South African Pavement Design Method (SAPDM)

Revision Update

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29th RPF

13th May 2015

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LTD

Reg. No.1998/009584/30

Aka GODZILLA

Current South African Pavement Design Procedure

GRANULAR BASES (MODERATE OR DRY REGIONS) DATE 1996

PAVEMENT CLASS AND DESIGN BEARING CAPACITY (80 kN AXLES/LANE)

ROAD CAT.	ES0.003 < 3000	ES0.01 0,3-1,0x10^4	ES0.03 1,0-3,0x10^4	ES0.1 3,0-10x10^4	ES0.3 0,1-0,3x10^6	ES1 0,3-1,0x10^6	ES3 1,0-3,0x10^6	ES10 3,0-10x10^6	ES30 10-30x10^6	ES100 30-100x10^6	Foundation
A							40A 125 G2 150 C3 40A 150 G2 150 G5	40A 150 G2 250 C3	50A 150 G1 250 C3	50A 150 G1 300 C3	
B						S 125 G4 150 C4	S*/30A 150 G3 150 C4	40A 150 G2 200 C4			150 G7
C				S 100 G5 125 C4 S 125 G4 125 G6	S 125 G5 125 C4 S 125 G4 150 G6	S 125 G4 125 C4 S 125 G4 150 G5	S 150 G3 150 C4 S 150 G3 150 G5				
D	S1 100 G5 100 G7	S1 100 G5 125 G7	S1 100 G4 125 G7	S1 100 G4 125 G6 S1 100 G5 100 C4	S 125 G4 125 G6 S 100 G5 125 C4	S 125 G4 150 G6 S 125 G5 150 C4					150 G9 G10

Catalogue Encourages The Use of "Virgin" material and limits innovation

Symbol A denotes AG, AC, OR AS. A0, AP may be recommended as a surfacing measure for improved skid resistance when wet or to reduce water spray.

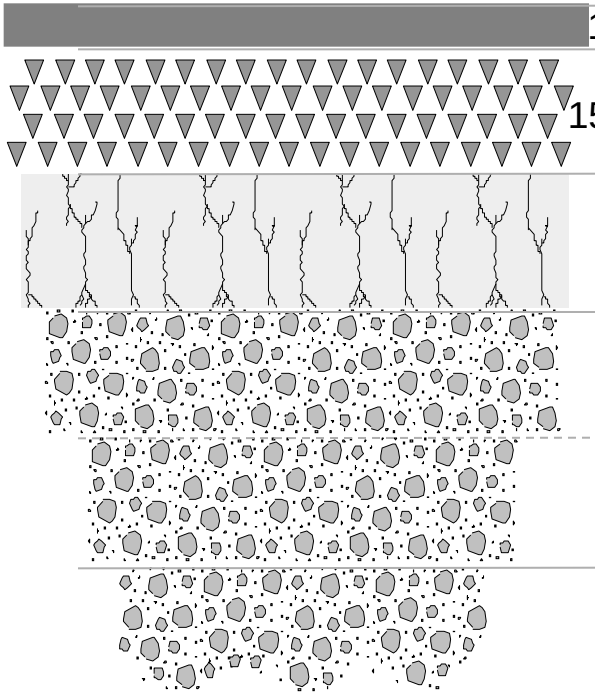
S denotes Double Surface Treatment (seal or combinations of seal and slurry)

S1 denotes Single Surface Treatment

* If seal is used, increase C4 and G5 subbase thickness to 200mm.

Typical South African Pavement and SAMDM

South African Pavement Structure



	Current ME Damage Model
10-40 mm Wearing course	Asphalt Fatigue – Freeme 1970s
150 mm Crushed stone base	Permanent Deformation FOS Maree 1970s to 1980s
150 - 300 mm Cemented subbase	Effective Fatigue and Crushing Failure De Beer 1980s
150 mm Granular upper selected subgrade	Vertical Strain Criteria Dorman and Metcalf 1965
150 mm Granular lower selected subgrade	Vertical Strain Criteria Dorman and Metcalf 1965
In situ subgrade	Vertical Strain Criteria Dorman and Metcalf 1965

In addition to age of models current SAMDM has number of limitations, i.e. no damage models for plastic deformation in Asphalt layers, number of models outdated, no models for “Foam”, “ETB”, Surface Seals, etc, etc

SAMDM – Lipstick on a PIG ?

Outdated models with new Software Interface

SAPDM Revision - Progress To Date

Research

- Basic research completed by most teams, Surface Seals still in progress - work only started April 2011
- May 2015 = 116 Reports

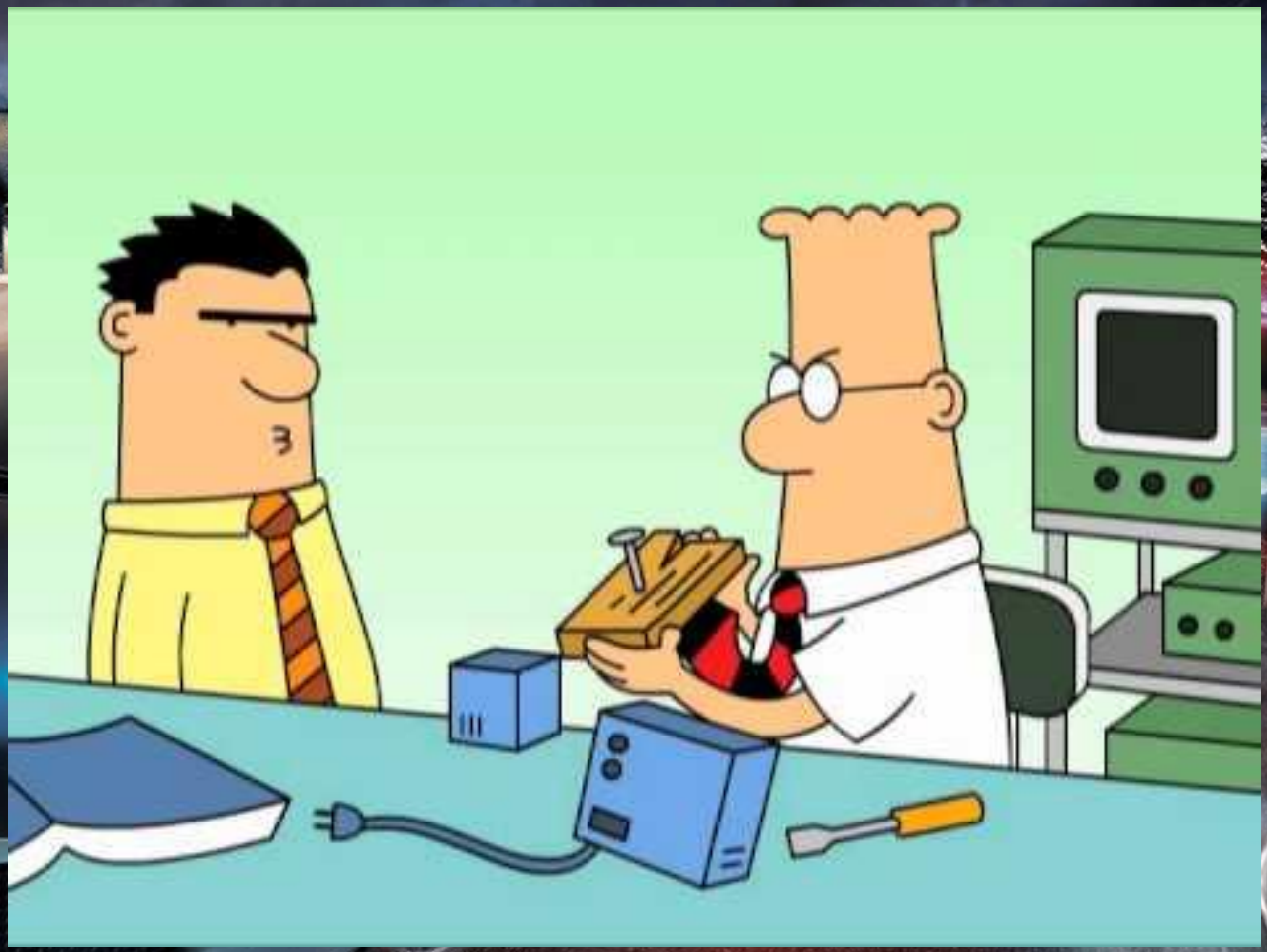
Field Trials

- Environmental = 41 Sites - Completed
- Experimental Sections
  - R35 Stabilisation = Oct 2012 - Monitoring Ongoing
  - R104 Instrumented Typical Pavements = Aug 2013 – Traffic Speed Deflectometer Measurements

Software Development

- Software coding in progress …

NEED FOR SPEED™ WORLD



South African Road Design System (SARDS)

Portal

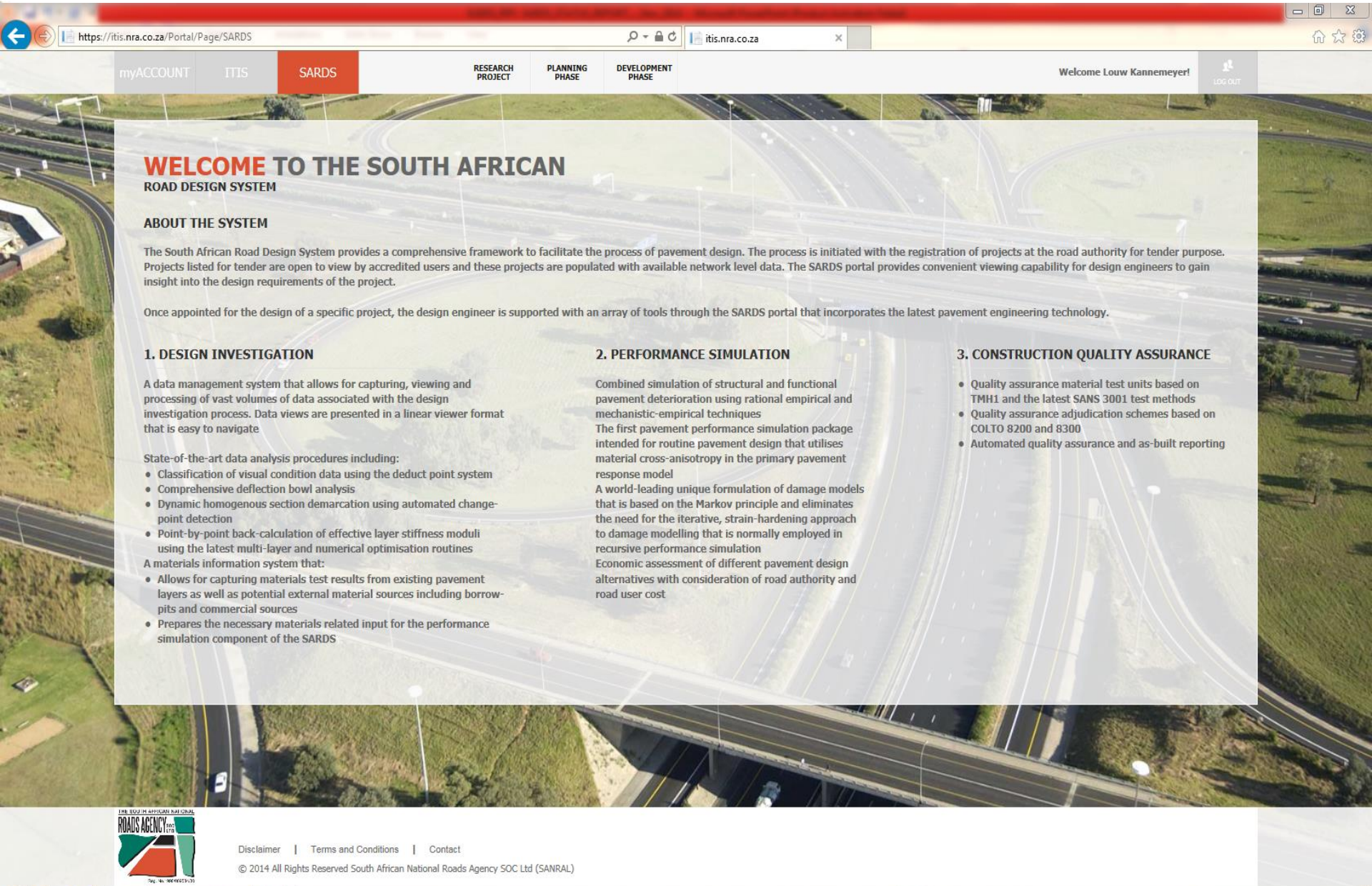
Why Name Change?

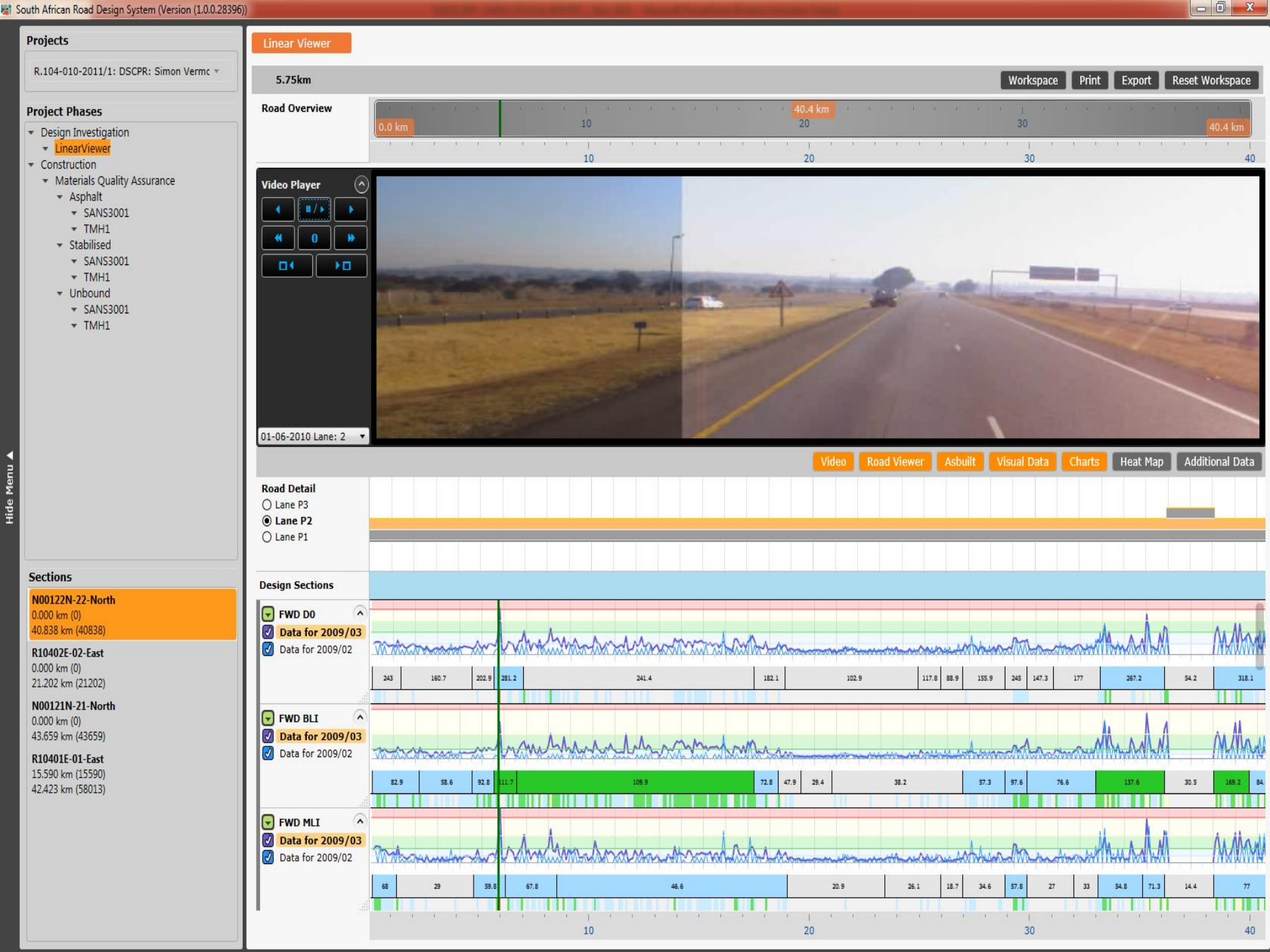
To differentiate the software portal from the pavement design revision, as software is not only doing pavement design, but capacity, safety, etc as well !

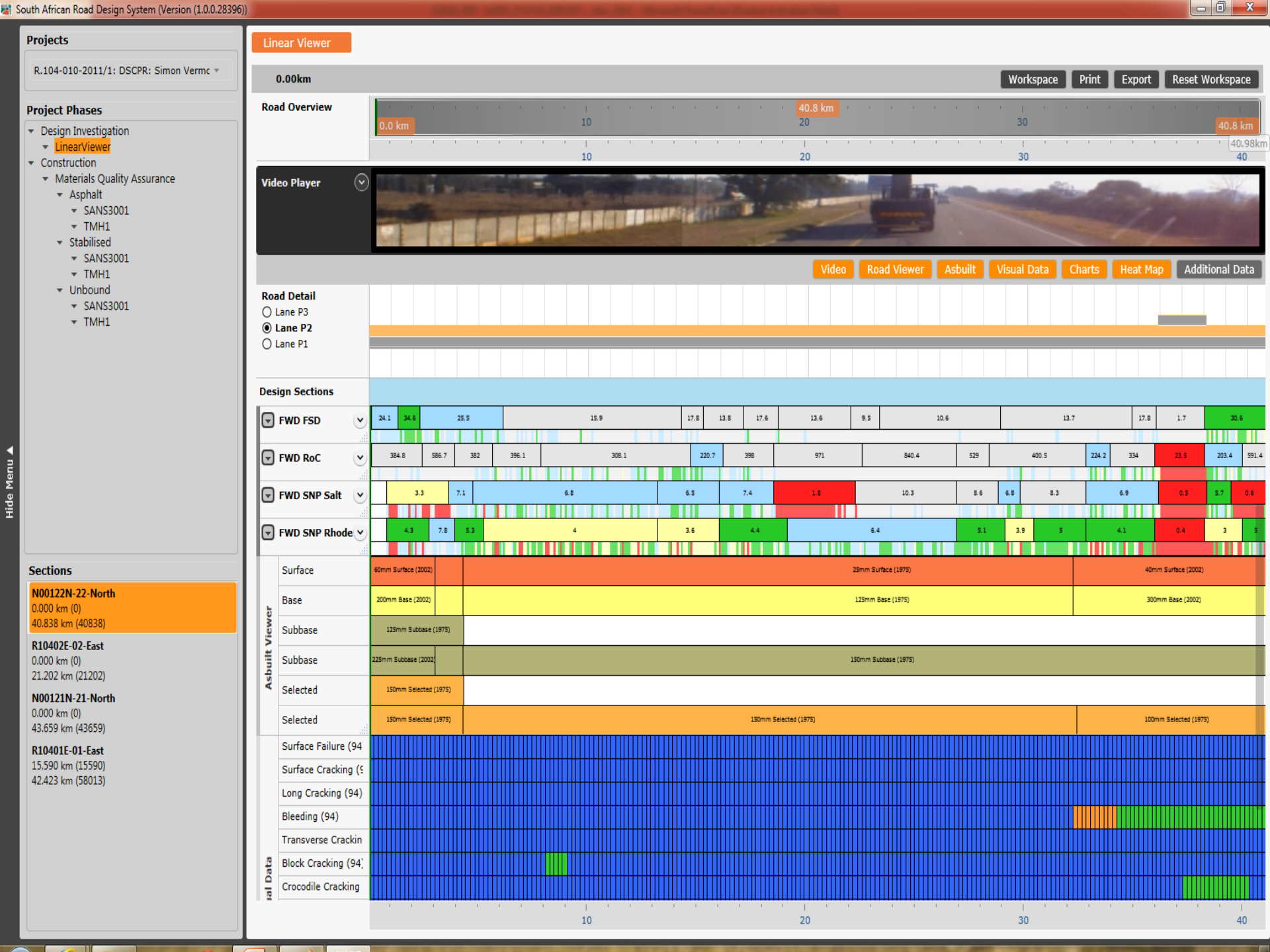
Asset Management Cycle and SARDS

Closing the Loop

South African Road Design System - SARDS




South African Road Design System (Version (1.0.0.28396))
Projects
R.104-010-2011/1: DSCPR: Simon Vermc
Project Phases
Design Investigation
LinearViewer
Construction
Materials Quality Assurance
Asphalt
SANS3001
TMH1
Stabilised
SANS3001
TMH1
Unbound
SANS3001
TMH1
Hide Menu
Sections
N00122N-22-North
0.000 km (0)
40.838 km (40838)
R10402E-02-East
0.000 km (0)
21.202 km (21202)
N00121N-21-North
0.000 km (0)
43.659 km (43659)
R10401E-01-East
15.590 km (15590)
42.423 km (58013)
Linear Viewer
5.75km
Workspace
Print
Export
Reset Workspace
Road Overview
0.0 km
40.4 km
10
20
30
40
Video Player
01-06-2010 Lane: 2
Video
Road Viewer
Asbuilt
Visual Data
Charts
Heat Map
Additional Data
Road Detail
Lane P3
Lane P2
Lane P1
Design Sections
FWD D0
Data for 2009/03
Data for 2009/02
FWD BLI
Data for 2009/03
Data for 2009/02
FWD MLI
Data for 2009/03
Data for 2009/02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40.8 km
40.98km
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Asbuilt
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Charts
Heat Map
Additional Data
Road Detail
Lane P3
Lane P2
Lane P1
Design Sections
FWD FSD
FWD RoC
FWD SNP Salt
FWD SNP Rhode
Asbuilt Viewer
Surface
Base
Subbase
Subbase
Selected
Selected
60mm Surface (2002)
25mm Surface (1975)
40mm Surface (2002)
200mm Base (2002)
125mm Base (1975)
300mm Base (2002)
125mm Subbase (1975)
225mm Subbase (2002)
150mm Subbase (1975)
150mm Selected (1975)
150mm Selected (1975)
150mm Selected (1975)
100mm Selected (1975)
Surface Failure (94
Surface Cracking (9
Long Cracking (94)
Bleeding (94)
Transverse Crackin
Block Cracking (94)
Crocodile Cracking
10
20
30
40

SARDS Detail Feedback

Title	Presenter
R35 Status Feedback	**H Theyse**
Surface Seals	**G van Zyl**

Thank You

https://itis.nra.co.za/portal

Creating wealth through infrastructure

Thank you!

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