

#Long-lifePavements: Technical Study Tour: Europe 2015






Road Pavements Forum
Cape Town: 12 May 2014



Mahendren Manicum & Krishna Naidoo

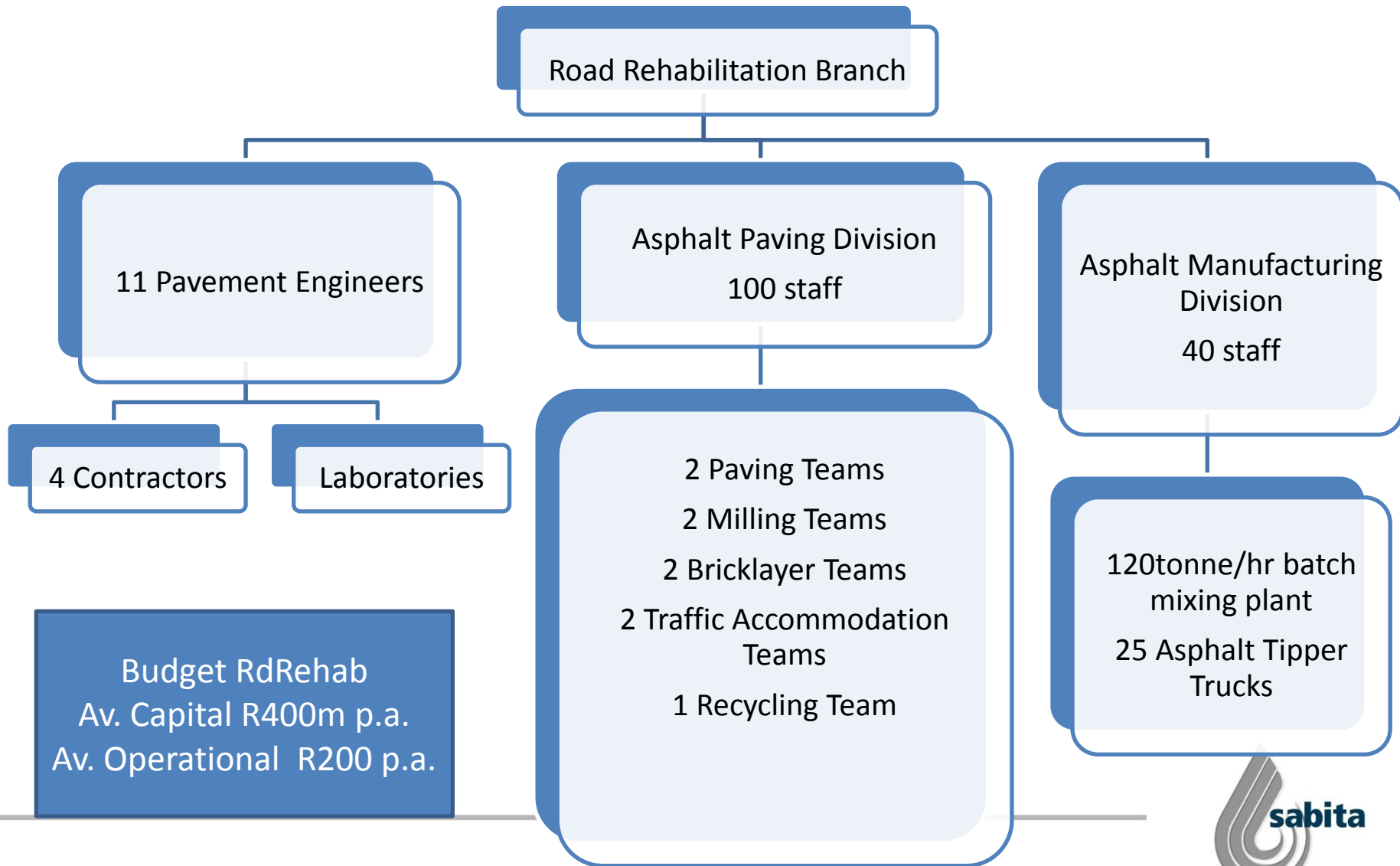
#Whygo

HEAVY DUTY / LONG-LIFE PAVEMENTS

Type	RIGID	FLEXIBLE			
	Concrete	GB5	HiMA	EME	TOTAL
Partners	No partners	Much Asphalt Effiage AQUA	Kraton AQUA	National Asphalt CSIR SABITA	Total SABITA
Status	Still struggling with Edwin Swales	Field trials complete. Project report being finalised.	Desktop study complete	Routine use	Desktop study in progress.
Milestone		Alternative to EME		EME guideline	
					

GUIDELINE FOR GENERIC HEAVY DUTY / LONG-LIFE PAVEMENTS

#Whygo



#Whygo

- Improve on heavy duty / long life pavements solutions situation
- Landmark conference for international roads industry
- Review our business model (municipal and consulting)
- Competitive edge (consulting)

2 PHASES

- Phase 1 – Conference in France
- Phase 2 – meetings and sites visits with various EU partners



Amsterdam

Enschede

Utrecht

Lyon



PHASE 1



PAVEMENT PRESERVATION & RECYCLING SUMMIT • FEBRUARY 22-25

#bigdata

- Venue: Palais des Congrès de Paris - France
- 22nd to 25th January 2015
- 108 Presentations
- Presentations from 19 countries
-
- 15 Sessions
- 3 parallel sessions
- 400 plus Attendees
- 49 Exhibitors

Global Participation

France, Belgium, US, Germany, UK, Australia, Morocco, Netherlands, Korea, Japan, New Zealand, Italy, Austria, China, Albania, Finland, Tanzania, South Africa, Spain, Mexico

- IRF, World Bank, EU Parliament, FIA



PPRS PARIS 2015

PAVEMENT PRESERVATION & RECYCLING SUMMIT • FEBRUARY 22-25



Landmark

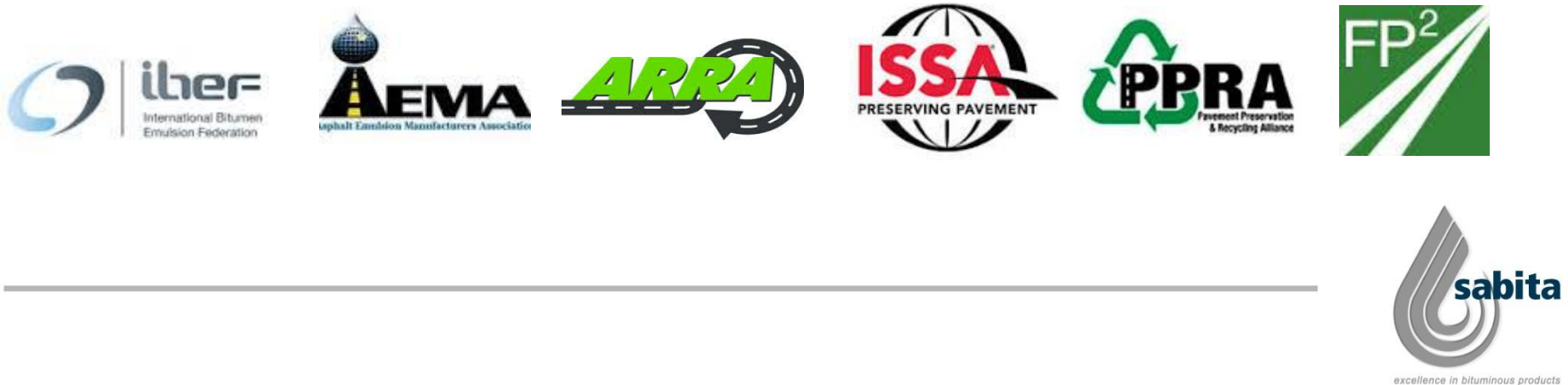
- Joint International Organisers
 - IBEF International Bitumen Emulsion Federation
 - AEMA Asphalt Emulsion Manufacturers Association
 - ARRA Asphalt Recycling & Reclaiming Association
 - ISSA International Slurry Surfacing Association
 - PPRA Pavement Preservation & Recycling Alliance
 - FP² Foundation For Pavement Preservation



Landmark

- First joint international recognition of the specialist discipline of pavement preservation and recycling.
- Recognition that it requires a considered and continuous funding stream
- Recognition that it takes specialist skills, tools and competence
- Not a generalist discipline!

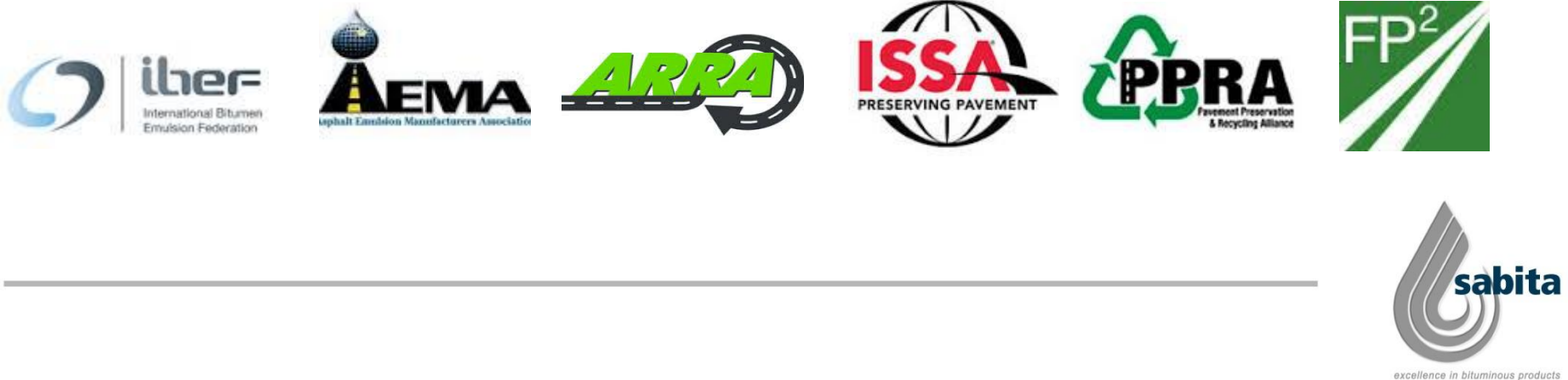
Finally!



Landmark

- Each international organisation is a further area of specialisation
- Not a generalist discipline!

Finally!



CHAIRMAN'S MESSAGE

Jean-François Corté – PIARC France

- “our societies cannot function harmoniously, our economies cannot prosper without a reliable and resilient transport infrastructure system”
- “the massive investments made during the last fifty years to provide our countries with modern road infrastructure have not been matched by resources and management provisions that would safeguard the sustainability of this heritage. What we now observe is a degradation of the state and service level over many networks”

#youthinkyougotproblems

- No aggregate data on condition
- Roads are biggest urban asset
- Backlog in maintenance
- Gap of ? In regular maintenance
- No significant improvement expected

- Which country?

#controltheconversation

- **Plenary Session**
 - Social Expectations
- **Socio-Economics Session**
 - Economic Impacts
 - Asset Management
 - Contracts
 - Funding
- **State of the Art Session**
 - FP² Session: A Global Approach
 - AEMA Session: Emulsions
 - ARRA Session: Recycling
 - ISSA Session: Surface Treatments
 - IBEF Session: A World of Emulsions

#controltheconversation

- **Innovation Session**

- Innovation Drivers

- Innovation: Products, Processes, Equipment

- Tools and Methods for Acquisition Processing and Management of Road Assets

- Industrial Interactions

- Sustainability

#controltheconversation

- Innovation Session
 - Innovation Drivers
 - Innovation: Products, Processes, Equipment
 - Tools and Methods for Acquisition Processing and Management of Road Assets
 - Industrial Interactions
 - Sustainability

#lostintranslation

- Economic Impacts
 - Cost of maintenance deferral – Australia
 - What value is attached to maintenance in projects financed by development banks – World Bank
- Asset Management
 - Strategy of road maintenance on French road network
 - Challenges of managing aging road infrastructure in Japan
 - How to assess the value road assets in view of road assets management

#lostintranslation

- Asset management
 - Asset management: a real job – France
 - Pavement preservation is applied asset management
- Contracts
 - Multi-annual maintenance contracts in Finland
 - Long term maintenance contracts – UK
 - Delivering good asset management in the road sector through performance based contracting – World Bank

#lostintranslation

- Funding
 - Toll – Germany
 - Financing – Tanzania
 - Tolling – South Africa
 - Concessions – Spain
 - Funding - US

#lostintranslation

FP² Session: A Global Approach

- Changing role of pavement preservation in US
- Concrete pavement preservation: integrating engineering, economics and environment
- Best practices for crack treatments

#lostintranslation

- AEMA Session: Emulsions
 - Measuring the tackiness of modified asphalt binders and emulsion residues using DSR
- ARRA Session: Recycling
 - 100% recycling of RAP using emulsions - Colas
- ISSA Session: Surface Treatments
 - Review of surface treatments in China
 - Application and interest of cape seal in road maintenance - Eurovia
- IBEF Session: A World of Emulsions
 - How to optimize road maintenance techniques - France

#lostintranslation

- Innovation Drivers
 - When the road owners promote innovation – Morocco
 - Initiatives taken in Netherlands to encourage innovation from private sector but also from ideas provided by the road users and staff of road administration

#lostintranslation

- Innovation: Products, Processes, Equipment
 - Asphalt plant: how regulations drive equipment design – Fayat
 - When innovation is boosted by partnerships – Wirtgen
 - Industries interactions: a success story – Colas
 - Recycling on a high performance level – Total
 - Performance and rational design of thin, highly modified pavements – Kraton

#lostintranslation

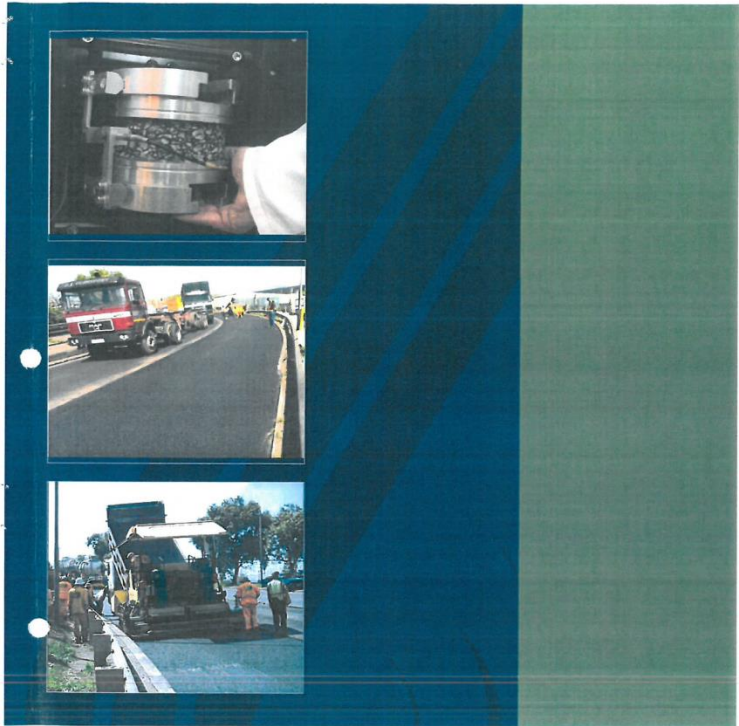
- Tools and Methods for Acquisition Processing and Management of Road Assets
 - Leveraging data for effective asset management – Australia
 - Towards a traffic-integrated structural assessment - France

#lostintranslation

- Industrial Interactions
 - Michelin and the circular economy – Michelin
 - French experience in use of byproducts
 - Byproducts from the agro industry – France
 - A review of the reuse of slag in Europe – Germany
 - Utilisation of demolition materials in concrete pavement - Lafarge

#lostintranslation

- Sustainability
 - Green chemistry – Eiffage
 - The industry approach for environmental challenges – Eurovia/IRF



Interim design procedure for
high modulus asphalt

Manual 33 January 2013



#technotourists

- Saied Solomons SA Bitumen Association
- Mahendren Manicum Naidu Consulting
- Johan van Heerden RHDHV
- Anesh Philip Unique Trading & Outsourcing
- Colin Brooks Much Asphalt (Pty) Ltd
- David JJ De Beer Much Asphalt (Pty) Ltd
- Wynand Nortjie National Asphalt (Pty) Ltd
- Sathseelan Naicker National Asphalt (Pty) Ltd
- Krishna Naidoo Ethekwini Municipality
- Jeffrey Letsie Mangaung Municipality
- Petrus Labuschagne Mangaung Municipality

#technotourists

- Andrew Byrne Raubex Constructions
- Donovan Naicker Aqua Transport
- Percy Moloto SA National Road Agency
- Riaan Burger SA National Road Agency
- Melanie Kemp Prov. Government of Western Cape
- Llewellyn Truter Prov. Government of Western Cape

SA EME TECHNOLOGY TRANSFER

- SABITA – Reunion HiMA Study Tour
- Options – Long Life / Heavy Duty Asphalt Pavements
- 2011 Trial for eThekweni in – South Coast Road, Durban
- 2013 SABITA Manual 33 – Interim Design Procedure for High Modulus Asphalt
- Workshop at CSIR – Change to EME

SABITA / PROF STEYN TRANSFER FUNCTIONS

- 2015 Transfer Functions for:
 - Fatigue
 - Permanent Deformation
 - Minimum Support Conditions

ROUTINE PAVING OF EME

- SANRAL N2 Eastern Region
- Naidu Consulting EME grading +

- Technical Study Tour France and Holland

STUDY TOUR PLANNING

- SABITA organised to tie in with Pavement Preservation Summit – France
- PPRS 22 February to 25 February 2015
- Study Tour 26 February to 6 March 2015
- Detailed questionnaire collated at Naidu Consulting offices meeting
- Dropbox – everything available

STUDY TOUR HOSTS

PPRS	Paris
USIRF + Eurovia	Paris
Colas	Paris
Shell	Strasbourg
TOTAL	Lyon
EIFFAGE	Lyon
University of Twente	Enschede
BAM	Utrecht

EME IS A ROUTINE MIX IN FRANCE

- Mix is certified for use via French Accreditation System

PAVEMENT DESIGN WITH EME

- Routine approach with standard French pavement design principles applying
- Support conditions as per standard French pavement design principles
- Typically:
 - Friction course
 - Binder course
 - EME

CONSTRUCTION WITH EME

- Standard french construction techniques and equipment used
- Min ambient temperatures of 5 degrees and rising
- Layer thickness relative to aggregate size

QUALITY MANAGEMENT WITH EME

- Routine approach in terms of French Processes and procedures
- Temperatures, Gradings and Bitumen Contents
- Lower voids are better

LCA WITH EME

- Routine approach – French Carbon Calc during tender phase SEVE
- A standard solution relative to traffic needs and pavement required
- Slegs ons gebruik RA in EME

ALTERNATIVES TO EME

- Proprietary GB5 – Eiffage
- Proprietary Modified Styrelf Mixes – TOTAL
- Proprietary Modified Mixes – BAM
- HiMA - Kraton

- Driven by optimisation of their value chain

EME SOUTH AFRICA

- 10/20 Locally manufactured and available off the shelf from Shell
- SANRAL Eastern Region doing more work
- Naidu Consulting doing more work
- SANRAL Western Region – Major Project
- IRPTN – Durban
- Routine Mix For Me...

EME SOUTH AFRICA

- Specification separating mix design requirements from routine control / acceptance testing
 - Iteration 1 – eThekweni Municipality
 - Iteration 2 – Naidu Consulting + SANRAL

- Routine Mix For Me...

STUDY TOUR: USIRF



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- Christine Leroy – Technical Manager, USIRF
- Ismail Cavagnol – Technical Business Engineer, USIRF
- Xavier Carbonneau Ph.D – Head of Asphalt Mix Division, Colas
- Jean-Luc Gautier – Technical Director, Colas

STUDY TOUR: USIRF

- Agency for financing infrastructure
- Govt decreasing maintenance budgets
- No new roads being built
- 18000 km of road decentralised to local govt
- Most of network is about 30/40 years old
- France has lost its education system for engineers
- Stopped education of engineers at college



STUDY TOUR: COLAS

- Christine Leroy – Technical Manager, USIRF
 - Ismail Cavagnol – Technical Business Engineer, USIRF
 - Xavier Carbonneau Ph.D – Head of Asphalt Mix Division, Colas
 - Jean-Luc Gautier – Technical Director, Colas
-
- Inventors of EME
 - Change in structure of company



Organisation of the CST



TECHNIQUE
RESEARCH
& DEVELOPMENT
DIRECTOR

TECHNICAL
MANAGER
LABORATORIES

Oil Products &
Processes

Cold Bitumen
Techniques

Road Chemistry

Asphalt Mixes

Composite
Coatings

Hydraulic
Binders

Equipment &
Products

SUBSIDIARIES

TECHNICAL
MANAGER
CED

Pavement
Design

Road
Assessment

Documentation

Metrology

Prospective

GEOTECHNICS
CIVIL
ENGINEERING

ENGINEERING

MATERIALS

TECHNICAL
DIRECTORS
FRANCE,
INTERNATIONAL
ROADS /
SPECIALITIES



STUDY TOUR

Strasbourg

- Sonia Hauguel – European Solution Centre Manager, Shell
- Frank Beer – Dipl. Eng. Technology Manager, Europe, Shell



STUDY TOUR



- New Shell Handbook available
- Regularly testing South African EME designs
- Gyratory compactor for workability test
- No of gyrations = layer thickness ?

STUDY TOUR: TOTAL



- Jean-Michel Michou – Marketing & Services (Bitumen)
- Strong PMB technology solutions – Styrelf
- Developed technology to allow bitumen to be transported in 25 kg blocks
- Pre-blended WMA technology in its bitumen



STUDY TOUR

Lyon



STUDY TOUR

- Luciole – dynamic roadmarking LED technology
- Noise management wearing courses: can adjust product to manage different sound frequencies.
- Also into pavement monitoring
- GB5
- Have South African office

STUDY TOUR

Enschede

- Mr. Jeroen van der Spiegel – Plant Manager at the Asfalt Centrale Hengelo
- Local Authority Perspective – Mr. Jan-Paul Boutkan

Head of the Department City Engineering Enschede and Chairman of the Engineer Network Twente

- Project SAA A1/A6 – Mr. Rinus Kok, Director, KWS Infra
- The Asphalt Paving Process – Towards a More Professional Approach
Dr. ir. Seirgi Miller, Asphalt Paving Research & Innovation Unit Department of Construction, Management & Engineering Faculty of Engineering Technology
- Utilities & Delay in Infrastructure Projects. – Mr. Léon olde Scholtenhuis, PhD intern

UNIVERSITY OF TWENTE.



STUDY TOUR

- Quality management during construction with available instrumentation
- Services in the road reserve

UNIVERSITY OF TWENTE.

STUDY TOUR

Utrecht

- Experiences with Low Energy Asphalt Concrete (LEAB)
Dr. Maarten M.J. Jacobs – BAM Wegen, TMA/A&O
- Definition of good bitumen foam – no consensus
- Longer life with foam mixes
- Work with DSR and asphalt mastic



#Change

eThekwini will explore:

- Grave Emulsion – Colas
- Finish Contracts – Finish Road Authority
- Frequency adjustable asphalt – Effiage
- New approach to quality management – Uni of Twente

PPRS PARIS 2015

The First Pavement Preservation & Recycling (World) Summit



Mahendren Manicum & Krishna Naidoo