Projects

Improving planning and operations through a Digital Measured Survey

PROJECT AT A GLANCE

Project:

Digital Measured Survey

Duration:

3 Weeks (2023)

PROJECT BRIEF

The delivery of a high-accuracy digital twin to give our client a modern, centralised site plan for improved planning and operations.

Our client approached LSTC Group in mid-2023 to solve a long-standing issue at their site. Despite the site's complexity and ongoing construction activity, they were operating with a site overview plan dating back to the 1950s. With the original ground control markers either lost or destroyed over time, the plan no longer aligned with real-world conditions. As new measured surveys were carried out across different sections, integrating these into the outdated overview became increasingly unworkable, likened by the client to ‘trying to fit a square peg into a round hole’.

The 2km x 1km site presented significant surveying challenges: it was densely packed with an array of features, including roads, buildings, pipework, equipment, infrastructure, jetties, docks, and danger zones. The client initially requested a traditional topographical survey, which would have required 20 weeks of on-site work. Instead, LSTC Group proposed a faster, smarter solution: a digital-twin approach powered by drone technology, georeferenced markers, and a cloud-hosted data delivery platform.

OUR APPROACH

Our team proposed a digital-first solution, combining drone-based aerial surveying with a robust georeferencing system. We placed multiple ground markers (survey pins with templated paint marks) throughout the site to establish new control points tied to GPS coordinates. Using this ground control network, we carried out drone flights covering the entire site, capturing high-resolution imagery and 3D data.

The site was fully surveyed within just six days. We then used the imagery to create orthophotos, 3D mesh data, and traced CAD linework. This post-processing and tracing work took less than three weeks to complete, delivering a modern, scalable representation of the entire site.

All outputs were integrated into an ArcGIS online portal. This gave our client on-demand access to a true digital twin: scalable orthophotos, accurate linework, and navigable 3D models. Users can log in to view data in real-time, measure distances, zoom into specific areas, annotate key assets, and generate screen grabs, all with up to ±25mm accuracy.

CHALLENGES

- Working on a vast, densely populated industrial site with extensive physical infrastructure.
- Outdated base plans with no remaining reliable survey control network.
- The need for a modern, scalable solution that could support frequent updates and multi-user access.
- Hazardous working areas which limited extensive on-foot surveying.

SERVICES USED

- Measured Surveying
- Aerial Surveying
- Data processing & modelling

PROJECT OUTCOME / DELIVERABLES

- Complete and accurate digital site overview hosted in ArcGIS.
- Scaled, high-resolution orthophotos and 3D mesh models.
- CAD linework updated and coordinated to real-world GPS coordinates.
- Fully interactive digital platform allowing:
    - Print-ready posters of the full site layout.
    - Contractor onboarding and site orientation.
    - Integration of historical and underground utility data.
    - Accurate, shareable information for tenants and third-party contractors.
- Our client has since commissioned a visual drone survey of the site's 100m cooling towers, with plans to automate monitoring through AI-enabled condition change detection within ArcGIS.