

RAPID LASER SCANNING TECHNOLOGY USED TO ACCELERATE SURVEYS



PROJECT OVERVIEW

UTEC, the lead brand for Acteon's Geo-services segment was contracted by Mott MacDonald to undertake 12 surveys for footbridges and three platforms located in Largs, Longniddry and Edinburgh Waverley, Scotland. The footbridge survey locations were Carluke, Hamilton West, Inch, Lenzie, Maxwell Park, Bowling, Lairg, Portlethen and Williamwood.

THE CHALLENGE

As with most rail related projects the challenge was to minimise time on-site due to the safety critical nature of working next to operational railway tracks.

As much work as possible needed to be undertaken at a safe distance from the tracks during daylight hours under "High Street Environment" and night shifts to be limited to track work only.

CUSTOMER GOAL

Mott MacDonald required plans, elevations, cross sections, laser sweeps, a permanent way survey and gauging. They required the data to be delivered timeously, within two weeks of field survey aspects, to enable them to start their design work within a tight schedule. The surveys pattern needed to be one to three shifts on site with data being delivered within the period of field survey works stated.

OUR SOLUTION AND ITS COMMERCIAL BENEFITS TO THE PROJECT

Operational bases across the world

- All equipment and staff were deployed from UTEC's Livingston office in Scotland.

Work at scale with a proven track record for delivery

- For the footbridges, skilled survey teams were deployed with a total station, RTK GPS and a laser scanner to provide a flexible solution.
- Platform surveys were undertaken by a four-person team on the night shift as full possession of the track was required to undertake the surveys safely. The four-person teams were required due to the short time (normally 3-4 hrs track work), therefore minimising the number of personnel required.

Optimise the project to increase commercial value

- Footbridges were surveyed during daylight hours with no need to access the track. Track access is costly with dedicated safety personnel and line closures required. Undertaking work where possible on a dayshift non-track access basis was beneficial to the customer as it had a significant effect on reducing costs with no requirement for possessions or hiring of additional safety staff.

Minimise the environmental impact

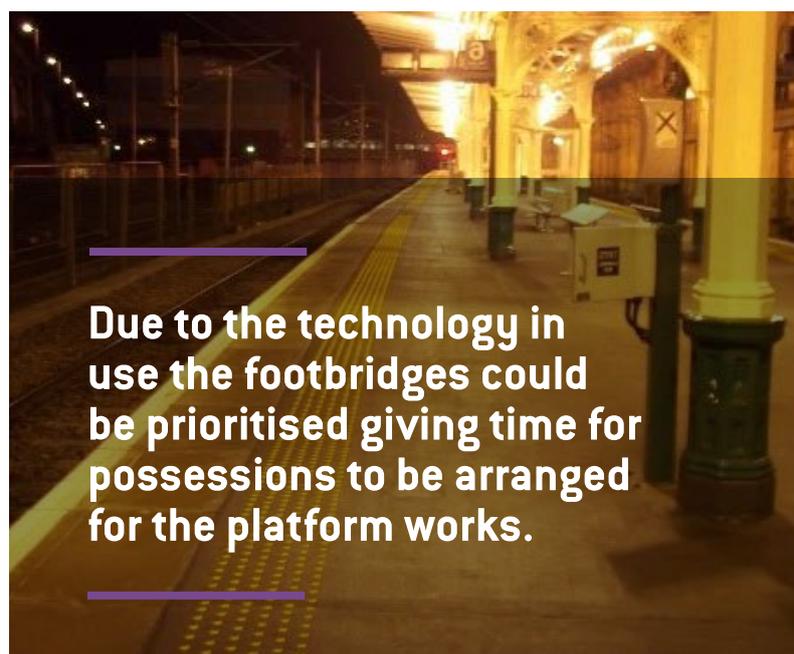
- Reducing the need for possessions directly impacted the carbon footprint of the project with fewer people visiting the site and over a shorter period.

Digital technology and data to enhance our expertise

- By utilising scanning technology, much of the work was undertaken at a safe distance from the tracks during daylight hours under "High Street Environment", and night shifts were limited to track work only, saving on time and cost.
- All bridges were laser scanned and the resultant registered point clouds were delivered directly to the client.
- Control was installed to Network Rail standards which assisted with current operational works but also provided the customer with a legacy control network for future projects.
- All survey work was carried out using Total Stations, a platform gauge and laser sweep. Topographic data was supplied in AutoCAD DWG format and laser scan data in the form of indexed point clouds (.rcs) and associated project file (.rcp).
- The main benefit for the customer in accepting indexed point clouds was the reduction in processing time normally required by the contractor on works of this nature, allowing the client to have hands on to the data within days rather than weeks.

PRODUCTS USED

- Total Station
- RTK GPS
- Laser scanner



Due to the technology in use the footbridges could be prioritised giving time for possessions to be arranged for the platform works.