



Project Summary

Organization:
LTC-CASCADE JV

Solution:
Geotechnical Engineering

Location:
Kent/Essex, United Kingdom

Project Objectives:

- To establish a single source of truth for all geotechnical data.
- To optimize workflow by removing technological impediments to sharing parts of the drawings among engineers on the project and CAD technicians.
- To modernize technologies for greater productivity by finding an alternative to the VPN connection.
- To ensure collaboration by enabling the multidiscipline team and external parties to easily access data.

Project Playbook:
OpenGround® Cloud

Fast Facts

- The LTC project is England's largest road investment project since the M25.
- The tunnel is 16 meters in diameter making it one of the largest diameter bored tunnels in the world.
- A comprehensive schedule of tests included investigating more than 700 locations with over 400 boreholes.

ROI

- OpenGround Cloud helped drive efficiency across the project, which saved time and improved workflows.
- The project team established single source of truth and trusted information for all ground related data.
- OpenGround Cloud accelerated collaboration and data-driven decision-making.

Improved Collaboration Helps LTC-CASCADE Deliver Largest UK Road Infrastructure Project

OpenGround Cloud Provides a Cost-effective Collaboration Solution to Enhance Workflows and Save Costs on Lower Thames Crossing

The Project

The Lower Thames Crossing (LTC) is a new motorway connecting Kent, Thurrock, and Essex through a tunnel beneath the River Thames. The Lower Thames Crossing will form a vital part of the UK's transport infrastructure and improve connections across the country.

With a projected cost of GBP 6.8 billion, it is England's single largest road investment project since the completion of the M25 more than 30 years ago. The project is unprecedented in size and scale, making it the longest road tunnel in the UK. At 16 meters in diameter, it is also one of the largest diameter bored tunnels in the world.

The Challenge

LTC requires enormous geological and geotechnical investigation along the entire route, both north and south of the River Thames as well as under it. Key areas of interest include a protected wetland in Kent, boring the tunnel under the river, and historical land development in the north.

The comprehensive and complex schedule of tests in Phase 2 includes investigating more than 700 locations with over 400 boreholes, some of which will be up to 100 meters deep. The team will also perform nine pump tests and around 85 trial pits and geophysical surveys, all of which require seamless information management. To maintain the schedule on the LTC, a large set of big data, consisting of historical, current, and draft data was developed from numerous phases of ground investigation across a large geographic area. The project team needs to access the data and share it across the multidiscipline project team, as well as with external parties.

To conduct the geotechnical investigation and analysis, LTC entered into a joint venture with CASCADE that includes industry-leading organizations Arcadis, COWI, and Jacobs.

The joint-venture structure adds additional complexity with regard to maintaining local copies of the HoleBASE database as the single source of truth for the project, while making it accessible to other members of the team's JV parent companies.

Another challenge is that the full functionality of the Civil 3D extension could not be utilized, as the link between the drawing at the server was broken when sections were transferred between engineers on the project and CAD technicians creating additional and unnecessary work.

Lastly, team members had to access the previous local database via VPN when they were not in the office, creating additional challenges. For example, the VPN connection was often slow and unreliable, especially when performing some of the more data-intensive tasks.

The Approach

To remedy these challenges, the project team took a different approach to the geotechnical and data management aspects of the project.

Moreover, the team had to implement project workflow solutions that would allow for seamless integration with current data, easily manage and share information among multiple organizations, geographies, and specialists, as well as act as a consistent source of truth with flexible reporting capabilities.

The solutions would also need to incorporate the best international practices in geotechnical project management and process workflow.

The Solution

The team opted to deploy OpenGround Cloud as it directly integrates with OpenGround Cloud Professional, Excel, and AutoCAD Civil 3D, while having the ability to connect to other apps using the Web API.

The collaborative nature of OpenGround Cloud allows BIM teams, suppliers, partners, and clients to easily access project data and be actively involved in any decision processes either through connected apps or a web portal.

OpenGround Cloud also helped the team eliminate outdated solutions and enabled LTC to implement a cost-effective and quick technological upgrade with the latest geotechnical software.

“OpenGround Cloud improved the workflow for all members of the team. The various add-ins are faster within the cloud version of the database, which is useful when dealing with large datasets such as CPT data.”

– Cedric Allou, Ground Engineering Lead, Lower Thames Crossing

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The Results

A key benefit of the cloud-based geotechnical information management solution is providing all team members access to the database depending on the needs of the project, which improved the resilience and security of the database. The database ensured that the team used a single source of truth for information throughout the project and could be confident that the latest version of any data was used.

A further benefit to the OpenGround Cloud is that database administrators can easily add users to the system. As such, users can be given appropriate levels of access and permissions depending on what they need for their workflow. The expiry date feature is particularly useful for external users and improves security as it prevents access to the system after users have stopped working on the project.

When adding users to the system the welcome email functionality is extremely useful as getting one version of the solution installed among different parent companies' IT

infrastructure is difficult. The welcome email allows users to install the program, while updates are automatic, which improves reliability and reduces the burden on the parent companies' IT department. On the Lower Thames Crossing project, it is especially relevant as most of the team is not based in the parent companies' offices.

“OpenGround Cloud improved the workflow for all members of the team. The various add-ins are faster within the cloud version of the database, which is useful when dealing with large datasets such as CPT data,” said Cedric Allou, ground engineering lead on the Lower Thames Crossing project. “In addition, maintaining the link with the database when members of other organizations need to access the data has also improved the workflow.

“Also, external support teams can more easily solve issues that arise due to the servers being cloud based. The process allows rapid responses to any issues and minimizes any potential downtime on the project.”



The Lower Thames Crossing is a proposed new road with a tunnel beneath the River Thames in UK.