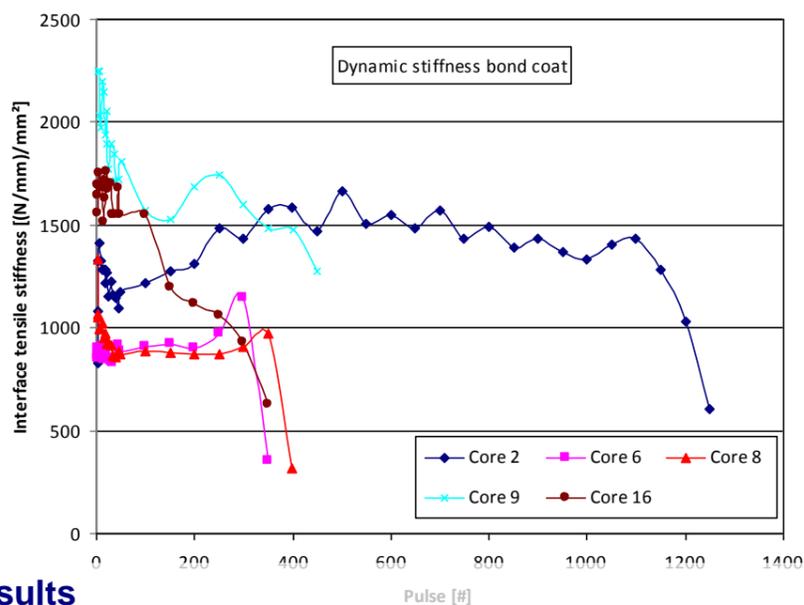
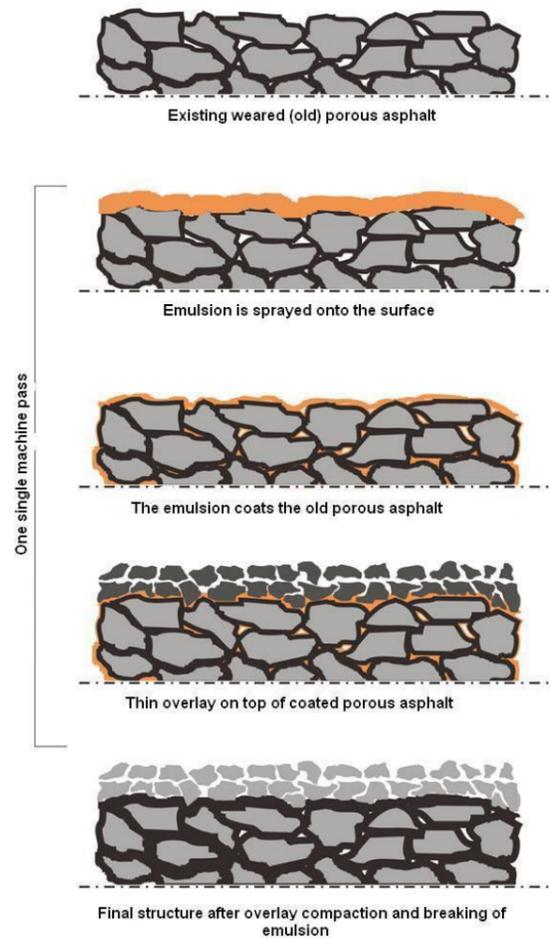


OPTIMUM BONDING OF THIN ASPHALT OVERLAYS ON POROUS ASPHALT

Introduction

In the Netherlands, polymer modified bitumen emulsion bond coats are mainly applied as tack coat under thin asphalt surfacings. Normally, these thin layers are laid down on a standard (dense) graded binder course. A new application of a thin asphalt layer is the usage as a high-quality porous asphalt repair.

In 2003 trial sections were constructed on the A7 in the Netherlands on deteriorated porous asphalt with a variation in the amount of applied emulsion bond coat and layer thickness of the overlay. From these sections, cores were drilled and the optimum combination of applied bond coat and lift thickness were determined by means of laboratory pull-off tests. After 5 years, from the sections with the optimal combination of bond coat and layer thickness, new cores were drilled and tested.



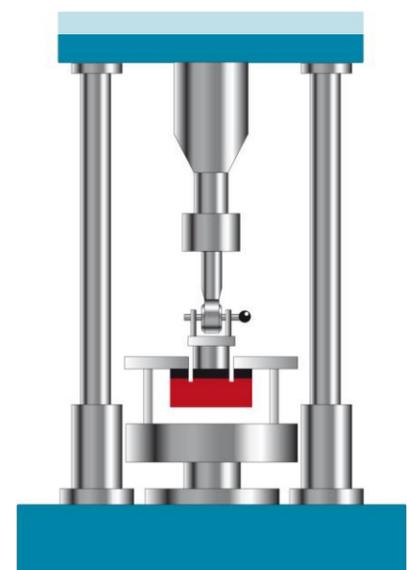
Results

- After 5 years in use, the bonding at the interface between the thin asphalt layer and the old porous asphalt layer is still intact.
- Using the laboratory static pull-off test, just after lay-down the structure fails in the thin surfacing; after 5 years the structure fails in the porous asphalt under layer itself.
- In the (still experimental) dynamic laboratory pull-off test, most of the 5 year old cores fail at the interface between the thin surfacing and the porous asphalt.
- From the observed field performance it can be concluded, that via the usage of polymer modified bond coat emulsions, it is possible to upgrade worn (old) porous asphalt to new quality.

Test program

The static (monotonic) pull-off tests were carried out on drilled cores as described in the German specification (TP Asphalt-StB Teil 81) with a constant load increase of 0.025 (N/mm²)/s at a constant temperature of 10 °C. The tensile stress needed to pull-off the thin asphalt layer is defined as the bond strength.

For the dynamic pull-off test, a cyclic sinusoidal period of 1 s (frequency 1 Hz) and a stress amplitude of 0.135 MPa on top of a static (tensile) load of 0.03 MPa was used. This at a constant temperature of 20 °C.



P.O. box 1 1633 ZG Avenhorn The Netherlands

Kees Plug kplug@ooms.nl
Arian de Bondt adebondt@ooms.nl

www.ooms.nl/research

Paper prepared for:
5th World Congress on Emulsions
12-14 October 2010
Lyon, France