

# Wales Digital Best Practice Networking Group Launch

Cardiff

6<sup>th</sup> September

Sponsored by

BLAKE  
MORGAN 

# Welcome

Milica Kitson  
Chief Executive

Constructing Excellence in Wales

BLAKE   
MORGAN





## Wales Digital Construction Best Practice Network

UK BIM Level 2 – How did we get here, where are we now, where are we going

# Building Information Modelling (BIM):

*use of a shared digital representation of a built object to facilitate design, construction and operation processes to form a reliable basis for decisions*

# UK Government strategy

**Collaborative 3D BIM** with all project and **asset information**, documentation and data being electronic

By **2016** a staged plan will be published with mandated milestones showing measurable progress at the end of each year impacting 3m people.



# Industry in transition



Government  
PUSH

Supplier  
PULL

Single Source  
of Truth

Sharable Asset  
Information

20% Capex

33% Total

Common Data  
Environment

Structured Data

Classification

BIM Execution Plans

Interoperability

Naming,  
Suitability  
& Revision

Supplier Assessments

Legal Protocol

Information Requirements

Level 1

Level 2

Level 3a

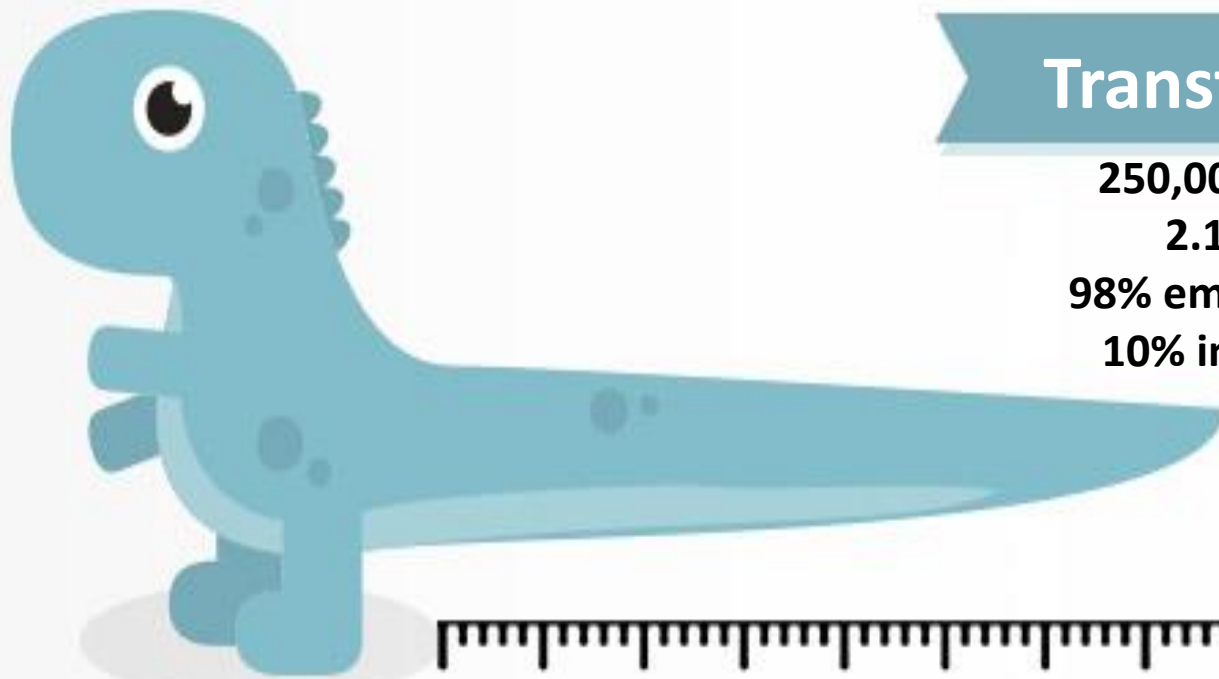
Level 3b

Level 3c

Level 0

BIM

Digital Built Britain



## Transformation

**250,000 businesses**

**2.1m people**

**98% employ 34 or less**

**10% impact so far?**

*Source ONS 2015*

**Long tail of industry**



## THE FARMER REVIEW OF THE UK CONSTRUCTION LABOUR MODEL

**MODERNISE OR DIE**

Time to decide the industry's future

### MODERNISE OR DIE – MARK FARMER CONSTRUCTION LEADERSHIP COUNCIL

- Low productivity
- Low predictability
- Structural fragmentation
- Leadership fragmentation
- Low margins, adversarial, financial fragility
- Training
- Demographics
- Lack of collaboration
- Lack of R&D
- Poor image

<http://www.constructionleadershipcouncil.co.uk/news/farmerreport/>

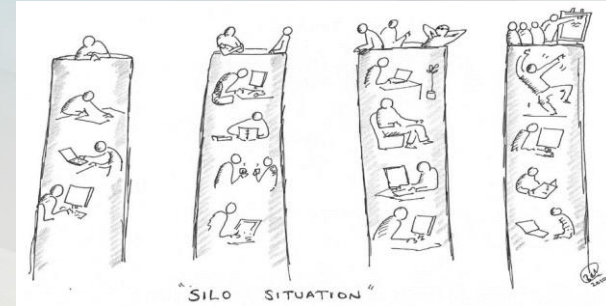
Introducing:



Common understanding; common approach; one voice



Transcending silos



Vision: a digitally enabled UK built environment

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***Mission***

To facilitate and ensure the adoption and implementation of BIM Level 2 as business as usual by 2020.

***Goal***

To reach adoption levels of 75% for the supply and demand chain.

***Our Values***

Innovative  
Supportive

Inclusive  
Transparent

Collaborative  
Forward Thinking

# UK BIM Alliance Manifesto

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- We aim to represent and coordinate the digital transformation of our industry by supporting the industry's implementation of Level 2 BIM.
- Our representation is independent and transparent, supported by a network that is empowered to work in partnership with government, institutions and industry.
- We invite any group, organisation and individual to join the Alliance and utilise the resources available to maximise the impact of the implementation on BIM Level 2.
- We will implement initiatives via projects that are independently funded and focused on achieving progressive outcomes in small achievable steps.

# UK BIM Alliance

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# Get Involved - signatories

ACE AD4 AECOM Arup Atkins Autodesk Babcock Balfour Beatty BAM BEAMA Bentley Systems  
Black & Veatch Bouygues BRE BRS BSI BuildingSmart International Buro Happold Cavendish  
CH2M CIAT CIBSE CIC CIOB City & Guilds Class of Your Own CLC Construction Excellence  
Construction Youth Trust Costain Crossrail Ferrovial Agroman Gleeds Heathrow HS2 IBM ICE ICES  
IET Infrastructure Client Group Institute of Town Planning IPA ISS Jacobs JCT Kier Knauf  
Insulation KTN Laing O'Rourke Landscape Institute Leica Mace Mapaction Mott McDonald MWH  
part of Stantec National Infrastructure Council NBS Network Rail/MPA Ordnance Survey Oxford  
Brookes University RICS Rolls Royce RSFM Scottish Futures Skanska Specialist Engineering  
Contractors Tarmac Tata Steel The Cubicle Centre TSA Turner and Townsend University of  
Cambridge Vinci Construction Wates Wienerberger Westminster University Willmott  
Dixon.....and growing...

# Our 3 C's

## Co-ordination

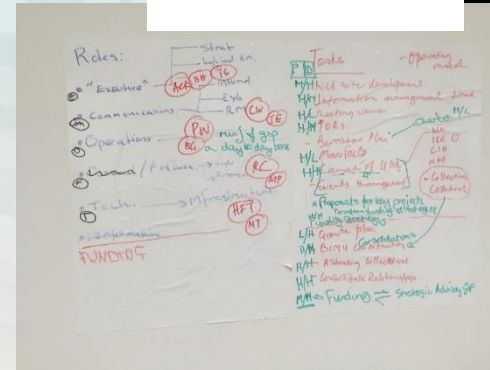
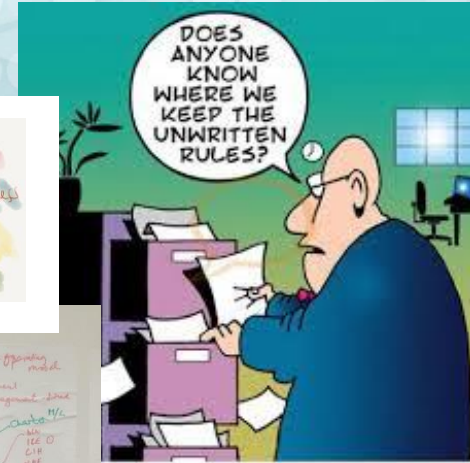
avoid gaps and overlap in team members work

## Co-operation

obtain mutual benefit by sharing work

## Collaboration

achieved results which could not be accomplished alone



# Strategies

- **Engagement (Awareness)**

Champion BIM Level 2 and the BIM level 2 mandate.

- **Upskilling (previously Education)**

Direct a programme for change that targets those stakeholders with the most to gain.

- **Knowledge Bank (previously Case Study)**

Celebrate the successful implementation of BIM Level 2 on projects and on through the life cycle, examining the benefits achieved.

- **Business Case**

Demonstrate how the adoption of BIM Level 2 positively affects the bottom line, and the business outcomes.

- **Optimisation**

Support consolidation of existing and developing tools and supporting infrastructure, whilst encouraging new approaches, new ideas and the creation of new tools to help the industry optimise its use of BIM Level 2.



# Digital Construction best Practice Network - Wales



ADEILADU  
ARBENIGRWYDD  
YNG NGHYMURU



## UKBIMA Wales Region Programme objectives;

- Share good and best practice on BIM and other digital construction technologies and processes e.g. GIS, IOT etc
- Create a network/movement (open to all) of construction professionals in Wales implementing digital processes and technologies
- Showcase the benefits of BIM etc and encourage client adoption

# Digital Construction best Practice Network - Wales



ADEILADU  
ARBENIGRWYDD  
YNG NGHYMRU

CONSTRUCTING  
EXCELLENCE  
IN WALES

Quarterly sessions

Would like you to recommend themes and projects/programmes to showcase

Contacts

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Rhys Lewis – Revizto - [r.lewis@revizto.com](mailto:r.lewis@revizto.com)

Dan Rossiter – BRE – [Rossiterd@bre.co.uk](mailto:Rossiterd@bre.co.uk)



# Unlocking Data to Benefit Railway Electrification

**THE  
GREATER  
WEST  
PROGRAMME**  
A modern railway for a better tomorrow

**NetworkRail**  

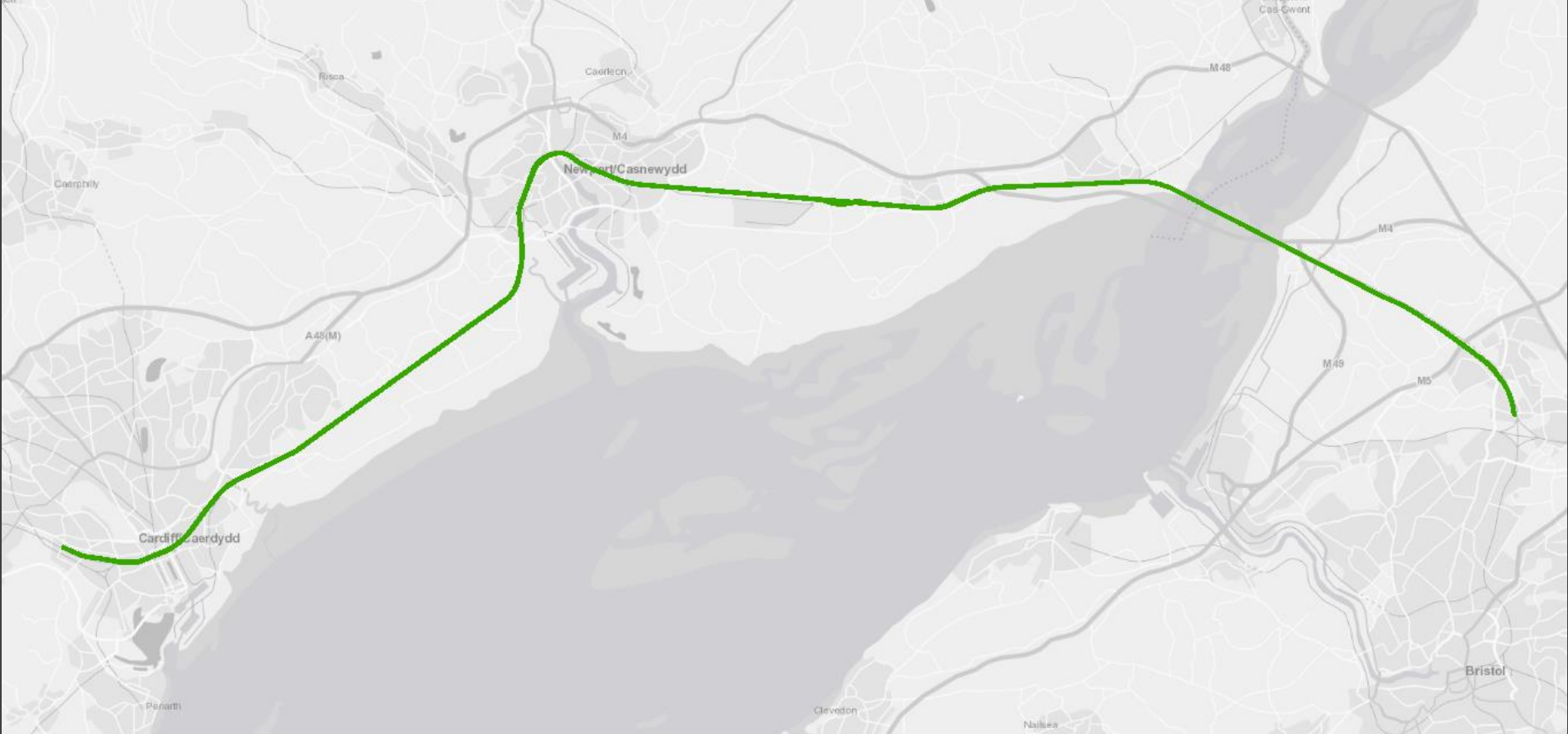

**ARUP**

# Project Context

# Electrification Map



# Electrification Map – Route Section 8, 9





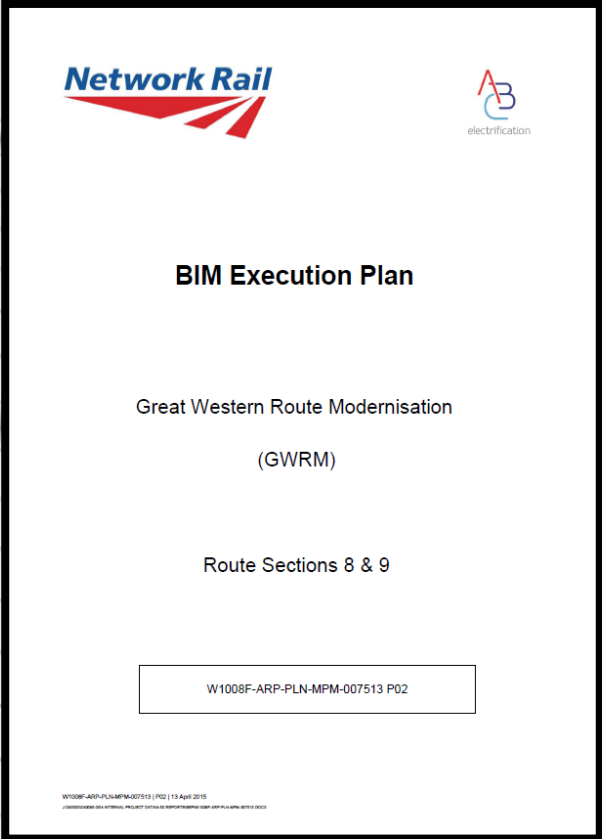
# Specific Innovations



# Data Storage



# BIM Execution Plan



The image shows the cover page of a BIM Execution Plan document. It features the Network Rail logo in the top left and the AB electrification logo in the top right. The title 'BIM Execution Plan' is centered, followed by 'Great Western Route Modernisation (GWRM)' and 'Route Sections 8 & 9'. A reference code 'W1008F-ARP-PLN-MPM-007513 P02' is enclosed in a box. At the bottom left, there is a small footer with the text 'W1008F-ARP-PLN-MPM-007513 P02 | 13 April 2015'.

**Network Rail**

AB  
electrification

**BIM Execution Plan**

Great Western Route Modernisation  
(GWRM)

Route Sections 8 & 9

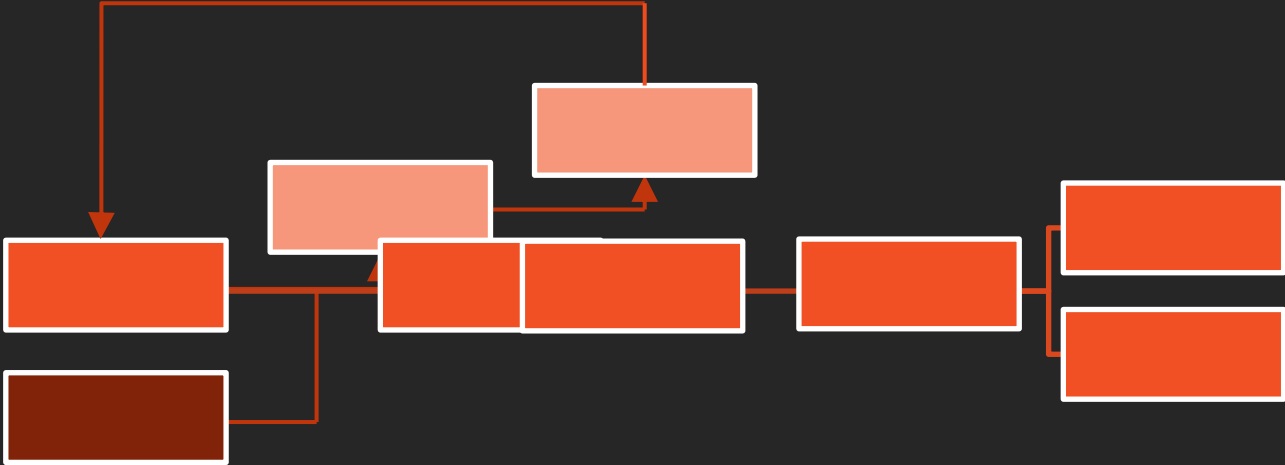
W1008F-ARP-PLN-MPM-007513 P02

W1008F-ARP-PLN-MPM-007513 P02 | 13 April 2015

PLAN:

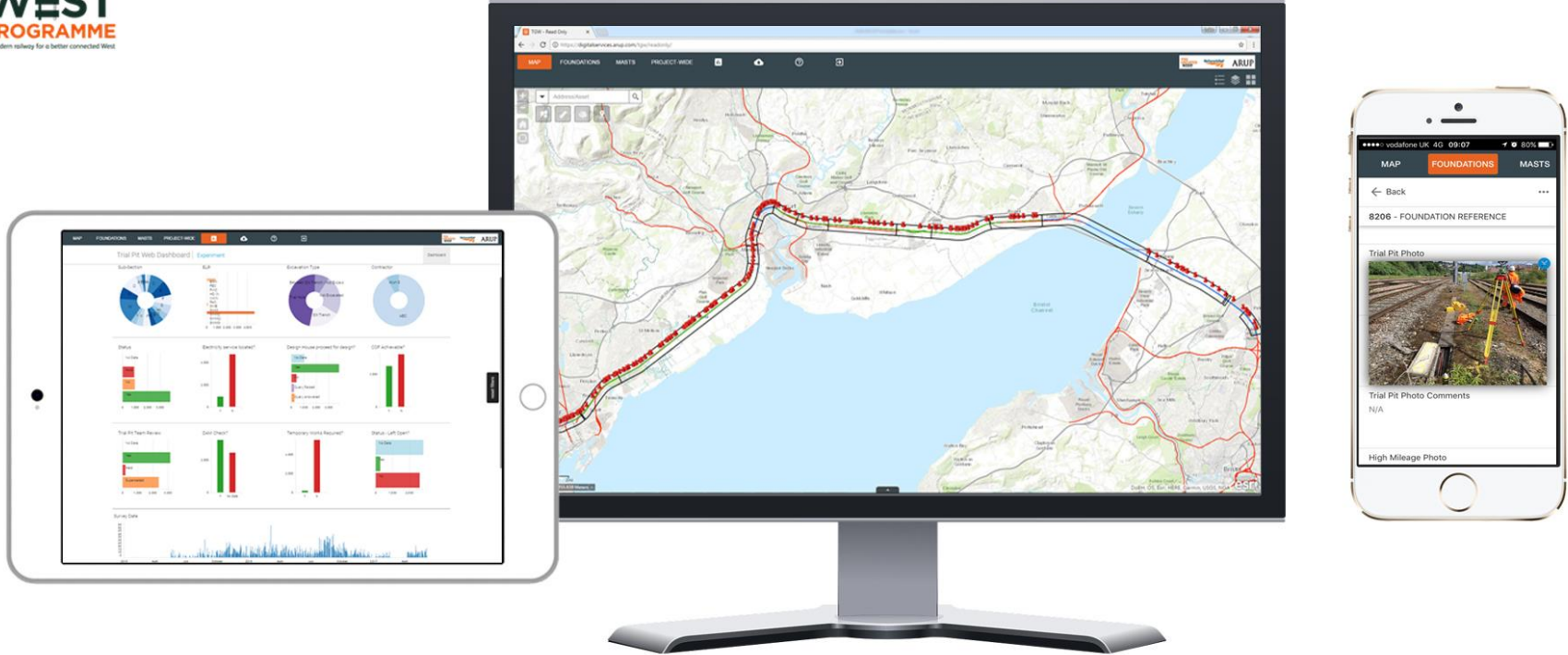


# Mirroring Process in the Data



# THE GREATER WEST PROGRAMME

A modern railway for a better connected West



The rail specific web viewer allows all parties to interrogate various data sets from multiple devices and locations. © Arup



# Survey Data

TGW - Read Only

https://digitalservices.arup.com/tgw/readonly/

MAP TRIAL PITS WALK OUT FND INSTALLATION FND AS BUILTS SNAGGING

THE GREATER WEST Network Rail ARUP

Address/Asset

Layer List

- Trial Pits
- Walk Out Forms
- AssetRequirements
- SitePhotos
- CrossSections
- EcologicalSurveys
- Point Clouds
  - Point Clouds
- Geology
- MainRivers
- HeritageSites
- Parks and Gardens
- Models

# Supply Chain

# Trial Pit Surveys

The image shows a smartphone screen displaying a survey form. At the top, there is a status bar with 'No SIM', '14:06', and '75%' battery. Below the status bar, the form has a header with 'Finish' and 'As Built Buried Services Trial Hole Form SU0001 170714' with 'Previous Page' and 'Next Page' links. Logos for 'THE GREATER WEST', 'Network Rail', and 'ARUP' are visible. The title of the form is 'OLE Foundation Data Sheet'. The form contains several input fields and dropdown menus:

- Structure Ref No: SWM/220/16Q
- Surveyor: [Empty]
- Date: Thu 09 Jul 2015
- Flt: [Dropdown]
- Box: Section: [Dropdown]
- Mileage: [Input]
- Line: [Dropdown]
- Position: [Dropdown]
- GPS Serial Number & Name: [Input]
- Ground Conditions: [Dropdown]
- Temporary Works Required: [Dropdown]
- Design Coordinates**
- Easting: [Input]
- Northing: [Input]
- Yes the design COF achievable: [Dropdown]
- As Built Centre Point Coordinates of Trial Pit**
- Easting: [Input]
- Northing: [Input]
- Elevation: [Input]
- Comments: [Text Area]
- Services**
- Gas: [Dropdown]
- Services located: [Dropdown]
- Depth: [Input]



# Installation Recording

Browser window: TGW - Read Only | digitalservices.arup.com/tgw/install/

Navigation: MAP FOUNDATIONS MASTS PROJECT-WIDE

Logos: THE GREATER WEST Network Rail ARUP

The map displays the railway route from Cardiff in the west to Newport in the east. Red, textured markers are placed along the line to indicate specific installation recording points. Key locations shown include Cardiff, Caerphilly, Newport, and Bristol. The Bristol Channel is visible to the south of the route. The map interface includes a search bar at the top left, navigation controls, and a scale bar at the bottom left.

Map coordinates: 336,875.336 183,825.650 Meters

Map data: Powered by Esri | Data: DoBH, OS, Esri, HERE, Garmin, USGS, NGA | Network Rail | OpenRailwayMap



# Construction Validation

FOUNDATION  
BSW/184/870-MB

FOUNDATION DETAILS

New Records Old Records

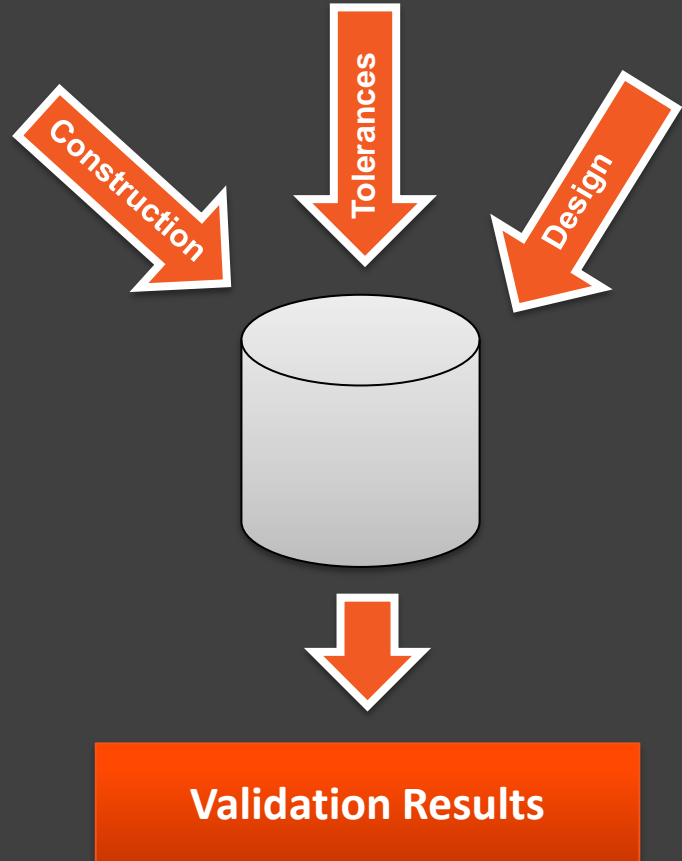
No records found.

Calcs Checked Records Trial Pit CHS Install Sheets QA Auger Install Sheets QA

Code	Value	Tolerance	Potential NCR
Difference between Design and As Built Head Level (mm)	-80	50	Out of Tolerance
Difference between Design and As Built Up Stand (mm)	52	200	0
Difference between Design and As Built Recof (m)	0.18	0.095	Out of Tolerance
Longitudinal	0.03	1	0
Perpendicular	0.156	0.095	Out of Tolerance
Orientation	44.97	10	Out of Tolerance

< Prev Next > Showing 1-6 of 18 items

CLOSE



# Project Reporting

TGW - Read Only

https://digitalservices.arup.com/tgw/install/

MAP FOUNDATIONS MASTS PROJECT-WIDE

THE GREATER WEST NetworkRail ARUP

Address/Asset

Operational Layers

- Asset\_List
- Masts
- Foundation As Built
- Foundation Trial Pits
- Walk Out Forms
- AssetRequirements
- SitePhotos
- CrossSections
- EcologicalSurveys
- Point Clouds
- Geology
- MainRivers

# Usage and Savings

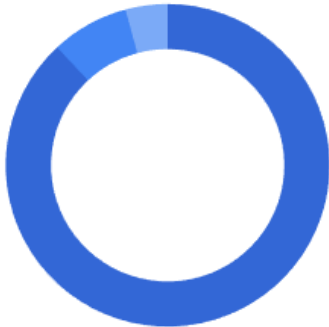
# Users

Organisation	Number of users with access
ABC	4
AGH	9
Alun Griffiths	15
Amey	5
Andromeda UK	11
Arup	169
Balfour Beatty	25
Capita	1
Critical Rail	2
GSE Systems	3
Keltbray	6
Network Rail	48
Opus International	6
PB World	4
Rees	1
SNC Lavalin	7
TSP	95
Wentworth House	5
WSP	5
<b>Grand Total</b>	<b>421</b>

- Average Stats (based on last 90 days)**
- 700+ hits a week
  - 90+ unique users a week

# Usage Stats

Sessions by device



Desktop

88%



Mobile

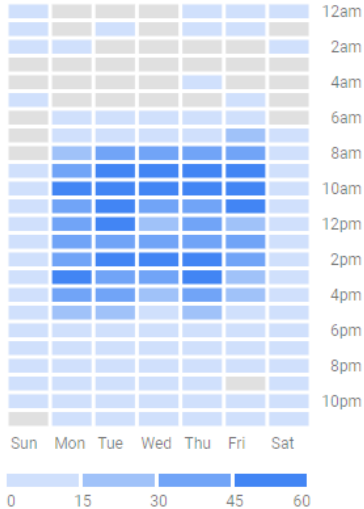
7.8%



Tablet

4.2%

Users by time of day



Sessions

2.9K

↑131.6%  
vs last 90 days



# Savings



Carbon Saving  
**>1.75 tonne yr**



Time Savings

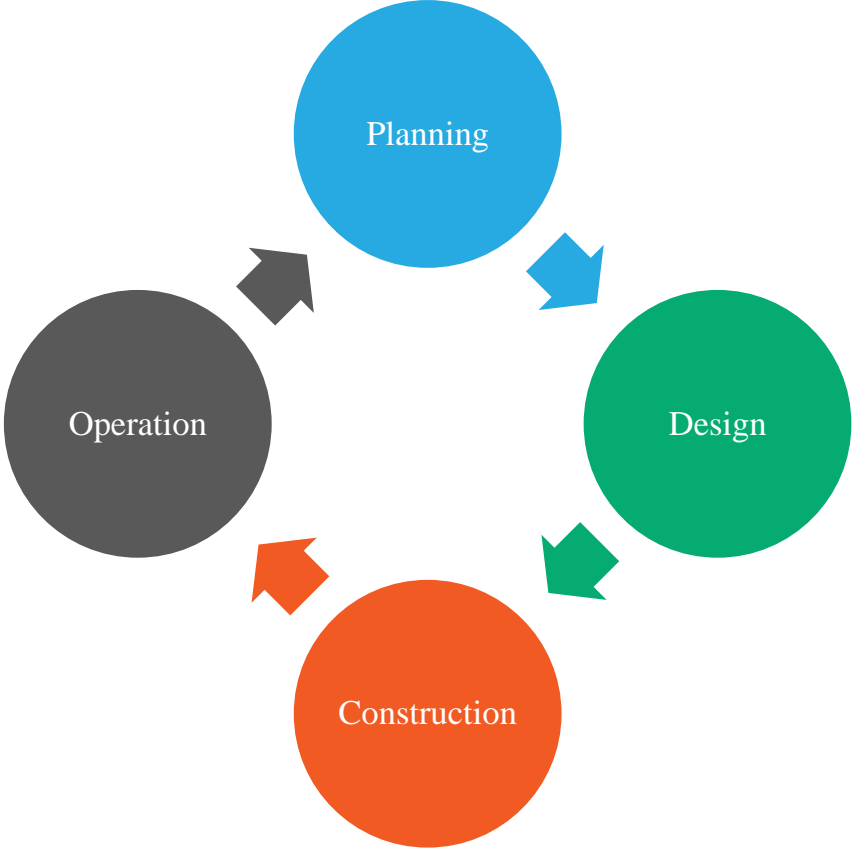


Reduction in resource  
**12.8 FTE**

Source: ABC, Network Rail, Arup Design Team  
Image Credit: Flat Icon

# Summary

# Asset Lifecycle







# Any Questions?



ARUP



Vision

# The future of learning in Monmouthshire

*“...to transform teaching and learning throughout Monmouthshire and to encourage whole communities to reach their full potential as well as provide all with better life chances”*



Caldicot School

Committed to Achievement

Ysgol Cil-y-Coed

Calon i Lwyddo



monmouthshire  
*sir fynyw*

**BDP.**



Interserve  
Ingenuity at work

Vision

## 21st Century ICT Visioning in School

*“...to contribute sustainable and meaningful change to teaching and learning in Monmouthshire schools that will prepare students for further education, training and to live and work in a digital world”*

*“When faced with steam-rolling technology, you either become part of the technology or part of the road”*



Caldicot School

Committed to Achievement

Ysgol Cil-y-Coed

Calon i Lwyddo

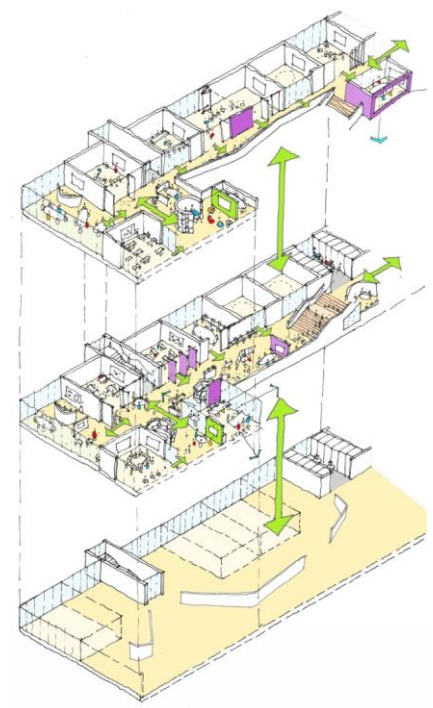
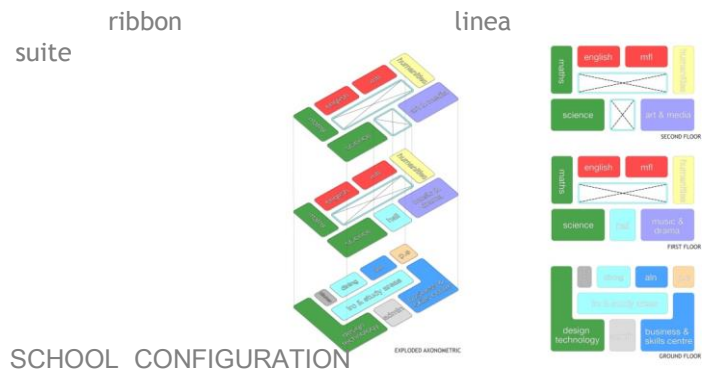
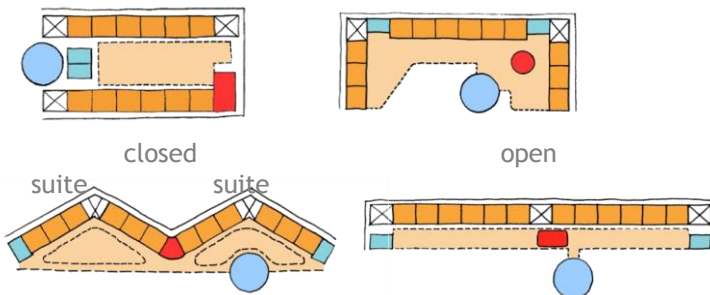


monmouthshire  
*sir fymru*

**BDP.**



# BDP. Concept



# BDP. Concept



# BDP.

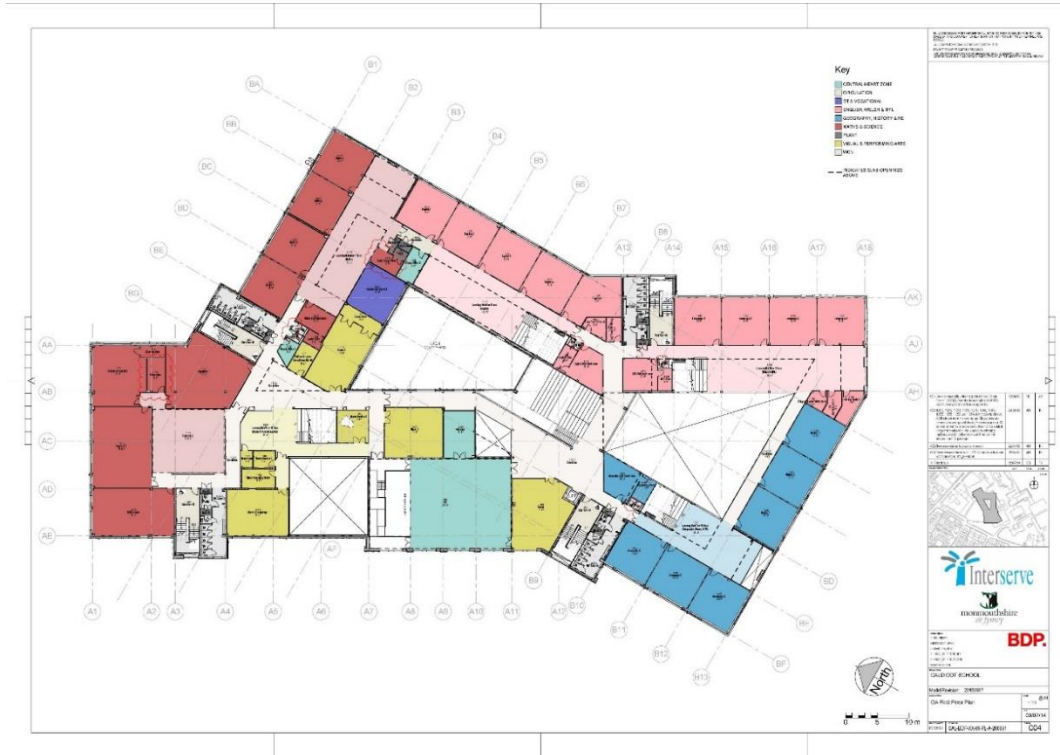
## Detail



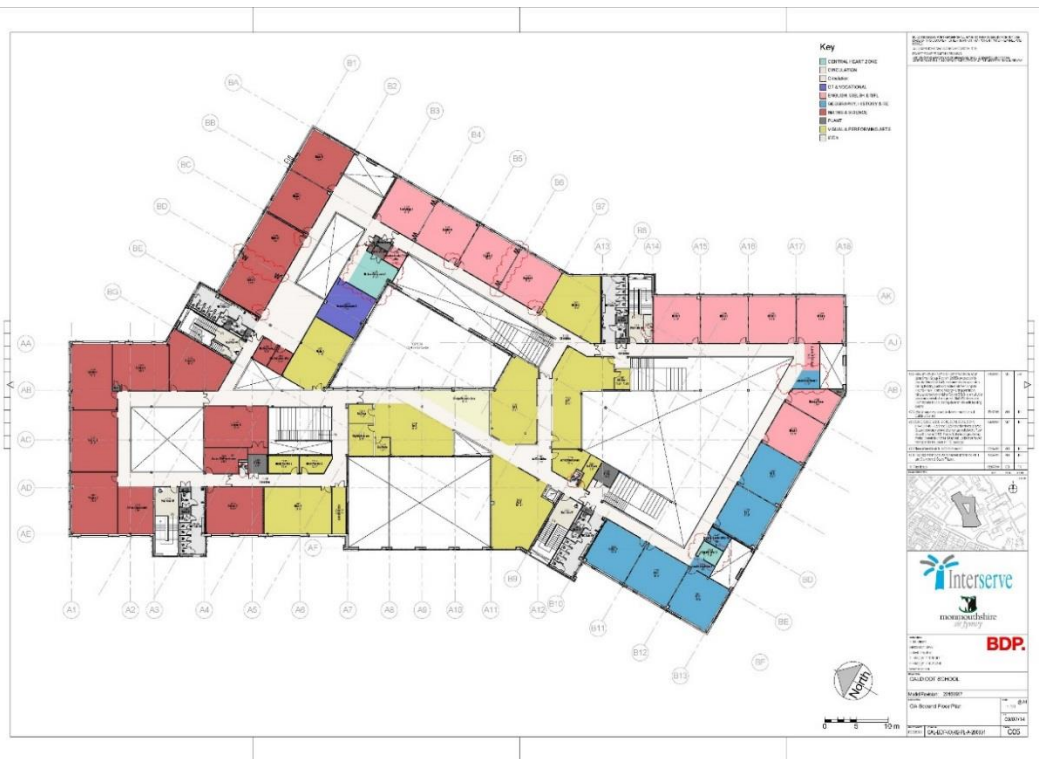


# BDP.

## Detail



# BDP. Detail



**BDP.**  
Visual



**BDP.**

Visua

I



monmouthshire  
*sir fynywy*



**BDP.**

Technology

 **NAVISWORKS**



AUTODESK  
**REVIT**



# BDP.



## Technology



Render in Cloud

**AUTODESK RENDERING**

Select 3D views to render in the Cloud

3D View: 3D View 1

Output Type: Still Image

Render Quality: Panorama

Image Size: **Stereo Panorama**

Exposure: Illuminance

File Format: PNG (Lossless)

Alpha (Transparency Background)

Credits required 0 **Render**

Estimated wait time <10 minutes

Email me when complete



Autodesk, Inc. [US] | https://gallery.autodesk.com/a360rendering

**AUTODESK RENDERING** NEW MY RENDERINGS GALLERY COMMUNITY RESOURCES SIGN IN

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When you create a new account.

### Fast, high-resolution renderings in the cloud

Create high-quality photorealistic images, panoramas, solar studies and illuminance simulations using Autodesk® Rendering.

**SIGN UP FOR FREE** **SIGN IN**

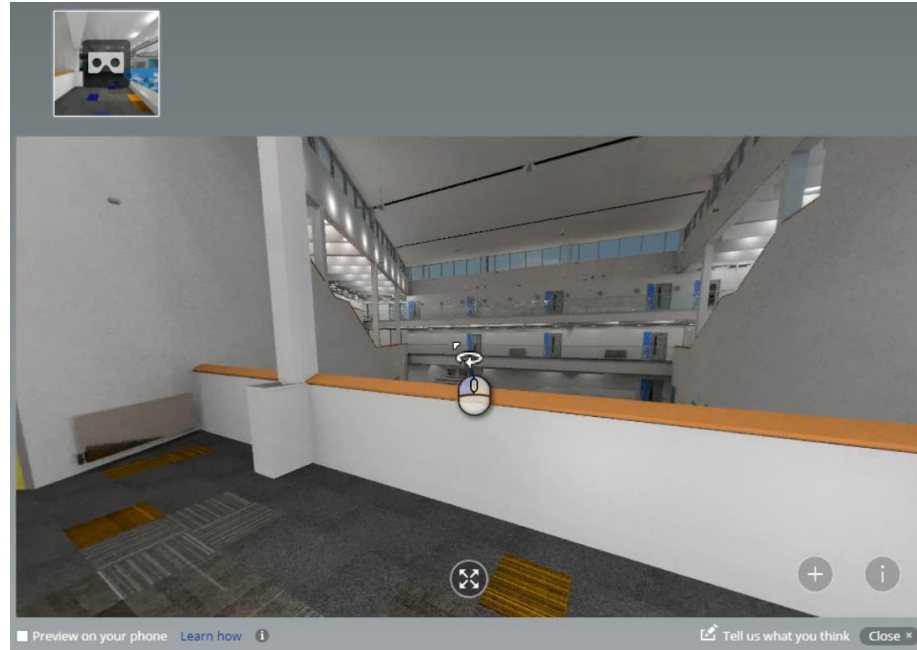
Show All Featured Panorama Turn Table **Stereo Panorama**

**TRY RENDERING**

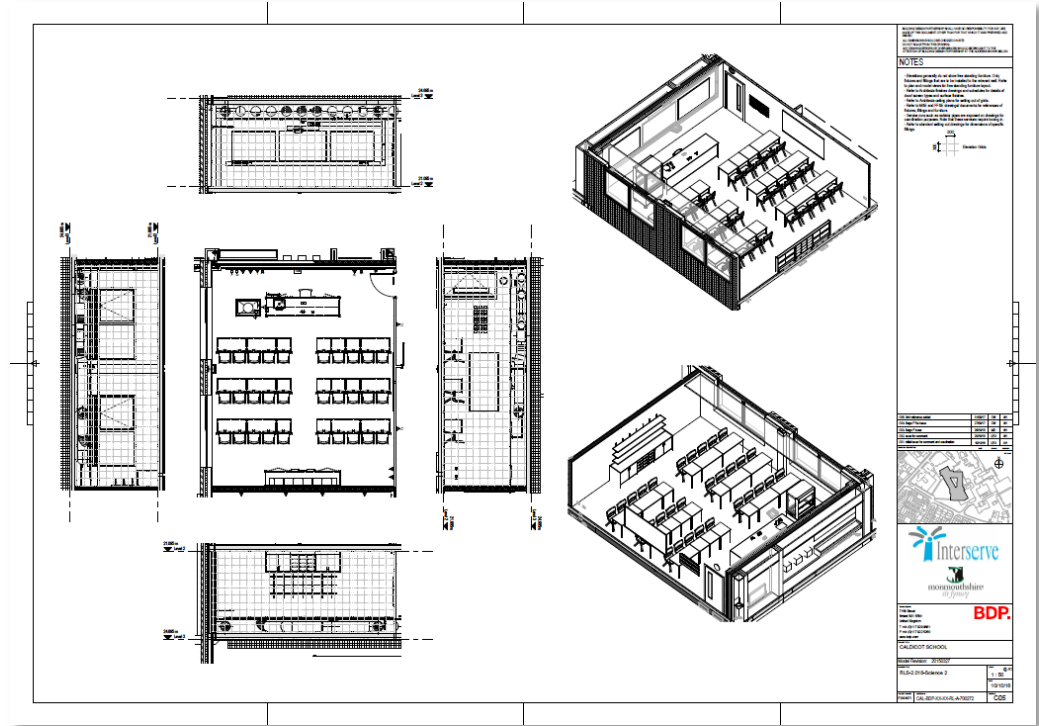
Living Room by Omar Alanasweh

# BDP.

## Technology

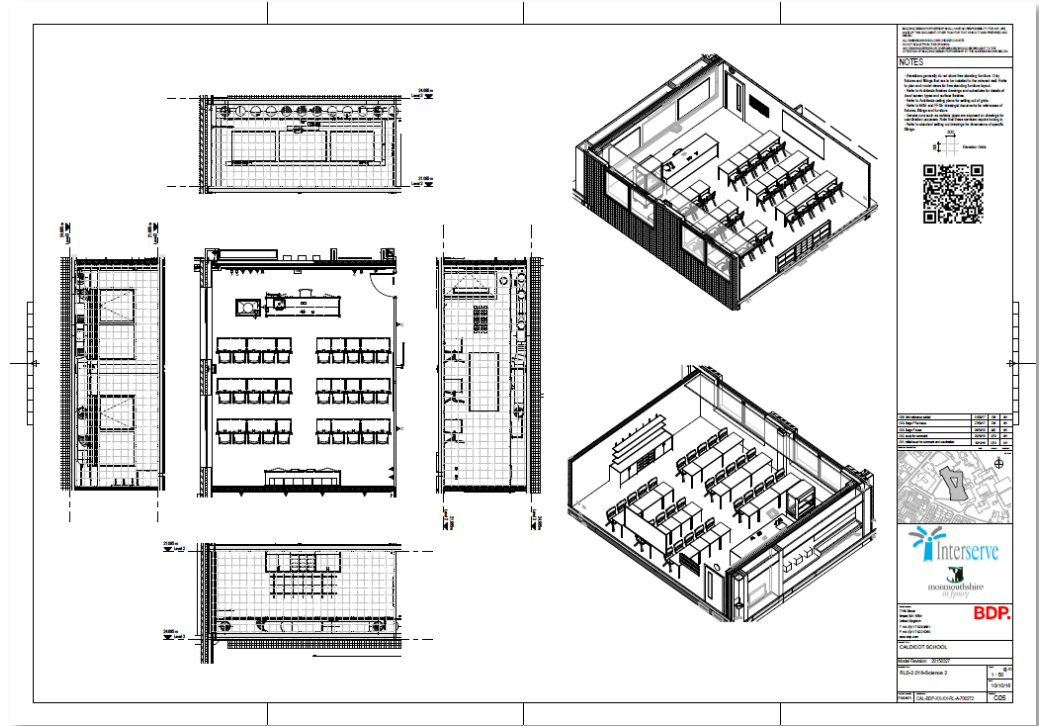


## Technology



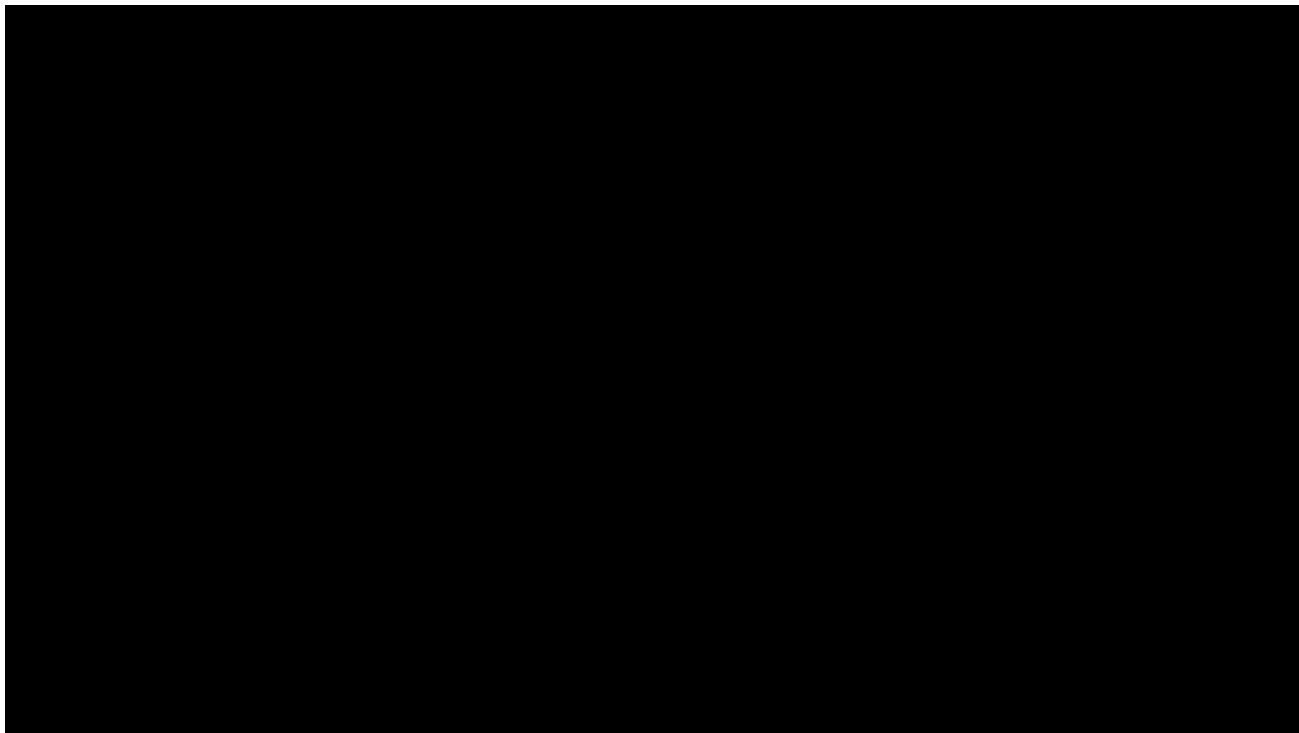


## Technology



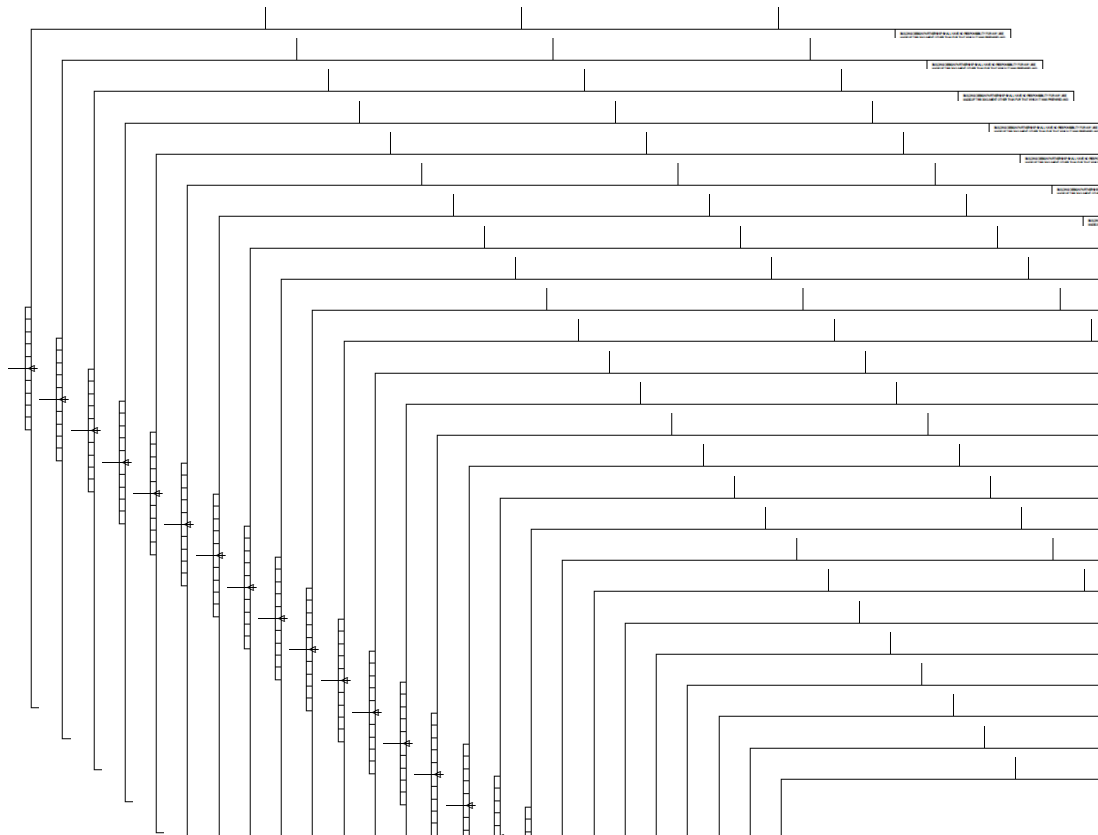
**BDP.**

Technology



**BDP.**

# Technology



# BDP.

## Technology



# Dyna

3D Views (Panoramas)

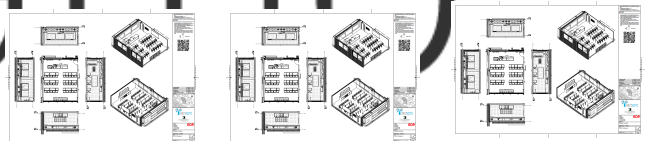

- Panorama for 0.001a
- Panorama for 0.001b
- Panorama for 0.002
- Panorama for 0.003
- Panorama for 0.006
- Panorama for 0.007

Panorama for 0.008

- Panorama for 0.009
- Panorama for 0.010
- Panorama for 0.011
- Panorama for 0.012
- Panorama for 0.014
- Panorama for 0.015

Panorama for 0.016

- Panorama for 0.017
- Panorama for 0.018
- Panorama for 0.019
- Panorama for 0.020
- Panorama for 0.022
- Panorama for 0.023



css

js

image.jpg

imageR.jpg

index.html

index2.html

infocard.png

twgl-dist.js

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0.001b

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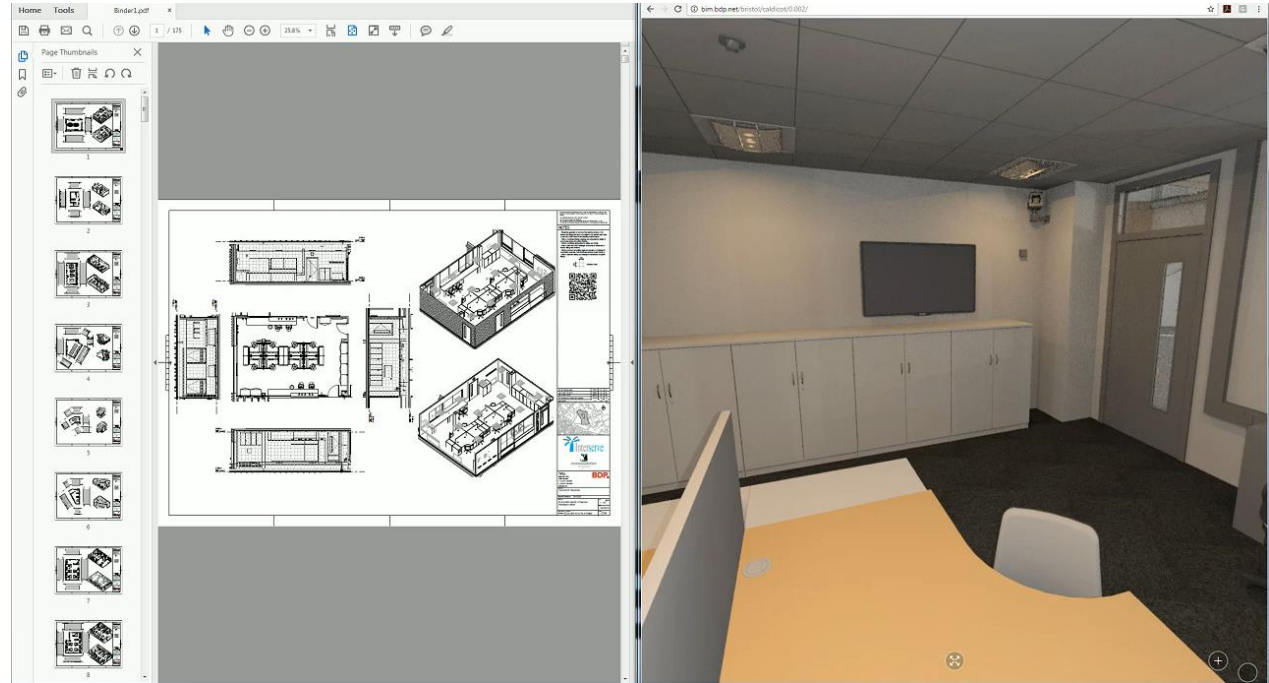
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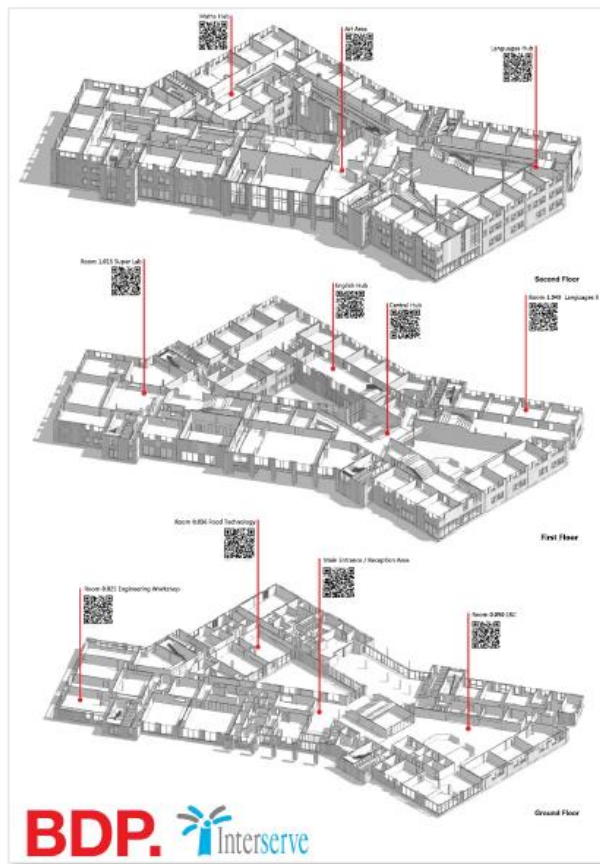
# BDP.

## Technology



# BDP.

## Technology



# BDP.

## Technology



# BDP.

## Interface





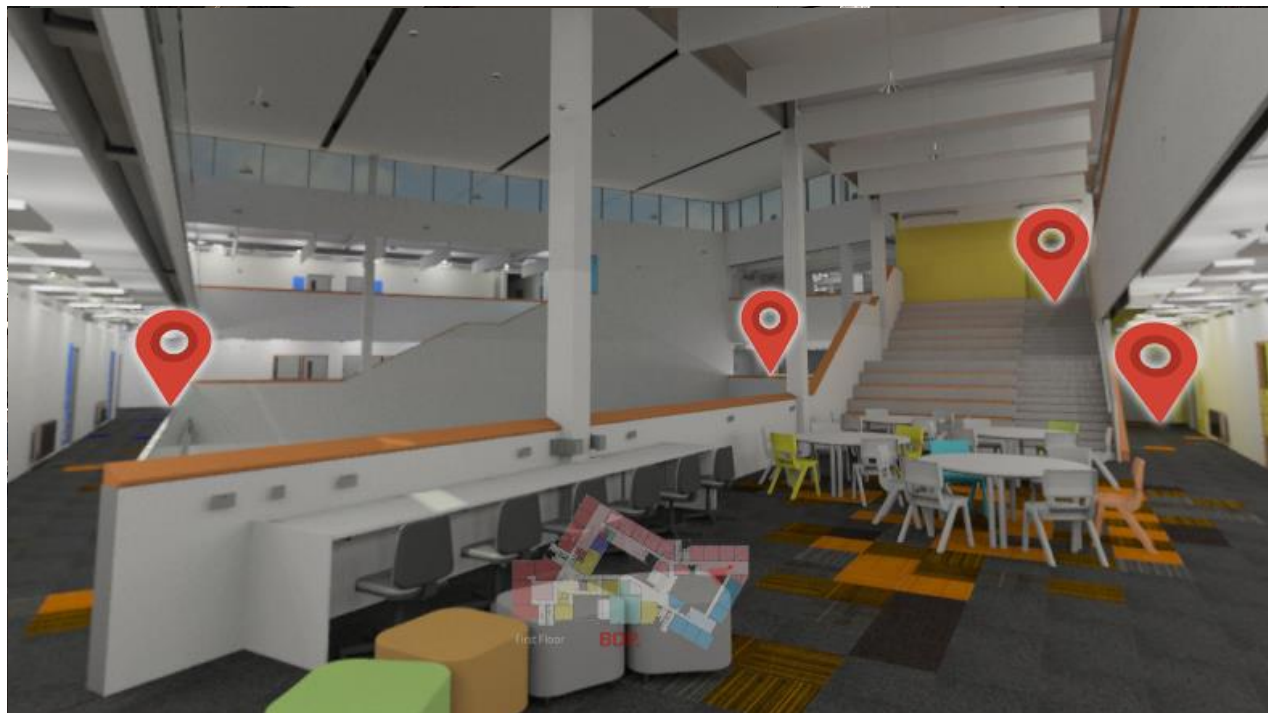
**BDP.**

Interface



**BDP.**

Virtual



**BDP.**

Reality



monmouthshire  
*sir ffynwy*



## Benefitting Stakeholders

- A fundamental tool for the development of an intelligent client
- Clarity of vision / product before commitment.
- Active engagement of all stakeholders via a virtual environment
- Development and testing of new educational thinking in real time
- Testing the daily management of the built environment
- Inform real change management strategies and ideas
- Educational training tool, preparing stakeholders how to use the new school from day one.
- Know where every penny is spent

Ground Floor BDP.

View Time: 01





BLAKE   
MORGAN



## CEW WALES & BLAKE MORGAN BIM and Legals

Jo Rees  
Partner – Blake Morgan



## Recent Case Law

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- Trant Engineering Ltd –v- Mott MacDonald Ltd
- 5 July 2017 TCC Decision before Mrs Justice O'Farrell





# Mount Pleasant Complex

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- Project: £55m power station in The Falklands
- Client: MOD
- Contractor: Trant
- Engineer: Mott MacDonald
- Dispute: Payment due to Motts



## Mott's' scope

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- design consultancy services
- full design
- design co-ordinator
- preparation & implementation of BIM
- Using Projectwise as collaborative platform
- principal designer
- DREAM assessment



## Payment Dispute

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- was there a contract?
- what terms?
- effect of payment £250k x 2?
- Motts denied access to Projectwise – revoking passwords issued to Trant



## Injunction

- Serious issue to be tried?
- Will damages will be an adequate remedy?
- Motts argued Trent exaggerated problem of withholding design data as had been supplied in pdf.
- Trent argued if there was no contract and no right to design result in loss of bargaining position.
- Damages would not be an adequate remedy.
- Judge found that Balance of convenience – which course of action is likely to carry risk of least injustice if it turns out to be wrong?



## Judicial Decision (I)

- “The Claimant’s position is that without restoring access to the relevant database on the ProjectWise platform, the project cannot be progressed. The claimant would be forced to start the project from square one, having lost a year of progress. In those circumstances, it would be appropriate for the court to permit the status quo by allowing the claimant access to the design data that had already been completed by MML at the time that the suspension/termination occurred, so as to allow the claimant to progress the project. It is said, with some force by the claimant, that there is very little by way of harm to the defendant if it is required to provide access to the design data that it has already provided, particularly in circumstances where the claimant has undertaken or is offering to undertake to pay any compensation whether by way of outstanding fees or damages that might subsequently be ordered”.



## Judicial Decision (II)

- “The claimant is entitled to the design data that has already been carried out by MML and that is currently sitting in the public database area of ProjectWise on the basis that it has either been done under the contract produced by MML or a simple contract. Even if there was no contract, MML has already accepted payment on account in respect of the work that it has carried out”.



## What does this mean for BIM and Collaborative Platform

- Courts not allow parties to use Collaborative Platform as a ransom
- Payment made to party providing design – unlikely to be able to withhold access.
- Unclear what turns on the fact payment had been made.
- Hosting party?



## Who should host the Collaborative Platform?

- Employer?
- Terms – right to revoke access.
- Revoke access to the party if dispute arose
- Does employer have the technical knowhow and capability?
- Project team with regular extraction
- Split hosting/gateways
- Need for clarity and understanding what happens in a dispute situation.



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# Workshop Discussion

Sponsored by

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