Development Guideline 18: Flexible Pavement Design

Applies from 1 July 2005

Amended 16 February 2007

Subdivision road pavements within the City of Whittlesea are to be designed in accordance with

1. Standards Association / Austroads publication "A guide to the structural design of road pavements" ("Austroads 2004");

2. VicRoads "Code of Practice for Selection and Design of Pavements and Surfacings" ("RC500.22")

All roads require a detailed pavement design based upon a minimum 25 year pavement life, supported by a Traffic Management Strategy or Traffic Engineers report.

Asphalt Surface (mandatory)

1. Wearing Course Asphalt
   A minimum of 25mm depth of 7mm asphalt:

   - In the case of subdivision, to be completed within 12 months after 'Practical Completion' (ie. after building construction traffic mostly completed);

   - In the case of trafficked roads, to be completed as part of the works.

2. Base Course Asphalt
   A minimum of 40mm depth of 14mm asphalt.
   Notes for asphalt:

- Asphalt fatigue is to be taken into account in the design;

- Type of asphalt is to be chosen specifically for the application, or traffic zone;

- Asphalt thicknesses may be varied within the subdivision in accordance with traffic loading;

- Account needs to be taken of special traffic loading during construction activities, at roundabouts and at major intersections;

- Pavements incorporating deeper thicknesses of base course asphalt (deep lift pavements) can be considered as a design solution.

Structural Pavements on "Reactive" Subgrades

The potential for swell of subgrades, or fill beneath the pavement layers, is to be tested (refer to City of Whittlesea Guideline 16 Geotechnical Testing for Road Subgrades) and classified in accordance with Table 5.2 of Austroads 2004.

Where the subgrade soils (fill or natural) are High to Very Highly Expansive, a capping layer (itself having low permeability and a low expansive classification) is required to be placed underneath the pavement layers to reduce the environmental effects on the subgrade.

Design pavement is therefore along the following lines:

3. Base – Thickness designed in accordance with Austroads 2004.

4. Sub-base – Thickness designed in accordance with Austroads 2004 where additional pavement depth is required.

5. Capping Layer for reactive subgrades - minimum 150mm compacted depth of suitable capping material, having low expansion characteristics and meeting the requirements of capping layers as contained in the City of Whittlesea Guideline 16. Required practice notes:

    - Note that pavements must be designed to have at least 100 mm depth of pavement material beneath kerbs for practical construction purposes.

    - Results of capping layer material selection tests must be submitted as part of pavement design approval;

    - The thickness and properties of the capping layer may be taken into account in the structural design of the pavement as per the Austroads design guide; · Ag drains behind kerbs are to be wholly contained within the capping layer, which is to be locally thickened at the edges to accommodate the Ag drains (i.e. there must be a capping layer minimum thickness of 150mm below the Ag lines);

    - The top of the subgrade soil shall be prepared and must pass proof rolling tests before placement of the layer of selected capping material; · Conduits, drainage pipes and service pipes are to be placed in the subgrade prior to installation of the capping layer, to ensure that the capping layer remains unbroken and performs its function of minimizing environmental movement;

    - If locally poor insitu conditions require modification to provide a workable platform for construction, that workable platform is to be in addition to and

located below the capping layer. In such cases, material selection and construction methods must produce a subgrade passing compaction tests and a capping layer sealing off environmental movement.

Expansive Nature	**Liquid Limit (%)**	**Plasticity Index**	**Pl x % < 0.425**	**Potential Swell %**
Very High	>70	>45	>3200	>5.0
High	>70	>45	2200 - 3200	2.5 – 5.0
Moderate	50 – 70	25 – 45	1200 – 2200	0.5 – 2.5
Low	<50	<25	<1200	<0.5

(From Austroads 2004 Table 5.2)

Structural Pavements on Non-reactive Subgrades

The reactivity of subgrades, or fill beneath the pavement layers, is to be tested and classified in accordance with Table 5.2.

Where the subgrade soils (fill or natural insitu material, or lime-stabilised insitu material) have been assessed as having a Low to Moderate expansive nature, in accordance the classification system in Table 5.2, the following shall apply:-

3. Base - Thickness designed in accordance with Austroads 2004.

4. Sub-base - Thickness designed in accordance with Austroads 2004 where additional pavement depth is required.

5. Capping layer - No capping layer is required.

Required practice notes:

- Note that pavements must be designed to have at least 100 mm depth of pavement material beneath kerbs for practical construction purposes.

- Locally weak subgrades shall be treated in accordance with the requirement to obtain a working platform. The actual depth treated will be subject to assessment of the in-situ conditions and the remedy necessary to produce a working platform, which enables a subgrade to pass stability tests by proof rolling.

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