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PAVEMENT INFORMATION NOTE

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Curing of Concrete Pavements

I have just come across a recent US FHWA sponsored research which documents the state-of-the-art on the theory and practice of good curing of paving .concrete. Compared to our practice, the findings and recommendations are quite radical and different. I have obtained the Reports and summarised the pertinent issues in the attached paper: "Latest Theory and Guidelines for Curing of Concrete Pavements" (Arvo Tinni September 2009).

Curing is the process of deliberate control of moisture and temperature within the prescribed limits. This is an important requirement for the development of strength and durability. Inadequate or incorrect curing can result in plastic cracking, spalling (including stress relief at the arises of saw cuts), susceptibility to wear near the surface of he concrete, erosion of the base and subsequent mechanical damage to the surface. As well as, curing is now defined as "initial" and "final".

The paper points out that there have been many changes in the concrete technology and understanding of the curing process since the original guidelines were formulated (apparently quite many years ago). Amongst these are: use of pozzolans, fineness of cements, paving construction practices and slipform paving, use of concretes with w/c ratios of <0.40 and grooving of the surfaces.

The guidelines recommend detailed planning of curing operations, which include:

- Initial and final curing times;
- Requirement of bleeding profile on all Trial Mixes;
- No application of final curing until bleeding stops;
- Bleeding stops with the outset of initial setting;
- Adjustment of curing compound application rates to suit the grooved surface;
- Curing compounds to have a min of 25% solids;
- Curing membranes to have a maximum moisture loss of 0.40 kg/m^2 in 72 h;
- Curing compound to be applied in at least two operations (2nd after 1st dry);
- Ambient evaporation rates of >0.3 kg/m^2 re likely to present problems when slipforming pavements;
- Check Blaine fineness to be less than 400 m^2/kg;
- Continual checking of the weather and concrete temperatures.

All those involved with paving should read the summary.

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