

N18 Gort to Crusheen Dual Carriageway

The €100m N18 Gort to Crusheen dual carriageway project forms part of the objectives of Ireland's National Development Plan which blueprints a high quality dual carriageway corridor linking the cities of Galway and Limerick. It consists of 22km new build dual carriageway, 10km local road realignment, 12km accommodation access tracks, 14 new bridges, a grade separated junction and an at grade roundabout junction.

The design of the scheme commenced in 1999 with Babbie Pettit undertaking route selection and preliminary investigations. The contract was awarded to Siac Wills Joint Venture Ltd. Bardon Composite Pavements won the contract to mix and place 86,000m³ CBM base.



The route of the new carriageway sits on an exceptionally high water table. Sealed drainage along the side of the carriageway formed part of SWJV's solution to preventing construction rain water run-off contaminating the water table. However, this prevented the use of traditional setting out pins. BCP were asked to investigate a Paving Control System, PCS900 produced by Trimble. It is a state-of-the-art positioning system which governs longitudinal and horizontal alignments and ultimately surface tolerance and level. Parallel to a key objective for this project was to achieve a high quality surfacing product demonstrated by ride quality. SWJV had previously developed their resources and improved site control by purchasing (in 2008) a blacktop manufacturing and paving plant, closely followed by ISO 9001:2000 accreditation and complimented by an onsite INAB accredited laboratory. The next logical step was to improve the control and ride quality of the CBM base and asphalt layers through automated paving control systems.

BCP decided to invest in the purchase of PCS900, supplied by Korec. The system operates by loading the project MX pavement design model into the SCS 900 control unit. A receiving mast fitted with a tilt sensor and radio is set up on the tow arm of the paver which communicates with the control unit. Drivelines are established through the SCS controller. The System controls the height and slope of the screed in reference to the 3D design model loaded into the control unit. The Trimble One Second Total Station Units are set up at a maximum distance of 200m apart with a minimum of two control stations being required - one to guide the paver and one to provide as built checking during paver operations. The manufacturers specify system accuracies of $\pm 5\text{mm}$ up to a screed width of 6m, however, accuracies of $\pm 5\text{mm}$ were achieved in the field with a screed of 10.9m wide exceeding the manufacturers expectation.

To achieve good results however, a good quality CBM aggregate is required to be delivered with consistent moisture contents and good grading control. A carboniferous limestone aggregate was chosen for this project from a local quarry and BCP provided a site based mixing plant establishing good control over the quality parameters of the mixed material and close proximity to the paver.

The use of the PCS system is an innovative solution to a specific site environmental problem. However, other and perhaps greater benefits can be observed, one of which is the complete removal of setting out pins, reducing labour requirement during installation and maintenance resulting in cost and time efficiencies. The paved quality of the CBM layer is also substantially increased as changes in levels, slopes, gradients are measured and controlled at greatly reduced increments allowing for smoother transitions, improving surface tolerance, line and level, ultimately enhancing the ride quality and overall finish of the pavement. The project is due to be completed by December 2010 and is currently on target.

Bardon Composite Pavements was created in 2009 to integrate three businesses: Sitebatch Technologies; Needham and Cullen and Roller Compacted Concrete Company. The new company has relocated to Maltby – Tel +44 (0) 1709 8145

