

Case Study

N7 Ireland

Shell Bitumen - helps resurface 28km of Ireland's N7 highway with a thin surfacing solution and Shell Cariphalte TS



The N7, which runs from Dublin to Cork, is noted for two firsts in the history of Irish roads. It was the first substantial length of dual carriageway in the Republic of Ireland and also the first section of motorway.

Now it is also the first major highways scheme in the Republic of Ireland to use a Thin Wearing Course System (TWSC). Originally built between 1950 and 1960, by 2004 the stretch between Naas and Rathcoole - bypassing villages of Johnstown and Kill was due for widening and resurfacing. The original specification for quiet surfacing in the form of porous asphalt had to be changed due to the need to keep the N7 open to traffic.

N7 Highway Maintenance completed ahead of schedule with innovative thin surface asphalt solution with Shell Cariphalte TS

Critical Success Factors:	- Close commercial & technical cooperation - Technical support - Comprehensive testing
Application:	Thin Surface Asphalt (14mm)
Volume:	Upto 1900 tonnes/day applied in two machines per echelon
Product family:	Polymer Modified Bitumen
Product grade:	Shell Cariphalte TS
Client:	National Road Authority, Ireland
Contractor:	Behan & Sons
Project Engineer:	Laing O'Rourke



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In September 2004 Shell Bitumen, Larry Behan and Sons the contractor and Laing O'Rourke Infrastructure, the principal contractor met to consider alternatives and put forward a 14mm thin surfacing solution using Shell Cariphalte TS, a polymer modified bitumen (PMB) binder. After significant testing and stringent quality controls were put in place Behan's successfully completed the 14km mainline and 14km side road sections ahead of schedule in August 2006, with Shell Bitumen supplying 2500 tonnes of Shell Cariphalte TS during the course of the work.

“ Shell Bitumen provided all the test data we needed to put forward a compelling commercial and technical proposal ”

Peter Abel, Project Engineer, Laing O'Rourke

Technical support key to delivering the surfacing solution

Andy Self, Shell Bitumen's Technical Manager takes up the story, "Because of the restrictions imposed on the construction of this section of road - very heavy traffic, all work undertaken using partial road closure and traffic management - thin surfacing was a very good option, as it could be laid quickly and kept opened to traffic." Thin surfacing asphalt also performs well in terms of noise level and the ride quality.

Even before presenting the thin surfacing proposal to the client Shell Bitumen addressed a number of important issues and provided test data to ensure the finished asphalt would meet the Irish specification RC 832. Peter Abel, Project Engineer at Laing O'Rourke explains "our formal submission to the client had to prove that Shell Cariphalte TS and the finished thin surface asphalt would meet the specification and Shell Bitumen provided all the test data we needed to put forward a compelling commercial and technical proposal. It's quite rare for us to have access to the bitumen provider but this early three way partnership was the right approach and gave the client confidence in the proposed solution"

Andy Self and his technical team carried out Net Adsorption Tests on aggregate samples from the Windmill Hill Quarry with Shell Cariphalte TS binder and the results were in the good range at >76%. This testing method, quoted in RC 832 evaluates the affinity between bitumen and the aggregate.

Delivery on specification, on time, every time

As with all highway maintenance projects ensuring that asphalt is delivered on specification, on time and at exactly the right place is paramount. And as Gearoid Lohan, Key Account Manager describes, this job had particular logistical challenges for the Shell Bitumen Supply & Delivery team to overcome. "In July 2005 our Dublin Terminal closed for essential repairs and a significant rebuild.

This meant that Shell Cariphalte had to be manufactured and supplied from Shell's PMB plant at the Stanlow refinery near Ellesmere Port. Despite the obvious challenges of transporting the Polymer Modified Bitumen by tanker on the ferry from Liverpool to Dublin and on to Behans Windmill Hill Quarry, the Supply & Delivery team did a magnificent job of delivering the binder on time every time with close cooperation with Behans to maintain stock levels" On some occasions four loads a day would leave Stanlow destined for Dublin.

Aggregate Quality Control

Laing O'Rourke established an accredited quarry laboratory to assist Behans in the extensive production quality control to ensure that the thin surfacing asphalt was produced and laid to very tight tolerances. Steve Elliott, Site Engineer for Behan and Sons explains "the quality of 14mm aggregate was closely controlled at the quarry, and test results of the 14mm thin surfacing have also been very consistent. The technical support from Andy Self and Lee O'Nions in Shell Bitumen's technical team has been superb and Shell Cariphalte has performed exactly as we expected." Laing O'Rourke also carried out ride quality pavement surveys on the finished product with very good roughness values.

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Steve Elliott, Site Engineer, Behan & Sons

Technical design partnership paves the way for success

Greg Thomas, UK and Ireland Sales Manager highlights early and close cooperation as the key to success. "By being involved early in the project. Shell Bitumen was able to add its expertise and experience in the design of the thin surfacing mixture and help to provide confidence to the contractor and engineers about the use of PMB."

So two years after the initial consultations with Laing O'Rourke and Behan's, motorists are now enjoying a quieter more comfortable journey and the National Roads Authority have been able to deliver this cost effectively without closing the road at anytime.

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