Demonstrating Pavement Life:  
A Multi-Faceted Approach  

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The Context  

• It is now common for the Contractor to design, as well as construct, rehabilitation/smoothing sections of pavement
The Context

• The Contractor is being required to demonstrate, following construction, that the expected life of a pavement is not less than the design life.

The Context

• The sole tool being advocated by Clients for confirmation of design life is FWD testing and back-analysis to obtain material strains.
The Basis for Design

• Two components:
  – Traffic and subgrade CBR leads to structural thickness, incl depth of base (Figure 8.4 and NZ Supplement)
  • Thicknesses result from field and laboratory testing
  – Base/subbase material prescriptions (M/4, M/3 Notes or M/22)

Basis for Construction

• Three components:
  – Material properties (e.g. base, subbase, modified subgrade)
  – Adequacy of compaction (B/2)
  – Compacted layer thicknesses
A Basis for Confirmation

• If the constructed pavement demonstrates:
  – Compliant material properties
  – Adequacy of compaction (B/2)
  – Design layer thicknesses,
• i.e. compliance with the structural components
• Can a PS4 be signed off at this point?
  – Not yet........

Why Not?

• Spaced-out nature of compliance testing (i.e. possibly missed the “bad” piece)
• The road needs to settle down under trafficking for final confirmation
  – For example, the degree of saturation may have been too high prior to sealing
  – Effect may not show up immediately
These are Reasonable

• In any event, a maintenance period normally applies
• So sign-off should be a two-stage process
  – Following confirmation of construction
  – Towards end of maintenance period
    • An “elapsed-time” confirmation
    • Testing (see next) is subject to no visual evidence of emerging problems

“Elapsed-time” Test

• Propose FWD testing
  – At small intervals, alternate OWPs
  – Record D0 and D0-D200 values
    • Emphasis is on reasonable consistency rather than absolute values
  – Require remedial work or revisit in a year’s time if there are significant outliers
    • Bounds in variability need to be indicated beforehand
SUMMARY

• Two-stage sign-off is proposed:
  – (a) at completion of construction, subject to signed off tests in accordance with prior-approved Quality Plan
  – (b) at end of maintenance period, subject to evidence of a consistent product from FWD deflections and curvature