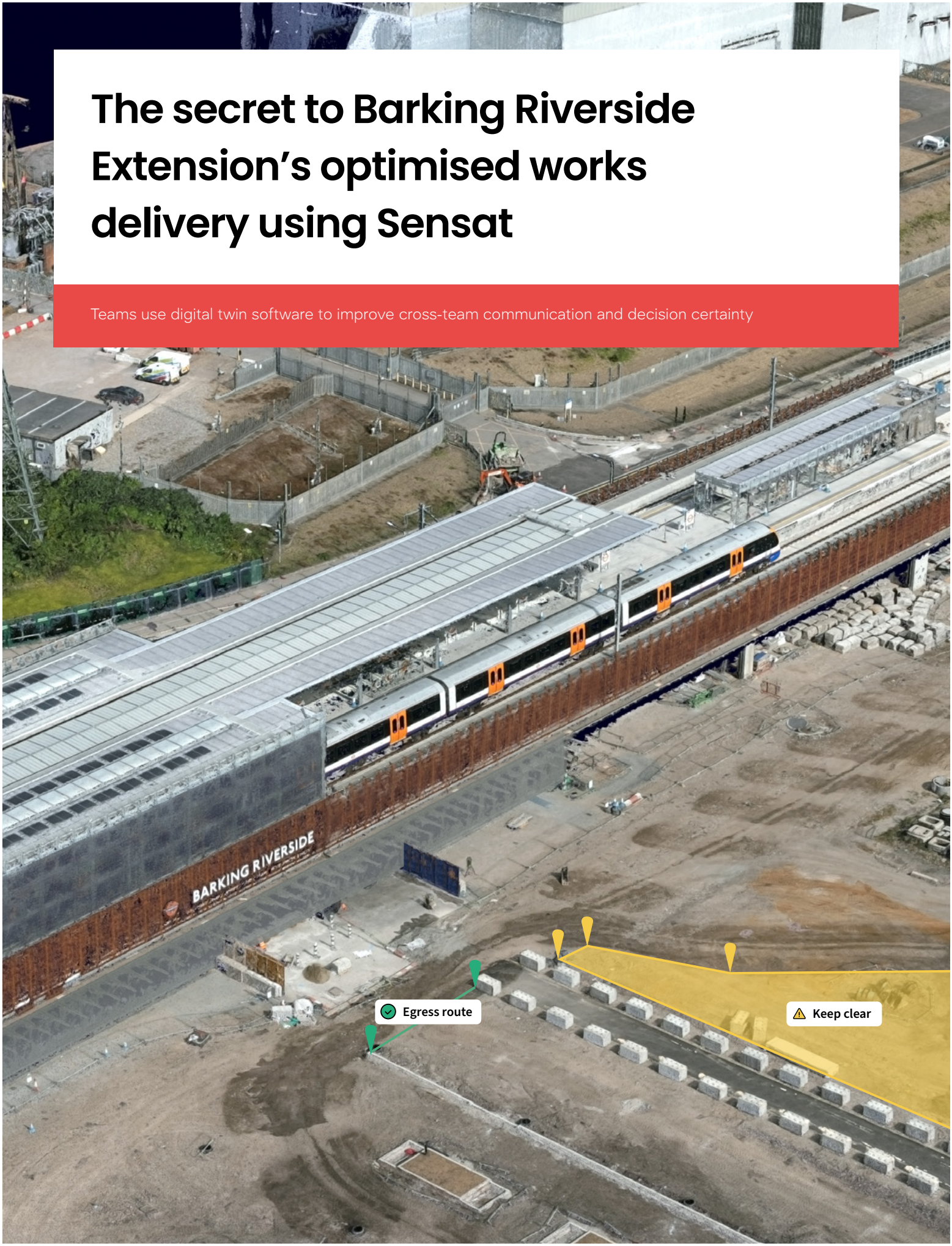
The secret to Barking Riverside Extension's optimised works delivery using Sensat

Teams use digital twin software to improve cross-team communication and decision certainty



MORGAN SINDALL MSVF VOLKERFITZPATRICK

sensat

Introduction

Industry

Rail

Location

London, United Kingdom

Project

Barking Riverside

London Overground Extension

Responsible for the Barking Riverside London Overground extension, Morgan Sindall Infrastructure and VolkerFitzpatrick joint venture (MSVF) needed to deliver a 1.5-kilometre viaduct, terminus station and a new railway line, as well as modify and realign existing Network Rail operational infrastructure.

With a tight build schedule, MSVF contracted Sensat from 2020 to 2023 to create a collaborative 'digital twin' of the Barking Riverside London Overground extension. The team accessed monthly progress updates of the site to better understand the project's constraints and empower decision certainty.

Learn how Sensat helped MSVF to

Bring information from different tools together

Keep subcontractors and stakeholders on the same page

Plan with more safety and certainty using digital rehearsals

More confidently make the right decisions

Challenge

It's difficult to share and understand project information between teams

The Barking Riverside London Overground extension site provided specific challenges around existing assets, interfaces and stakeholder management. Teams held this important information in multiple tools, which risked being hidden from other teams and project managers and could have led to avoidable errors being accidentally embedded into programme delivery. MSVF wanted to ensure this didn't happen on the Barking Riverside Extension project, so they could avoid delays, rework and proceed with more certainty.

Solution

See information from different tools in one place

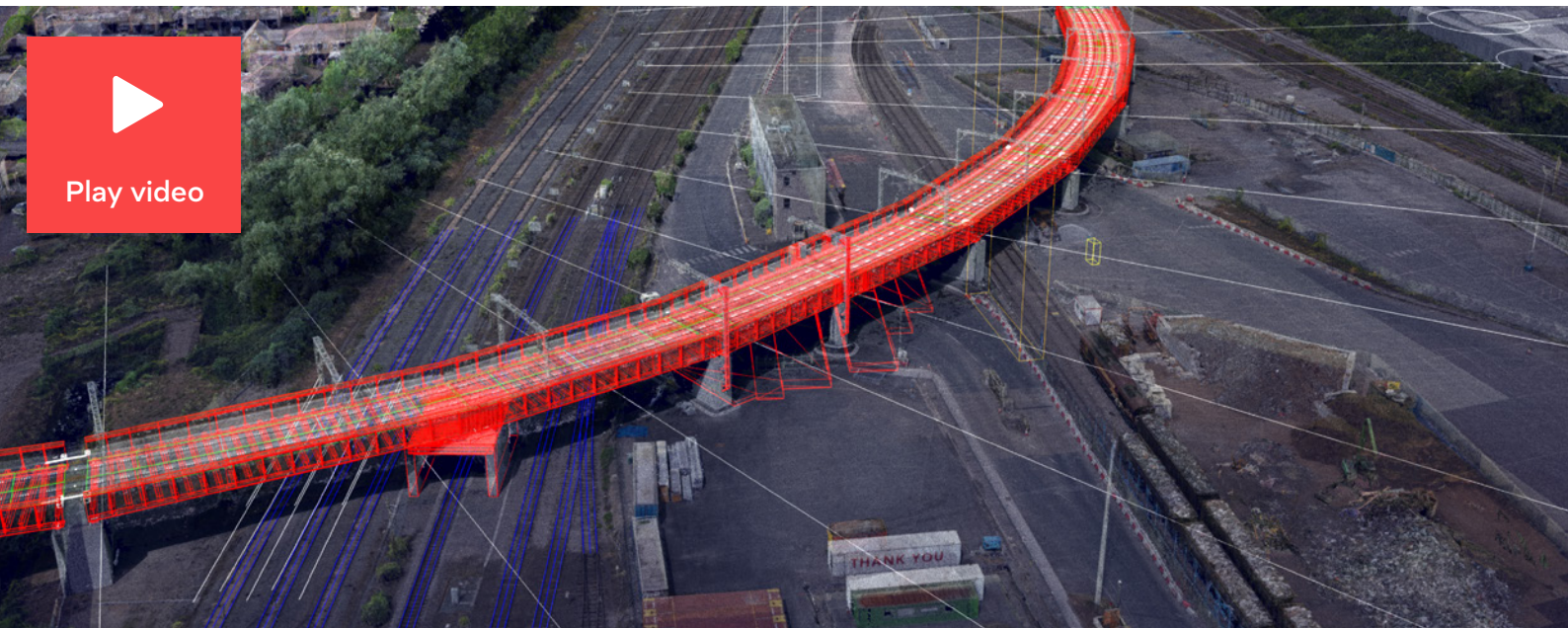
Sensat's cloud-based visualisation platform provided a 'digital twin' for MSVF to view project information including surveys, boundaries, environment/archaeology areas, designs, HS1 tunnel locations, costs, and schedules in 2D and 3D on a high-resolution reality base map.

Unlocking this project information encouraged more holistic decision-making between teams with the knowledge and foresight of what each other is doing. For example, previously station design files were difficult to access and understand unless you were a technical BIM engineer (with the correct software licence). With Sensat, whether you are a technical engineer, local engagement officer, or project manager, anyone with access could understand and gain insights from information thanks to its visual format. This helped to identify and mitigate risks daily before they impacted the schedule of works. Over the three years working with Sensat, the team uploaded and visualised over a thousand files in the context of the real world for the whole project team to inform better and more confident decision-making. ■

1000+ files

Over 1000 files visualised on Sensat

Below 3D visualisation of Barking Riverside overground extension viaduct (CAD design model overlaid on point cloud)



Challenge

Relaying progress is time-consuming

The Barking Riverside Extension project included over 10 different subcontractors, clients, and teams which MSVF needed to keep informed. Traditionally to track and communicate the progress of works, civil infrastructure teams rely on extensive site walks, photos, videos, onsite observations and regular meetings for communication. Gathering all the necessary information and organising the meeting can take days, delaying progress and detracting from other tasks that need to be carried out.

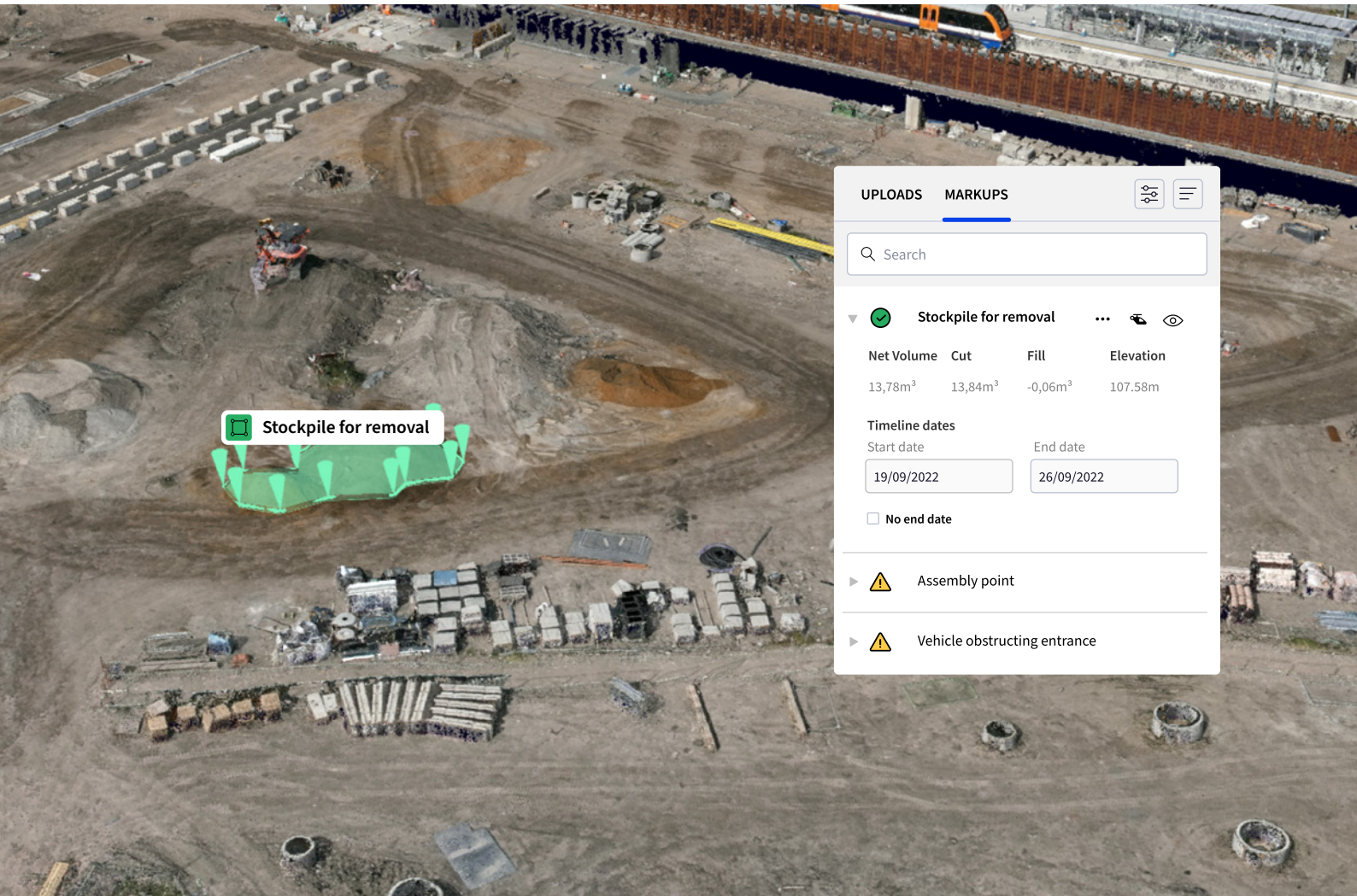
Solution

Ensure everyone is on the same page

MSVF used the up-to-date digital environment to enable visual storytelling and bridge the gap between technical and non-technical stakeholders. Teams shared screenshots from the most current site view or navigated around the interactive site in 2D and 3D in presentations.

Sensat was also used to communicate and plan works in inaccessible areas along the rail corridor. Using the 'digital twin', teams could familiarise themselves with the environment from the safety of their office before executing work on site.

Below Volume measurements were completed for stockpiles site-wide and allowed accurate estimates for removal trucks.



£240,000

estimated saving utilising Sensat's unlimited user licence

MSVF also used Sensat as the backdrop for discussion when onboarding subcontractors: highlighting potential risks and clashes, discussing solutions and mitigations, and bringing everybody up to speed about the plan going forwards. At peak construction, over 200 users accessed the up-to-date site information, via a browser-based platform thanks to Sensat's unlimited user licence.

> **Being able to integrate design over up-to-date site scans and other models really helped us to understand and preempt any issues with design and planning future works.**
>
> **Ryan Gordon** Site Engineer at Morgan Sindall Infrastructure

Above 2D orthomosaic overlaid on top of OS map

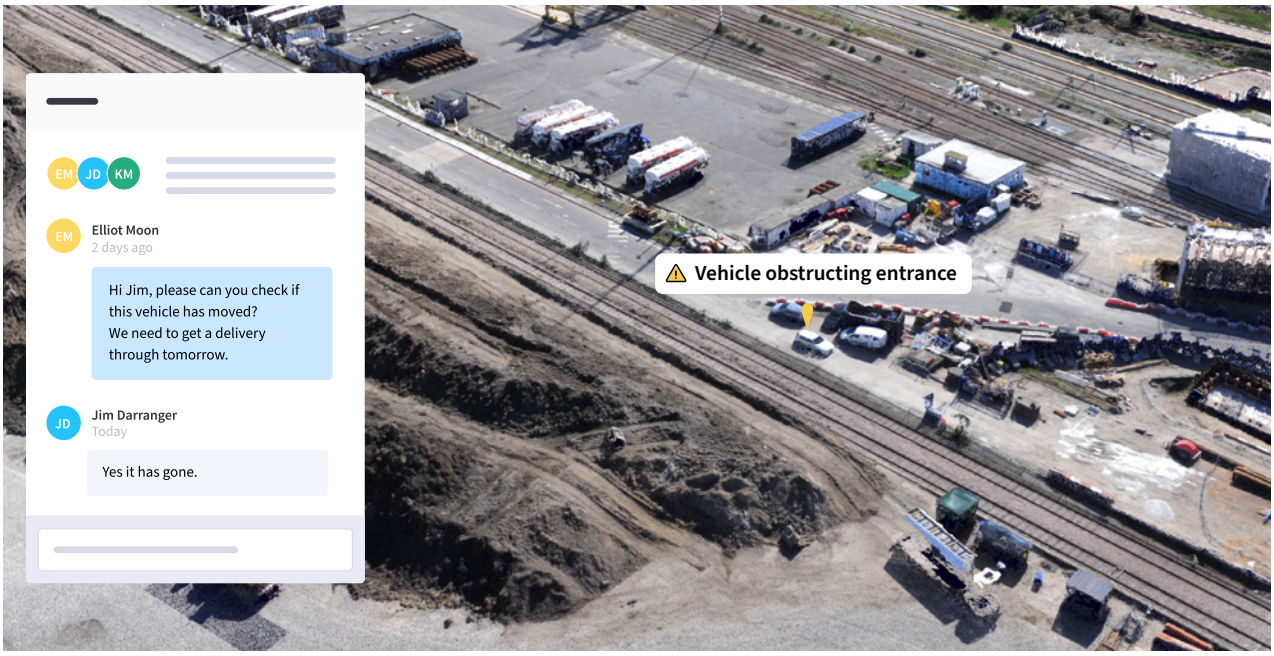
Unlimited user licence

MSVF utilised Sensat's unlimited user licence to freely add users without concerns about per-user fees. This helped to improve communication, whilst maintaining a single source of truth. It is estimated MSVF saved £240,000 using Sensat, based on 200 users at £600 per year for individually licensed software.

Challenge

Sometimes unforeseen obstructions mean we arrive on site and can't do the work

It's not uncommon for teams to arrive on site and plans to have changed due to unforeseen obstructions. MSVF wanted to minimise wasted trips to the site and looked for a way to better plan works which were in sync with the real-world environment.



Above Teams have used the platform to enhance planning works. Activities included spotting obstructions as well as defining areas & limits of work such as rail corridor chainages

Solution

Planning with safety and certainty using digital rehearsals

The replica of the Barking Riverside Extension project helped to improve site safety. Using desktop planning teams could better align plans with their site which reduced the need for site visits, extra surveys and money spent to take measurements on-site. MSVF's Safety, Health and Environment (SHE) team were able to use Sensat to support their routine safety inspections, allowing for risk identification in advance of their weekly site walkouts. It was estimated that one SHE site walkout was saved per month over the course of the project on top of an unmeasurable reduction in injury and in compensatory events as a result of injury.

1 Safety, Health and Environment walkout

saved per month

Teams also overlaid designs into Sensat as a way of visually inspecting plans before they were carried out. Sensat allowed for the identification and marking up of site features such as access and egress routes, safe working areas, as well as hazard identification. Teams undertook conventional ground inspections from a desktop which took people directly out of harm's way whilst enabling them to undertake the same tasks digitally. ■

Challenge

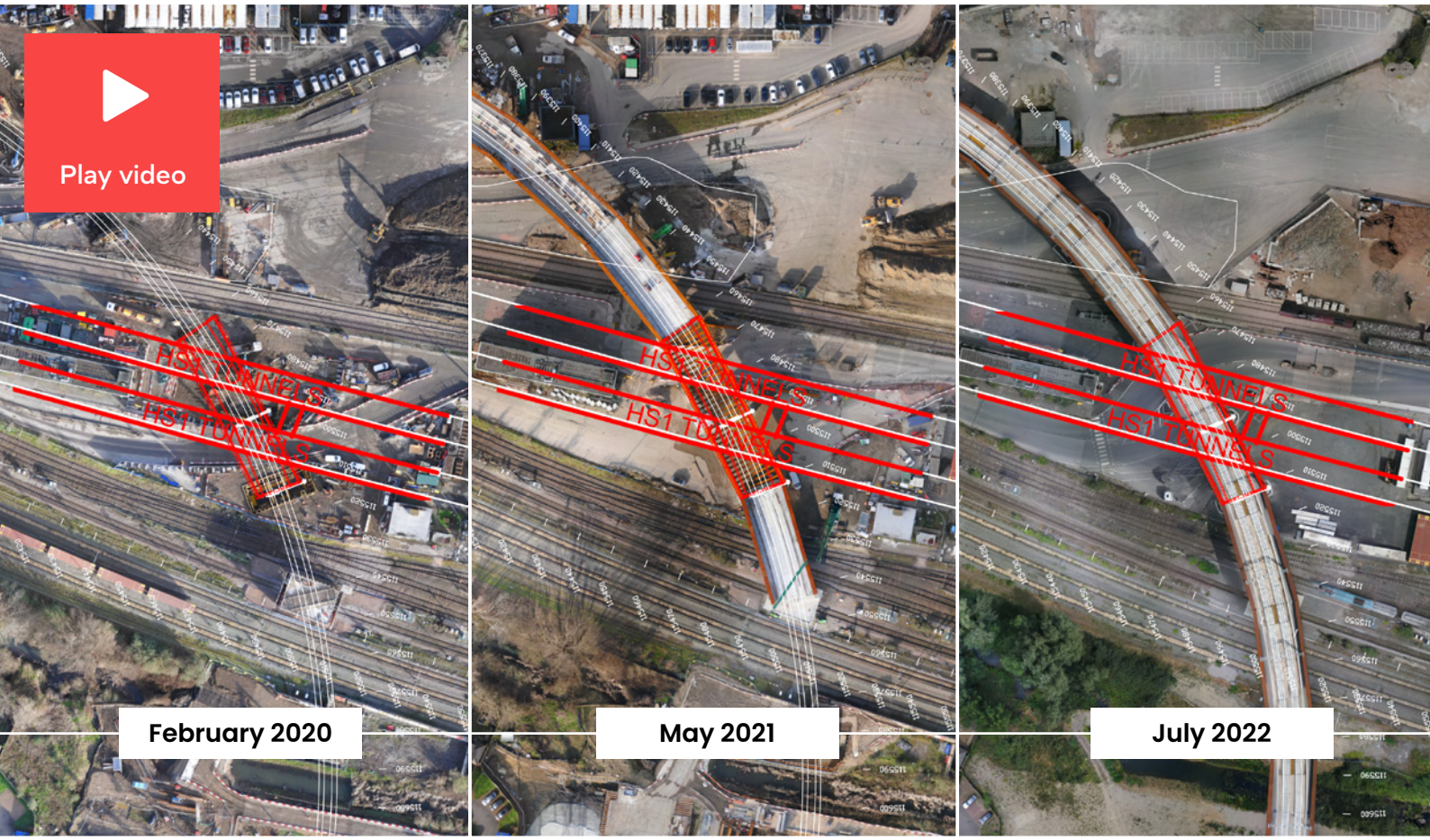
24 monthly site refreshes

were provided for the Barking project.

Slow or ineffective decision-making has huge knock-on consequences

On the Barking Riverside Extension, project managers faced a multitude of time-critical decisions on a daily basis. MSVF had assigned managers to each major work package, but synchronisation was often difficult due to technical software obscuring information from different teams and project managers. These cross-dependencies could have led to bottlenecks or delays in making decisions, resulting in costly consequences if incorrect.

> **We used Sensat to review construction progress. Sensat informed our design progress meetings and allowed the Architectural team to see what was happening on site without having to visit Barking.**
>
> **Istiaq Prodhan** Senior Architectural Designer at Weston Williamson + Partners



Above 24 Monthly site scans taken using Sensat's UAVs (unmanned aerial vehicle), enabling desktop progress updates.

> **We have been using Sensat to visualise the Barking Riverside London Overground extension to keep all subcontractors and stakeholders aligned and on the same page. With Sensat we can gain a holistic understanding to make the best decisions.**
>
> **Jim Bushell** Survey and Monitoring Manager at MSVF

Solution

More confidently make the right decisions

Since 2019, 24 monthly site refreshes were provided for the Barking Riverside Extension project, helping the team to reduce risk and visually inspect progress against their schedule of work. On a day-to-day basis, operating within a complex environment, they used Sensat to better understand and communicate their scope of works relating to:

- Site layout, logistics and swept path analysis
- Network Rail assets, including HS1 track routes
- Interfaces with project teams, adjacent construction sites and local stakeholders
- Environmental considerations they are subject to
- Land (and land ownership), including Network Rail boundaries

By seeing these constraints together, Barking Riverside Extension project managers could more confidently select the right plan and proceed with more certainty. It's estimated that saving 10 site visits per week across the programme resulted in an estimated minimum £520,000 cost saving. ■

Estimated £520,000 savings

thanks to reduced site visits.

> **The ability to complete measurements and leave comments within the digital site environment was especially helpful during earthworks. It saved several hours of work on site and was far safer than being surrounded by high risk plant such as diggers and loaders.**
>
> **Ryan Gordon** Site Engineer at Morgan Sindall Infrastructure

Use cases

Lift plans

When bringing cranes on site, the team used Sensat to plan access, propose clearance areas and inform the wider team of a crane's arrival.

> **Sensat was invaluable for large quantity take-offs and for refuting claims, thanks to the monthly updates keeping an assurance record of the project.**
>
> Tom Housden
> Site Engineer at Morgan Sindall Infrastructure

Swept path analysis

With large deliveries arriving on site regularly, including 30-metre beams, the teams used Sensat's in-platform measurement tools alongside the base map of reality to ensure trucks had suitable turning circles and could arrive and exit without any issues.

Accurate measurements for troughing

Teams used Sensat to measure distances along the rail corridor and accurately purchase the required amount of troughing, preventing waste and over-ordering.

Possession planning

Teams created digital rehearsals of rail possessions. Using markup tools, the MSVF teams could highlight areas due for possession, and communicate plans with the wider team.

Out-of-the-box value in 2 weeks

With Sensat's two-week value guarantee, the teams on MSVF experienced out-of-the-box value from the get-go. Using a tried and tested 3-step activation plan, the team got started without needing to download specialist software or decide which team members needed a licence. Like every Sensat project, MSVF's Barking Riverside Extension project has been allocated a dedicated Customer Success Manager who works closely with the project from start to finish, and unlike other software, Sensat's support comes at no additional cost.

Sensat held specific user drop-in sessions to help teams get to know the tools appropriate to them. For example, the works delivery team were shown new ways of marking up area layouts over the backdrop of the real world.

1 Refine goals

In a 1 hour co-creation call, Sensat will help to:

- Define project goals
- Define a timeline for achieving ROI

2 Build context

Over 2 weeks:

- Visualise project files within minutes
- Start gaining learnings from your data

3 Generate value

- Continue to invite users with Sensat's unlimited user licence
- Sensat can help run specific user drop-in sessions

Conclusion

Together MSVF helped their team to unlock insights and fuel data-driven decisions using Sensat. Thanks to MSVF's proactive approach, they were able to deliver the Barking Riverside London Overground extension ahead of schedule in July 2022. Across the duration of the partnership, Sensat helped teams to better understand the project's constraints, enabled project managers to confidently make the right decisions and empower decision certainty.

Discover how we can help your project tellmemore@sensat.co.uk

Testimonials from the Barking Riverside Overground Extension team

MORGAN SINDALL INFRASTRUCTURE

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WW+P

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