

Use of seawater for compaction of bitumen-surfaced pavements



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Construction of a new bitumen-surfaced road or airport pavement in an arid area usually requires the use of several thousand cubic metres of water per day for compaction.

The use of salt water – or even only brack water – for compaction in the past has had mixed success and often resulted in surface disintegration of the primed

base course and/or blistering of the surfacing. This experience led to fresh water usually being specified – particularly in the granular base course – in order to avoid such salt damage.

However, fresh water is usually scarce in such areas and fresh groundwater may also be “fossil” or only slowly recharged, and thus essentially non-renewable. In the past this has often resulted in fresh water having to be piped in over long distances, and in at least one case also up to an elevation of 1 000 m above the source.

Experimental sections were therefore constructed in 1976 at Lüderitz on

the arid coast of Namibia in order to develop methods of successfully using seawater for the compaction of all layers of a new road with a G3 base course under a Cape seal surfacing.

These experiments have shown that, provided certain precautions are taken in the design and construction, seawater can be used in all layers including a G3 base course without experiencing any significant degree or extent of salt damage, either during construction or in the long term – at least up to 36 years.

The sections in which seawater were used have never even been resealed and have only received two rejuvenation sprays and some edge patching and shoulder regraveling in 36 years (see photo) – a remarkable performance for any road!

The early results of these experiments were successfully applied in the construction of a private road in the diamond area along the west coast, but it is only now that long-term performance-related proof of their success with a G3 base on a Category B trunk road is becoming available.

It is expected that details of this work, as well as that involving the successful use of G3 and G4 bases containing far more salt and gypsum than normally allowed, will be released later in the year by the Namibia Roads Authority. □



Source:

http://www.saice.org.za/downloads/monthly_publications/2013/2013-Civil-Engineering-June/#/0