

Bentley[®]
Advancing Infrastructure



Project Summary

Organization:

Dragados SA and London Underground Limited

Solution:

Project Delivery

Location:

London, England, United Kingdom

Project Objective:

- Improve passenger access, circulation, and interchange at the Bank-Monument Underground station
- Facilitate collaboration among the many different project disciplines and organizations

Products Used:

AECOSim Building Designer, Descartes, Navigator, ProjectWise[®]

Fast Facts

- The Bank-Monument station is used by more than 52 million passengers each year, one of the most complex subterranean railway stations in the United Kingdom.
- The Bank Station Capacity Upgrade will provide an additional 45 percent capacity during peak hours.
- Bentley's Connected Data Environment based on ProjectWise was accessed by 425 individual users, with 120 concurrent users during peak design time.

ROI

- ProjectWise housed approximately 1,800 3D models and almost 4,800 drawings.
- The project team streamlined workflows and collaboration, increasing the overall project value by 40 percent.
- Using ProjectWise as the connected data environment helped the design team work to approve 95 percent of packages during the first approval process, with only three of the 57 packages rejected.

Dragados and London Underground Streamline Collaboration on Major Subterranean Station Upgrade

ProjectWise Facilitated Collaboration Among 400+ Users on Thousands of Designs

Upgrading an Urban Underground Station

Located in the City of London, the Bank-Monument station is one of the most complex subterranean railway stations in the United Kingdom. It is a major gateway to the area, used by more than 52 million passengers each year, and is of strategic importance to London and United Kingdom economies. Transport for London estimates that well over 100,000 passengers use the station during peak times, totaling just under 400,000 journeys each weekday.

In 2013, it was decided that the Bank-Monument station required an upgrade to better maintain access to the City of London, the London Underground network, and the Docklands Light Railway network. This Bank Station Capacity Upgrade will improve passenger access, circulation, and interchange, providing an additional 45 percent capacity during peak hours. Dragados SA and the London Underground Limited were jointly tasked with overseeing the planning, design, and construction of this upgrade.

Collaborating to Meet Core Requirements

Dragados is one of the largest private-public partnership contractors in the world, having performed the design-build portion of more than 65 concession projects worldwide. To date, the organization has constructed over 1,380 kilometers of tunnels through all varieties of geological conditions and over 1,700 kilometers of rail, high-speed rail, and mass transit.

Dragados was assigned to work with London Underground Limited on this project as part of an innovative contractor engagement procurement process, which focused on benefits and core requirements instead of client design. London Underground Limited was incorporated in 1985 and provides passenger rail services, and refurbishment and maintenance of parts of the rail network in Greater London. It was essential that Dragados and London Underground work together seamlessly to deliver this massive project.

Overcoming A Complex Design Challenge

The estimated GBP 6.07 billion project will provide a new passenger entrance with lift and escalator connections, a new

train and platform tunnel, and new tunnels and other internal connections. The project team faced many challenges, however, significantly with the existing station's location. Located in the heart of the City of London, the site is surrounded by valuable and historical buildings and sites, and it joins with two stations that were built at different levels.

The existing layout hosts six underground lines in an intricate net of tunnels, shafts, and galleries. To address these challenges, the project team needed to effectively coordinate among the different disciplines and organizations, as well as manage the exchange of information among design team members. The models needed to support construction and provide reliable handover information that is compliant with London Underground's CAD standards.

Bringing Together Teams and Content

The project team produced 2D and 3D drawings and models to be used by a variety of disciplines for different purposes. During planning, the site models were used to support the logistics and consent teams for the stakeholders' agreements prior to the beginning of the project. The models were also used in design reviews to validate better engineering options and support key decisions being made.

To make sure that each discipline had access to information across all stages of the project and could easily collaborate on the designs, the project team used ProjectWise to bring together the team and the content. Bentley's Connected Data Environment based on ProjectWise became particularly important for this project because of the amount of people involved. The project had 425 individual users from more than 30 different companies. During peak design time, there were 120 concurrent users accessing documents. Dragados and London Underground, as well as outside contractors and project stakeholders, needed to collaborate throughout the planning and design stage, making it necessary to house all models in one location and establish a single source of truth across the project.

“With ProjectWise, we hosted more than 15,000 files that have been produced for 150 users from more than 30 different companies. It provides a unique source of truth and other general benefits like real-time information exchange and full version control.”

*– Pablo Corredor
BIM Manager
Dragados SA*

Find out about Bentley at: www.bentley.com

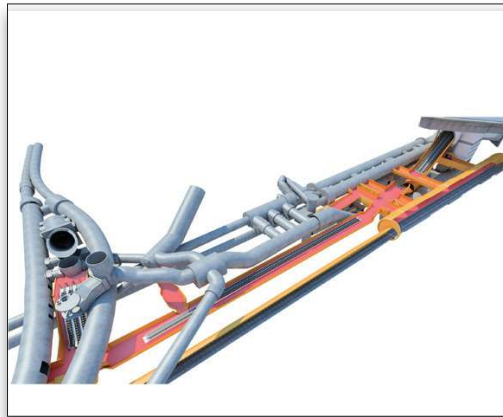
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Saving Time and Cost

ProjectWise housed approximately 1,800 3D models and almost 4,800 drawings produced during the project’s design phase. By using the application, team members improved content management of all these models and drawings. When compared to other projects’ electronic document management systems, the team found that ProjectWise consumed five times less staff resources when managing the same number of files.

By working in this collaborative environment, the project team recognized a huge potential for bidding teams to work with London Underground, which created opportunities to deliver additional project value. Dragados streamlined workflows and collaboration by using ProjectWise, which increased the overall project value by 40 percent. Using ProjectWise as part of a common data environment

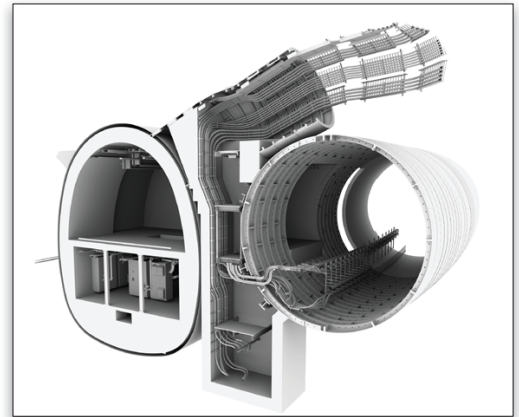


ProjectWise supported clash detection by hosting the iModels and overlay files.

facilitated the controlled exchange of graphical data between project participants, as well as created a traceable approval process. This improved collaboration helped the design team work together and with the client to approve 95 percent of packages during the first approval process, with only three of the 57 packages rejected.

Aligning Connected Data Environments to Meet Deadlines

Dragados and London Underground were fully aligned in ProjectWise. By leveraging ProjectWise and Bentley’s other applications, the project has been successful, owing to enhanced collaboration among all project participants and the consistent management of design content across the project. Currently in the construction phase, the team is on time to complete the project by May 2022.



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