Health and Safety Executive

Progress using BIM

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Efficiencies from Project inception

Do you have confidence in your critical Health & Safety data? Typical delivery models for H&S information are poorly structured with a mix of formats, stakeholders, quality levels and access points.

JACOBS Safety Web Solution

Integrating early data and establishing hazard and risk management

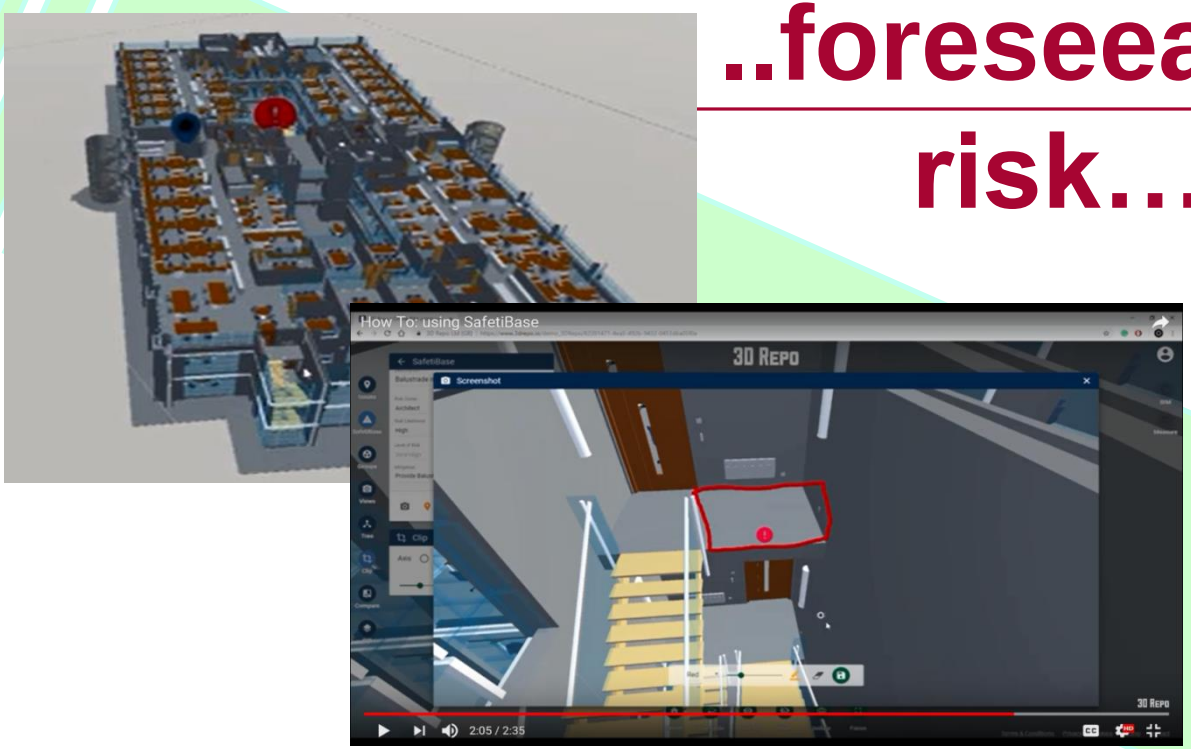
Create and socialise a legacy of safety information to support the full asset lifecycle.

Stay informed of hazard locations and safety risks when visiting site. Assign ownership for accountability.

Integrate with design tools to prioritise focus and mitigate hazards to avoid expensive and time consuming re-work.

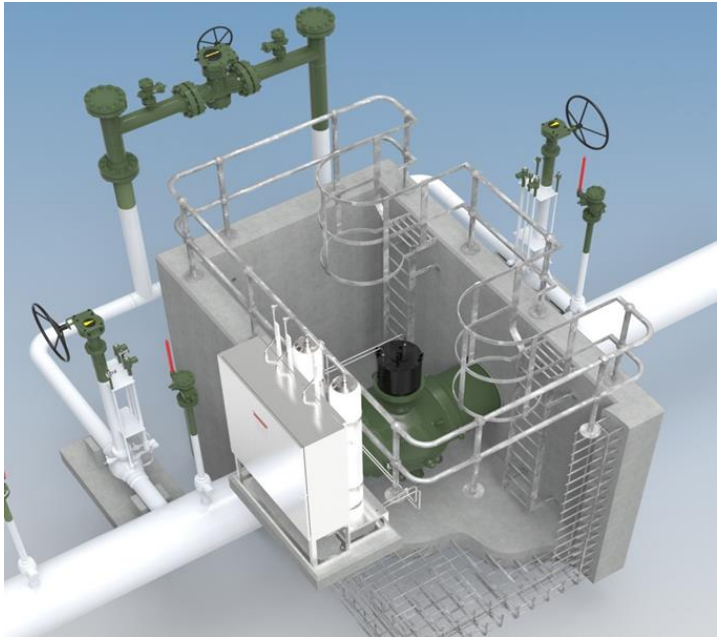
Coordinate actions and manage hazard profiles efficiently with automated reporting and deliverables.

..foreseeable risk…

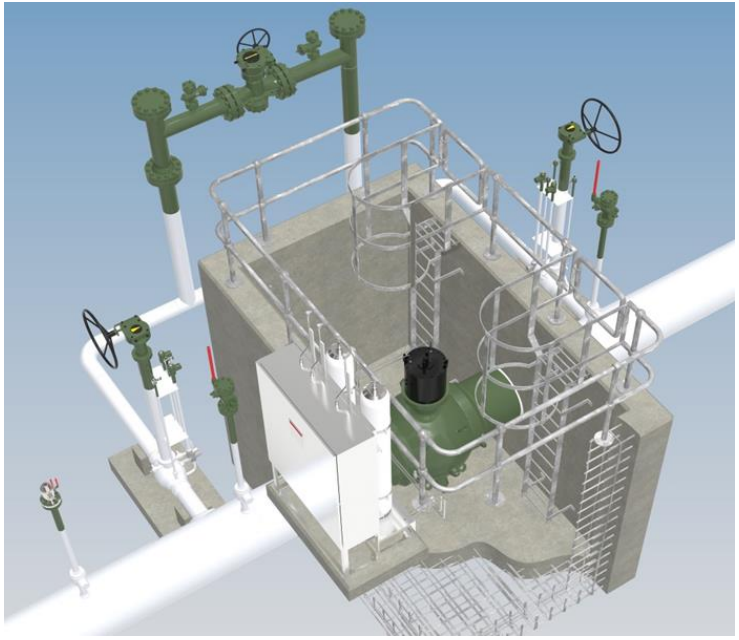


Accident Report "IP Fell from open edge on stairwell"

…power of Visualisation and Review

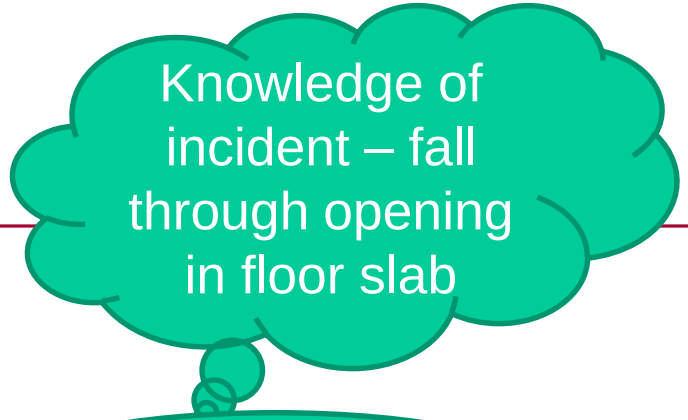


Railing Without Gated Access



Railing With Gated Access

..a line of foresight….



First opportunity to spot risk

After Houssain et al 2018

FOR	WHEN	WITH	HAVING	THEN
Design Element	Work Activity and location	Having risk factors	Risk	Treatment actions

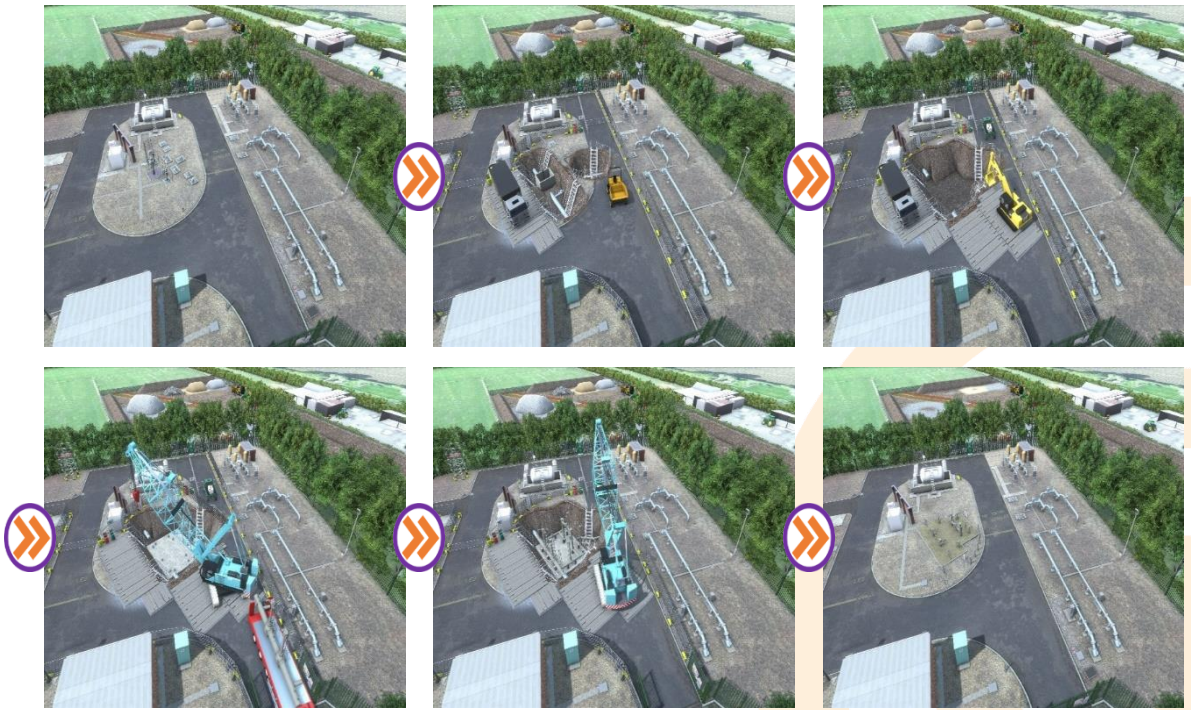
Eliminate
Reduce
Control t.s.d.
Inform

Discovering Safety Project

Linking risk factors to treatment action

National Grid Asset Health Offtake Replacement (2019)

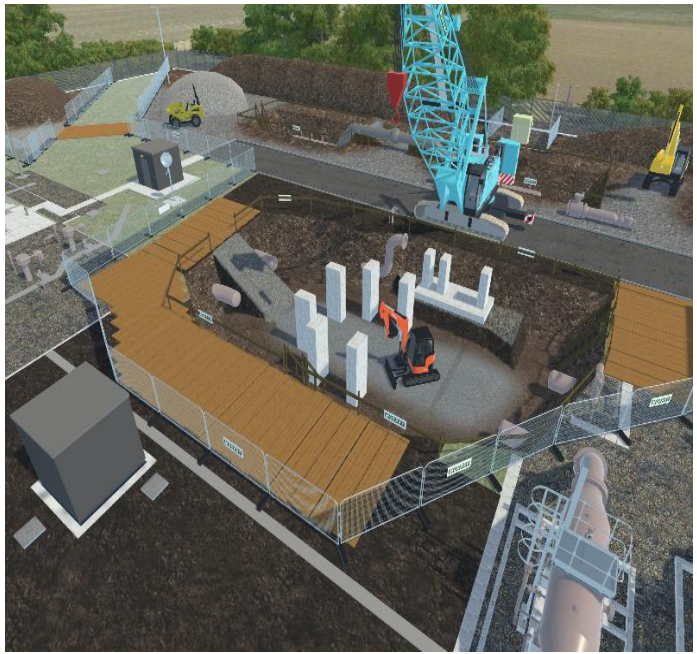
Digital Rehearsal (Rehearse & De-risk)



- BIM
- Block Valve (2017)
- Offtake Replacement (2018)
- **Offtake Replacement (2019)**
- Large Scale Projects
- Site Establishment
- DRPL
- Work Flow
- Clash Detection & Hazardous Areas

Large Scale & Complex Projects

Digital Rehearsal (Rehearse & De-risk)



- Methodology and plant selection
- Confirmation of temporary works and working areas

National Grid Asset Health Offtake Replacement (2018)

Digital Rehearsal Vs. Reality

National Grid Asset Health Offtake Replacement (2019)

Stakeholder Engagement

- BIM
- Block Valve (2017)
- Offtake Replacement (2018)
- **Offtake Replacement (2019)**
- Large Scale Projects
- Site Establishment
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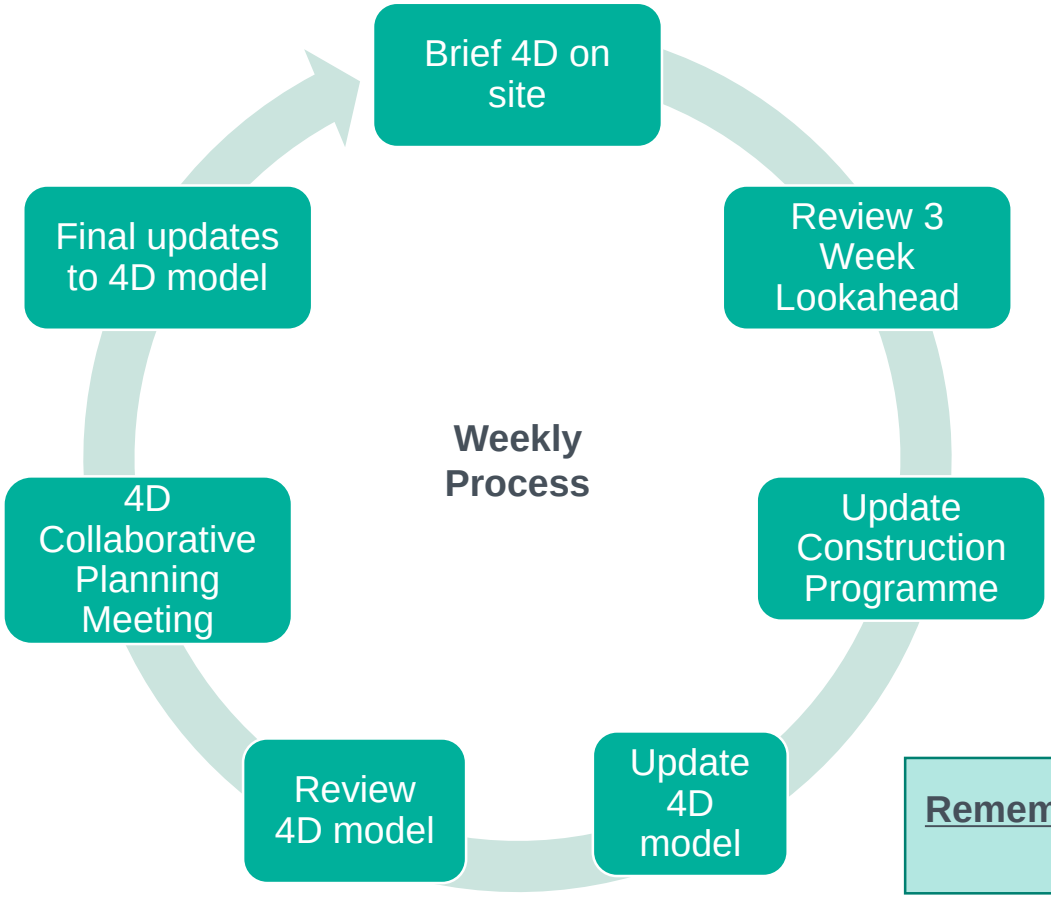
Greenwich Pumping Station Site

Thames Tideway Super Sewer Project

- Congested site
- Residential area
- Logistics are key
- Multiple structures
- Adjacent railway

Execution – 4D Collaborative Planning

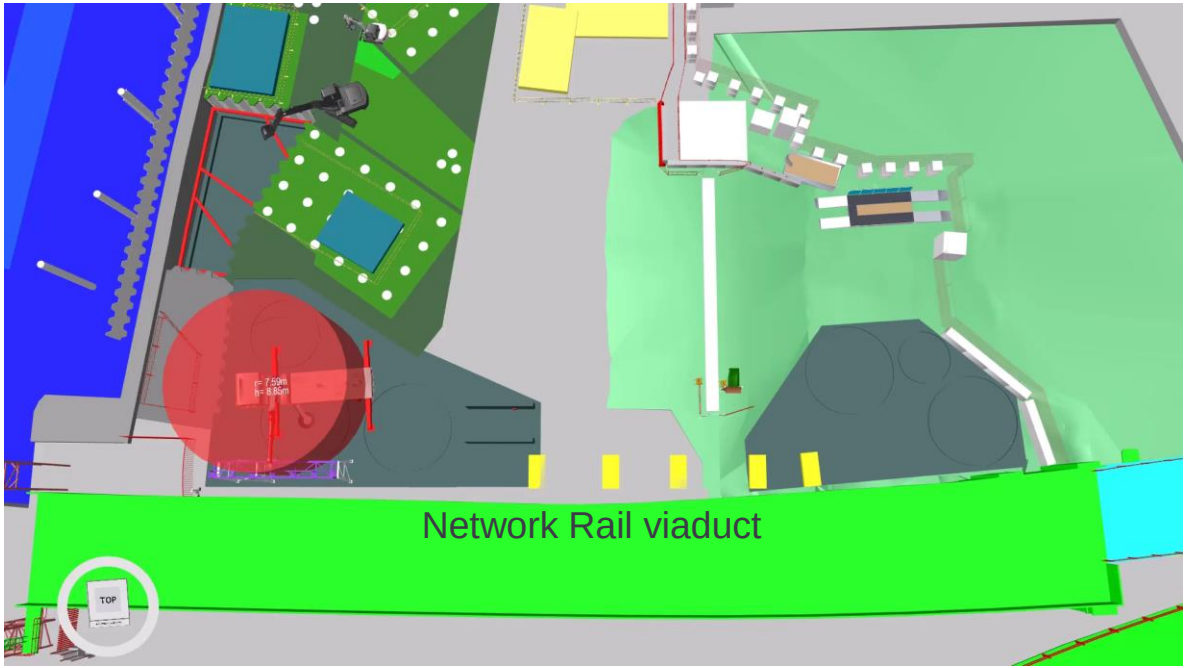


4D-based Start of Shift briefings

Remember: ***"We are not trying to perfect the model we are trying to get it perfect on site"***

Execution – 4D Collaborative Planning

Pipe Racks interface with Network Rail viaduct



50% less meetings

Avoided night working

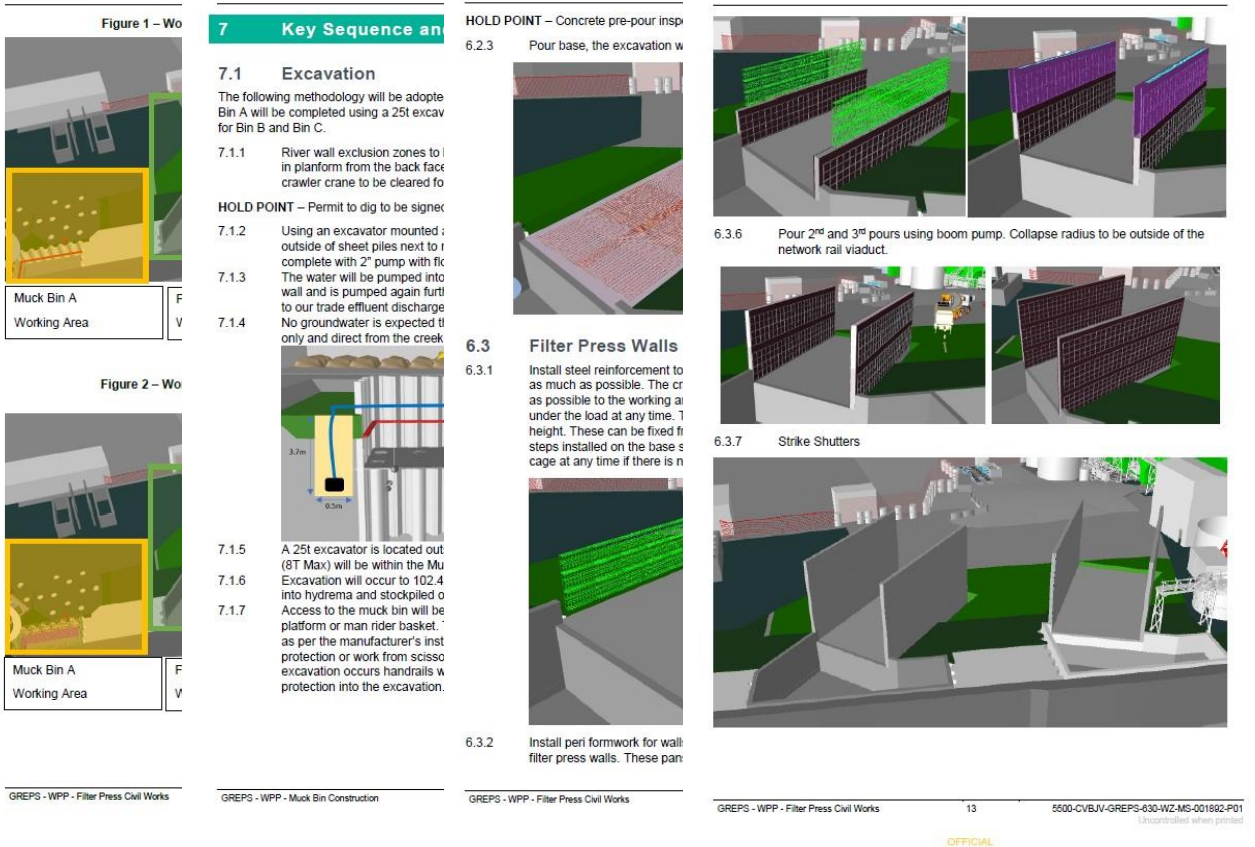
50% programme reduction

Enhanced constructability analysis

Improved collaboration with internal/external stakeholders

Advanced planning

Execution – 4D Collaborative Planning



Risk Assessment Method Statements + 4D

30% document size reduction

20% less time to create

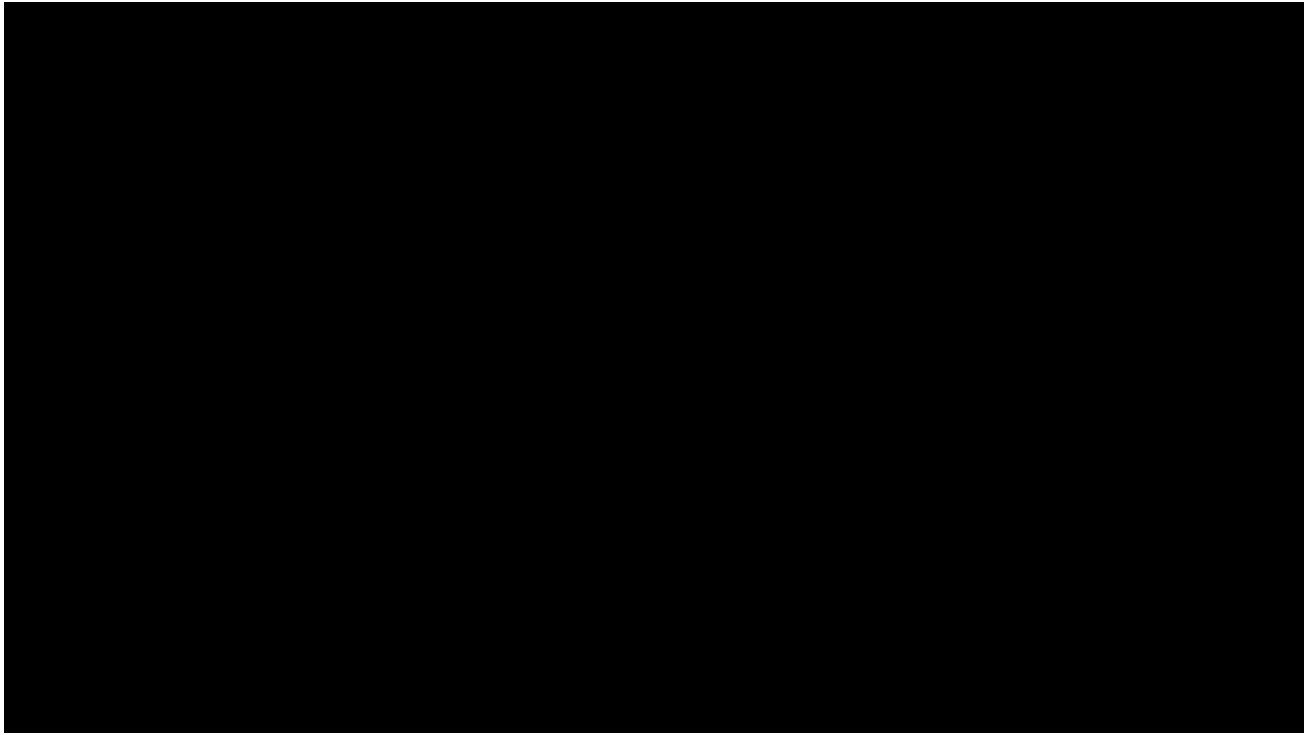
Streamlined approval process

Improved understanding by site operatives and different teams

Lessons Learned

- An effective CDE
- Requirements for Models in Contracts
- Detailed examination and improvement of programme
- Detailed 4D Models
- Training involves everyone
- Senior management buy in

The Digital H&S File



Structured H&S Information:

- Compliant 007G H&S File
- Pertinent O&M data
- Readily accessible to end user
- Clarity through visualisation
- Pre Construction Information ready for future projects.

Conclusions

- Evidence is growing that BIM techniques and tools enhance H&S delivery –at every stage
- Visualisation using 3D and 4D models is powerful in enhancing early identification of risk
- The tracking of risk and risk treatment through a project into end use is increasingly important
- Clients hold the keys – recognise what can be done and invest in early detailed design
- Reducing risk is productivity – good business