Design of Rural Collector Roads Using PavEXpress

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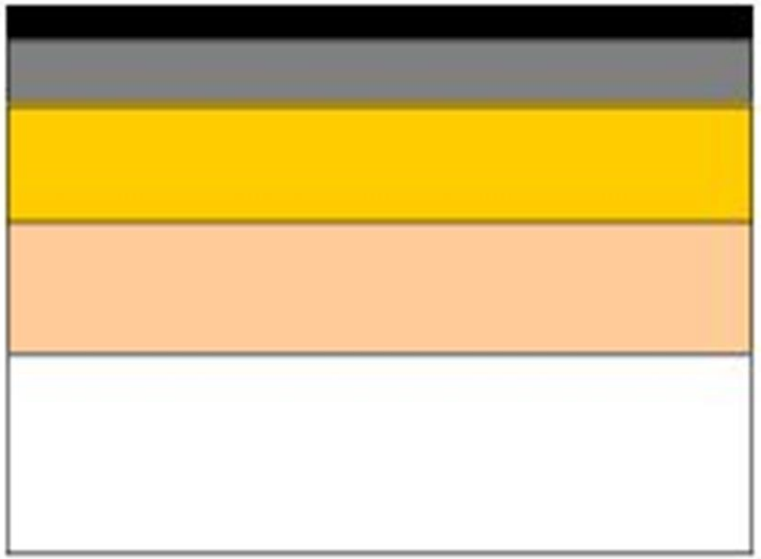
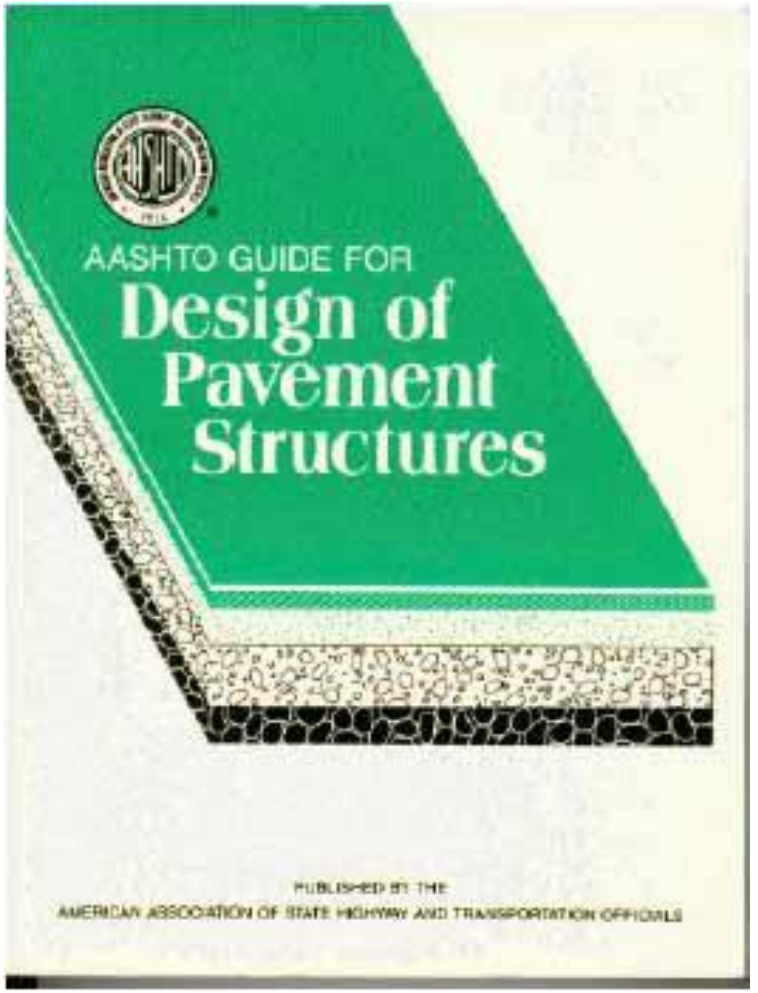
Outline of Presentation

- Introduction
- Design of New Flexible Pavements
- Design of Asphalt Overlays
- Software Demonstration

Design Method and Section

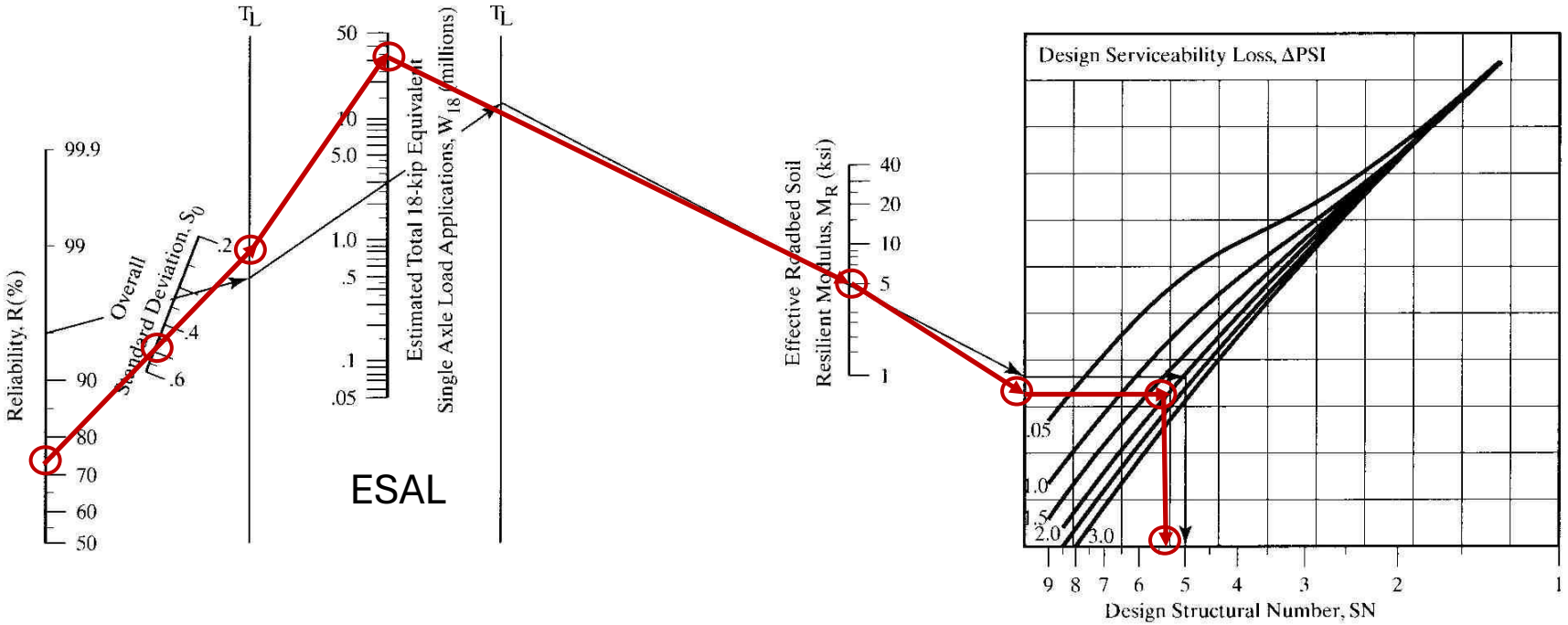


Asphalt surface
Asphalt base
Base course
Subbase course
Subgrade



1993 AASHTO Design Guide

Design Parameters of Flexible Pavement (AASHTO)

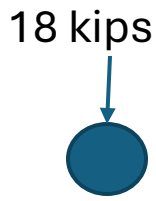


Suggested Levels of Reliability, R

Functional classification	Recommended level of reliability	
	Urban	Rural
Interstate and other freeways	85-99.9	80-99.9
Principal arterials	80-99	75-95
Collectors	80-95	75-95
Local	50-80	50-80

Overall Standard Deviation, S_0 0.40 - 0.50 (typical), R = 75% → 0.50

Equivalent Single Axle Load (ESAL)



EALF = 1.0

EALF = $(L_x/18kips)^4$

15,000 lb + 6,000 lb = 0.49 ESAL

0.48 ESAL 0.01 ESAL

T_f

$$ESAL = (ADT)_0 (T)(T_f)(G)(D)(L)365(Y)$$

Growth factor

Lane distribution

Average daily traffic

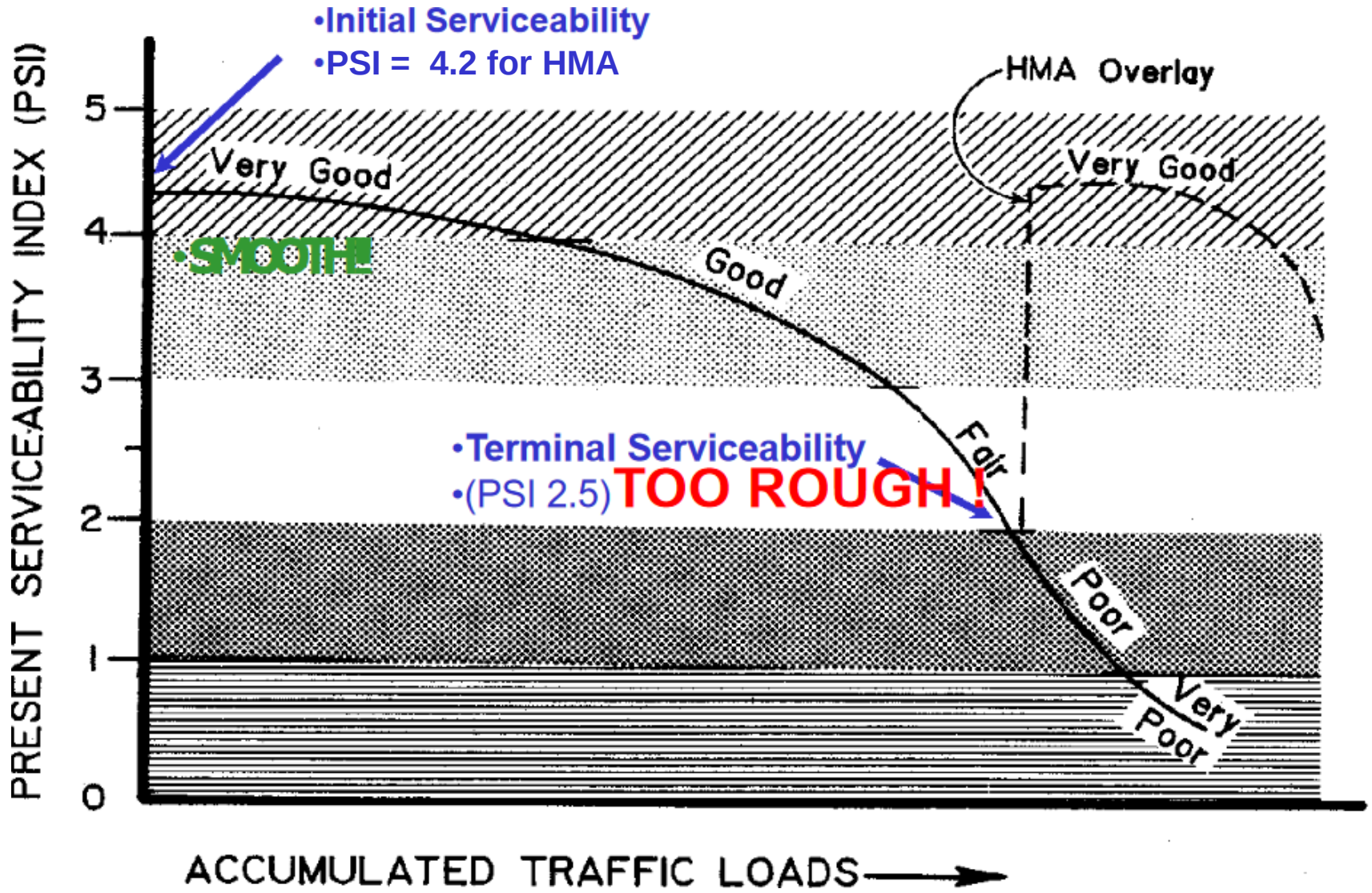
% truck

Truck factor

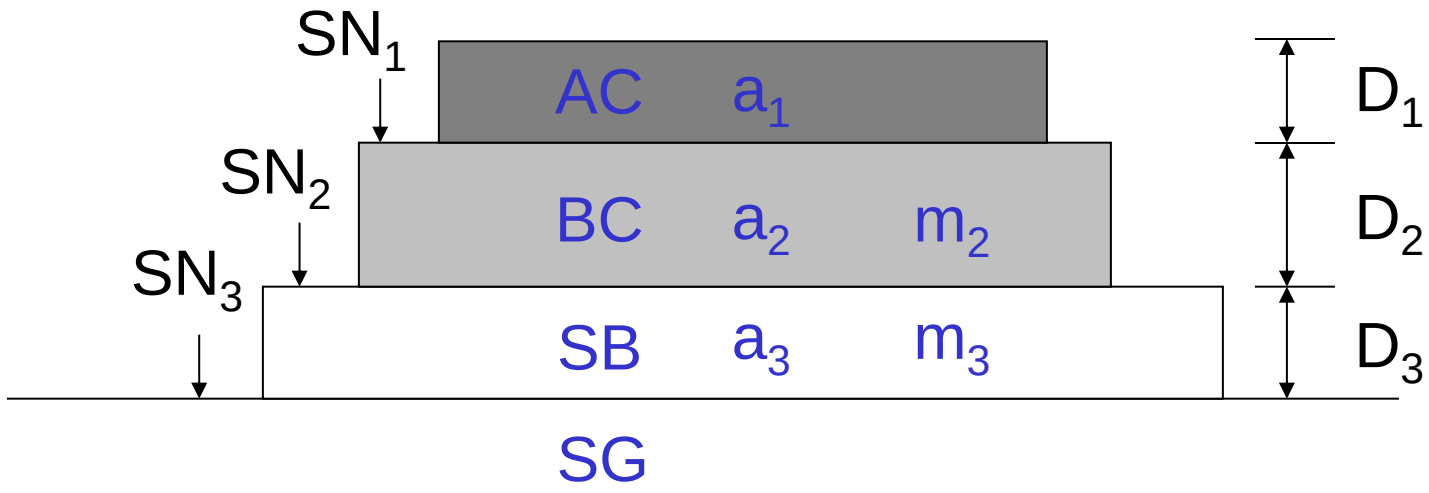
Directional distribution

Years

Serviceability Index



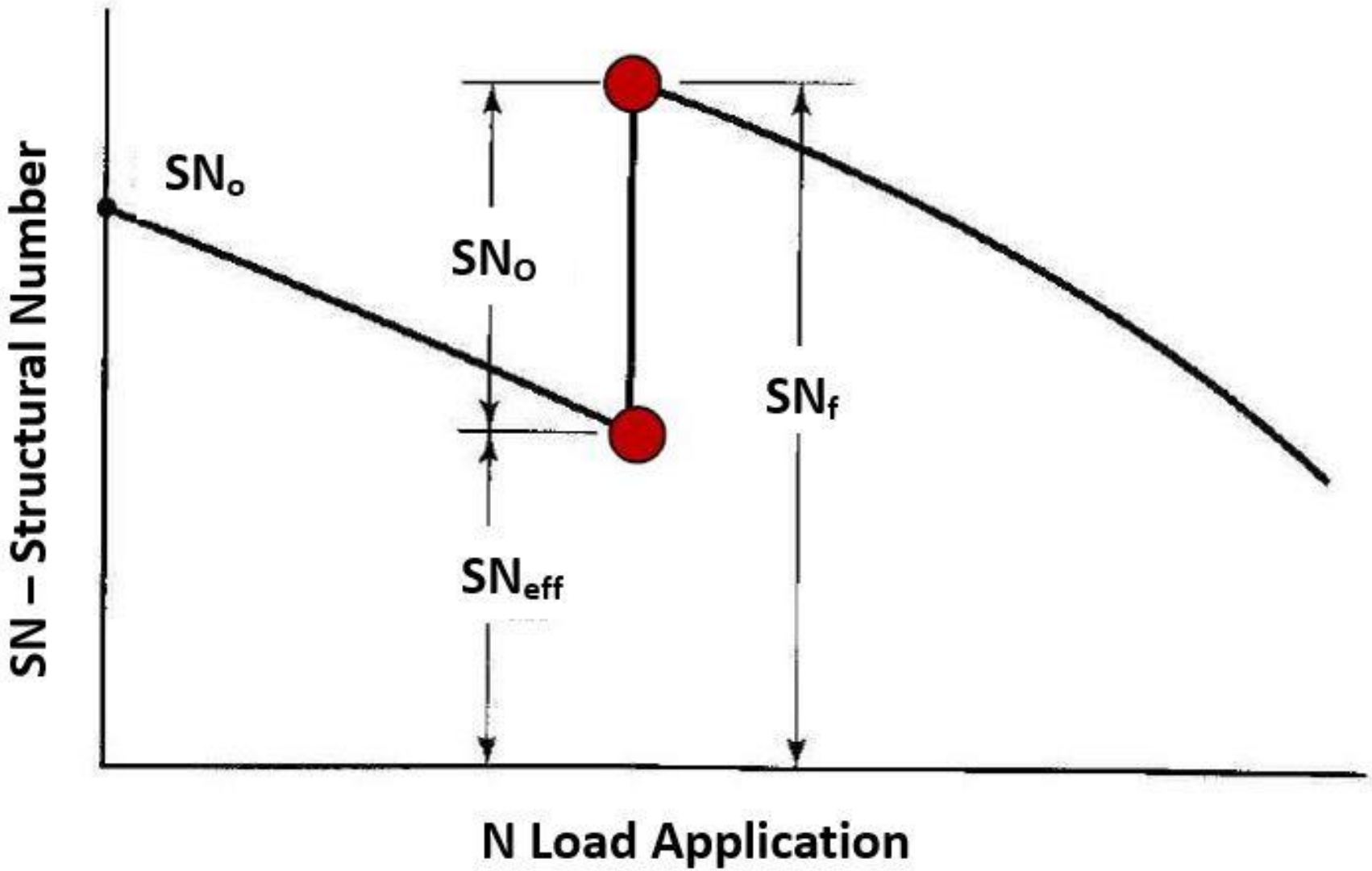
Structural Number (SN)



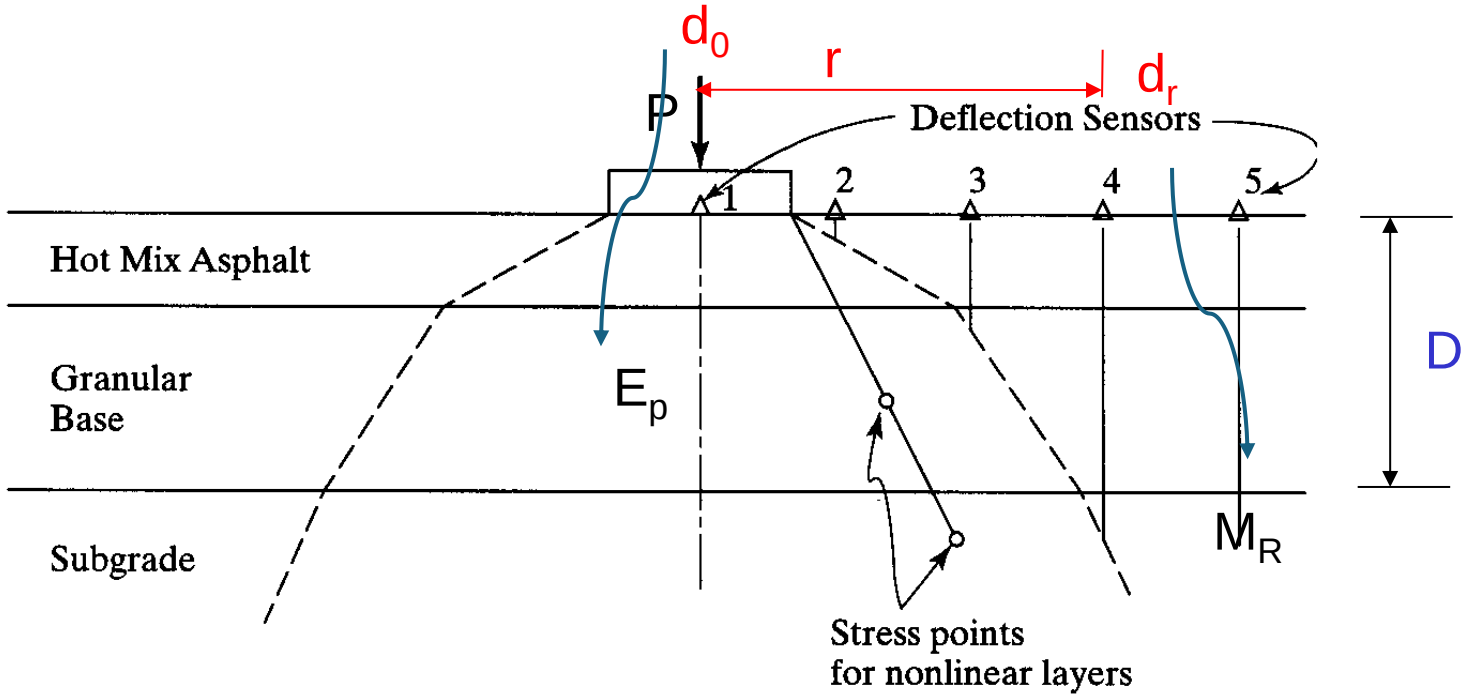
	Layer coefficient, a	Drainage coefficient, m
AC	0.44	
BC	0.14	1.0
SB	0.11	1.0

Quality of Drainage	Typical m value
Excellent	1.20
Good	1.00
Fair	0.80
Poor	0.60
Very poor	0.40

Structural Number Before and After Overlay



Non-Destructive Test (NDT) Method To Evaluate Existing Flexible Pavements



Use E_p back-calculated from the previous calculations to estimate effective SN

$$SN_{eff} = 0.0045D\left(\sqrt[3]{E_p}\right)$$

Required SN (overlay) = SN (after overlay) - SN_{eff}

Background of PavEXpress

- The PAVEInstruct learning module is a web-based pavement design education system with video instruction by leading industry experts.
- PAVEInstruct accompanies **PAVEXpress**, a web-based software created to design flexible and rigid pavements using AASHTO 93/98.

Now let's do the demo of PAVEXpress

PAVExpress