1st Annual Asphalt Briquette Competition

STELLENBOSCH UNIVERSITY

Undergraduate and Advanced

Road Pavement Forum
6 November 2016

In the beginning.....

Guinea Pig Testing

Undergraduate

The competition……

YOU ARE HEREBY CORDIALLY INVITED TO THE

1st Annual Asphalt Briquette Competition

TUESDAY, MAY 10, 2016 AT 15:15

PAVEMENT ENGINEERING LAB
CIVIL ENGINEERING PARKING QUAD,
STELLENBOSCH UNIVERSITY

sabita

excellence in bituminous products

Sponsored by:

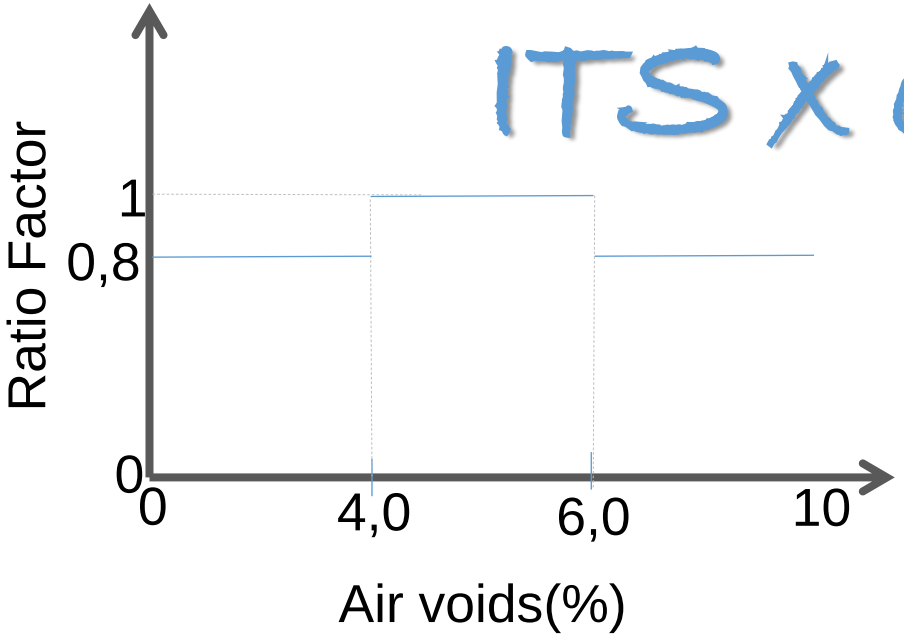
bvi ENGINEERING PROCUREMENT MANAGEMENT

Much Asphalt

Technical Support:

Undergraduate Criteria.....

(a) Indirect Tensile Strength



(b) Target Air Voids

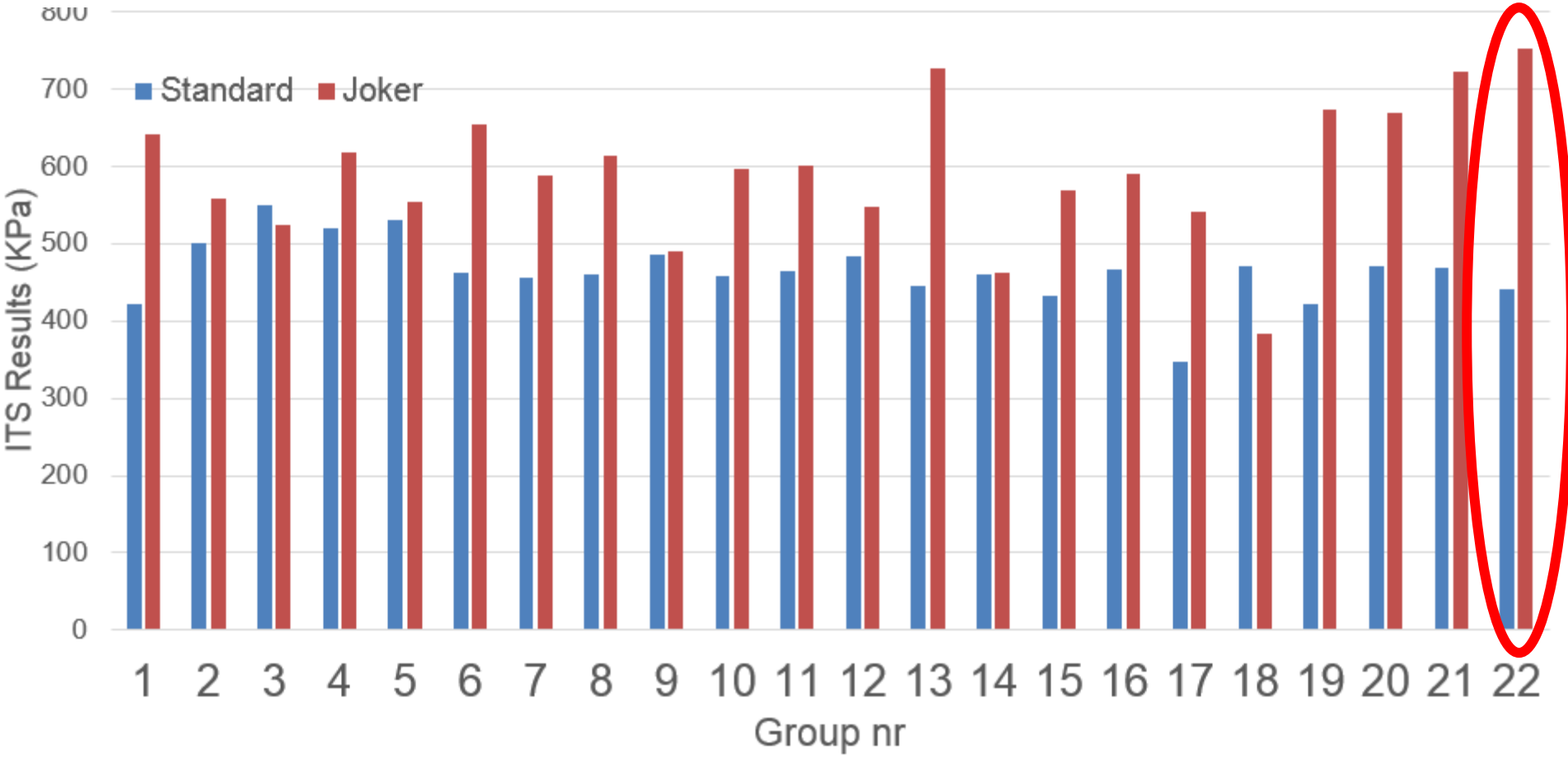
1

2

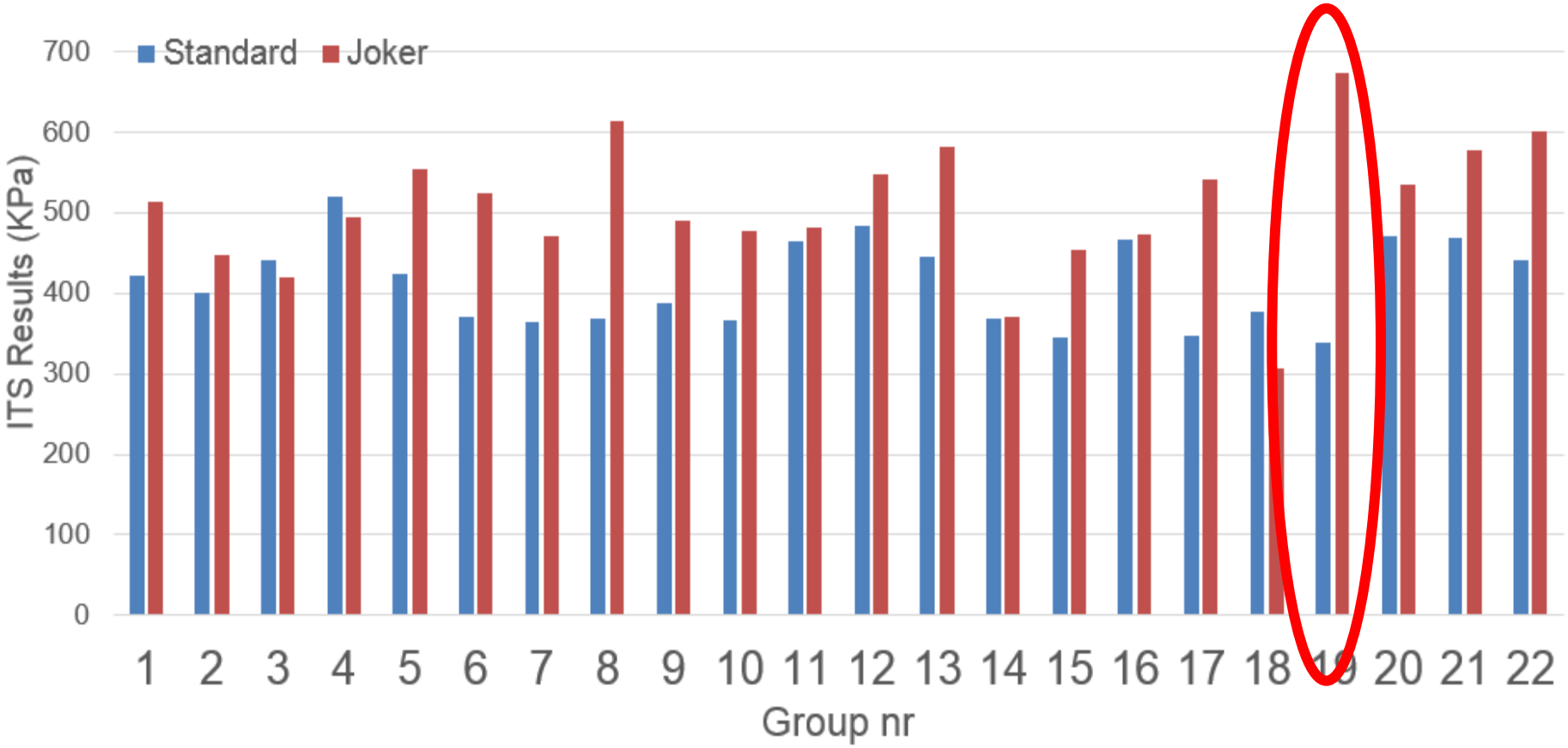
The concentration.....

The results……

(no consideration of voids)



The results……
(Penalised with factor of 0.8)



The consolation.....

The consolation.....

Thanks to the sponsors.....

The winning group.....

Upping the ante.....

1st Annual Advanced Asphalt Briquette Competition

19-23 September 2016

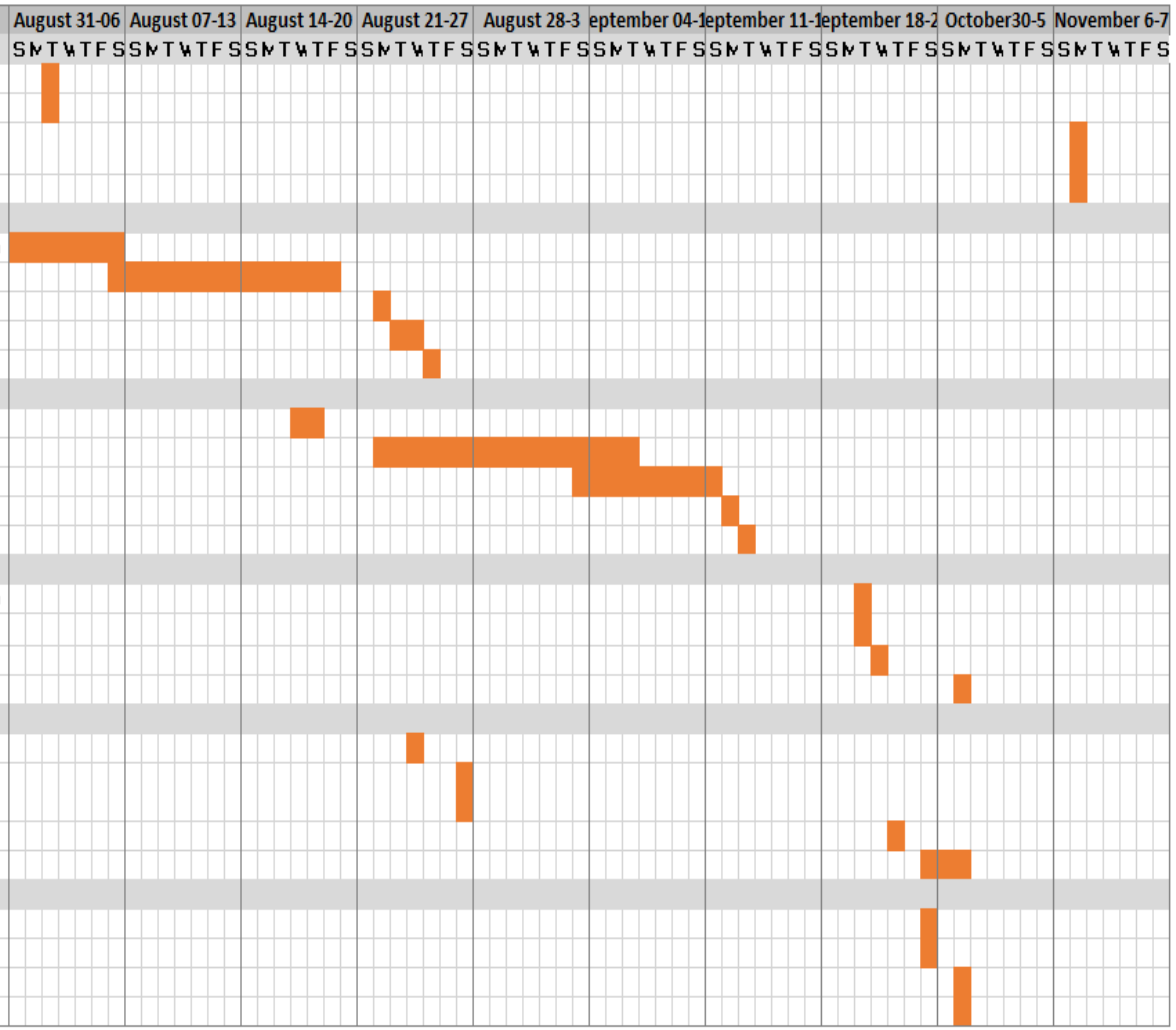
STELLENBOSCH UNIVERSITY

Upping the ante.....

Warm Mix Asphalt Technology

Precision Planning.....

Task name	Duratio	Resource Name
Meetings and briefs (all stakeholders)		
Inception meeting (stakeholders)	0.5 days	Sabita, MUCH,BVI, SU
Workplan Meeting (Deadline details)	0.5 days	Sabita, MUCH,BVI, SU
Feedback Meeting	0.5 days	Sabita, MUCH,BVI, SU, UP
RPF Presentation	0.5 days	SU
Competition Development		
Thinkscrum	5 days	Jenkins, Vd Ven, Gerber, Rudman
Development of Workshop Notes	14 days	Jenkins, Vd Ven, Rudman
Dummy-run of Workshop Activities in Laboratory	0.5 days	Gerber, Rudman
Recalibration of Workshop Notes	2 days	Jenkins, Vd Ven, Rudman
Final Dummy-Run	0.5 days	Gerber, Rudman
Acquision and Preparation of Materials		
Acquisition aggregate	2 days	Briedenhann
Sieving aggregate in Various Fractions	14 days	Nojewu
Constitute of Fractions in Set Grading	7 days	Willianms, Collins
Acquisition of Bitumen	0.5 days	Briedenhann
Acquisition of Sasobit	0.5 days	Briedenhann
Excecution of Workshop Activities		
Asphalt Briquette Competition Briefing		Jenkins, Vd Ven, Gerber, Rudman
Groups to Prepare or Modify Gradings	0.5 days	Williams, Rudman, Gerber
Mixing of First set of Samples	0.5 days	All
Mixing of Second Set of Samples	0.5 days	All
Testing of specimens		
Testing of Raw materials for Workshop Activities	0.5 days	Williams, Collins
Testing of Dummy Specimens (calibration of measurement criteria)	0.5 days	Briedenhann
Testing Round 1 Specimens	0.5 days	Briedenhann
Testing Round 2 Specimens	0.5 days	Briedenhann
Finalisation and Reporting of Results		
Reporting of Results Round 1	0.5 days	Gerber, Rudman
Intermittent Competition Winners Announcement	0.5 days	Gerber, Rudman
Reporting of Results Round 2	0.5 days	Briedenhann
Final Competition Winners Announcement	0.5 days	All



Precision Planning.....

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PMII Class 2016

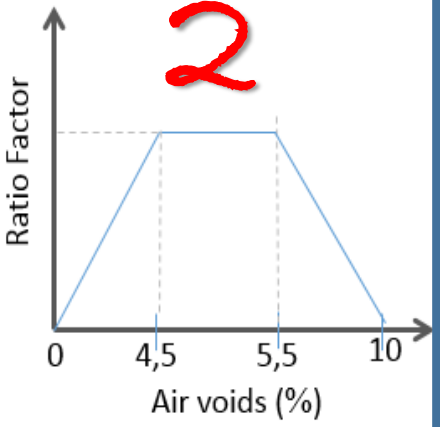
The challenge..

Excecution of Workshop Activities
Asphalt Briquette Competition Briefing
Groups to Prepare or Modify Gradings
Mixing of First set of Samples
Mixing of Second Set of Samples

1

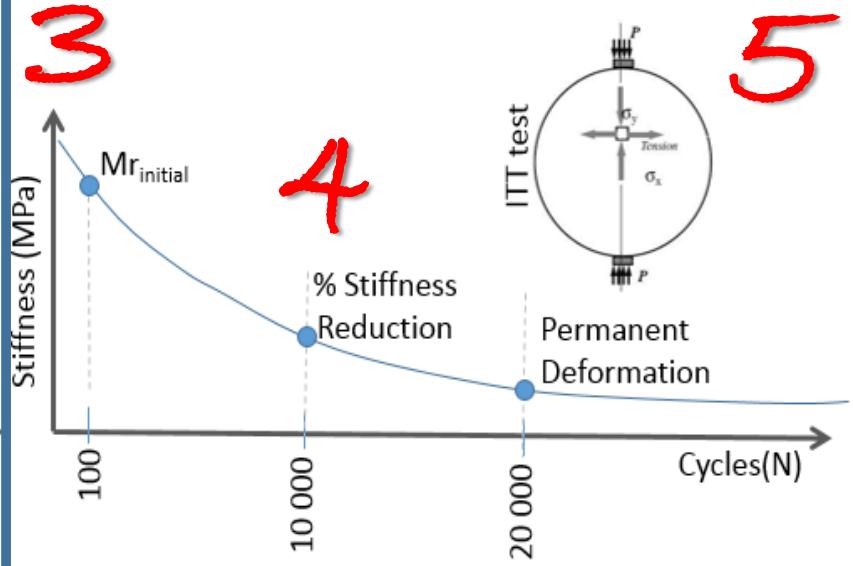
(a) Indirect Tensile Strength

2



(b) Target Air Voids

3 4 5



(c) Indirect Tensile Test [dynamic] to determine Mr initial at 100 cycles **(d)** % stiffness reduction at 10 000 cycles and **(e)** Permanent Deformation, all at 10Hz, 15°C

During the course (interim)

After the course (final)

The good .....

Excecution of Workshop Activities
Asphalt Briquette Competition Briefing
Groups to Prepare or Modify Gradings
Mixing of First set of Samples
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The good .....

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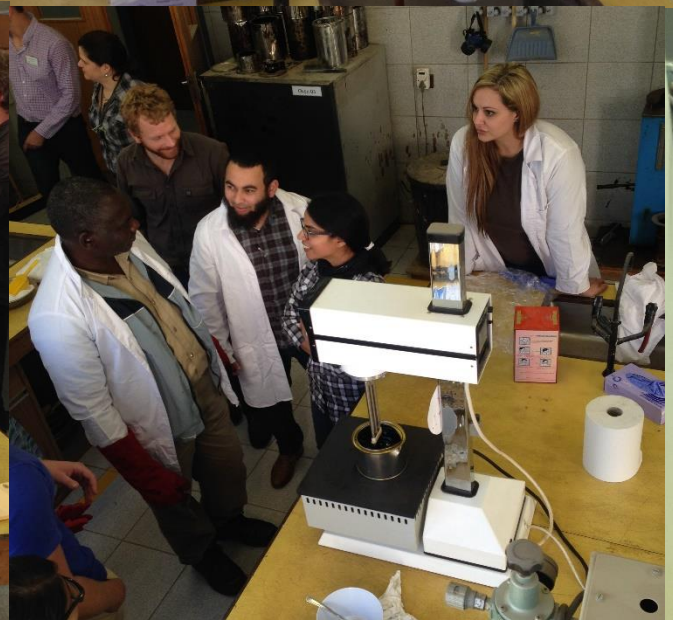

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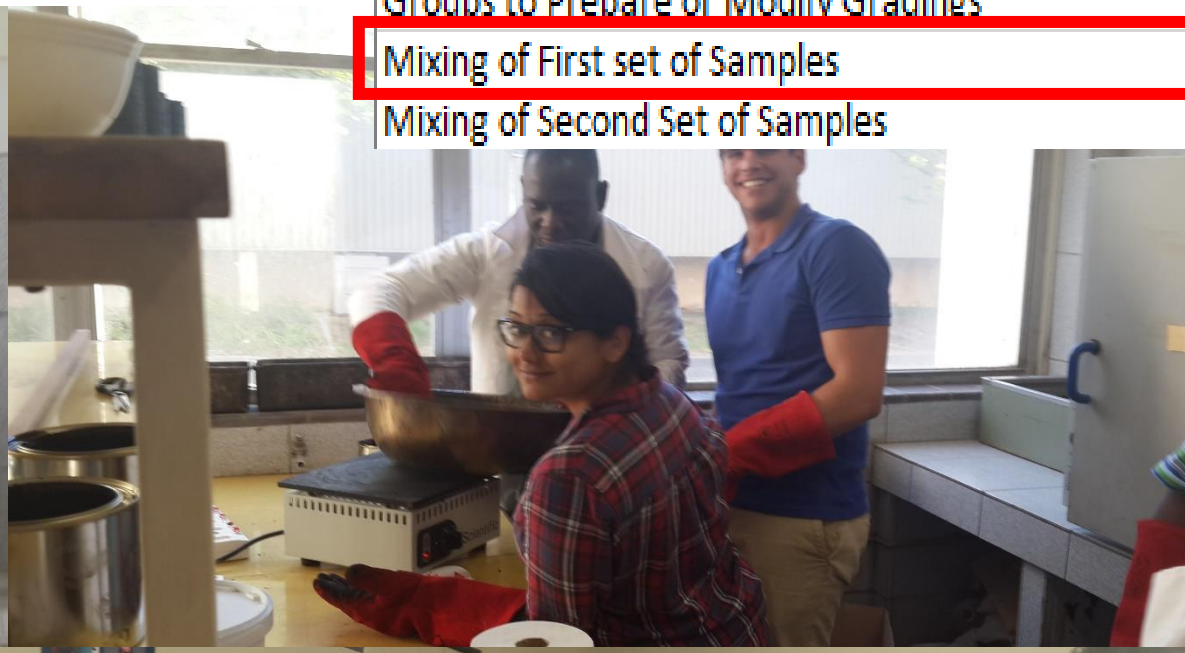

The serious .....

Excecution of Workshop Activities
Asphalt Briquette Competition Briefing
Groups to Prepare or Modify Gradings
Mixing of First set of Samples
Mixing of Second Set of Samples






The very serious

Excecution of Workshop Activities
Asphalt Briquette Competition Briefing
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Mixing of First set of Samples
Mixing of Second Set of Samples

The crazy .....

Excecution of Workshop Activities
Asphalt Briquette Competition Briefing
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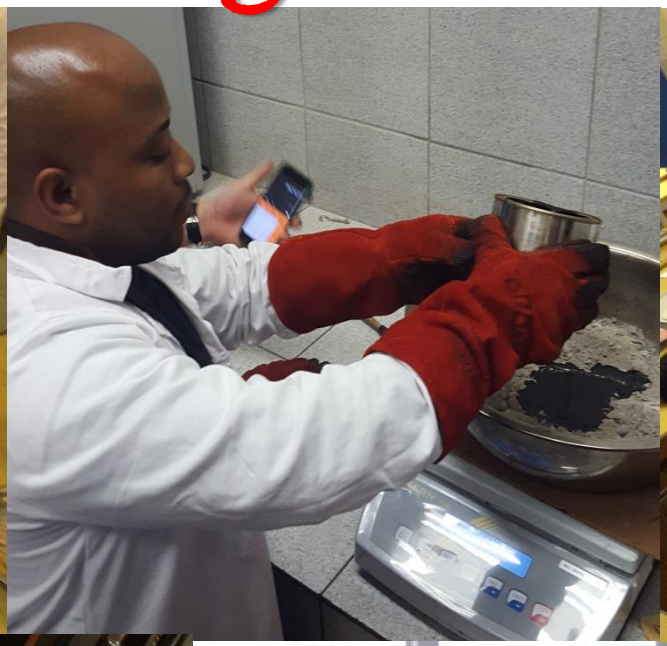
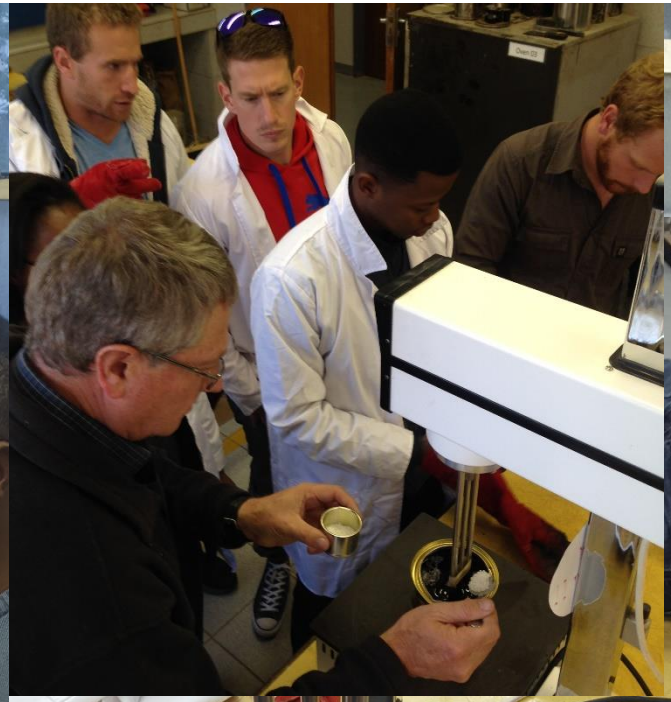
Mixing of First set of Samples
Mixing of Second Set of Samples

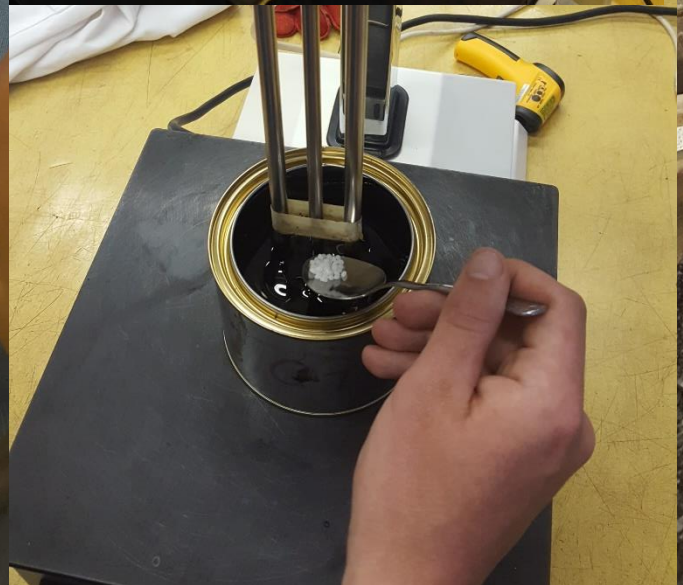
Hit it bokkie!

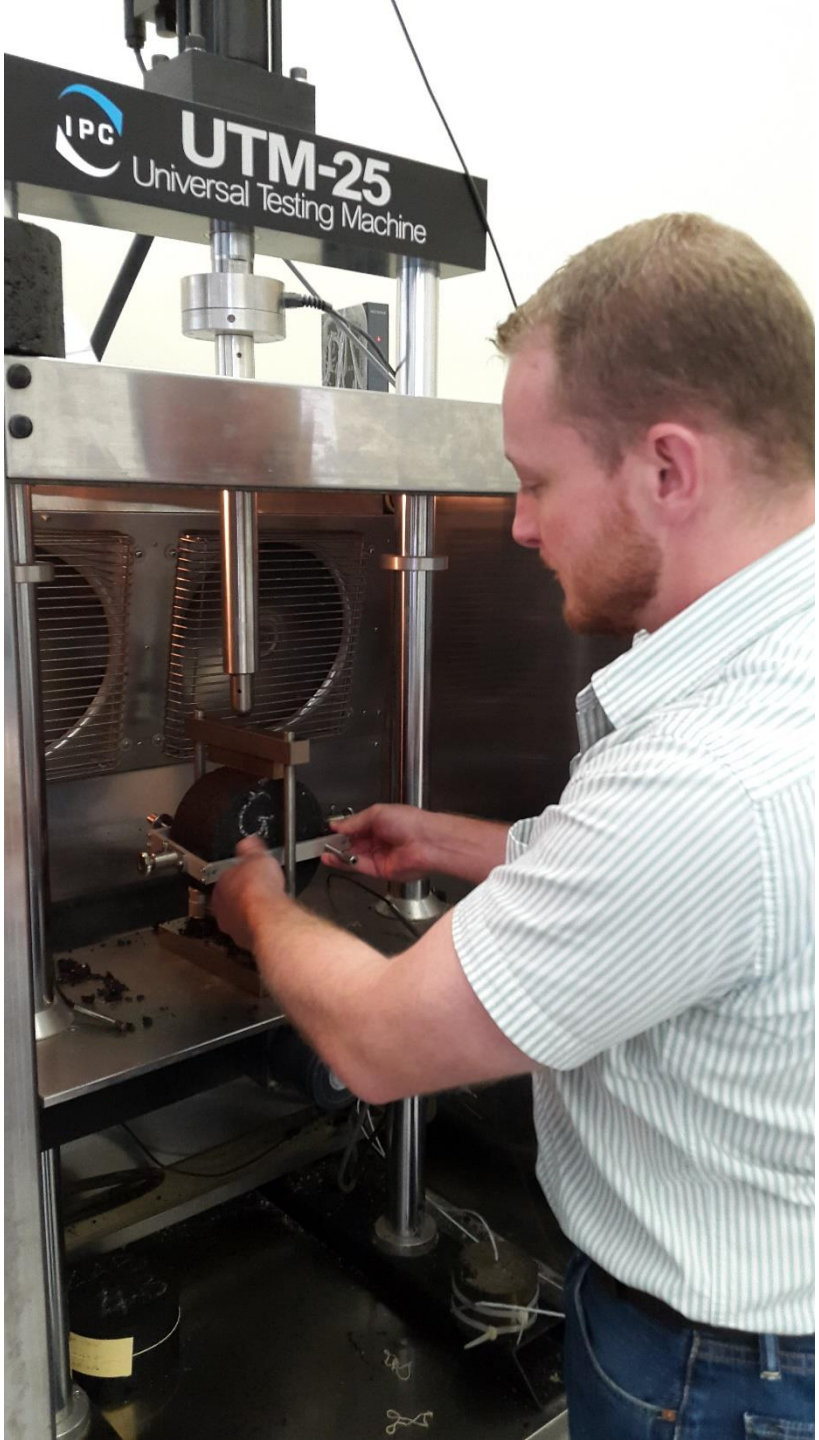
Precision engineering.....?



Precision engineering.....?







Testing of specimens
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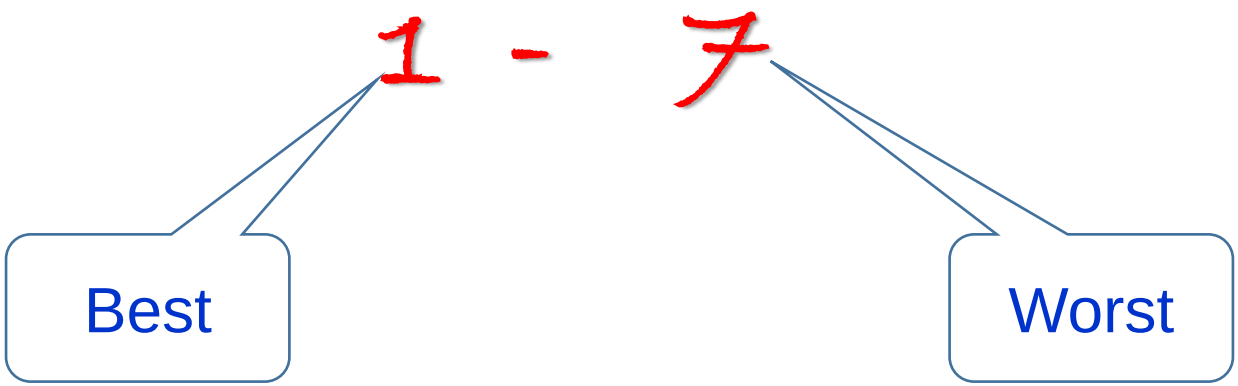
Competition rules.....

-Ranking of best to worst:



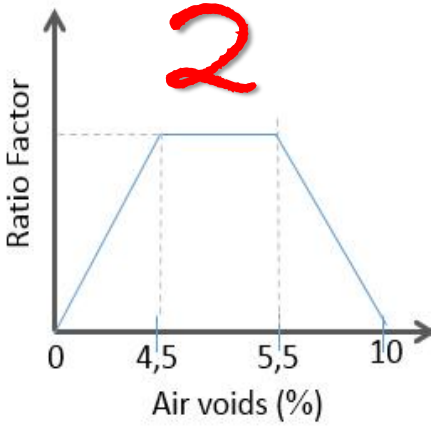
-for each of set out criteria

The challenge……

1

(a) Indirect Tensile Strength

2



(b) Target Air Voids

During the course (interim)

And the winner is .....

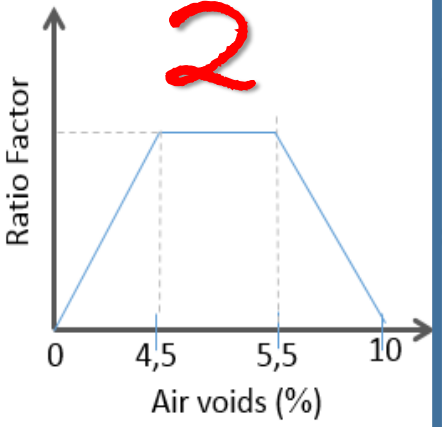
VOIDS (%)							ITS (kPa)			Final Ranking
Group nr	Binder content (%)	SASOBIT (%)	Rice (1000kg/m3)	BRD (1000kg/m3)	Voids (%)	Ranking	Force (KN)	ITS (KPa)	Ranking	
1	5.7%	1,3%	2,497	2,359	5,53	2	30,77	1632	7	9
2	5.7%	3,0%	2,483	2,376	4,30	4	44,11	2007	1	5
3	5.8%	3,5%	2,475	2,373	4,10	7	37,29	1840	3	10
4	5.2%	3,0%	2,488	2,359	5,20	1	38,45	1863	2	3
5	5.7%	1,3%	2,52	2,380	5,55	3	33,19	1783	6	9
6	6.0%	2,5%	2,484	2,380	4,18	6	33,76	1813	4	10
7	5.7%	1,5%	2,498	2,353	5,81	5	34,81	1802	5	10

1st

Adding all criteria.....

1

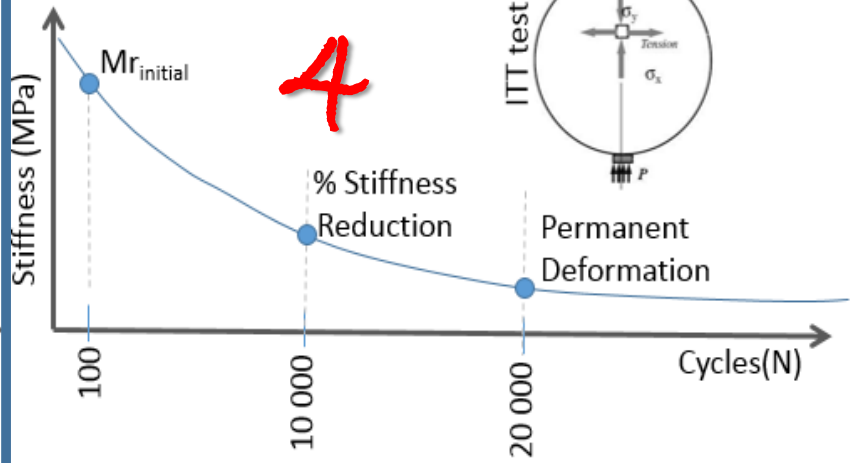
2



3

4

5



(a) Indirect Tensile Strength

(b) Target Air Voids

(c) Indirect Tensile Test [dynamic] to determine Mr initial at 100 cycles **(d)** % stiffness reduction at 10 000 cycles and **(e)** Permanent Deformation, all at 10Hz, 15°C

During the course (interim)

After the course (final)

And the ^ winner ~~is~~ .....

interim

was

VOIDS (%)							ITS (kPa)			
Group nr	Binder content (%)	SASOBIT (%)	Rice (1000kg/m3)	BRD (1000kg/m3)	Voids (%)	Ranking	Force (KN)	ITS (KPa)	Ranking	Final Ranking
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7	5.7%	1,5%	2,498	2,353	5,81	5	34,81	1802	5	10

1st

And the new winners are .....

VOIDS (%)					ITS (kPa)			Mr initial (Mpa)		Fatigue Life		Pemanent Deformation		Final Ranking	
Group nr	Binder content (%)	SASOBIT (%)	Voids (%)	Ranking	Force (KN)	ITS (KPa)	Ranking	Resilient Modulus @ 20% Stress Ratio	Ranking	% Reduction @ 10 000 cycles	Ranking	με @ 20 000 cycles	Ranking		
1	5.7%	1,3%	5,53	2	30,77	1632	7	17509	4	21,4	5	21402	3	21	
2	5.7%	3,0%	4,30	4	44,11	2007	1	10701	6	13,0	2	10910	2	15	2nd
3	5.8%	3,5%	4,10	7	37,29	1840	3	18244	3	N/A	6	N/A	5	24	
4	5.2%	3,0%	5,20	1	38,45	1863	2	10994	5	16,2	4	9460	1	13	1st
5	5.7%	1,3%	5,55	3	33,19	1783	6	9561	7	N/A	6	N/A	5	27	
6	6.0%	2,5%	4,18	6	33,76	1813	4	23676	1	8,5	1	21769	4	16	3rd
7	5.7%	1,5%	5,81	5	34,81	1802	5	18770	2	13,9	3	N/A	5	20	

Outcomes achieved

(undergrad)

Outcomes achieved

Outcomes achieved

(undergrad and advanced)

- sound fundamental knowledge
- practical application and exposure to the laboratory and pavement technology
- advanced: WMA Technology exposure
- various challenges involved in the laboratory
-industry networking


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excellence in bituminous products
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MANAGEMENT
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