FOAMED BITUMEN TAKES OFF AT HUGHENDEN

FKG GROUP AND FLINDERS SHIRE COUNCIL'S INNOVATIVE APPROACH AND USE OF FOAMED BITUMEN STABILISATION (FBS) ON THE HUGHENDEN AIRPORT RESTORATION PROJECT IS A MAJOR FACTOR IN ITS SUCCESS. *ROADS & CIVIL WORKS MAGAZINE* TALKS TO FKG GROUP PROJECT MANAGER SIMON WEIER ABOUT THE PROJECT AND THE APPROACH REQUIRED TO GET THE JOB DONE.

The use of foamed bitumen in Australia dates back to the 1960s.

The idea was introduced more than half a century ago when it was trialled via rudimentary, agricultural equipment. Foamed bitumen stabilisation (FBS) is now becoming a more feasible application on the country's roads.

FBS is a mixture of air, water and bitumen. Hot bitumen is injected with a small quantity of cold water. As a result, it expands to nearly 15 times its original volume, forming a fine mist or foam. In this state, the bitumen has a large surface area with low viscosity.

The use of FBS can allow for a thinner pavement overlay thickness, which can significantly reduce the resources and virgin materials required for construction.

Simon Weier, Project Manager at FKG Group, says FBS is very popular in New Zealand and South Africa and is starting to gain some real momentum here in Australia. For FKG Group FBS has also proved a popular and successful methodology to use.

FKG Group prides itself on its expertise in FBS, explains Mr. Weier. He says that's also part of the reason the company was awarded the $6.5 million contract to undertake the Hughenden Airport Restoration project in 2014.

In 2012 devastating floods caused saturation damage to Hughenden Airport in Queensland. The damage meant considerable repair work was required to rehabilitate the airport runway, taxiway and parking apron.

The scarcity of pavement materials in that part of western Queensland meant that the client, Flinders Shire Council, and FKG Group faced a considerable environmental challenge in how to manage the limited resources.

He adds that it was Steve Turner, Director of Engineering at Flinders Shire Council, who proposed that FBS be used as the appropriate methodology for the project.

The council commissioned the use of FBS in a bid to recycle as much of the existing material as possible. Applying the FBS methodology meant that local materials could be employed at an increased modulus, reducing the overlay thickness and decreasing the reliance on the scarce, local virgin quarried materials.

FKG Group mobilised the site in April 2014 – just two weeks after being awarded the contract. Work began within two weeks of the firm receiving the project's letter of acceptance. "The big challenge when we started was the timing," says Mr. Weier "The council had a very strict deadline of 30 June and if we went over that we would be costing them a lot."

FKG Group undertook the FBS mix designs and, due to time constraints placed on the project and significant waiting lists for domestic laboratories, this meant materials had to be airfreighted to New Zealand for testing.

With the scarcity of local materials and the daunting timeframe already in the back on their minds, the team from FKG Group focused on an innovative approach. It set up on-site storage and heating facilities for bitumen and additive storage due to the airport's remote location.

Three Wirtgen stabilisers were on site for the project, with more from FKG Group's fleet on hand should they be needed.

While FKG Group mobilised quickly to tackle the challenges laid out in front of them, it was the unexpected condition of the terrain that threw the first real spanner in the works. "Once we started on the work, we came across some very poor subgrade materials," says Mr. Weier.

FKG Group chose a blend of lime and cement stabilisation as an appropriate application to support and strengthen the subgrade, while still recycling the existing materials. Mr. Weier says due to the unprecedented discovery of the poor subgrade, more cement was needed at short notice. One of FKG Group's suppliers, based in Toowoomba, came on board quickly to deliver the material.

Multiple activities ran concurrently on site, including physical mixing, placing and the movement of material in a safe manner.

The contract also required the installation of aeronautical ground lighting on the airport's runway, which was delivered by FKG Group company, NRG Electrical.

FKG Group delivered the Hughenden Airport Restoration project in the scheduled 12-week timeframe. Approximately 16,033 tonnes of existing pavement material was used in the program of works.

More than one year later, the airport is fully operational and Mr. Weier says the use of FBS has increased the resilience of the pavement for future disaster events such as flooding.

Following the success of the project, FKG Group, in conjunction with the council, co-authored a technical engineering paper, which shared the best practice and expertise learned from the project. It was delivered at the Institute of Public Works Engineering Australasia (IPWEA) Queensland state conference in 2014.

Not only that, but FKG Group and Flinders Shire Council won the award for Excellence in Recycling in Stabilised Pavements in Local Government at the 2015 AustStab Awards of Excellence in July.

Mr. Weier says it is fantastic to see the FKG Group team so proud of their achievements and to receive industry recognition too.

"[Steve Turner] said he couldn't be more happy with the project and there's no pavement issues or bleed," he says. "I'd probably say it's the most rewarding project I've been a part of."