

World first in precision paving at Heathrow

The demanding tolerances of concrete slab laying required at T5 and Heathrow Airport has called for the use of the high-tech 3-D Machine Guidance Systems of Leica Geosystems installed on Gomaco GHP2800 Slip-Form Pavers.

BENEFITS:

- a better quality surface
- laying of concrete with precision, reliability and speed
- concrete is laid with less paving preparation
- elimination of on-site obstructions improves overall airport logistics

The project saw the deployment of the world's first entirely string line free paving system at a major international airport.



This four year project funded by the BAA and AMEC Pavement Team will deploy the world's first entirely stringline-free paving system at a major international airport. After installation of the system in February this year and the start of production in July, the system is delivering real savings and quality improvements at Heathrow.

Gone are the days of the time consuming and costly installation of steel pins, flags and guide wires traditionally used in slip-form guidance. This error-prone method severely restricted site logistics, impacted on safety and increased costs. Today at Heathrow, the Pavement Team are completing all the slipform concrete paving for T5 and the upgrade of existing runways at Heathrow Airside by using two Leica LMGS-S Machine Control Systems and 6 x TCA1101+ total stations. Once the sub base has been prepared, the road / slab design is imported into the Leica LMGS-S system and the engineer sets up a pair of TCA1101 total stations adjacent to the working area to start tracking the slip-form paving machine.

The paver - a Gomaco GHP2800, receives real-time digital commands for steering and height corrections

via an on-board Leica computer from the TCA1101's. This also includes the machine's attitude (roll and pitch) from two dual-axis tilt sensors and adjusts the machine's hydraulics if necessary, affording an extremely accurate position and heading data. The machine is automatically steered according to the design and allows the concrete to be placed in. Two instruments guide the Gomaco and a third checks the final surface and re-aligns the machine if required.

Concrete is laid with less paving preparation (as by previous methods) at a rate of 1m / minute (510mm x 7.5m slabs) with a resulting accuracy of +/- 3 mm in height and +/- 10mm in plan (standard deviation). This increase in productivity is estimated to be around 20% and a better, smoother surface results without any costly wastage of concrete. Kevin Robinson, Works Superintendent, who is responsible for the day-to-day operation of all of

AMEC's paving machines, said: "This machine automation system means much easier and safer access to the machines, without the restrictions previously placed with the old stringline system."

"The elimination of on-site obstructions has considerably improved overall airport logistics."

These new Heathrow terminal taxiways and associated paved areas will have had all the benefits of using this major new 3-D Machine Guidance System. This has been the first time such a system has been used on such a scale on such a large and prestigious project. The results speak for themselves - a better quality surface, laid with precision, reliability and speed - the only choice for large-scale projects and an end to string line guidance.

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Works Superintendent, AMEC***