

## Benefits and Negatives of Concrete Pavements

Arvo Tinni  
Tinni Management Consulting  
March 2013

### Benefits

The beneficial attributes of concrete pavements can be summarised as:

- 1 Longer lasting – 40 year Design Life (some States in US are already using 50 years and even this may increase in the future).
- 2 Heavy duty Pavements have generally the lowest cost.
- 3 Pavement maintenance costs are up to 10 times cheaper than the same for flexible pavements.
- 4 Minimum maintenance requirements result in less traffic disruption, minimum congestion time and as a result Work zone safety.
- 5 Lowest Life Cycle Cost of all Heavy Duty pavements and highest salvage value.
- 6 Can be constructed over poor subgrades.
- 7 Thinner overall pavement thickness = lower consumption of raw materials.
- 8 Resistant to abrasion from turning actions.
- 9 Not susceptible to high or low temperatures.
- 10 No affected by weather, inert to spills and fire.
- 11 Completely recyclable.
- 12 High abrasion durability.
- 13 Profile durability.
- 14 Safer because it maintains its shape, no deformation, resistance to rutting and potholes and excellent skid resistance.
- 15 High sustainability rating through use of local materials.
- 16 Use of waste products like flyash and slag.
- 17 Riding quality does not deteriorate.
- 18 Can be slipformed up to 13 m.
- 19 Saving of fuel costs of at least 1.1% over asphalt (VTI Sweden – 1.1% 2008, NRC Canada – 0.8 to 6.9%).
- 20 Light colour enhances night visibility.
- 21 Less energy for street lighting (up to 30%).
- 22 Less heatsink effect (av 8°C lower than asphalt = less air conditioning energy in urban areas).
- 23 Longitudinal diamond grinding, called Next Generation Concrete Surfacing (NGCS) now provides quieter surface than for example Open Graded Asphalt overlay.

## Negatives

- 1 To provide economics and quality, it requires larger projects
- 2 For required quality and finish, slipforming is essential
- 3 Green field sites provide maximum economics
- 4 The operation must have its own batch plant
- 5 Set-up costs are significant
- 6 Slipforming must have a minimum length 200 m of paving runs available
- 7 Concrete must have a minimum compressive strength before the pavement can be trafficked. (Theoretically only about 4 MPa, but Client Specifications often call for 20 MPa)
- 8 Slab repairs or replacements, if required, take longer
- 9 Transverse texturing creates high frequency noise that can be objectionable to some motorists. (Concrete = 1100 Hz vs Asphalt ~800 Hz)
- 10 Tyre/road noise can become a nuisance issue in urban areas after 80/90 km/h speeds (if allowed)

Evaluation with the use of the Principles for Pavement Selection will demonstrate and highlight the locations or situations where a flexible pavement must be preferred for concrete.