

BIM & Innovation

HS2 Supplier Conference Breakout Session

Agenda

- **Introduction to BIM**
Bill Grose: Efficiency Challenge Group – Design & BIM
- **Government BIM Strategy – The Future**
Adam Matthews: BIS BIM Task Group
- **BIM in HS2**
Jon Kerbey: Head of Systems and Asset Information
- **BIM in Practice**
Bob Thompson: Executive Director, Keller Ltd
- **Introduction to Innovation**
Bill Grose: Efficiency Challenge Group – Design & BIM
- **HS2 Test-Bed for Innovation**
Darryl Stephenson: Head of Innovation
- **Q&A**
All

Q&A

Q1. How would you classify your company in the supply chain?

- A. Tier 1, Lead designer, main contractor, JV partner or supplier, contracting directly to client
- B. Tier 2, designer, supplier or subcontractor to tier 1
- C. Tier 3, supplier to tier 2
- D. Other

Q&A

Q2. How many staff are directly employed by your company?

- A. 1-25
- B. 26-100
- C. 100-500
- D. Over 500

Q&A

Q3. How would you classify your main line of business?

- A. Design
- B. Construction
- C. Project management (including QS)
- D. Manufacture & supply
- E. Other professional services
- F. Trade association, institution
- G. Academia
- H. Government & public sector
- I. Logistics & Distribution
- J. Other



Introduction to BIM

Bill Grose

The Acronym

Building Information
Modelling or Management
Maybe AIM

Definition

HM Government

Building Information Modelling (BIM) is a collaborative way of working, underpinned by the digital technologies which unlock more efficient methods of

PAS 1192-2:2013

Process of designing, constructing or operating a building or infrastructure asset using electronic object oriented information.

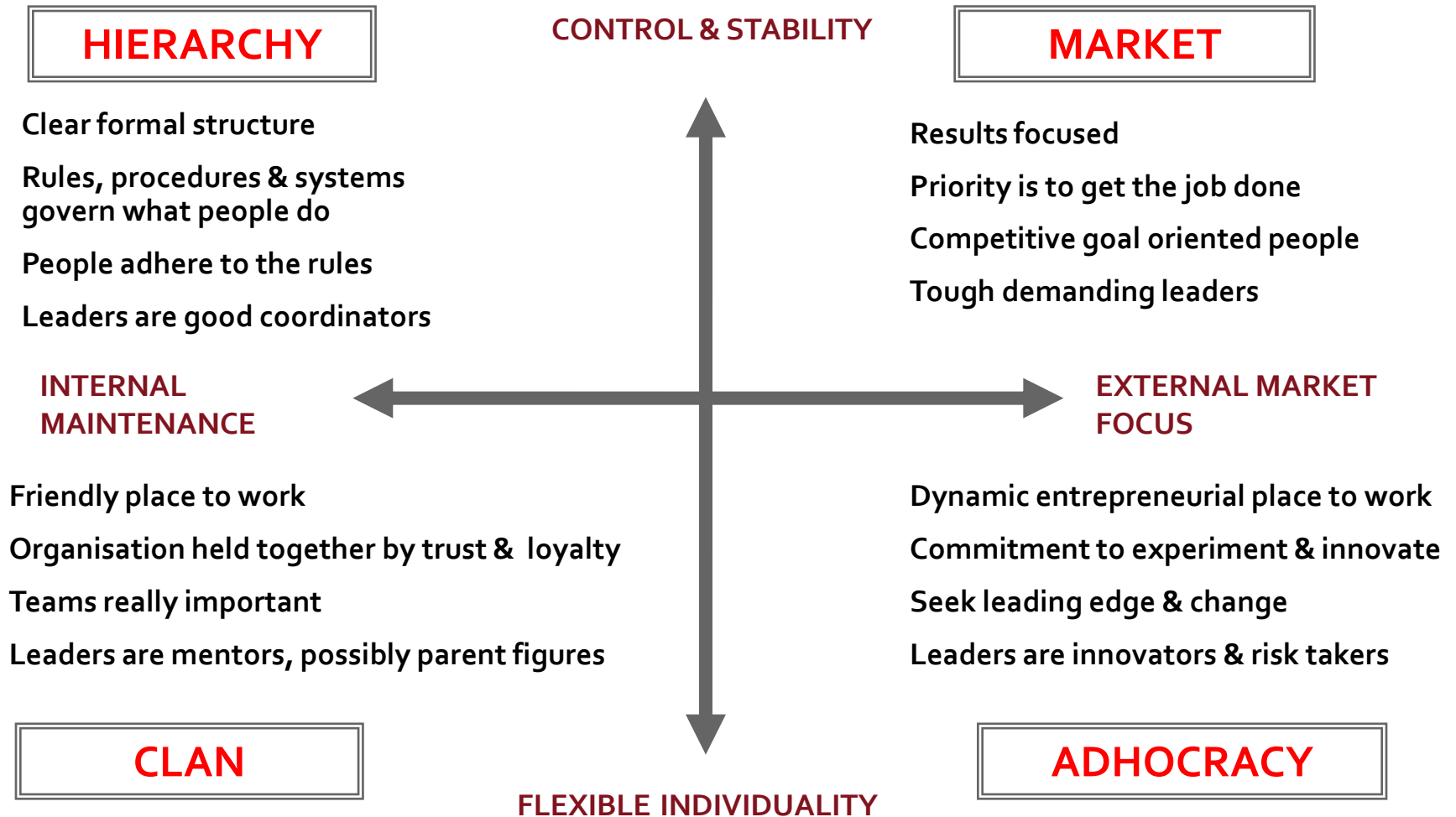
BIM Maturity

BIM maturity level	Information Management	Information Modelling
0	No project wide common standard for flow and production of information	2D CAD and paper issue
1	A project wide consistent approach to flow of information	2D/3D CAD produced independently by team members
2	A project wide consistent approach to flow <u>and</u> <u>production</u> of information	3D models produced by all team members to common level of detail using common tools
3 "vision"	As BIM level 2	Single project model

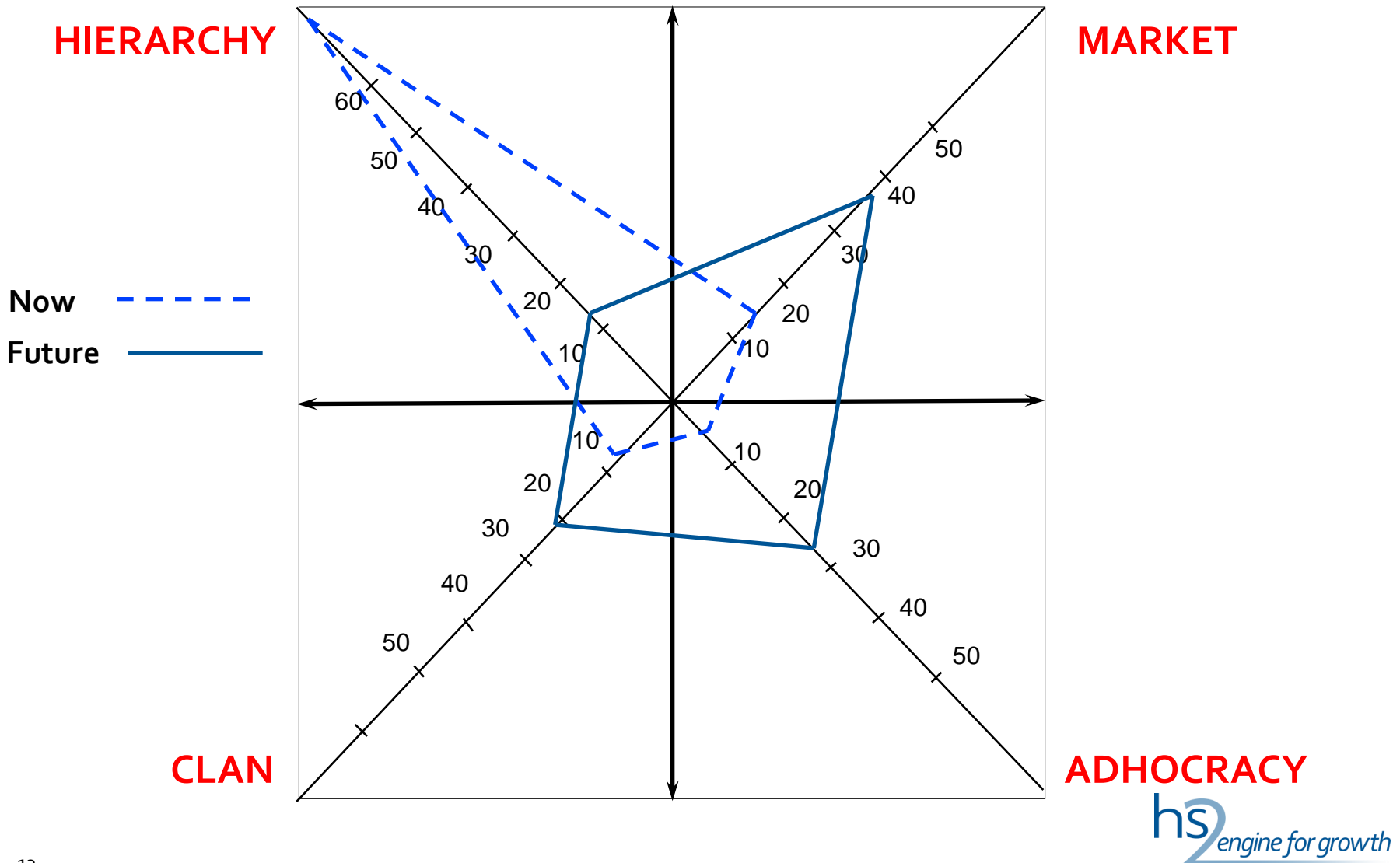


A collaborative approach that improves project delivery through adopting standard processes and tools

Organisation Culture Model



HS2 Organisational Culture Comparison





Government BIM Strategy: The Future

Adam Matthews

Government Construction Strategy

 **Cabinet**Office

Government
Construction
Strategy

May 2011

2.31 The Cabinet Office will co-ordinate Government's drive to the development of standards enabling all members of the **supply chain to work collaboratively through Building Information Modelling**

2.32 **Government will require fully collaborative 3D BIM** (with all project and asset information, documentation and data being electronic) **as a minimum by 2016**

Central Funded Public Estate

8 x

Major Public Procurers

£20bn



CabinetOffice

BIS | Department for
Business Innovation & Skills

Objective

Government Construction Strategy

 CabinetOffice

Government
Construction
Strategy

May 2011

“**15-20%** cost and carbon reduction on all centrally procured government construction projects within the current parliament (2016)”



CabinetOffice

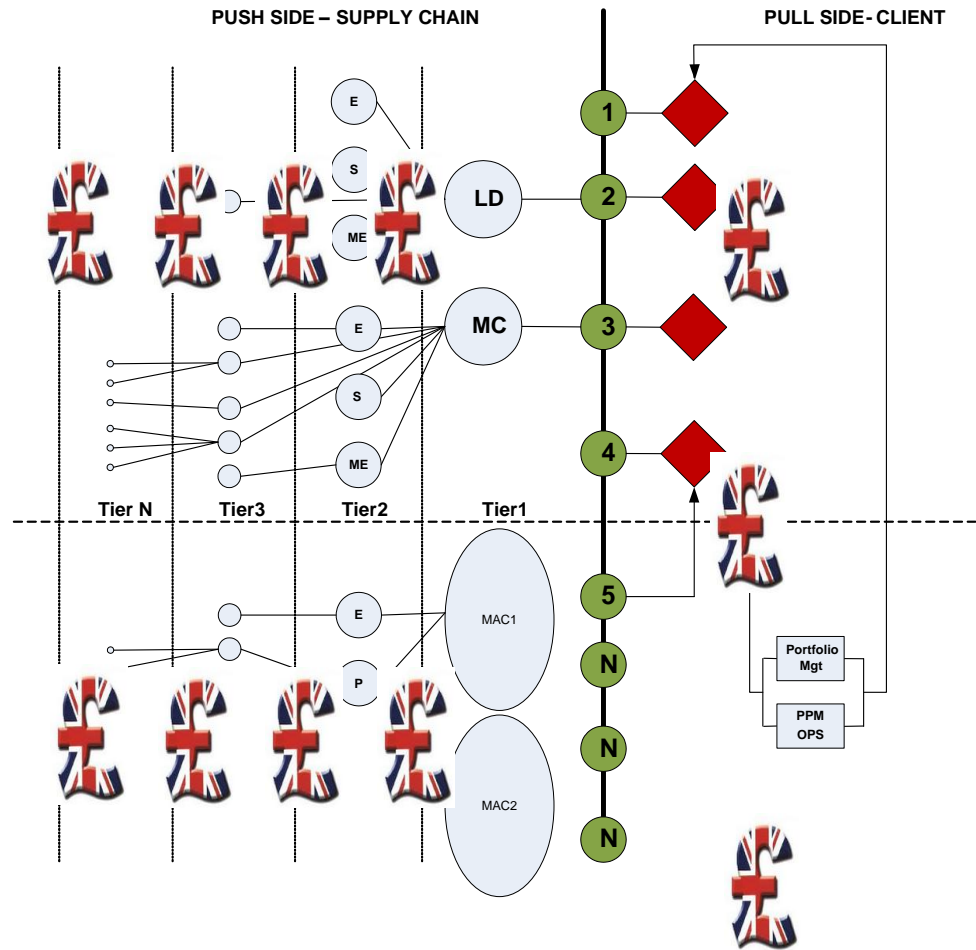
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Open Sharable Information

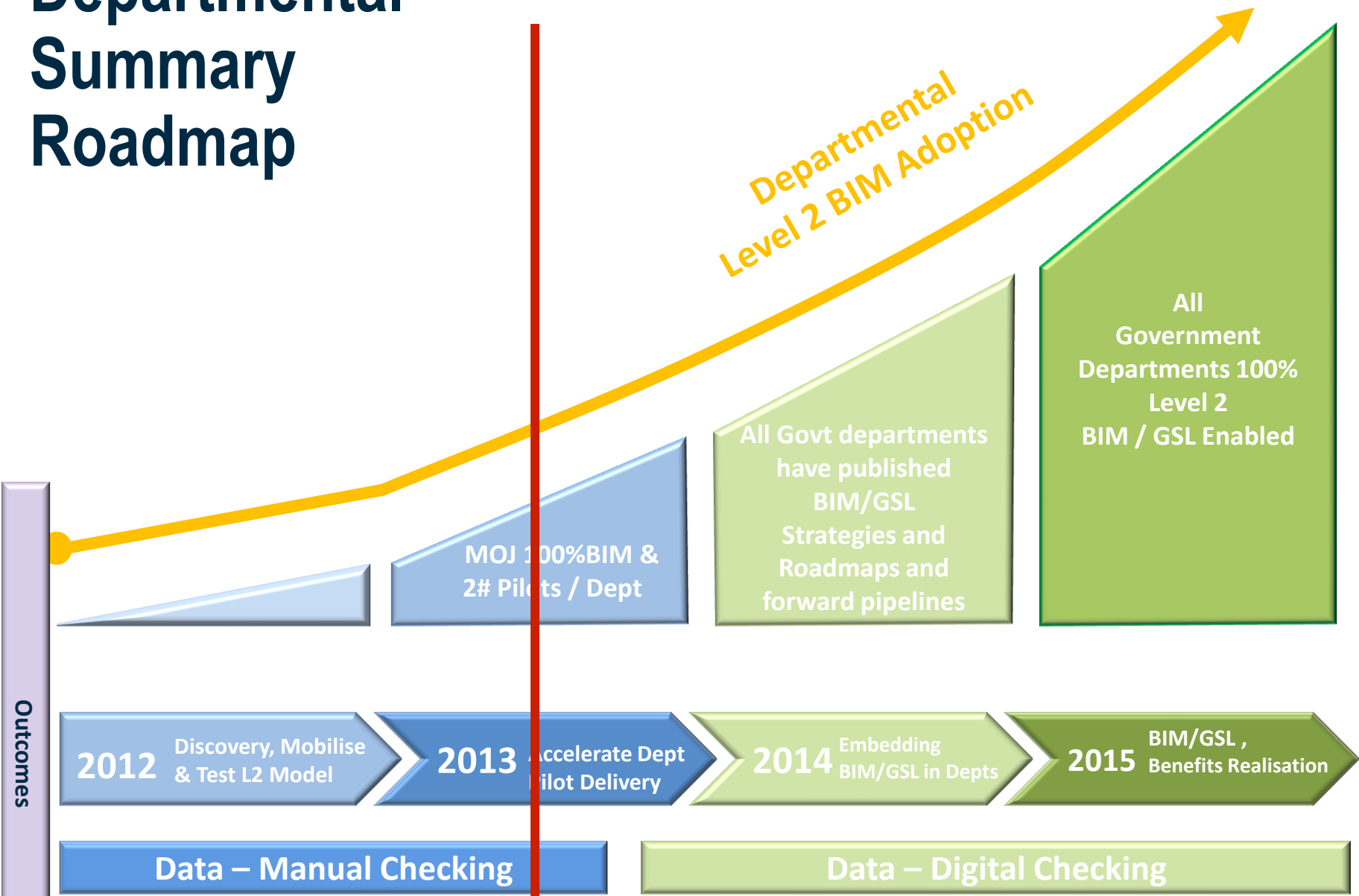
“Government as a client can derive significant improvements in cost, value and carbon performance through the use of open sharable asset information”

Level 2 - Business Case



Rollout

Departmental Summary Roadmap



2016 Legacy – Digital Built Britain

Outcomes



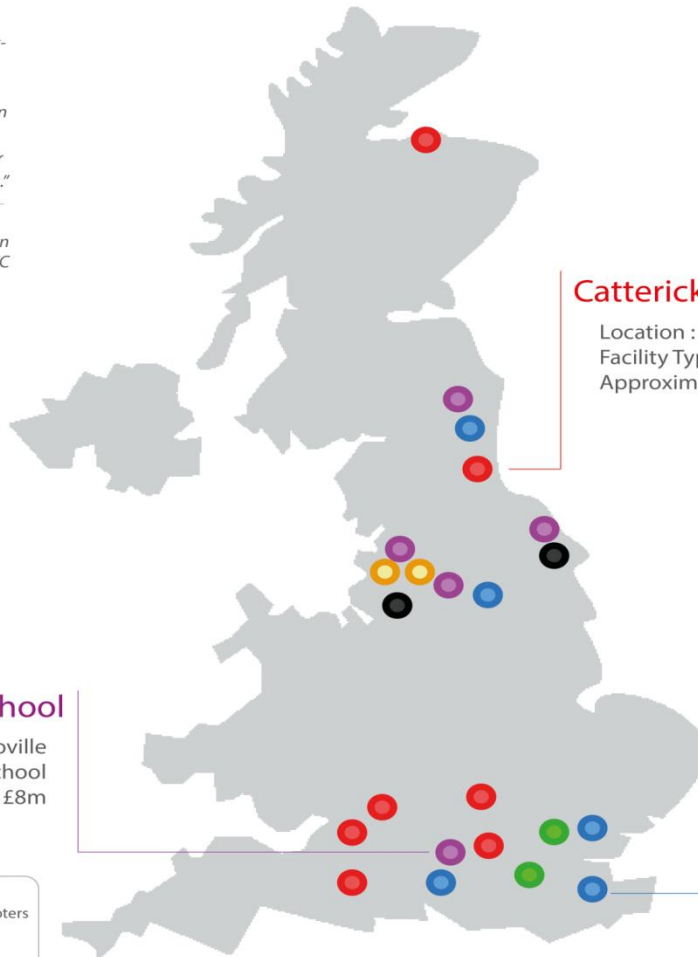
CabinetOffice

BIS | Department for Business Innovation & Skills

Projects

"Hampshire County Council Property Services is currently adopting the Government's objective of BIM Level 2 maturity on two pilot Primary School projects. Early benefits of this adoption have been greater coordination of information across disciplines, an ability to produce and update information quickly and a better understanding of the project by the client and end users."

Bob Wallbridge, Strategic Manager for Design and Implementation in Property Services, HCC



Waterlooville School

Location : Waterlooville
Facility Type: School
Approximate Value: £8m

Catterick Garrison, Healthcare Facility

Location : Catterick, Darlington
Facility Type: Healthcare
Approximate Value: £5.5m

HMYOI Cookhm Wood

Location : Cookhm Wood
Facility Type: Prison
Approximate Value £20m:

- Local Government
- ProCure 21+
- Highways Agency
- Defence Infrastructure Organisation
- Environment Agency
- Ministry of Justice

These are BIM Early Adopter Projects, either in progress or on a candidate list under-consideration to become Early-Adopters

This list will remain live and may change with circumstances; it does not commit any specific project to be confirmed as an Early Adopter



Cabinet Office

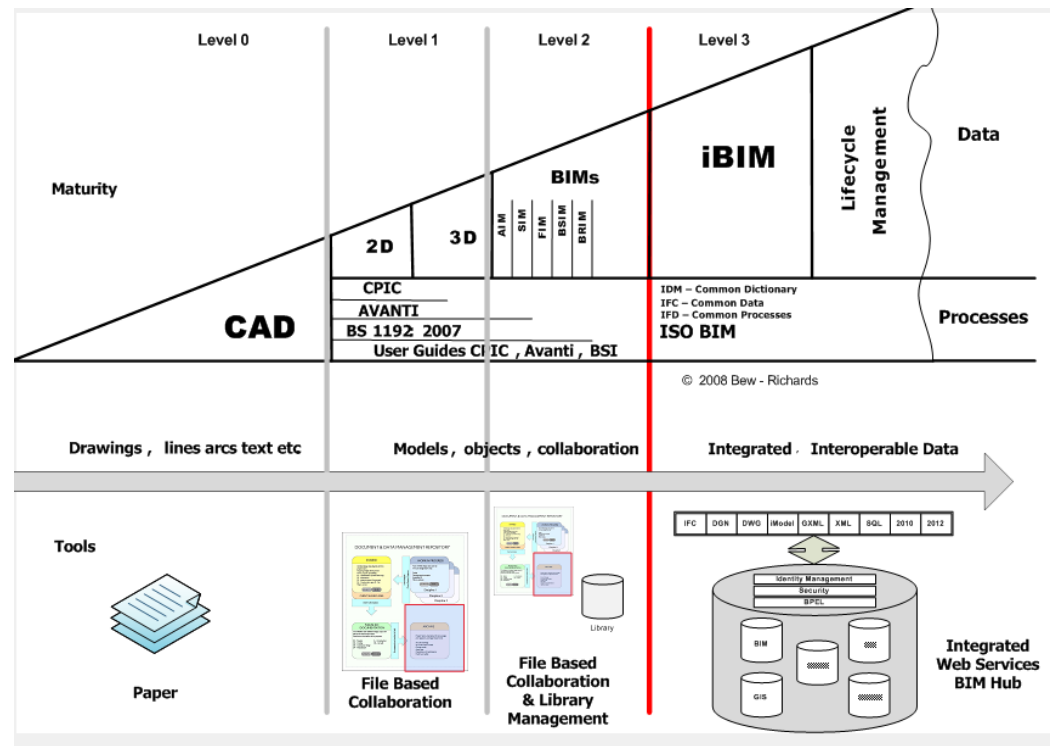
BIS

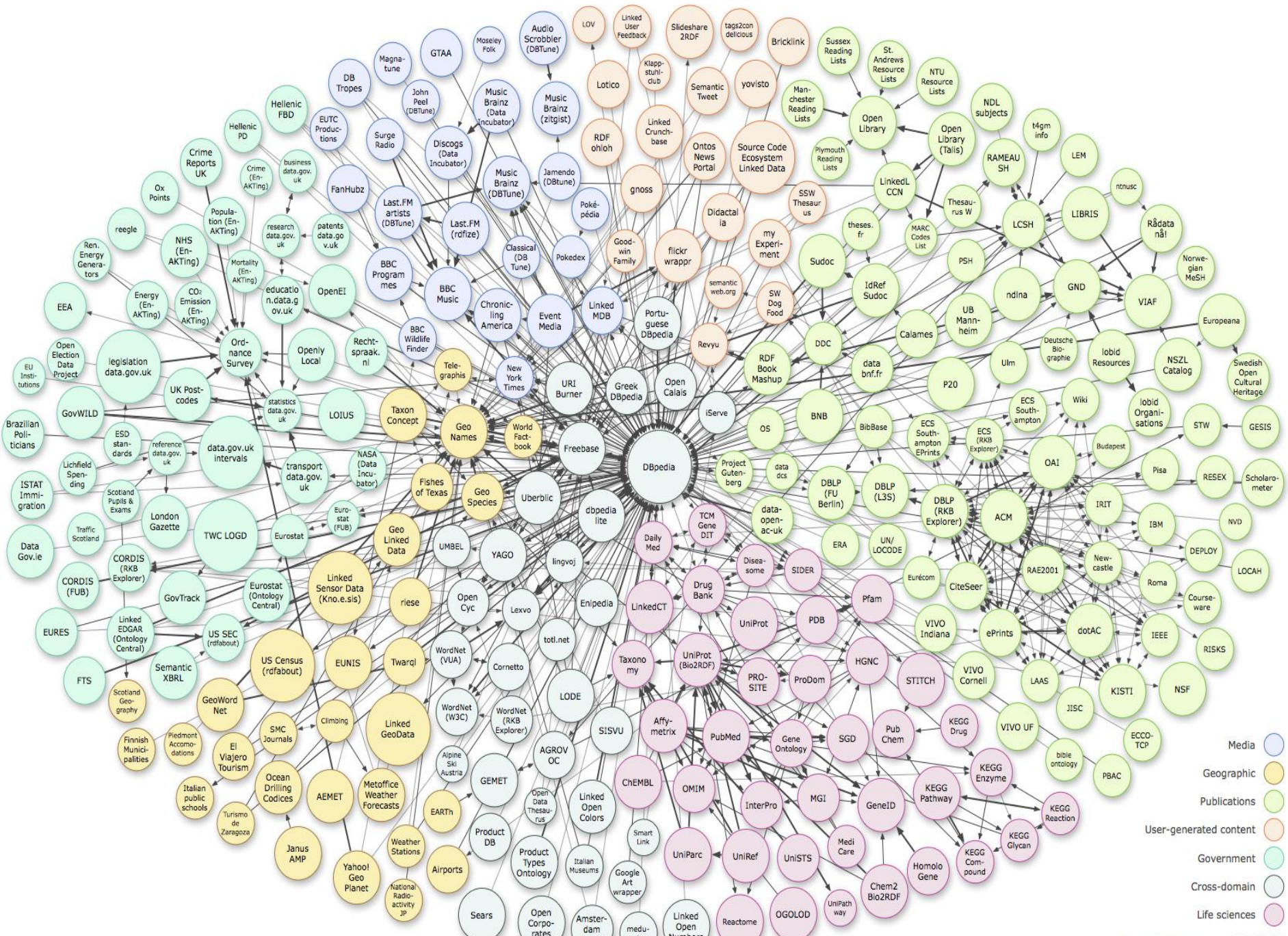
Department for Business Innovation & Skills

What's Next?

What is Level 3 ?

- Future Proof
- Online
- One Transparent Model
- Self Checking
- Secure
- Automated Processes
- Knowledge Based
- Artificial Intelligence
- Self Procured
- Market Futures
- Commercial Transaction Model
- Constraint Management
- Post Occupancy Automation and Productivity







BIM in HS2

Jon Kerbey

BIM Vision



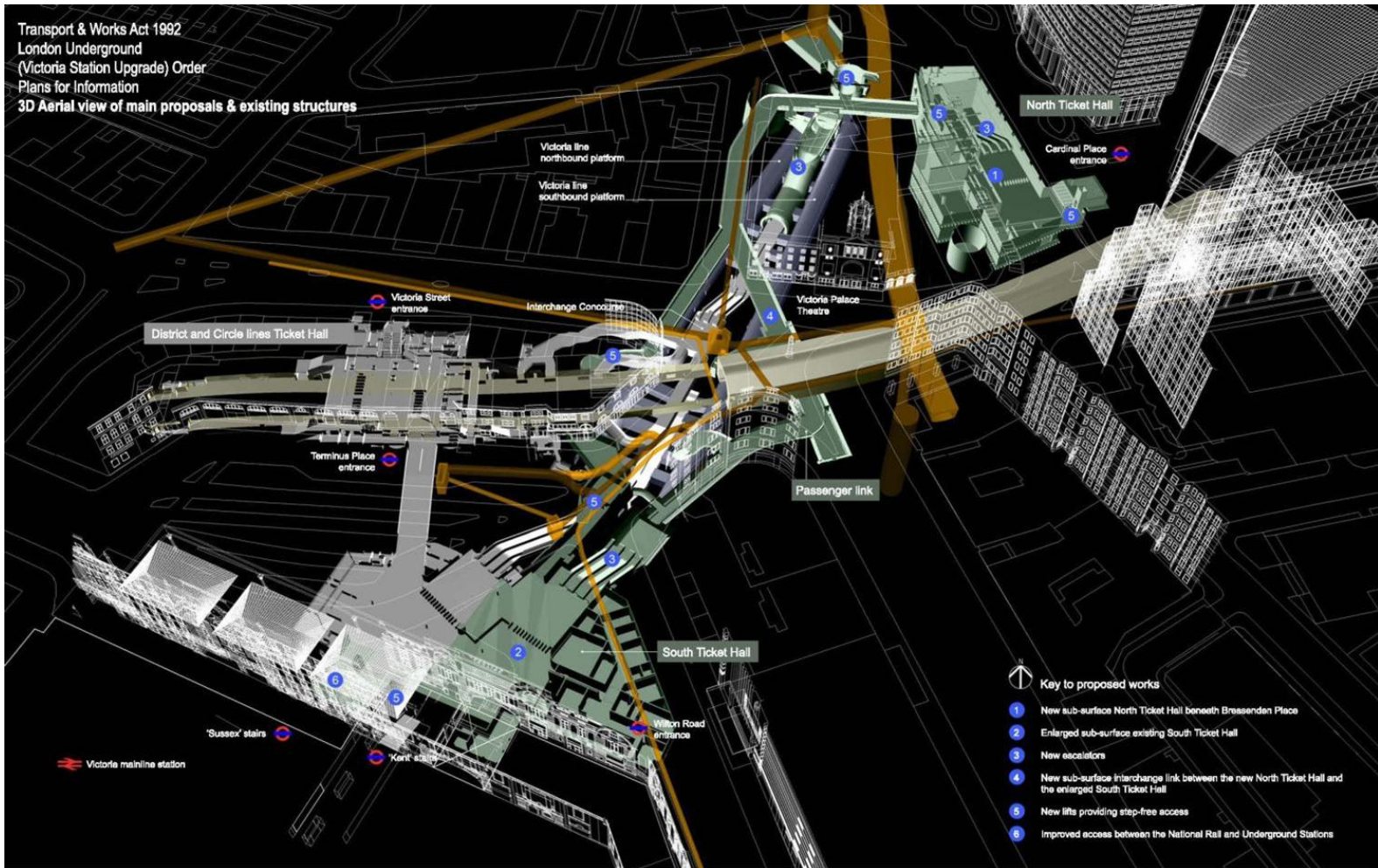
BIM
 STARTING ON THE RIGHT TRACK TO
 AN EFFICIENT, SUSTAINABLE FUTURE



BIM in Reality

Bob Thompson, Keller

Victoria Station Upgrade Jet Grouting



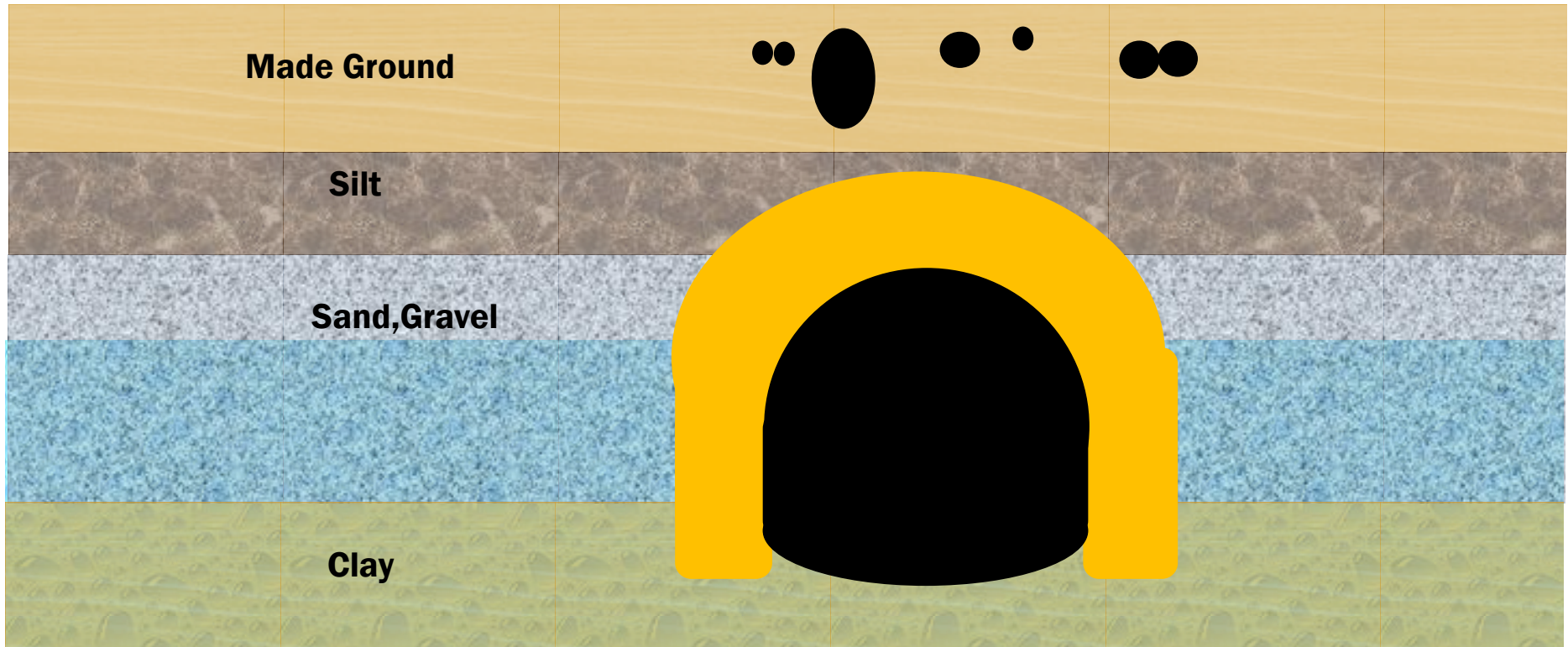
Victoria Station Upgrade Jet Grouting



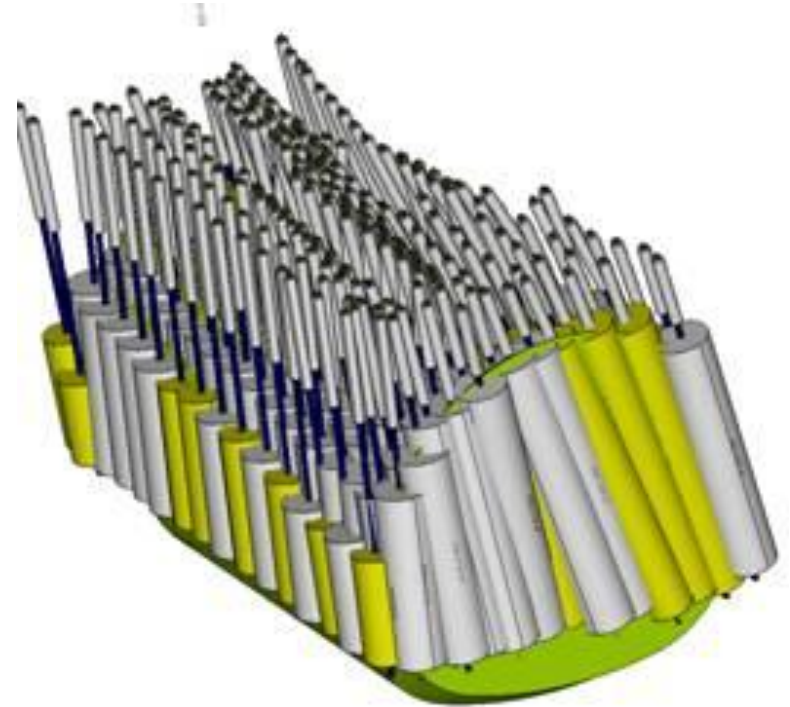
Victoria Station Upgrade

Ground Conditions

Treatment Area



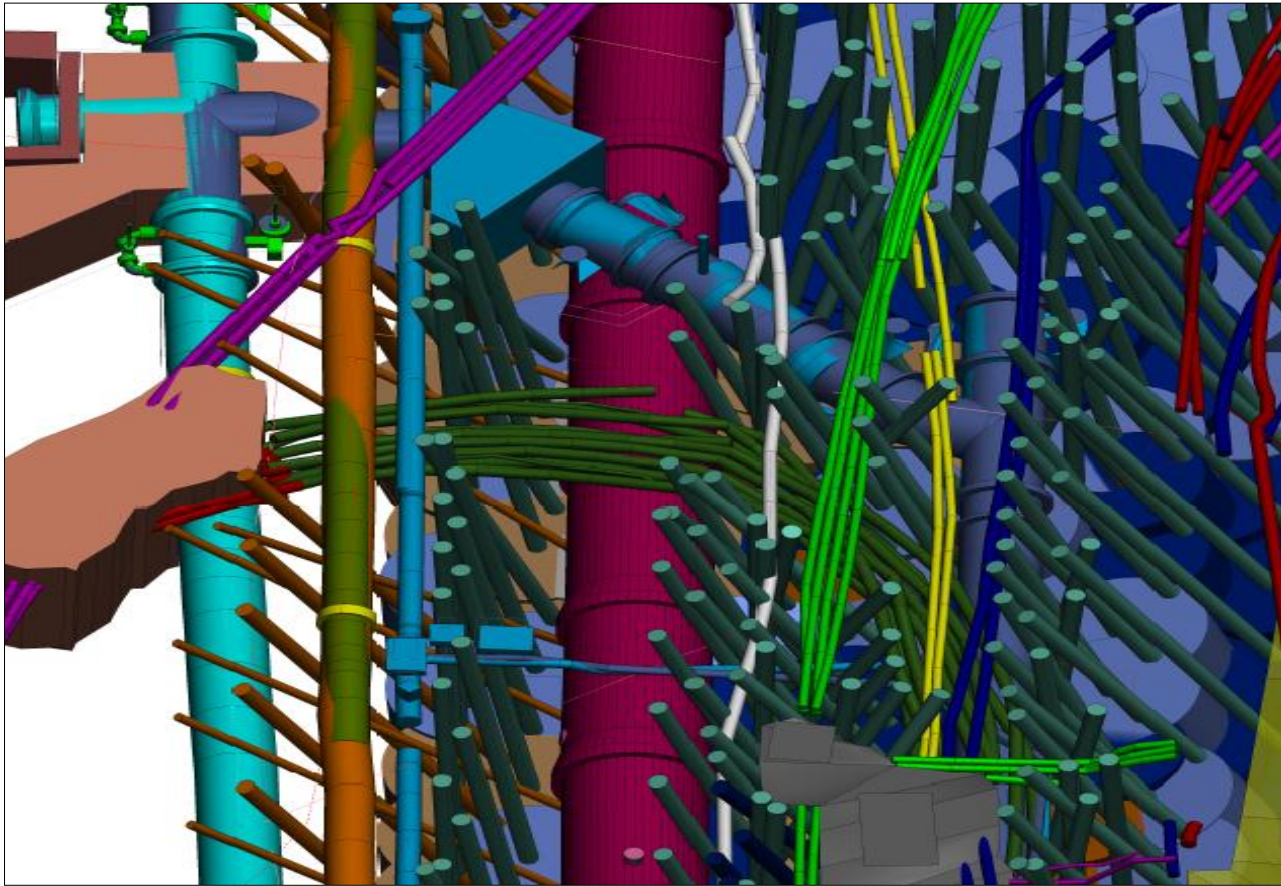
Victoria Station Upgrade



Victoria Station Upgrade - Services



Victoria Station Upgrade – BIM/Microstation



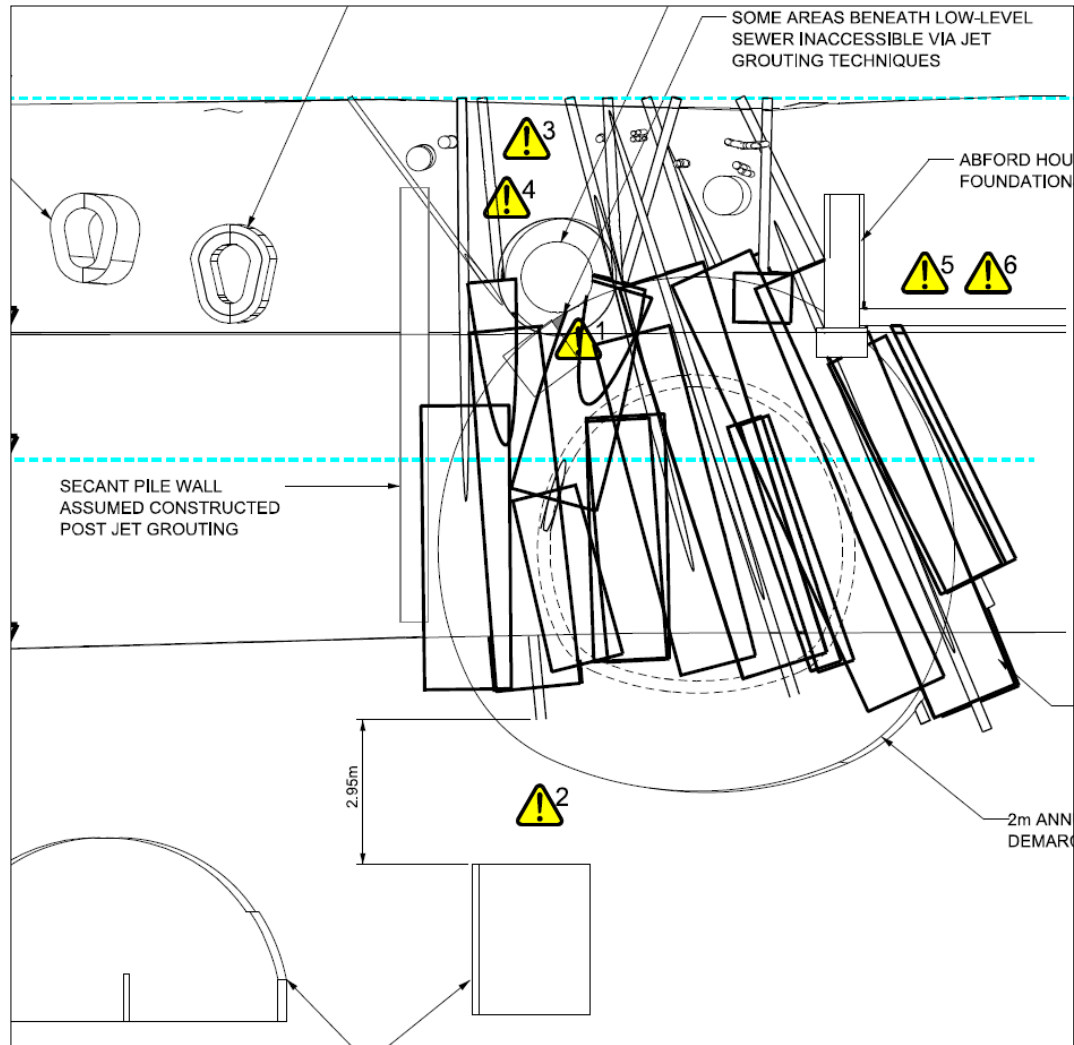
Victoria Station Upgrade



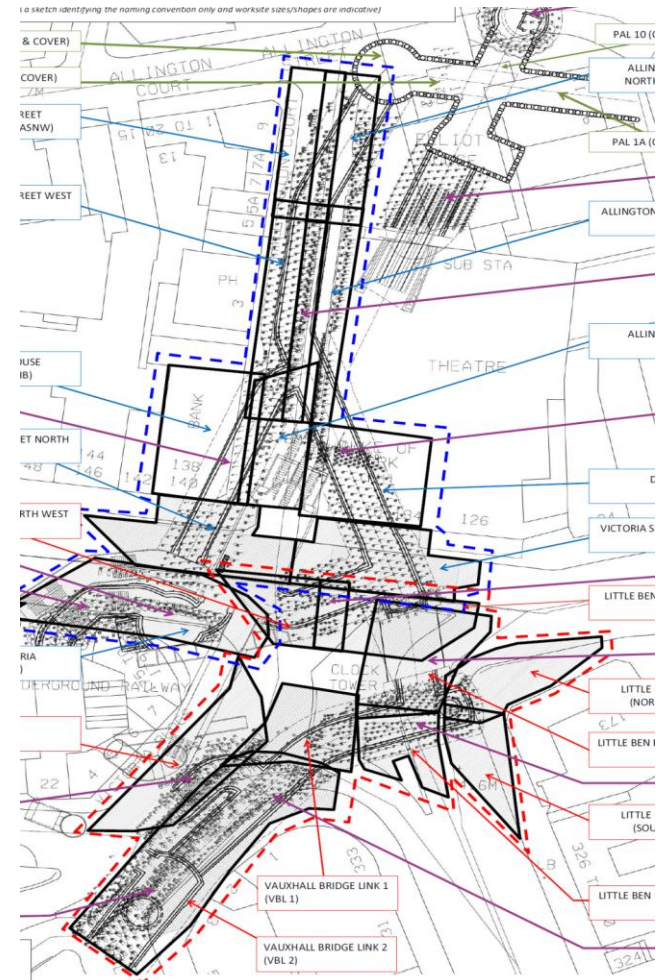
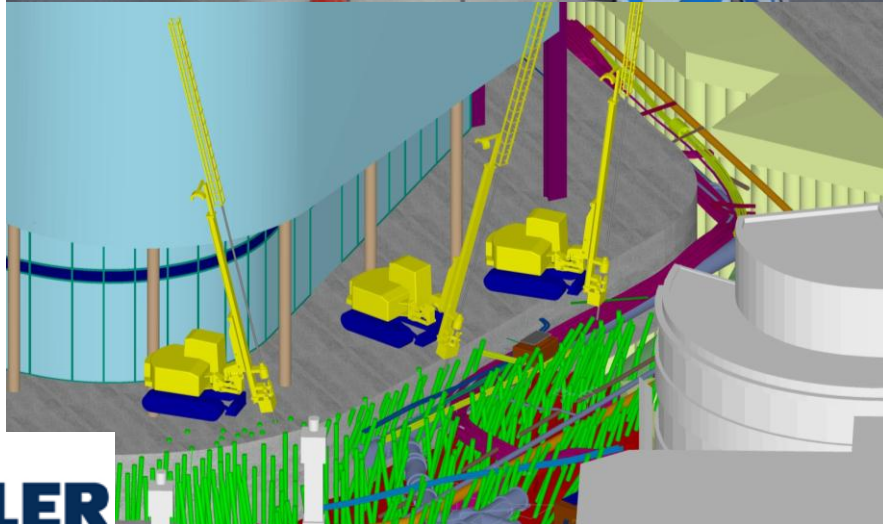
Victoria Station Upgrade



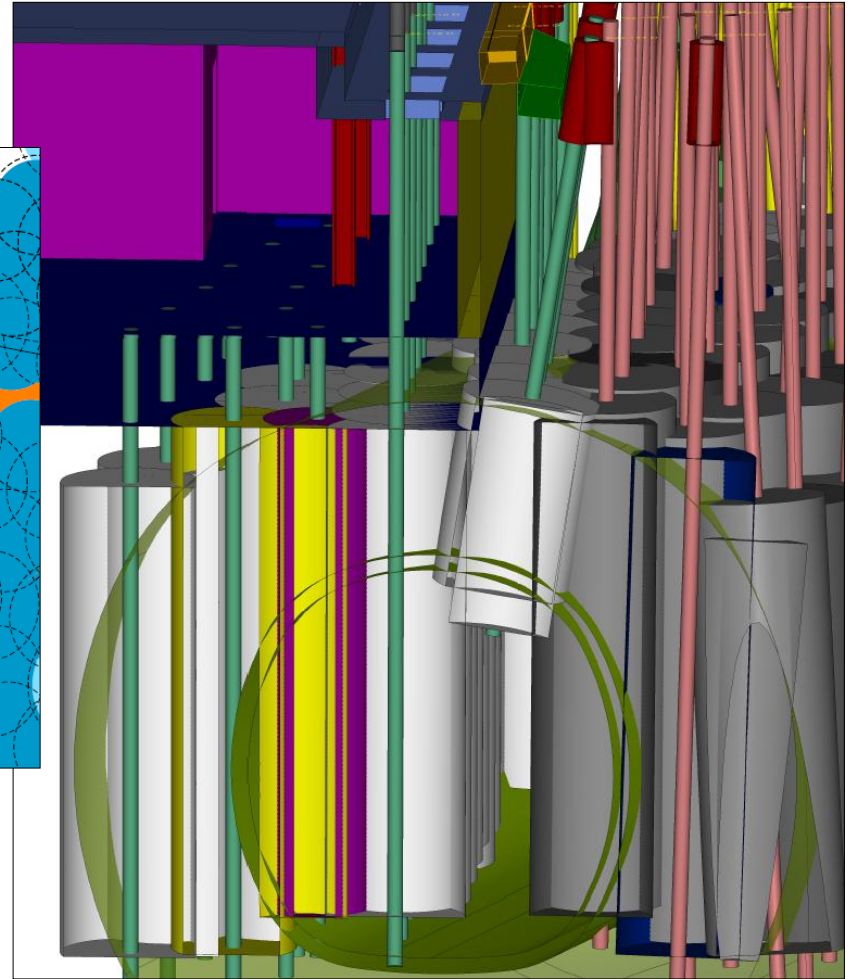
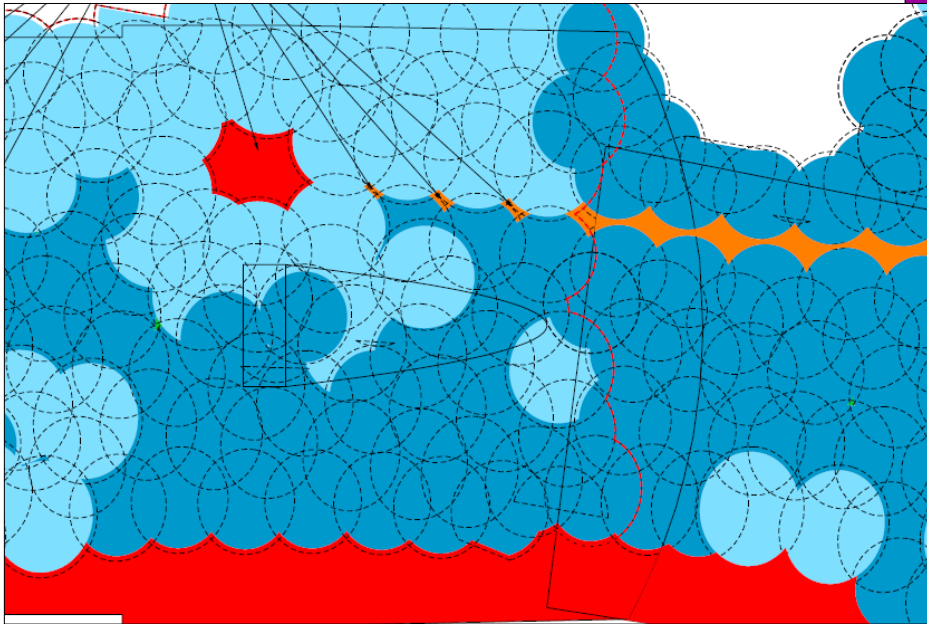
Victoria Station Upgrade



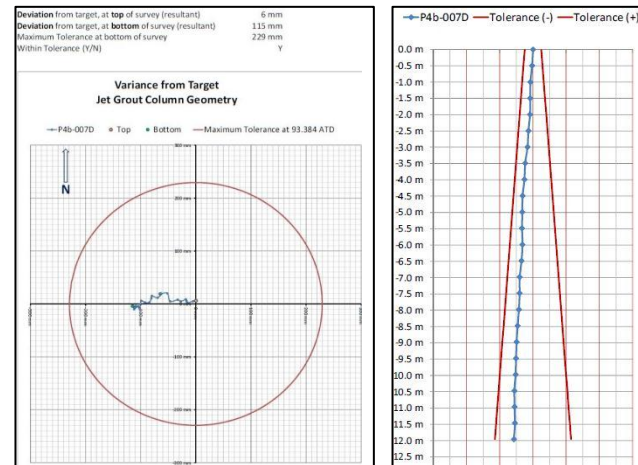
VSU – Restricted Worksites



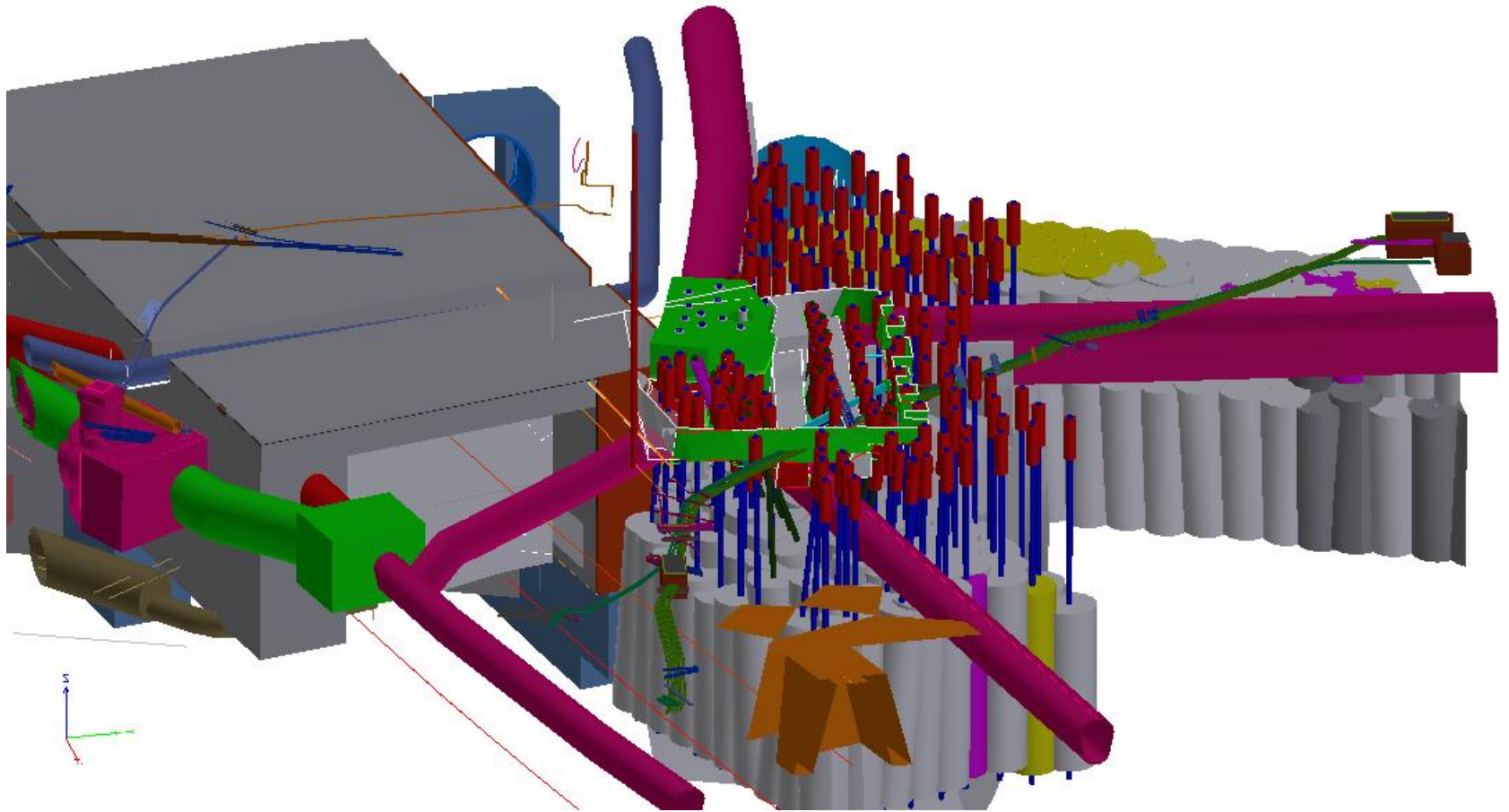
Victoria Station Upgrade – Gap Identification



Victoria Station Upgrade – Shape Accel Array



VSU – Design becomes “As Built”



Interactive Q&A

Use your voting buttons

Q&A

Q4. How embedded is BIM in your organisation?

- A. Ingrained in everything we do
- B. Understanding and techniques are applied to larger projects
- C. Some parts of the business do it
- D. Not at all

Q&A

Q5. How embedded is BIM in your suppliers?

- A. Ingrained in everything they do
- B. Understanding and techniques are applied to some of their projects
- C. Some parts of their business do it
- D. Not at all

Q&A

Q6. What is the single most important component for BIM to succeed in delivering savings?

- A. Collaborative working
- B. Earlier, more complete and more accurate information
- C. Financial incentivisation
- D. Early Contractor Involvement



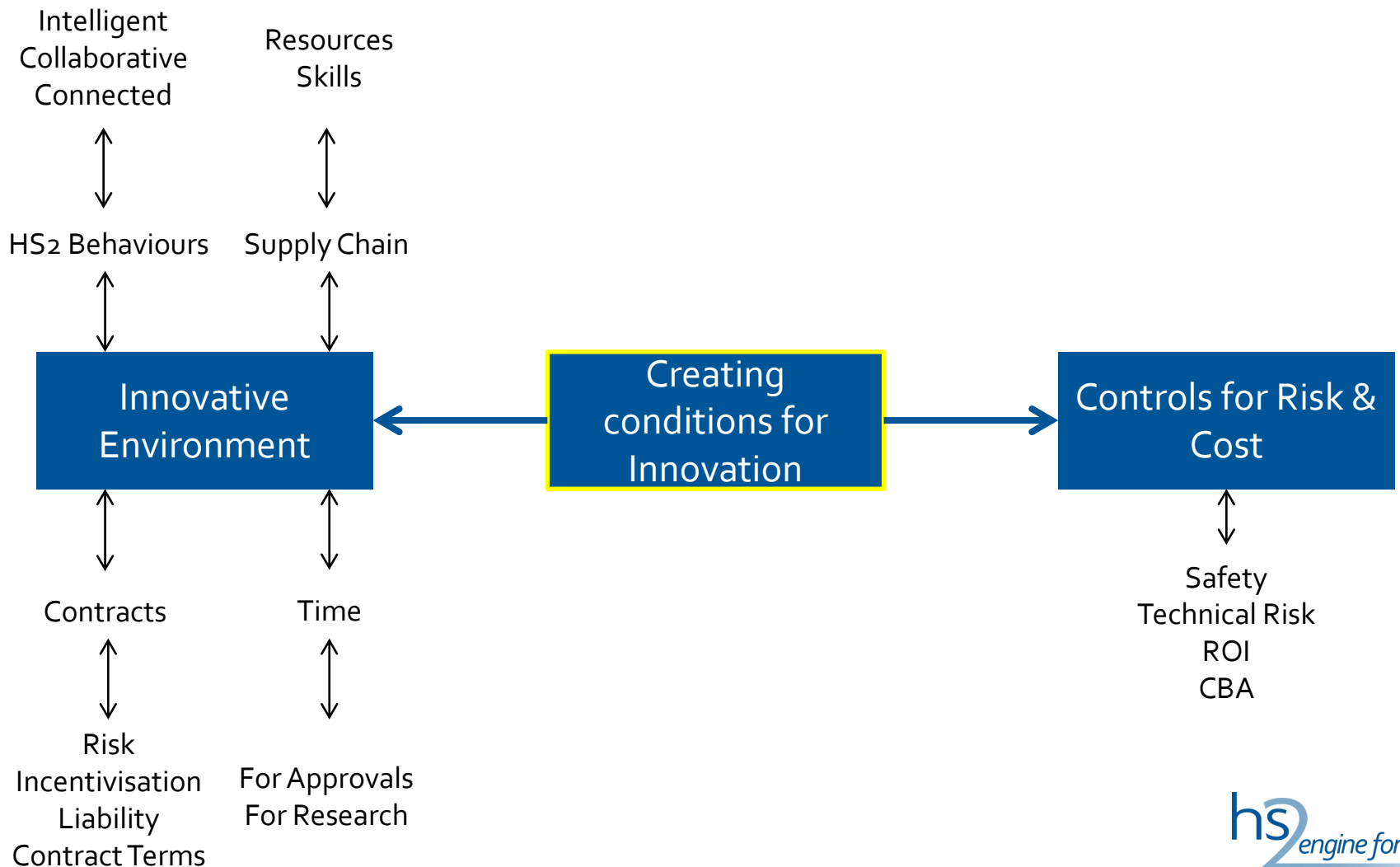
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- UK has a world-leading reputation for innovation.
 - Top universities in the world
 - 1% world population, but 15% of most highly cited papers
 - Global innovation index – UK was 14th in 2009, then 10th then 5th then 3rd

(World Intellectual Property Organisation, Cornell)

- The top countries in the world for industry/academic collaboration -

UK, Singapore, USA, Finland, Switzerland

Creating conditions for innovation





BIM as a test bed for innovation

Darryl Stephenson

HS2 requirements

- Dynamic suite of sense checked proposals
- Full market engagement
- Case study type evidence to add credibility
- Robust governance of the programme
- Better end product

Virtual construction modelling

- Rehearsing the real thing
- Increased confidence levels
- Test bed for innovations
- One of the building blocks of being an Informed Client

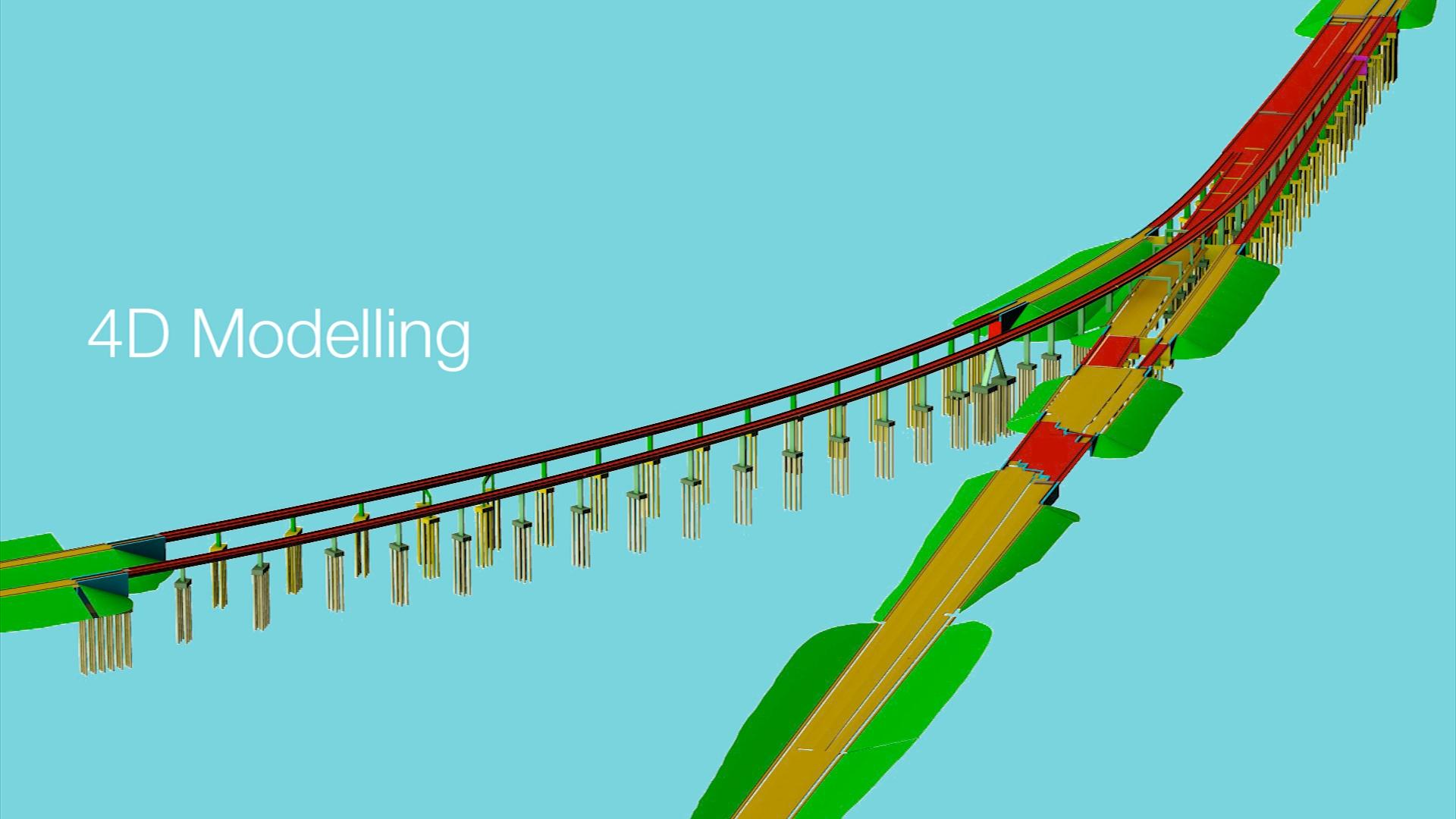
Data for 4D modelling

- Extract the data contained in BIM
- Simply a way of combining data sets for enhanced output
- No re-working of base data

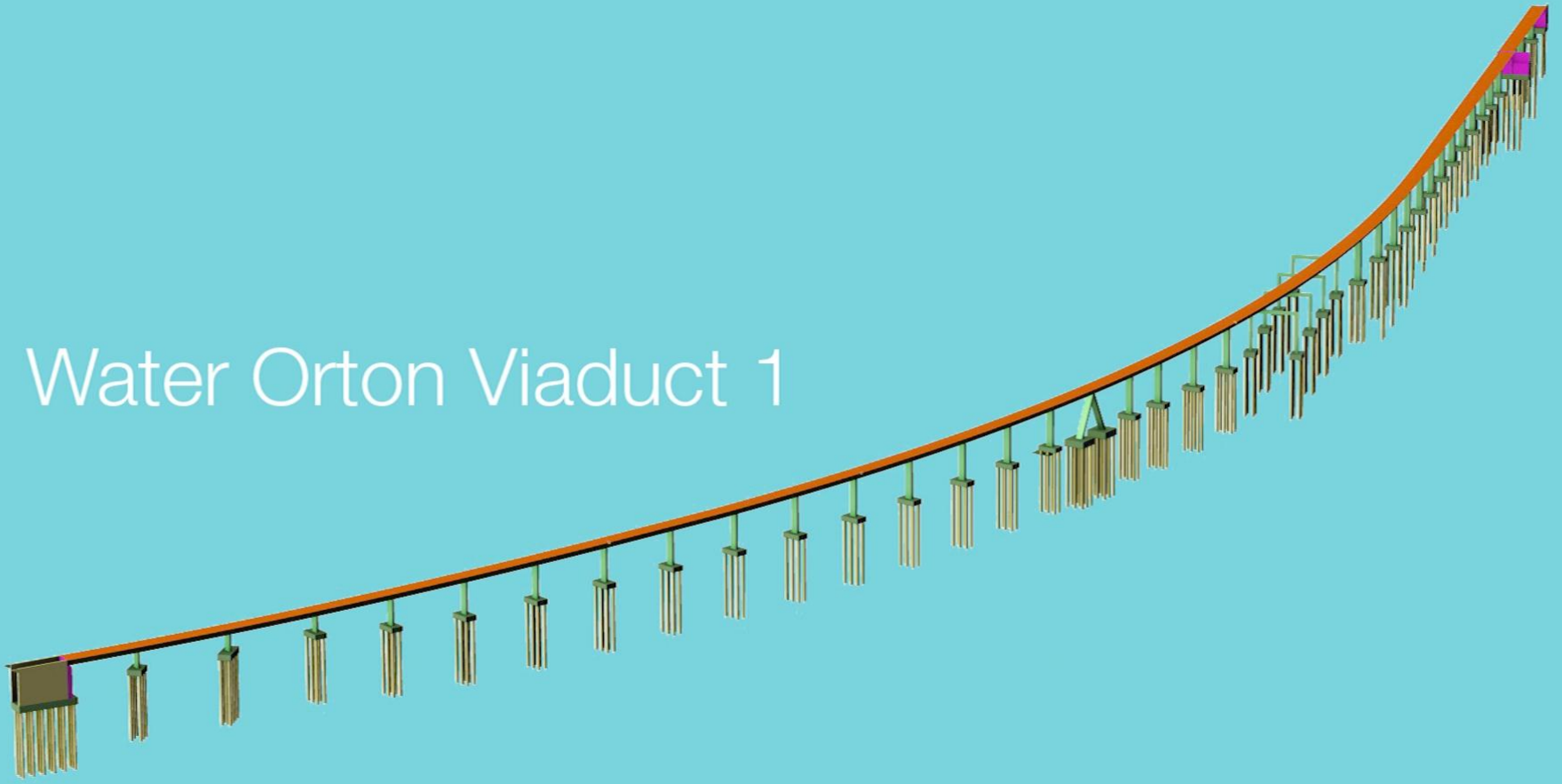
Building the model

- May 2013 case study programme commenced
Outline designs modelled by HS2 team
- Detailed programme review
- Changes to programme and drawings are automatically reflected in visualisation & Cost

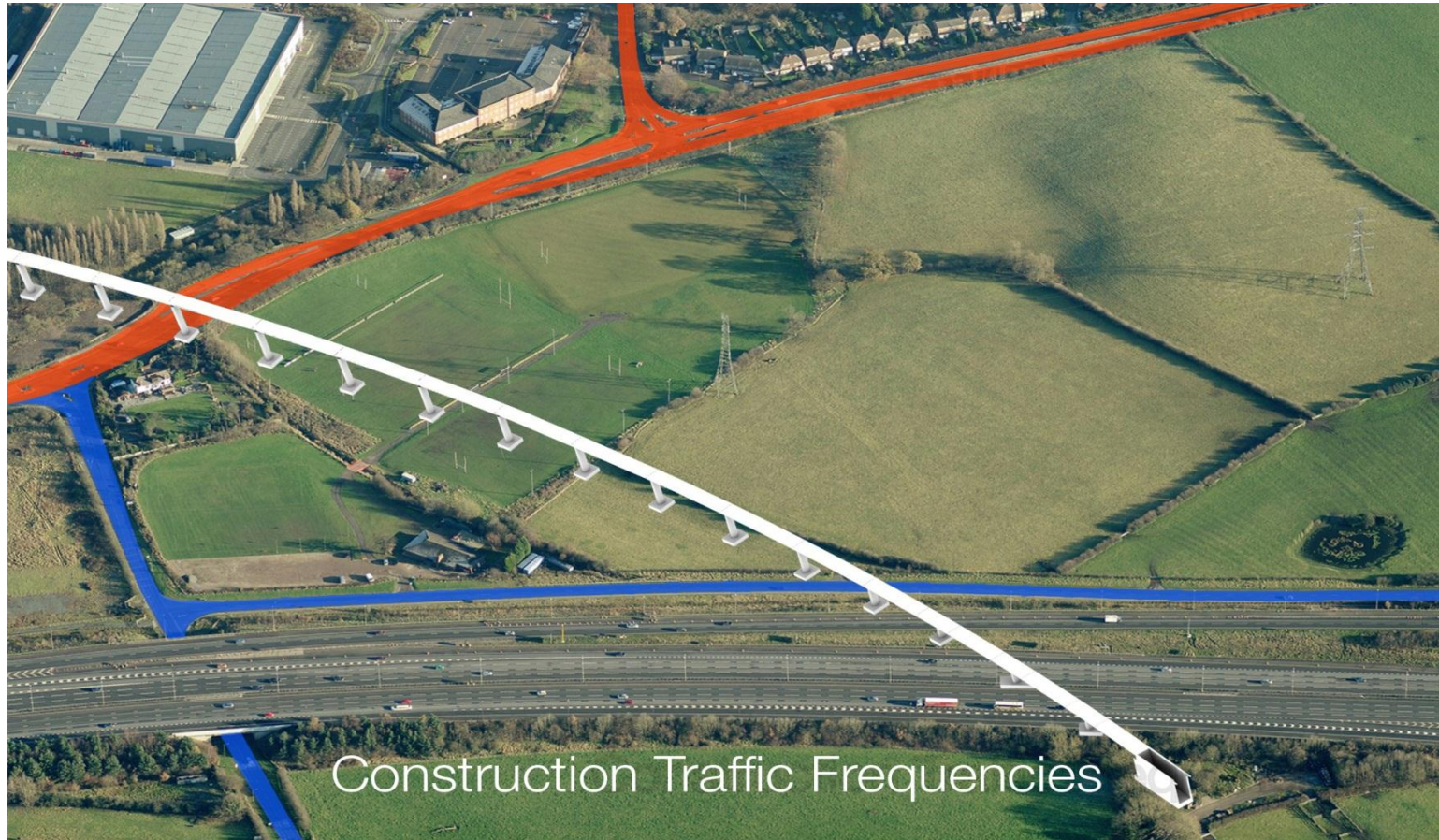
4D Modelling



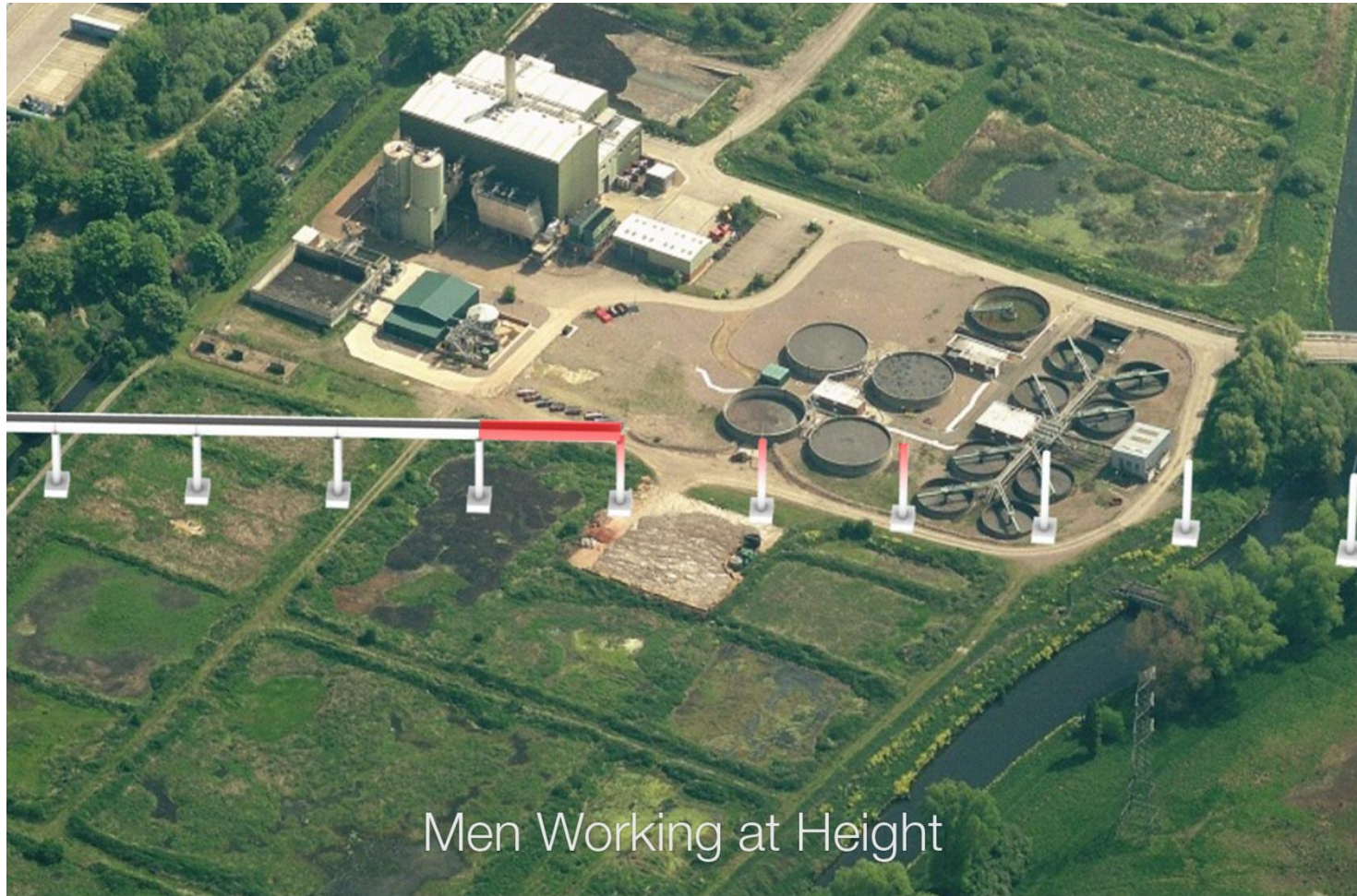
Water Orton Viaduct 1



Further dimensions



Further dimensions



Men Working at Height

4D Programme

- Commence expansion of model
- Jan 2014 June 2014 test innovations
- Model becomes benchmark for tender purposes

The next steps

- Engagement with the market
- Detailed scenario modelling
- Suppliers to showcase their best products
- Work with you to get the very best possible result

Interactive Q&A

Use your voting buttons

Q&A

- **Q7 Where should innovation be focused for greatest effect?**
 - A. Procurement
 - B. Temporary works, staging and enabling work
 - C. Physical works
 - D. Operation & maintenance

Q&A

- **Q8 Which of these has the most potential for innovative savings?**
 - A. Materials
 - B. Standards & specifications
 - C. Design
 - D. Delivery

Q&A

- **Q9 Which of these carries the highest risk of blocking innovation?**
 - A. Government/Department
 - B. Client organisation
 - C. 3rd Parties/approvers
 - D. Form of contract
 - E. Industry
 - F. Other

BIM & Innovation

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