMat task group

The workshop concluded with a clarification of the roles of TDFP vs RPF BitMat task group.

The role of the TDFP (in relation to the RPF BitMat task group) was clarified as follows.

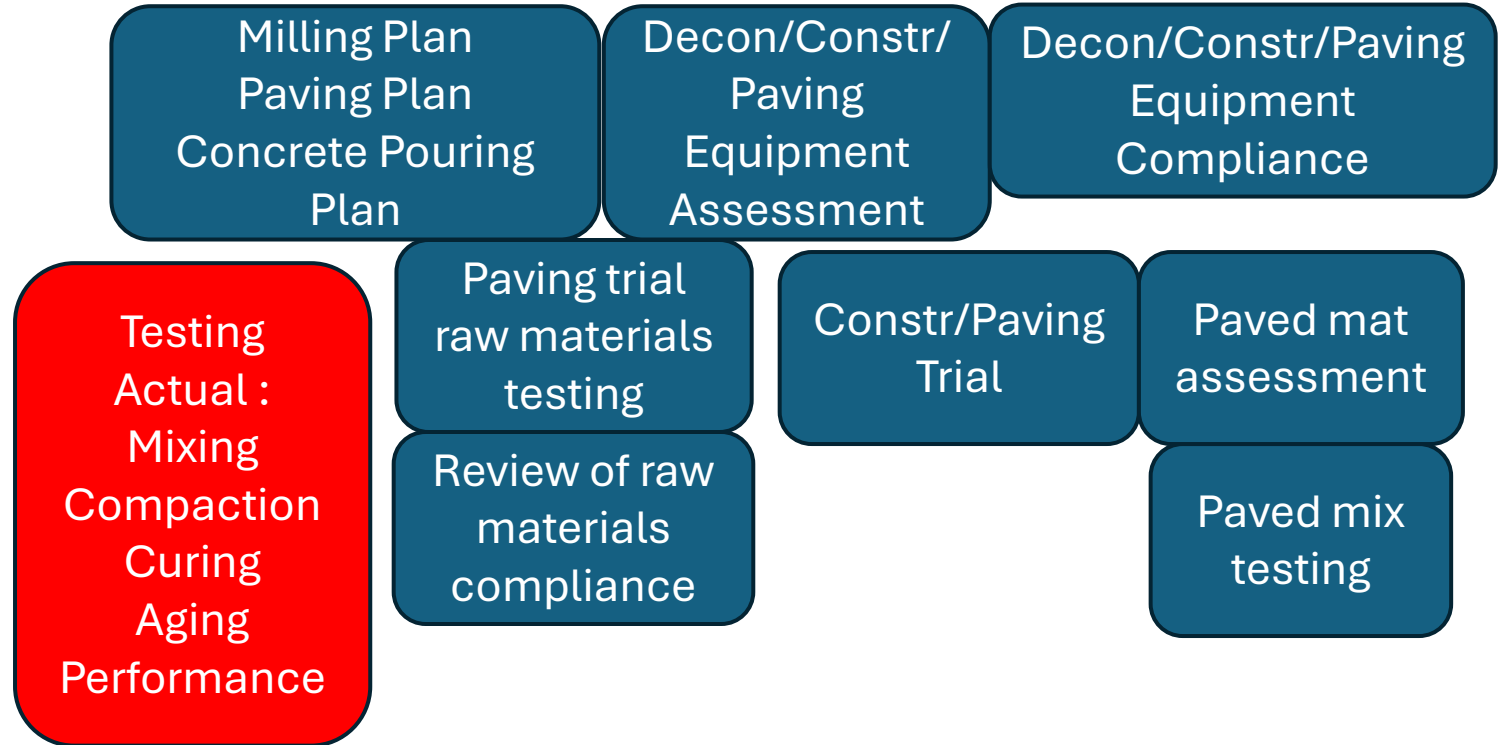
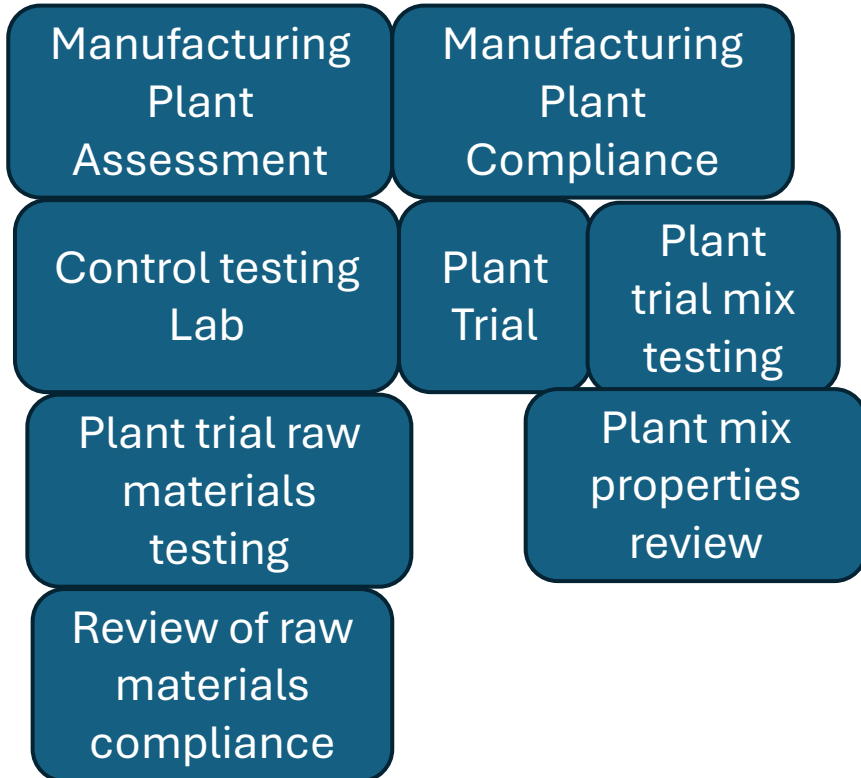
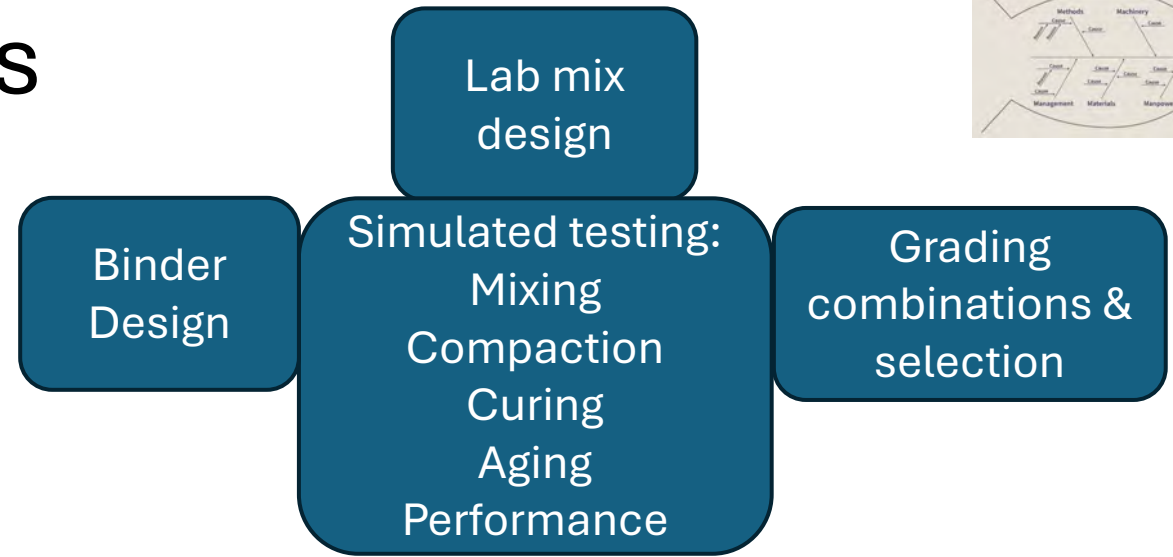
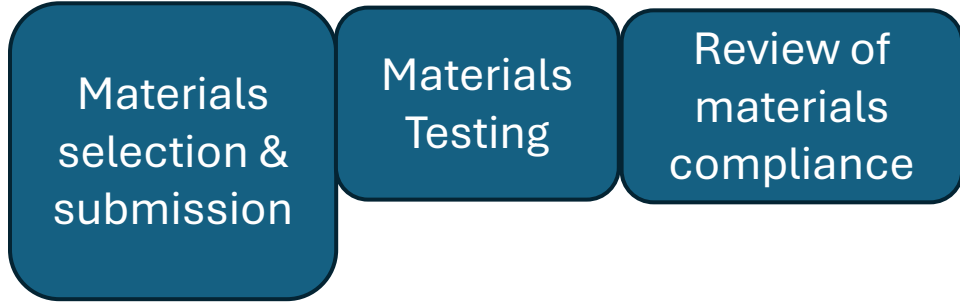
- The purpose of this committee is to afford the members of Sabita an opportunity to interact with other leading parties in the roads industry on matters which impact on their capacity to provide quality products and services.
- From time to time technology matters will be discussed, examined and evaluated. Where this requires in-depth investigation, working groups can be convened to either resolve such issues or give guidance on further study in the particular field.

The role of the RPF BitMat task group was essentially to:

- Give strategic guidance on matters that need to be investigated and resolved to advance sustainable practice in the field of bituminous materials in general.
- From time to time it may appoint and oversee specialist working groups to investigate specific fields. It was not envisaged that in-depth technical discussions and debate would take place at meetings of that group.

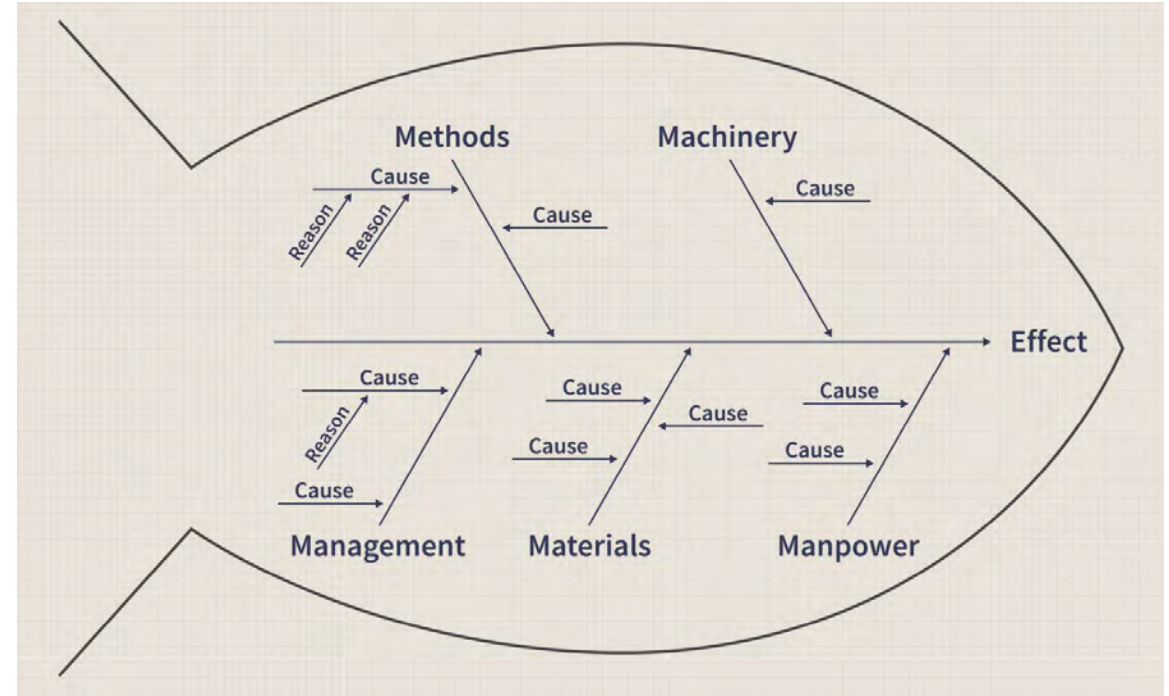


some Hold Points



now list the people involved in the mix design process...

1. Designers
2. Supervision consultants
3. Main contractor – Contracts Manager
4. Main contractor – QA Manager
5. Construction/Paving Contractor
6. Mix designer
7. Binder designer
8. Manufacturing Plant Manager
9. AN Other



RPF BitMat Changes

- Additional leadership capacity:
 - Zane Babamia (SANRAL) babamiaz@nra.co.za
 - Salome Naicker (SANRAL) naickers@nra.co.za
- Check and balance between SABITA TD & BitMat?
- In-depth technical discussion not envisaged nor intended,
- But in-depth technical discussion will not be restricted.

RPF BitMat Changes

- MS Teams channel?
- BitMat will not only engage on resolutions but any matters that comes up at RPF.
- Also, matters brought up during the networking breaks.

Membership?

