

Forethought prevents tension during airport works

Shrewd planning and close cooperation minimized the potential for dissension during runway refurbishment at Aberdeen airport.

Discord was a distinct possibility at Aberdeen airport where runway resurfacing effectively involved three contractors, an onerous materials specification and a tight programme with very fixed windows. In fact, everything went sweetly and the job recently finished five weeks early. Credit goes to the way the contract was planned and then carried out – with no rows breaking out between the different parties.

The airport runway at Aberdeen was last resurfaced in the early 1980s and wore well until comparatively recently. A quarter of a century old, the surfacing showed signs of its age and the decision was taken to plane off the top 50mm and replace this with fresh asphaltic concrete. Other resurfacing works were carried out at the same time, to a taxiway and hard standing.

“Resurfacing a live runway can be a tricky business, involving intense periods of night working when the planes aren’t flying, and placing a material – Marshall Asphalt –which is demanding both in its mixing and laying,” says the project manager of Ferrovial Agroman Airports UK, Stuart Campbell.

Ferrovial was contracted to do the work in joint venture with Lagan Construction. Lagan was responsible for asphalt laying with asphalt production subcontracted to local company Leiths (Scotland). “There was certainly room for disputation, shall we say, if the job had not been carried out properly. But everyone did their job correctly and we were helped in this by a client with foresight,” Campbell says.

Airport owner BAA was both client and consultant for the runway refurbishment. The job was scheduled by BAA to go 30 weeks, a generous timescale for the work to be done. “Very sensibly, the client had built 12 weeks into the programme as a planning window which allowed us time to really fine tune the work,” Campbell says.

The 12 weeks were put to good effect: everyone involved knew exactly what they had to do, and by when it had to be done. Also, there are security issues when working airside at an airport and the window meant that ‘passing up’ the workforce (i.e. issuing the required security clearance) could be carried out without undue haste. “It really helped smooth the job,” says Campbell.

Another factor was the expertise brought to bear in mixing and laying the Marshall asphalt. Marshall Asphalt is a continuously graded asphaltic concrete of high bitumen content which meets the functional requirements of airfield pavements (see box); and it is ticklish stuff. Not every asphalt supplier can mix the material; nor every asphalt contractor lay it.

This is not just a matter of lack of skill but also lack of inclination. Marshall asphalt has its moments (i.e. can go wrong).

Aberdeen based Leiths has a good reputation for its asphalts, including Marshall Asphalt. “We worked at Aberdeen airport to an airfield pavement specification issued by BAA which is onerous in terms of production,” says Leiths’ technical director Neil Anderson. “There was no room for any deviation from the spec – we had to get it right.”

Altogether, 15,000t of Marshall Asphalt was required. Stone was of 14mm size with a relatively high PSV (polished stone value) of minimum 58. This high quality aggregate was also supplied from a Leiths quarry. Marshall Asphalt normally gets its primary friction characteristic from continuous grooves mechanically cut perpendicular to the centre line of the runway.

But there is a time lapse between laying and subsequent grooving. BAA wanted incoming aircraft at Aberdeen to benefit by good resistance to skidding in the new surfacing from the start – hence the high PSV stone to provide skid resistance in the 48h interval between laying and the material being grooved.

Leiths' Marshall Asphalt mix was bound by straight run bitumen supplied by Nynas, which has a high reputation for the effectiveness of its products and also their consistency. "The bitumen came from our Dundee refinery, so didn't have far to travel. We were pleased to provide Leiths with technical support on this contract, as we have on many other of the company's asphalt contracts over the years," says Nynas' Scotland area sales manager Nigel Hardy.

Nynas is a pan European company with research and development facilities not just in the UK, but in Sweden, Belgium and other countries. "Our asphalt engineering facilities have helped countless customers verify designs and find innovative solutions to contractual issues," Hardy says. "We like to help provide the most appropriate answers and value the appreciation of our customers and their clients."

Once the Aberdeen airport mix was absolutely right – and BAA's ultra cautious engineer initially took some persuading – the material had to be delivered to site "with the right consistency, the right temperature and at the right time," says Anderson. Lagan Construction, also with Marshall asphalt skills, laid the material during night time possessions of the runway, between 23.00 and 06.00 the following morning, weather permitting. There could be no excuses: the new asphalt had to be down and serviceable and plant put away well before that morning's planes were scheduled to begin arriving.

Leiths subsidiary company Markon was responsible for planing up the old weathered asphalt, and among its contingency measures was a 150t mobile crane on standby, to lift out a planer in the event of a break down. Markon planing manager Scott Darling says: "We planed off the amount required precisely to match the new material being batched." Leiths was batching about 350t of Marshall Asphalt each night, on average.

The contract started midsummer and was initially valued at just over £5M but rose to £9M with additional works. Leiths went on to batch 3000t of Marshall binder asphalt plus 4700t of its proprietary stone mastic asphalt Rigaphalt. Mixed with variety of stone sizes (14mm, 10mm and 6mm to suit circumstances) and again using Nynas binder, this was used in surfacing for taxiway and hard standings.

"Rigaphalt is designed to airport standards in terms of physical properties and is tough stuff," Anderson claims. "It has been used before in military applications. This is the first time it's been used in a civil airport."

Recently completed, the work at Aberdeen airport drew several letters of praise to Stuart Campbell. "Which was very gratifying," he says. "The job went very well, no argument."

At the time of writing, Ferrovia Agroman has just moved on to Glasgow airport to resurface Alpha taxiway, again working for BAA. As project manager Stuart Campbell comments: "The good work at Aberdeen has obviously stood us in good stead."

Leiths, meanwhile, has moved to RAF Lossiemouth to surface a taxiway where delamination through moisture penetration of a slurry seal/Marshall asphalt interface has been causing problems. (FOD – foreign object damage – is not something that can be tolerated.)

Leiths is again using one of its own products, Rigatex, to replace the top 50mm of the old slurry seal/Marshall pavement. Rigatex uses (in this application) a 10mm stone and a polymer modified binder from Nynas' Performance range to produce a highly durable airfield surfacing. The Nynas product is called Nypol 103 and is a highly engineered, high performance binder, according to Scottish sales manager Nigel Hardy.

Functional requirements of airfield pavements

- Good ride ability
- Good friction characteristics
- High strengths and the ability to withstand shear stresses induced by heavy wheel loads and high tire pressures
- A durable, hard wearing weatherproof surface free from loose material and sharp edges
- Resistance to fuel spillage and jet blast
- Facilitate economic maintenance surfacing

