Customer:
Tri-Tech Surveys

Project:
Corridor mapping of 4km road job

Solution:
senseFly eBee X with corridor option

Case Study

Corridor mapping with senseFly's eBee X

How Tri-Tech Surveys achieved 4km of crisp, clear corridor mapping imagery in a single morning: Experience counts on a new project that will see Tri-Tech's UAV team carrying out monthly drone surveys of earthworks on a 4km stretch of road in Nottingham.

Construction sites evolve rapidly but the regular monitoring of earthworks can be time-consuming and unsafe when using conventional ground based surveying techniques. For this reason, more and more contractors are turning to drone technology for cost effective, efficient and unobtrusive visual project tracking as well as using their captured aerial imagery to map, measure and analyse progress.

Ted Harland, Managing Director of Tri-Tech Surveys and long term KOREC customer, has seen a steady growth in this type of work and was recently contracted to carry out a series of regular earthworks surveys for an Earthworks Subcontractor on a Balfour Beatty 4km road project in Nottingham. The highly experienced drone pilots at Tri-tech felt that this work could best be undertaken using their senseFly ebee X RTK fixed wing drone with an additional senseFly corridor mapping option. The corridor mapping option combines a camera integration kit with a corridor mission block in the eMotion flight planning software.

Like many corridor mapping projects, the Nottingham job brought its own particular set of requirements:

- Efficient coverage of 4km of linear site
- Meeting CAA regulations to retain line of sight with the eBee throughout the flight
- Achieving high accuracy mapping when parts of the site were inaccessible for establishment of GCPs
- Requirement for very crisp, clear photogrammetry suitable for taking measurements off
- Need to achieve a first-rate result within a short time frame

Ensuring quality photos for quality photogrammetry

Once on site, the Tri-tech team established six Ground Control Points (GCPs) on accessible parts of the project using a Trimble R10 GNSS receiver and Trimble's VRS Now service (Virtual Reference Service). These points were then tied into the local network. Tri-tech have also activated the eBee's High Precision on Demand RTK/PPK option for absolute accuracy of down to 3 cm which the team felt would be sufficient when backed up by the six control points.

Determined to produce the highest quality photos possible, the team's experience meant that they were confident in how best to override the default settings of the eBee's S.O.D.A camera in order to achieve the best possible clarity of image. They did this by adapting the ISO (sensitivity of sensor to light) and shutter speed to the light conditions of the day.

SenseFly's corridor mapping option includes an integration kit that houses the S.O.D.A camera in a portrait position which means that 30% fewer images are required when undertaking linear mapping projects. This also reduces processing time by 30%. The corridor option allows pilots to fly closer to the ground for higher resolution whilst maintaining the required image overlap. However, having overridden the S.O.D.A camera settings, the Tri-tech team knew that by flying at 100m rather than at around 60m, they would be able to complete the job in a

> "The end result was exactly the crisp, clear imagery that we were determined to provide for our client "
>
> **Ted Harland, Tri-Tech Surveys**

▲ Ted Harland with his eBee X

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single morning without compromising the quality of the imagery.

Flying and processing

With senseFly's eMotion flight management software, flights are built using mission blocks. Ted selected the corridor option, highlighted where he wished to map and the software auto-generated his eBee's flight plan. CAA regulations demand that you always retain line of sight to the drone so a two person team followed the eBee in a 4WD vehicle while the eBee flew autonomously. The job was completed in a single morning with around 2,000 pictures taken.

▲ An integration kit houses the S.O.D.A camera in a portrait position

Back at the office, the data was processed to meet the customer requested deliverable of a point cloud, georeferenced ortho-mosaic and a gridded DTM. The data was also packed for HTML viewing so that basic measurements could be carried out easily.

Following the successful completion of this survey, Ted feels that the corridor mapping option proved particularly useful. "What stood out for us on this job is senseFly's corridor mapping option which allowed us to use the S.O.D.A camera in a portrait position whilst the software enabled us to easily create our corridor flight plan. The S.O.D.A camera is one of the lightest camera choices which means that our eBee flew beautifully and CAA regulations rather than battery life dictated the length of our flights. Being able to go mobile and roam with the drone also meant that we always retained the required line of sight to the eBee. The end result was exactly the crisp, clear imagery that we were determined to provide for our client and it was all achieved within a single morning's work."

Our thanks to Ted Harland, Managing Director of Tri-Tech (www.tritechsurveys.com) for providing the information for this article.

About Tri-Tech

Based in Yorkshire but operating nationally, Tri-Tech Ltd is an innovative UK Surveying and Site Engineering company offering a wide range of Land and Engineering Surveying Services both to the public and private sectors.

Established in 2005, the business has grown and with it a reputation of providing a service second to none.

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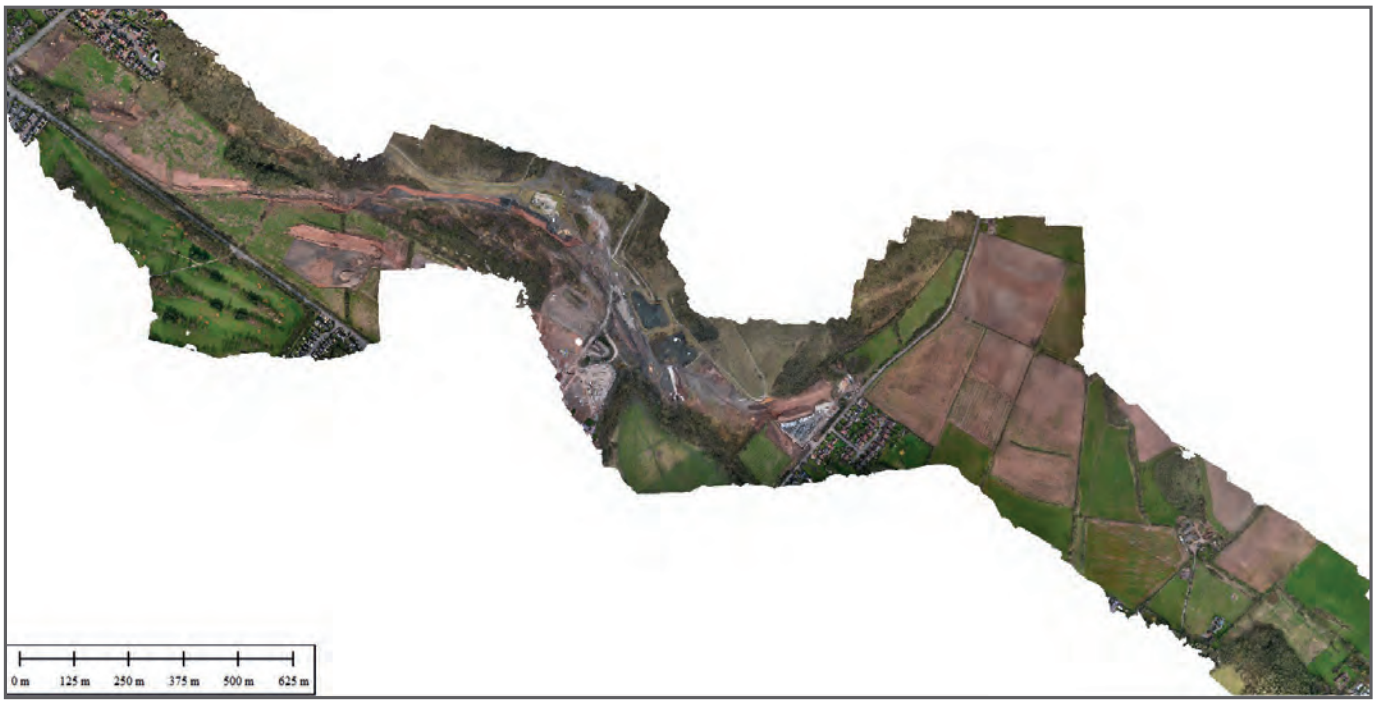

▲ The survey was completed in a single morning

Contact us:

Please do get in touch for further information on any of the products or services mentioned in this case study, a demonstration, support or just a chat about your requirements.

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