



Oral History Program

Pavement recycling & stabilisation

SUMMARY REPORT

The Aran Pugmill

Stabilisation can be done in two ways: plant mix and insitu. Plant stabilisation uses pugmills, a conveyor belt mechanism that feeds material from a stockpile up into a rotating shaft with paddles (or 'mill'):

'It has chutes and weighing controls from other conveyor belts.... Pugmills were set up in some quarries, where they would actually add stabilising agents to quarry product. There was prime, new product and on some occasions they had mobile pugmills that they could deliver to a site for a period of construction and could stabilise there. One of the brands of these was Aran, which was a modern brand, which perhaps was more mobile than the other brands, lighter, easier to use, better production, and so one milestone, I suppose is pugmill development and crushing material and the movement of stabilisation from the subgrade of the pavement up into the base layers and the subbase layers.' (Porter, Tape RTA-PRS:FH5, Side A, 24:01 and Tape RTA-PRS:FH6, Side A, 19:16)

Trevor Dunstan designed and built the Aran Pugmill, which became a standard for the industry. It all began when Hartwig Schroeder of Farley and Lewis wanted a mobile pugmill for a cement stabilisation project near Townsville:

'And so I sat down on the dining room table at night with a calculator and a pencil and nutted out what this thing was going to look like, and how it could all be packaged on one trailer, and where we'd put the mixer and the metering and feeding system and the silo, and I came up with a design of a plant which had an integral feed hopper, its own engine, a mixer, discharge conveyor and a self-elevating silo, and I worked out all the dimensions and made a quote to these folks and it would never happen today, but Herr Schroeder bought this thing over the telephone.' (Dunstan, Tape RTA-PRS:FH11, Side A, 09:18)

Dunstan and his partner were given just eleven weeks to design and build the pugmill, which they achieved. It soon proved itself and the road authorities were very supportive of the new machine, as they allowed materials to be used on small job sites and the quality of mix was superior:

'Those plants were principally mobile plants- they were self contained in one unit and they were primarily designed to add a binder at a modest dose rate – at the sub 10% range. Some of the later ones had capacity for two and even three primary ingredients, where it might be necessary to adjust the grading by adding some sand, or something like that. At the rear of the machine was one hopper, or in the later machines there were two, that were loaded from either side, below which was the metering feeder, which was a belt feeder.' (Dunstan, Tape RTA-PRS:FH11, Side B, 30:02)

What made the Aran pugmill different from the others?:

'The thing that our machines did that they had not had before was that they were able to give a measure of quality control. Previous to that, there had been very little success with good binder metering and our binder metering system was able to produce consistency that just hadn't been achieved before and it did allow those types of pavements to be used with a greater degree of predictability. We were the

first people, probably anywhere in the world, to be able to meter cement on a continuous basis very accurately and we still hold our heads high in being the technology leaders in that field.' (Dunstan, Tape RTA-PRS:FH11, Side B, 40:25 & 50:25).

After the machine had been in use, Dunstan made further modifications to the configuration of mixing blades and then came up with a design for a cleated belt feeder, his contribution to continuous mixing technology worldwide:

'It was an amazing improvement over anything that had been there before and we were able to meter cement and Fly Ash very accurately with very good repeatability and excellent standard deviations, which hadn't been previously possible.' (Dunstan, Tape RTA-PRS:FH11, Side A, 23:25)

Australia still has 40 or 50 Aran pugmills, but with the decline in the pugmill method of construction, a number have been shipped overseas, mainly to Asia. Dunstan feels that with the Aran Pugmill, he made a significant contribution to stabilisation:

'We made it possible. The mixing machines of the day were a lot worse than they are today. There are a lot of other things we made possible as a consequence to that – we've been one of the leading players in making dam construction more affordable. That is a direct result of our involvement in stabilisation and there are people in many parts of the world now that have water that they otherwise wouldn't have been able to afford, because of that, and there are people who have had their environment cleaned up because of that.' (Dunstan, Tape RTA-PRS:FH11, Side B, 56:56)

Trevor Dunstan



Trevor Dunstan completed a degree in Mechanical Engineering at the University of Queensland and helped to design engines for the Ford Motor Company in Geelong, Victoria. At the age of 23, he had attained a position as Assistant Chief Engineer for a bulk materials handling firm. In 1977 he started Aran International and is credited with having designed and built the first Aran pugmill, which became a benchmark in the stabilisation industry.