Category 3: Excellence in Sustainability

Stabilisation of Floodways on Adventure Way, Innamincka, SA

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Downer
Relationships creating success

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Overview & Objectives

Downer was awarded the project on the Adventure Way, which is the unsealed road between Innamincka located in the far north east of South Australia and the Queensland border, to reform/reconstruct and provide a bituminous seal for the entire 27km of road.

The road has a number of floodways throughout the 27km section of road, however due to the nature of the existing material (high plasticity and poor grading), a decision was made not to cement stabilise the floodways, which is the standard treatment for outback roads.

The road was successfully reconstructed over a four month period and opened the way for tourists to travel in all conditions.

However, a weather event post construction saw 90mm of rain hit the area and subsequently the road surface through the floodways was damaged. The remainder of the road withstood the deluge and held up extremely well.

Initiative

Given the high plasticity and inconsistent nature of the insitu material, the client (DIT) approached Downer for a solution to repair the floodways in lieu of the conventional cement additive treatment.

A stabilisation triple blend powder binder solution was offered, especially due to the varying nature, ungraded composition and plasticity of the existing pavement material.

The binder offering was a product named Roadmaker 442. Roadmaker blends are always made up of:

- GP Cement
- Ground Granulated Blast Furnace Slag
- Hydrated Lime

In this case 442 =

- 40% GP Cement
- 40% Ground Granulated Blast Furnace Slag
- 20% Hydrated Lime

Downer had recently had very good success with Roadmaker 442 on the Ngarkat Highway, the Strzelecki Track and on Kempe Road between Oodnadatta and Coober Pedy.

Operating Environment

- The varying nature, ungraded composition and plasticity of the existing pavement material provided a complicated solution to remediate
- Roadmaker 442 was the ideal solution and a very good candidate to improve the bearing and modulus strength of the pavement, treat any PI issues and provide a semi-bound pavement

Challenges

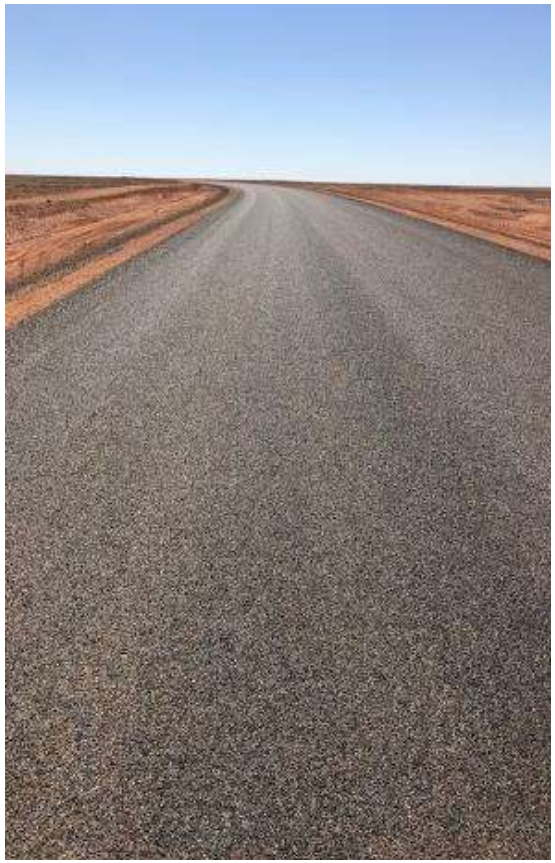
- The remote environment and the poor salinity of the bore water that was needed for the stabilisation process provided some challenges and the water needed to be sourced from a selected bore near the Queensland border
- In addition, the existing pavement material was historically sourced from open-pit material alongside the road and therefore the pavement consisted of large rocks up to 500mm, which caused damage and a high number of replacement tooling from the stabiliser drum

Key Points of Interest

Slag is a supplementary cementitious material used in addition to GP cement to extend the working time of the material. The slower curing also reduces cracking in the pavement layer. GP cement reacts quicker in the cooler temperatures than Slag, reducing the time for the pavement to setup. Lime is also a slower acting additive, but necessary where high moisture contents and clays are present in the host materials. The lime stops the clay particles clumping together, which can occur when just using a General Blend cement, getting a more homogeneous blend.

Evidence of Success

Floodways erosion on the Adventure Way (after the use of Roadmaker 442)



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Supporting Data and Images

Below is a photo of some saturated samples of clayey silty material – from left is Roadmaker 442 and moving right pure lime and cement blends.

Supporting Data and Images

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