PRACTICAL ROAD PAVEMENT
ENGINEERING
NEW ROADS AND REHABILITATION

INTRODUCTION
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Practical road pavement engineering involves the location, testing, utilization, design, maintenance and re-use of road building materials. The purpose of this exercise is to provide a road which will carry a range and volume of traffic, for a specific design period, at an acceptable level of performance.

ART SCIENCE

INTRODUCTION

Practical pavement engineering is in fact a combination of both.

Science : A good theoretical knowledge of materials properties, characteristics and performance; the mechanisms of loading, the transference of load and modes of failure, and the interaction of the two.

Art : Practical experience and engineering common sense.

Conditions are often similar but never the same.

- Pavement design is thus largely an exercise in sensible ongoing quality control.

INTRODUCTION

Maintenance does not form a part of this course. However, the designer needs to understand that maintenance is a vital part of the life of a road and must take this into account in all phases of road works.

INTRODUCTION

South Africa has an extensive road network which until fairly recently was in relatively good condition. With the curtailment of road funding it is important to look after our current investment :-

FLEXIBLE ROADS IN SOUTH AFRICA

Road - Type		Kilometres
Rural	- Freeways (paved)	5 000
	- Single carriageways (paved)	60 000
	- Single carriageways (gravel)	440 000
Urban	- Paved	94 000
	- Gravel	20 000

The Total network would take you round the world 15,5 times!!

INTRODUCTION

Regrettably because deterioration takes place over a period of time (i.e. years) the short-term view, particularly of politicians, is that in difficult financial times we can either reduce or stop maintenance funding "for a while". This premise is both false and dangerous.

A very rough estimate of Replacement Cost (year 2020) for the 720 000 km is of the order of three trillion Rand [R 3 X 10^{12}]. So just like with a house it is vital that we maintain our investment.

INTRODUCTION

Maintenance encompasses :-

- Routine works such as grass cutting, cleaning side drains and culverts, rubbish removal
- Repairs to signs, fencing, the road surface (patching), and
- More extensive work such as resealing, minor reconstruction/rehabilitation and regravelling.

CRITICAL COMMENT

- Often too little, too late. Maintenance needs to be systematically and well done. The concept that maintenance is a task of little importance to be carried out by those of limited ability is both foolish and definitely will be costly!

INTRODUCTION

One of the biggest problems in a large road network is to decide where and how to spend one's limited maintenance budget. This is where a pavement management system (PMS) can play a key role.

- PMS FUNCTIONS
- 1. OBJECTIVELY: measure the Type, Degree and Extent of distress.
- 2. COMPARE: all roads and street conditions and PRIORITISE in order of need for attention.
- 3. GUIDELINE: provide a guide in the form of a set of calculated treatments for each road condition. The calculations are based on a set of algorithms. The outcome can be used for estimating costs and hence preparing a budget for approval by senior management.

REFERENCES

Site Investigation

Materials and Testing

Design and Maintenance

List of TRH and TMH documents for various design aspects: www.nra.co.za technical specifications

Typical Road Cross-sections - terminology

SABITA Manuals: www.sabita.co.za manuals

SA Pavement Engineering Manual (SAPEM)

Google: “Manuals & Policies - SANRAL”