



RAR2015 Conference
RPF Feedback
CSIR - 10 November 2015

Riaan Odendaal
Much Asphalt

Content

- Background to Conference
- Delegates
- Authors
- Papers
- Conclusion



Background

Conference theme : Future Pavements Trending NOW!

Emphasis on sustainable use of resources and benefits of CTR with regards to life cycle cost and performance.

Conference main focus points structured around:

- Performance Evaluation and Design
- Mix Properties
- Binder Properties (PG)
- Functional and Environmental Aspects
- Evaluation and Design of Chip Seals

Delegates

- 168 delegates attended mainly from USA
- 9 Delegates from South Africa
 - Prof Alex Visser
 - Georges Mturi
 - Wynand Nortje
 - Herman Marais
 - Riaan Odendaal
 - Werner Kruger
 - Gerhard Fourie
 - Sasheen Rajkumar
 - Jacques van Heerden



Authors

- 48 Papers published in the proceedings



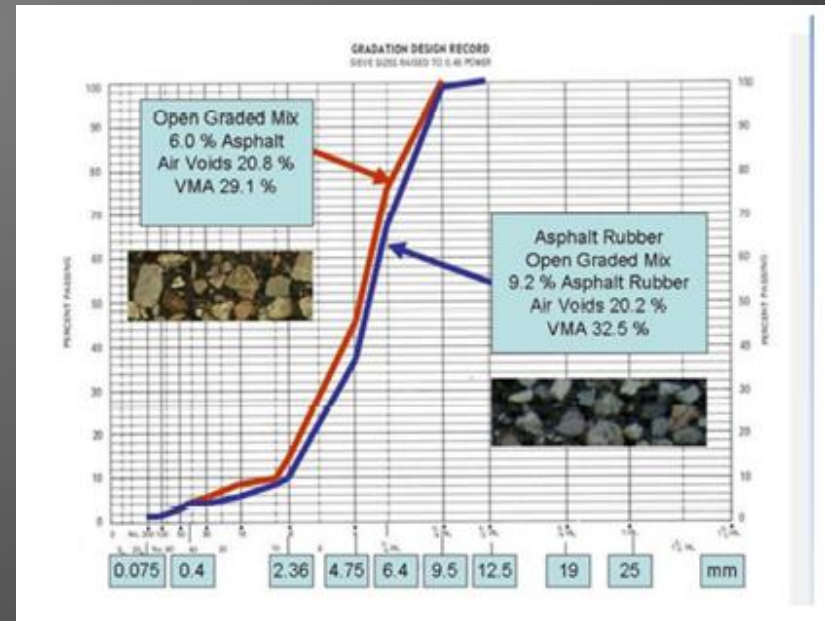
Papers – Performance Evaluation

Rubberised asphalt open graded mix, international experience – Way et al

- Objective of this paper is to review and summarise the use of ARFC's in various countries
- “ARFC's are multifunctional layers providing skid resistance, reduced cracking & smooth surface with less noise.
- Manufactured from high quality clean aggregate, typical BR content of 8.5%.
- Placed 12.5mm - 25mm thick”

Papers – Performance Evaluation

- USA “Starting in the 1980’s asphalt rubber open graded mixes(ARFC) began to be used in Arizona, California and Texas.”



Papers – Performance Evaluation

- Portugal began using ARFC surfaces in about 2003 to provide smooth riding surface, skid resistance and less tyre noise.
 - Reported 5-6 dBA reduction compared to typical dense graded asphalt and 8-10 dBA compared to concrete surface



Papers – Performance Evaluation

- China started some trials with dry blend AR in dense graded mixes in 1980's.
 - 2004-2007 many experimental sections with wet & dry method
 - 2007 to date ARAC and SAMI used in more then 20 China provinces
- 2010 ... 300 Million scrap tyres



Papers – Performance Evaluation

- Brazil constructed first ARFC in 2012 on rehabilitation of RJ-122 originally constructed in 1970's.
 - 45mm AR Gap graded structural plus 25mm ARFC
 - Best ranked structural and functional characteristics in federal and state network.



Papers – Performance Evaluation

Conclusion

- ARFC provide a surface with several attributes that can last up to 10 years
- ARFC have been successfully designed, specified and constructed worldwide
- ARFC when used in conjunction with GG AR base course is cost effective when rehabilitating older cracked pavements

Papers – Mix Properties

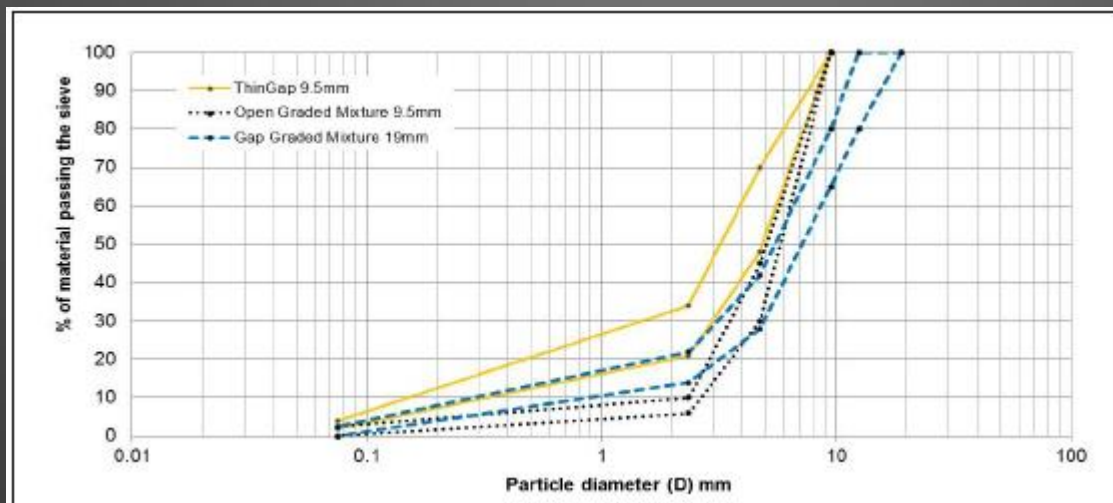
Development of new asphalt mixture ThinGap 9.5 mm with reacted and activated Rubber – Sousa et al

- Objective to develop a mix with superior performance.
- Ensure reflective cracking resistance without compromising rutting performance

Papers – Mix Properties

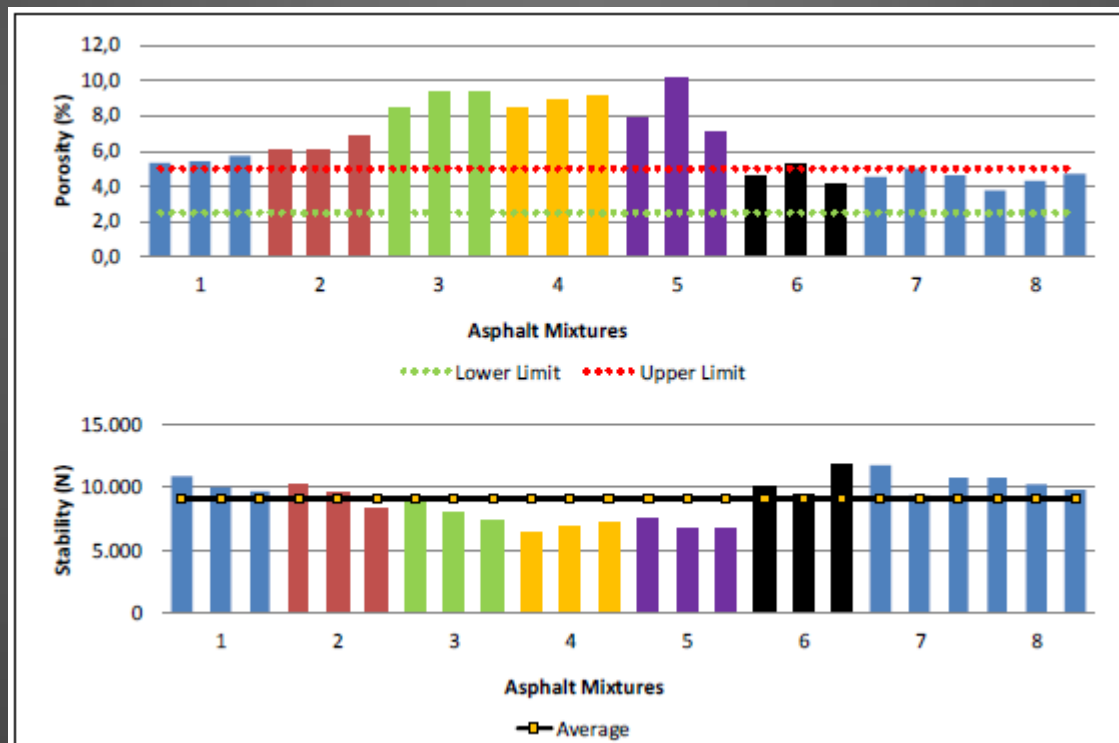
ThinGap 9.5mm

- 35/50 base binder with 45% RAR
- RAR composed of pre-blended soft bitumen, fine crumb tire rubber(-600um) and filler
- Binder SP >80 deg C & > 50% resilience recovery



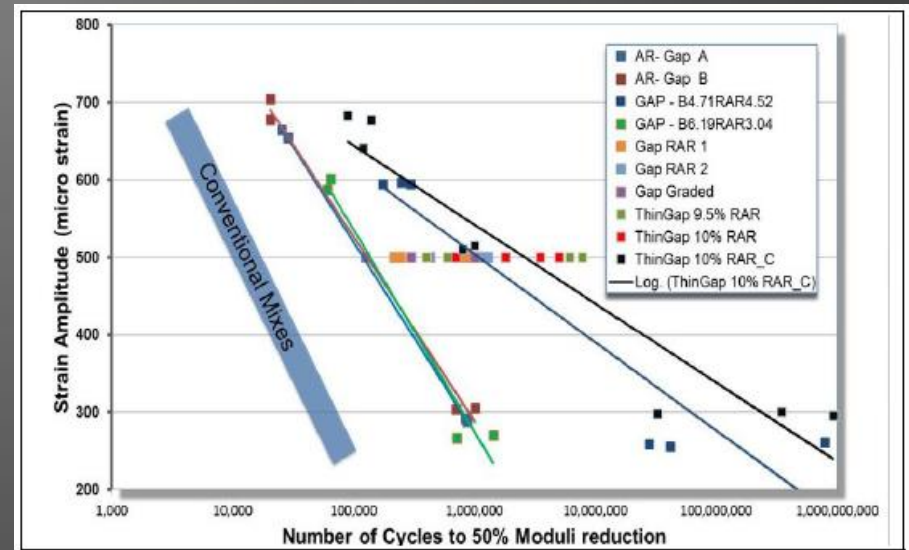
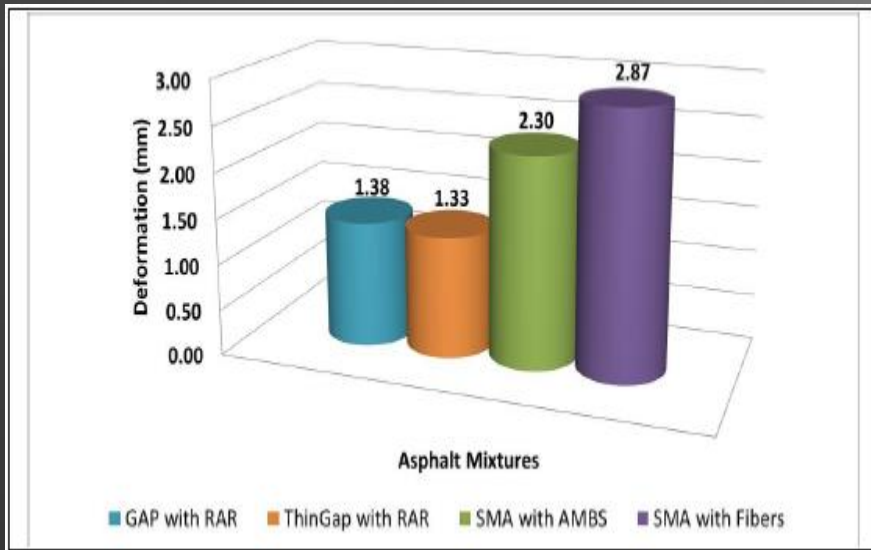
Papers - Mix Properties

- Mix subjected to marshall compaction for voids & Stability (Void spec 2.5-5%, Stab >9kN)



Papers - Mix Properties

- Mix 6 subjected to wheel tracking test
- Fatigue life at 10Hz, 20 deg C & 500u strain



Papers - Mix Properties

Conclusion

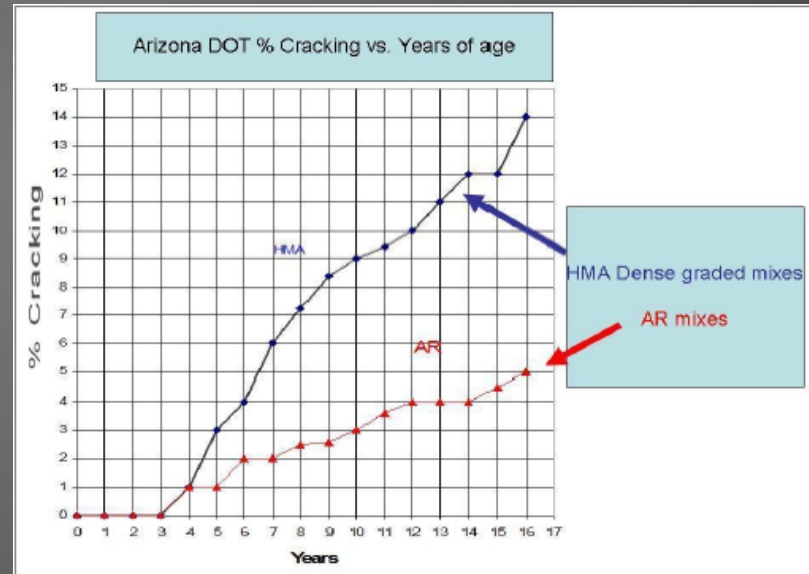
- All objectives met with respect to Rut resistance & Fatigue
- Grading limit for ThinGap 9.5mm developed
- Layer thickness reduces to as low as 16mm



Papers - Binder Properties

Rubberized asphalt and neat asphalt aging properties – Way et al

- Compare predicted & field performance
- 15 years plus ADOT data on retained pen and visc as well as visual .



- Concluded that PAV aging is relevant to neat binder aging but not to BR binders

Papers - Binder Properties

Feasibility study of performance grading of asphalt rubber binder - Houston et al

- Phase 1 validated use of DSR with adjusted gap height of 3mm to mitigate particle interference.
 - 10 laboratories participated in Pacific coast conference on asphalt specifications (PCCAS) round robin with acceptable SD between laboratories
- Phase 2 underway to build precision and bias statement.

Papers – Environmental aspects

3 Papers on low noise road surfaces

- All concluded noise reduction with use TR modified asphalt mixes
- Drive towards quite pavements in countries like Poland, Czech Republic and USA



Conclusion

- **Papers presented covered a wide range of research in the use of Asphalt Rubber**
- **Definite growth in the use of Asphalt Rubber binders internationally**
- **Move away from on site manufacturing to Terminal manufacturing**

