When does 4 foot become 5 foot 3?

ABA Surveying's latest project sees the Company expanding quite literally, to accommodate the requirements of Irish Rail.

The railway line between Dublin in the east and Cork in the south west connects two of Ireland's main cities. The line covers some 279 kilometres in a predominantly twin-track configuration and passes through some of the country's most beautiful scenery.

Irish Rail's main objective is to increase line-speed and shorten journey times along the route. In order to achieve this, a full survey of the existing route layout has been commissioned from Fugro-BKS Surveys.

ABA Surveying is partnering Fugro-BKS Surveys for the project. The survey includes a control network of PGMs for the survey and subsequent works, a topographic survey of the tracks including all trackside detail and extending outside the boundary fences, the accurate recording of track, switches and crossovers and all detail that may present a gauging issue were the track to be slewed or lifted.

Primary data capture is by aerial photography capturing all trackside detail with an accuracy of approximately 40mm and ground survey capturing all structure detail to millimetre accuracy.

ABA's involvement in the project is to provide accurate clearance profiles at nominal 10metre intervals throughout the route and at points of restriction to be used in order to assess gauging or passing clearances.

With two tracks totalling almost 600 kilometres between them, ABA decided to utilise two of their HDS6000 scanners, one on each track, each mounted on a Leica GRP trolley using their well established 3D kinematic scanning technology. 3D kinematic scanning minimises project risks in many ways. One example may be where tree cover may obscure the aerial photography or detail may be missed by being overlooked in the dark. The dataset captured by ABA can be revisited and interrogated at anytime should the need arise.

ABA Surveying bridge a "five foot" gap in the Railway Industry

ABA are used to working with their trolleys on Network Rail infrastructure but before they could use them in Ireland, some modifications had to be made. The biggest difference is the gauge. The Irish gauge is 1.60m, not the standard 1.432m found in the UK. ABA is used to finding solutions to meet a client's requirement. Firstly the trolleys were each extended by 165mm to accommodate the larger gauge. Then the hardware in each trolley was configured and calibrated to work on 1.60m gauge using ABA's purpose built test track. Finally, the new X, Y, Z position of the HDS6000 scanner relative to the rails was calculated and applied to the calibration set.. Leica GPS System1200 equipment is mounted on the trolley and, using Smartnet, records the position of the trolley every 10 metres along the track.

ABA started the project at the beginning of November 2008 at Dublin's Heuston Station destined for Cork. The speed at which the trolleys travel depends on the environment surrounding them. In areas of open track the speed can be 3-4km per hour but in areas of restriction, the speed is reduced to 1km per hour to enable higher density of data capture. These areas include station platforms, overbridges, underbridges and tunnels. Other areas, such as signals, Loc boxes and buildings are also passed slowly.

The trolleys are pushed and at the same time are continuously recording cant, gauge to millimetre accuracy and chainage every 20mm along the track. At the same time, the scanners are continuously recording all trackside features of detail.

ABA's part of the fieldwork is expected to be completed by late January 2009 due to track time constraints, not the speed of ABA's data capture. ABA even considered the Irish weather and made two canopies to protect the scanners from the rain. Once the aerial photography is complete and the track data is delivered to ABA, production of clearance profiles can begin. The centre line of the track, taken from the aerial photography and the continuous cant and gauge data, taken from the trolley is combined to better define the track geometry. Most of the route is open country with good GPS coverage. In areas where gauging is tight, such as bridges, tunnels and stations, ground survey is to be carried out. Paint marks are sprayed on the cess rails before the scanner passes. These points will be surveyed during the ground survey and the co-ordinates will be used to fix the position of the track to within approximately 5mm. Finally, the speed profile is added to the clearance file and is then ready as a deliverable for analysis by Irish Rail.

Please feel free to check out our website or call me, Alan Barrow for more information:

ABA Surveying Ltd
Telephone: 01483 797 111
Email: alan@abasurveying.co.uk
Web: www.abasurveying.co.uk