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Customer Story

Reduce waste and increase certainty

Trimble Connect AR



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How Laing O'Rourke is using augmented reality for construction through their adoption of Trimble's Connect AR app.





About The Whiteley redevelopment:

The Whiteley, at 101,000m2, will deliver 139 luxury homes, 20 shops, cafes and restaurants, a central public courtyard, cinema, a gym and London's flagship Six Senses hotel and spa with 110 rooms in the Bayswater area.

The redevelopment involves the demolition of the existing shopping centre behind a retained historic Grade II listed façade. The project uses a top-down construction methodology, meaning Laing O'Rourke build down into the basement and the above ground levels simultaneously.

Augmented Reality has seen a boom in recent years with take up across a range of diverse sectors from entertainment and interior design to manufacturing and medical training. As the technology becomes easier to use, AR is making a profound diff erence to the way we work. The construction industry is now experiencing its own digital revolution and 3D representations of projects and BIM models are now commonplace, bringing with them the means to easily visualise the graphical representation of the model and data that exists within it, reducing error and uncertainty.

Delve a little deeper into the modern-day construction industry and you'll also find Virtual, Augmented and Mixed Reality technologies designed to bring the 3D model and its benefi ts to life through the viewing of digital models at 1:1 scale, onsite and in context. This encourages a digitally enabled workforce to feel more connected to the work they are doing, allows for earlier identification of misinterpretations of design data and engages a broader group of stakeholders who can engage with the production process more readily.

> We have been able to put detailed 3D models in the hands of site supervisors, operatives, steel fixers, construction managers and more. The result is a better-connected team, increased understanding, and complete end to end digital delivery.

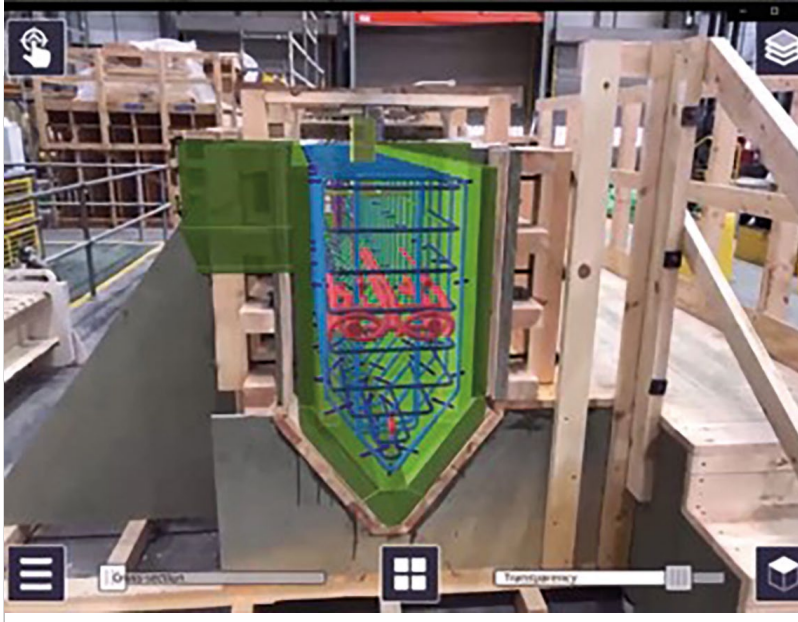
Antony Bromley, Lead Digital Engineer

Construction company Laing O'Rourke is a business that understands that if it is to meet the evolving needs of its clients and also engineer a low carbon future, then it must push boundaries through its workfl ows and its adoption of technology. For Laing O'Rourke, this has meant pioneering a new way of working, based on the digitally enabled manufacturing of components in its UK factories and then harnessing the right hardware and digital systems to optimise the process from design through to manufacturing and the final build on-site.

Part of this strategy has seen them adopt the BuildingPoint UK and Ireland supplied Trimble Connect AR app which is currently being used on The Whiteley project in London. The scheme involves the demolition and reimagining of the existing shopping centre behind a retained, historic Grade II listed façade.

Site challenges – why The Whiteley lends itself to Connect AR technology

Key challenges for the Laing O'Rourke team are associated with managing and planning the multi - disciplinary interfaces between the specialist sub-contractor teams during both design and onsite work. In keeping with the client's delivery requirements, some areas of the project are in fitout and commissioning stages whilst others are in the initial construction phase. The project is located in central London with a relatively tight footprint which means that the team is operating a 'just in time' approach as far as practicable. Therefore, collaboration, rapid communication and a detailed level of understanding are essential requirements on a daily basis. These requirements are underpinned by detailed and data rich 3D models.



Typical Connect AR view supplied by Laing O'Rourke

For these reasons the clarity that Connect AR can bring to a project has been invaluable and consequently highly rated by Laing O'Rourke's project Lead Digital Engineer:

> We aim to close the gap between onsite activities, design, and the digital build. Traditionally in the construction industry, site teams have relied upon 2D information which does not leverage off the data rich construction and fabrication models readily available to the design teams.
>
> With advances in mobile solutions and technology such as Trimble Connect (cloud-based common data environment and collaboration platform) and the Trimble Connect AR app, we have been able to put the detailed 3D models in the hands of site supervisors, operatives, steel fixers, construction managers and more. The result is a better-connected team, increased understanding, and complete end to end digital delivery."

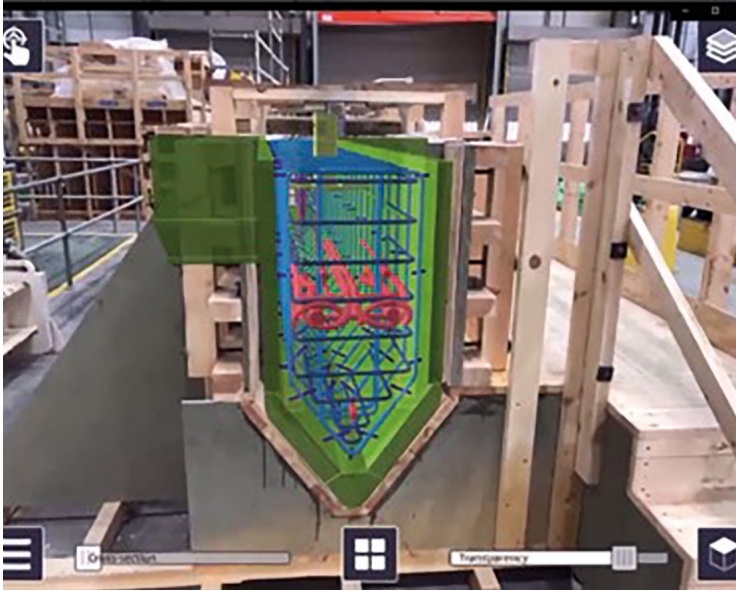
Working closely with the specialist teams involved on the project, the Laing O'Rourke central Digital Engineering function has also been particularly interested in collecting site feedback on the Connect AR app.

Using Connect AR on site - three experiences

MEP team - Building Services Technical Apprentices:
"Trimble AR is allowing us to cross reference digital build models and current works in real-time. I have been using Trimble Connect for quality assurance and to better understand completion progress on site. Personally, it has aided me most with the positioning of equipment and services on site, for example orientation of pumps, which is not always clear on 2D drawings and schematics."

Structural Team - Superstructure Principal Engineer:
"The AR mobile solution has been used on site to visualise sequence conflicts between enabling works, temporary works and associated material laydowns against the permanent works install. For example, we can prioritise the removal of specific temporary works and understand if equipment and materials need to be relocated to allow the subsequent trades to start work. This mitigates delays in works commencing on time."

Digital Engineering Team - Lead Digital Engineer:
"AR allows us to rapidly check and verify install vs design. It gives us immediate confi dence when we see the direct AR overlays between the model and site build. Where there are discrepancies, we can easily convey the issue along with images to the appropriate people. The technology is much quicker to use than traditional 2D drawings which might not be to hand during a site walk. The Trimble AR app allows us to leverage off the 3D models we already have and seamlessly integrates them into the field."



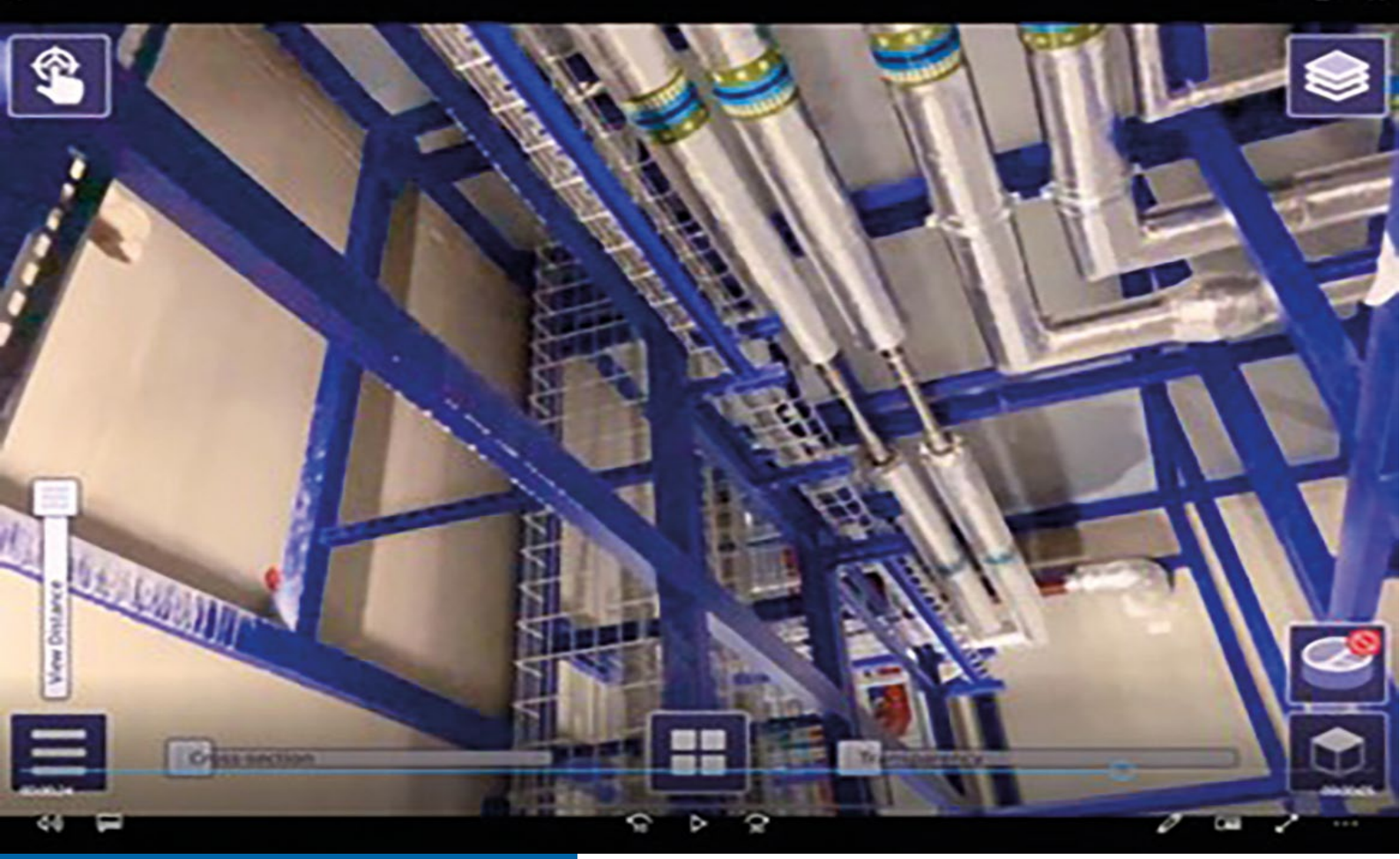
Typical Connect AR view supplied by Laing O'Rourke

Is Connect AR delivering?

Antony Bromley, the Lead Digital Engineer reports that feedback on the Connect AR app has been extremely positive due to increased access to models and an increased level of engagement from site personnel that wouldn't ordinarily use 3D models. The payback is that staff are saving time through a better understanding of equipment installation that would not be possible in 2D.

The app has also been used for client engagement. The ability to see the build in AR brings total confidence that the delivery replicates the models. Additionally, he reports that it facilitates a more engaging conversation and a better connection to the project journey ahead particularly when visualising the project on site prior to construction commencement.

With plans to use Connect AR to check steel reinforcement fi xing onsite and also within the factories to check precast elements as part of the QA process, Antony concludes that above all, the app closes the gap between the design teams, site teams and clients. "The limitations of the Connect AR app seem to be only your own imagination!"



Key Connect AR benefits for The Whiteley project

• Provides quality assurance and better understanding of completion progress on site.

• Provides confl ict resolution through visualisation, mitigating any delays to works commencing on time.

• Useful for real-time checking and verification of works completed.

• Faster, clearer and more accessible than using 2D drawings. The app allows Laing O'Rourke to leverage of the 3D models they already have.

• Ideal for client engagement and assurance that the build replicates the models.

• Enables multiple teams to engage with information in different and new ways of working and support skills for the future.

About Trimble Connect

Trimble Connect AR is an augmented reality app that gives building construction workers even greater accessibility to 3D models in the field. The app runs on Android and iOS tablets and smartphones. Via QR markers, it allows for easy positioning of 3D models whilst on the job site.

Trimble Connect AR has been designed to revolutionise QA/QC workflows through the viewing of digital models at 1:1 scale onsite and in context. This enables the Laing O'Rourke project team to validate the build, observe omissions, and visually collaborate to resolve issues. The company has purchased several Connect AR licenses from BuildingPoint UK and Ireland with further trials starting on other projects.

All information kindly supplied by Laing O'Rourke and BuildingPoint UK & Ireland.

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