

Stringless 3D Highway Slipform Paving in Belgium



Task

Stringless 3D Slipform Paving on the E40 Freeway Renewal Project

Customer & Client

Betonac NV, St Truiden, Belgium
Flemish State Highways Dept., Belgium

Date

August – October 2003

Project Facts

Components

- 1 x LMGS-S v3 System
- 3 x TCA1800 Total Stations
- 1 x GOMACO GHP2800 New Generation Paver

Field

- Elimination of over 80km of stringline to be setup for 4x10 km of highway paving.

Office

- Direct CAD export of paving production models to paver.



Benefits

- 3mm in 3m (0.12" in 10') 'rideability' achieved.
- Enormous survey and preparatory cost reductions
- 'Zero-clearance' paving width at pinpoint accuracy
- Automated Quality Assurance Reports for Highways Dept.



The E40 highway (interstate freeway) is a 'strategic road corridor', linking the busy North Sea ferry and freight ports of Zeebrugge, Dunkerque, Ostend and Calais in Northern France, the southern regions of the Netherlands, to Flanders (Belgium) and western Germany. This stretch of the E40 typically carries well in excess of 57,000 vehicles each way per day. Needless to say, with such high traffic volumes, fast maintenance is crucial to prevent crippling delays.

In early 2003, specialist contractor Betonac NV was awarded the contract for a complete breakout and reconstruction of a worn-out, 6-lane (eastbound and westbound), 8km stretch, immediately west of the Belgian capital Brussels. Betonac decided that work had to be undertaken in four distinct phases, which traditionally would require 4 sets of stringline (a total of over 80km!) to be installed near the live motorway – work requiring weeks of expensive surveyor's time and safety. Betonac therefore decided to invest in **Leica Geosystems' LMGS-S 3D Machine Automation System** to save considerable time and effort on this time-critical project.

To make matters even more challenging, Betonac had to maintain 3 lanes of live traffic in each direction, and pave each 8km phase in maximum 192 hours, and work with only 750mm (less than 2') clearance adjacent to the New Jersey median barrier!

In August 2003, prior to the main carriageway project start, Betonac's GOMACO GHP2800, New Generation, already equipped with the GOMACO's 'Plug and Pave' compatible G21 Network Controller was connected to the Leica Geosystems' LMGS-S 3D system; at the workshops of GOMACO/Leica's dealer Oswald be Bruycker NV, in Oostende.

Running with 'zero-clearance' adjacent to the New Jersey barrier meant a couple of modifications to both the paver and the 3D system – the Leica total stations, which track the ma-

chine's position as it paves, required specially-adapted tripods, the machine required the front track and header plates to be modified to fit into a 'zero-clearance' working space. Neither presented a difficult problem to the specialist project team from Leica, Gomaco and Oswald De Bruycker, but rather helped create a highly-focused 'paving solutions team' which is now looking forward to its next challenging highway project in Belgium.

Tolerances for finished levels and line were +/- 3mm (0.1") level and +/- 10mm (0.3") position, which was easily achieved, but ride smoothness was Betonac's key criteria from the Flemish Highway Authority, who specified a 6mm in 3m (0.24" in 10') 'rideability' target. Much to the client's approval, these were greatly over-achieved, with only 3mm per 3m (0.24" per 10 feet) being consistently achieved. The Flemish highway authorities have now endorsed the Leica 3D System for future concrete motorway projects.

Space and mobility restrictions created enough challenges for Betonac, but LMGS-S proved to be the right choice from day one; Betonac completed the project 4 days ahead of schedule and significantly under their original budget, and have now decided to use LMGS-S for all their future slipform paving projects. Betonac have now also confirmed their intention to use Leica's full range 3D Machine Automation Systems on their GOMACO Commander III 3-track paver. Thanks to Leica Geosystems and GOMACO, stringlines and stakes are now history for this forward-thinking Belgian contractor.

Leica Geosystems wishes to thank Betonac NV, Oswald de Bruycker NV, Fugro Inpark BV and Gomaco Corporation for their kind cooperation in the preparation of this report.

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Application Report: Machine Automation