CONSTRUCTING EXCELLENCE Hampshire

BiM regions

the home of digital construction

South

INNOVATING FUTURES

Promoting better business outcomes through the use of BIM and digital technologies.

CONSTRUCTING EXCELLENCE Hampshire

Introduction

BiM regions
the home of digital construction
South

The Role of the BIM Manager

Agenda

18:00 – Introduction + BIM update by Mike Turpin, *Innovating Futures*

18:10 – What is a BIM Manager; Client View by Allister Lewis, *HCC*

18:35 – What is a BIM Manager; Contractor View with David Cotterill, *Senior Design Manager, &*

Lee Ramsey, *Head of Design Management and Building Information Modelling* **Morgan Sindall**

Construction & Infrastructure

19:00 - Questions

Hampshire County Council

MORGAN SINDALL
CONSTRUCTION INFRASTRUCTURE

BIM Level 2 – An update

BiM regions
the home of digital construction
South

- Current suite of BIM standards currently being "updated" for consistency and due to be released mid autumn
- Minor changes only as BIM Level 2 is set

- Work now beginning on Digital Built Britain initative

BIM Show Live 2018

BiM regions
the home of digital construction
South

Call for papers is now open!

It's official, we're now looking for speakers, but be quick as entries close on Thursday 16 November.

We're looking for the brightest minds and the best ideas, those who share our appetite for all things digital, and believe in the power of technology.
Papers are now being accepted for the four content streams; Next Generation, Data, Strategy and Stories.

Submit Now

www.bimshowlive.co.uk/speakers

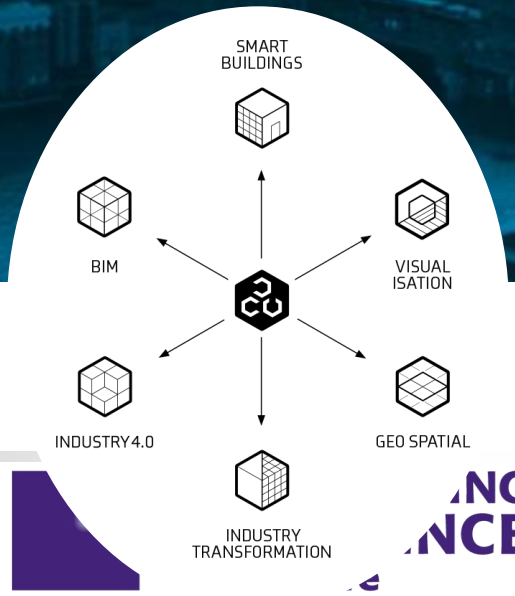
INNOVATING FUTURES

Promoting better business outcomes through the use of BIM and digital technologies.

CONSTRUCTING EXCELLENCE Hampshire

Digital Construction Week

BiM regions
the home of digital construction
South



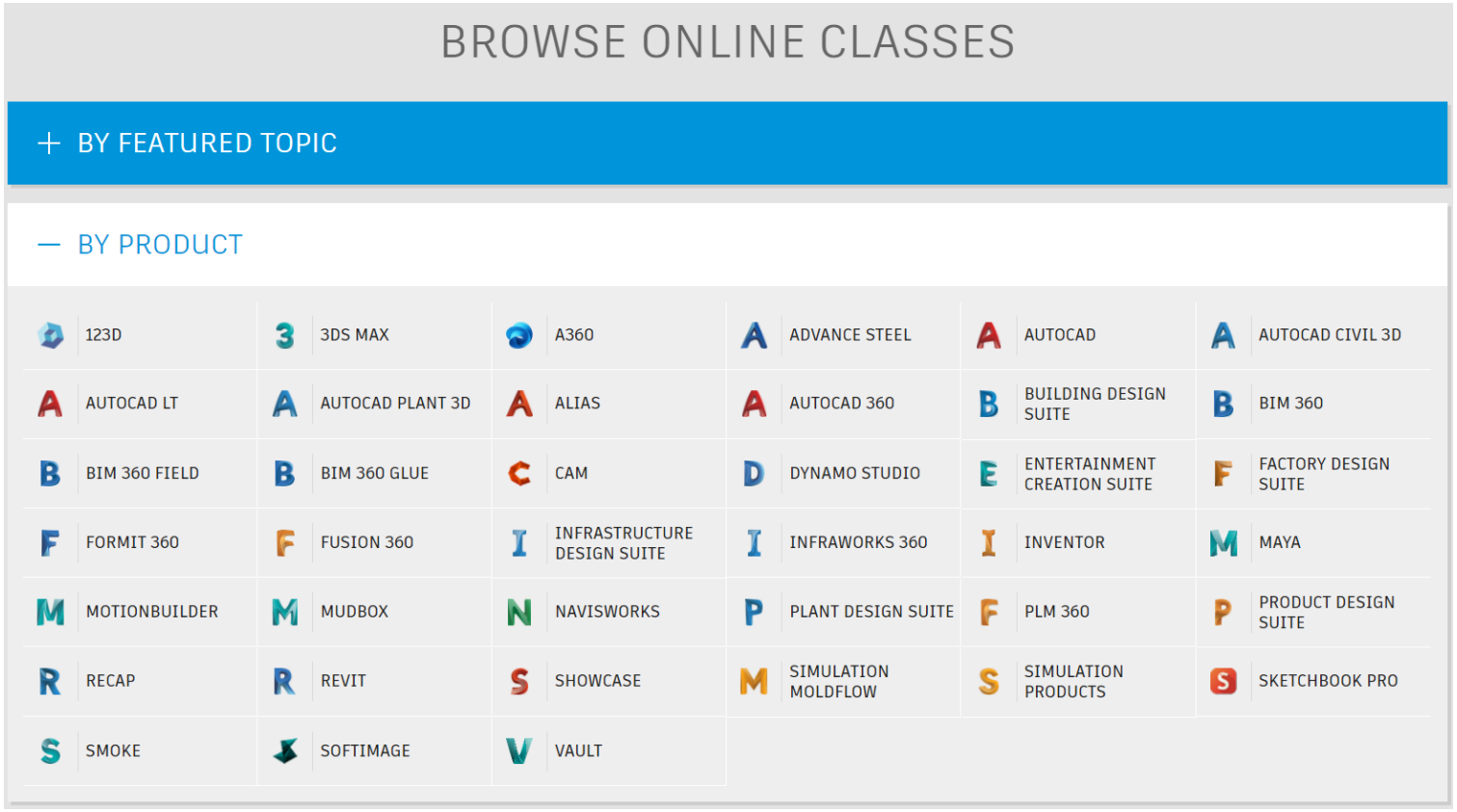
www.digitalconstructionweek.com/home

INNOVATING FUTURES

Promoting better business outcomes through the use of BIM and digital technologies.

Autodesk University

BiM regions
the home of digital construction
South



au.autodesk.com/au-online/overview

INNOVATING FUTURES

Promoting better business outcomes through the use of BIM and digital technologies.

CONSTRUCTING EXCELLENCE Hampshire

Historic BIM

BiM regions
the home of digital construction
South

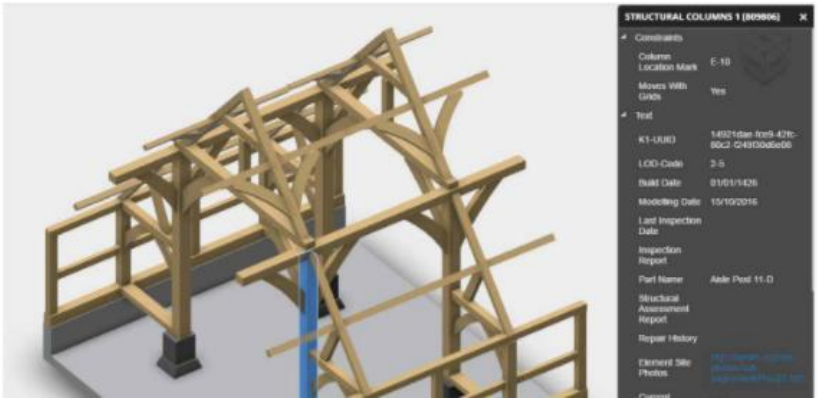
- Recently released case study and information by Historic England.
- Free for download!

Historic England

BIM for Heritage

Developing a Historic Building Information Model

- Lots more at http://bim4heritage.org/



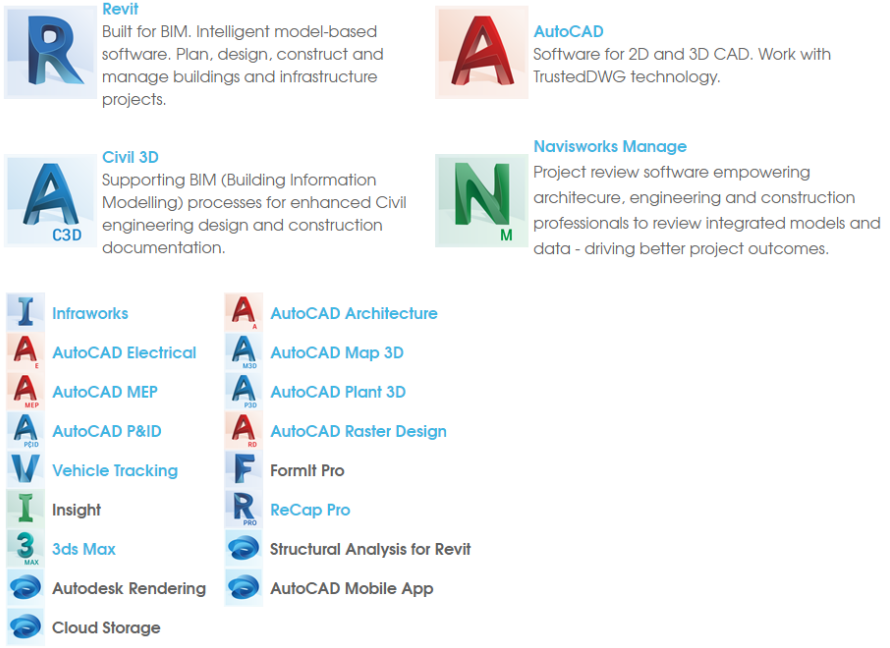
https://drive.google.com/file/d/0B7c0D1Nn7e_Qcm1VZlYyNmJnaFk/view

Autodesk AEC Licence Changes

BiM regions
the home of digital construction
South

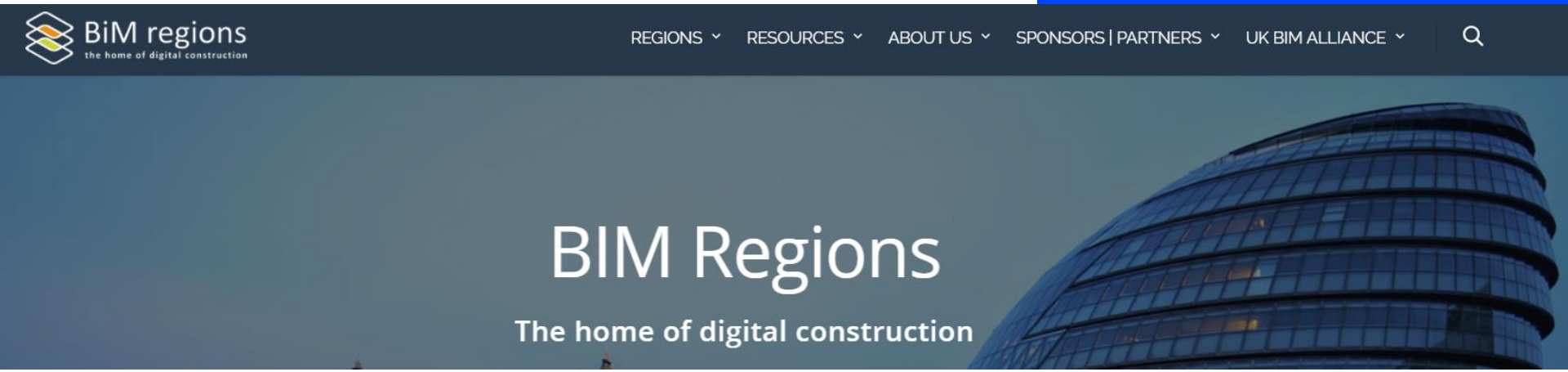
- Change from “Suites” to “Collections in 2016
- Move from perpetual licences to subscription only
- AEC Collections now also contain:
  - Revit Live
  - Fabrication CADmep
  - Robot Structural Analysis Pro
  - Advance Steel
  - Dynamo Studio
  - Structural Bridge Design

(On top of the previous 21 features)



South BIM Relaunch

BiM regions
the home of digital construction
South



UK BIMALLIANCE

http://www.ukbimalliance.org/news-and-events/newsletter/

WHAT IS A BIM MANAGER?

Multidisciplinary team and client view

Allister Lewis – BIM & CAD Strategy Manager Hampshire County Council (HCC)

Allister Lewis - Architect & BIM Manager

Architect

- Worked in private and public sectors over last 15 years on a range of projects
- Architect with experience of public buildings – schools, community centres, children's centres, libraries and housing

---

RICS Chartered BIM Manager

- BIM Manager - Passionate about BIM, collaborative working and high performance buildings
- Studying for an MSc in Building Information Modelling and Management

BIM MANAGER ISSUES AT HCC

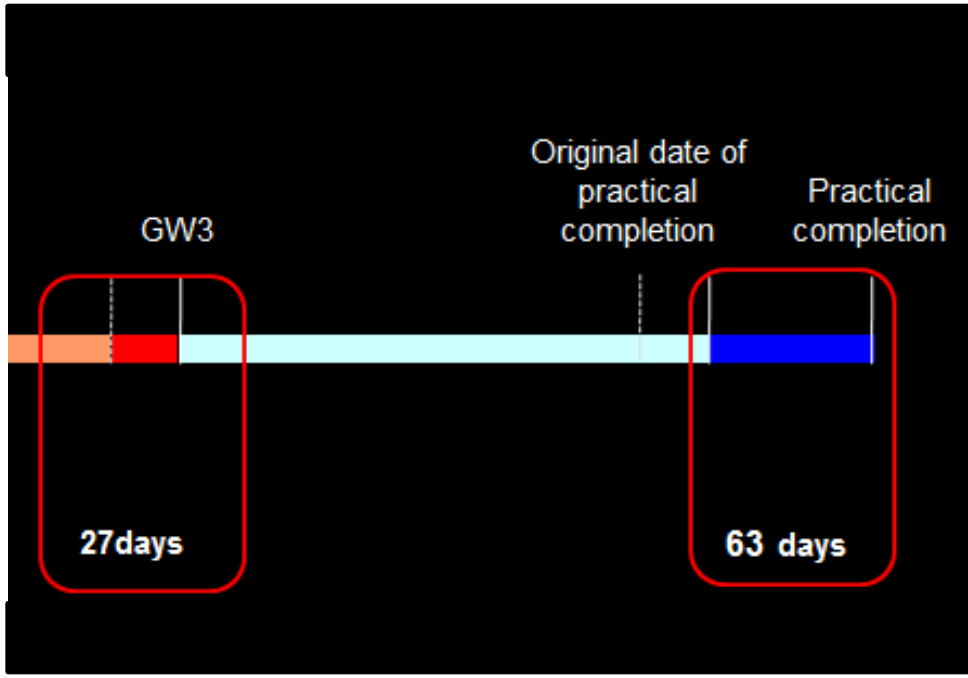
- There are drivers to **improve efficiency** at HCC
- Confusion on what '**BIM**' is and what may change
- Ongoing consultant specific **Hardware** issues
- Out of date **Software** of different types utilised
- No **Standards** for how information is shared and issued
- Confusion of IT and **BIM / CAD** roles
- Uneven **Training** and support organised
- **Programme / timescales** unclear

WIDER INDUSTRY CONTEXT

- Construction industry **productivity is low** and has not changed significantly over past 50 years.
- There is a Government drive to **improve** productivity.

What does this mean for **HCC**?

- It was identified that in D&I 2015 programme projects were **90 days** on average delayed.
- BIM has been identified as the **best way** to support greater productivity.
- Aim is to be as efficient as possible with the **correct tools**



WHERE TO START?

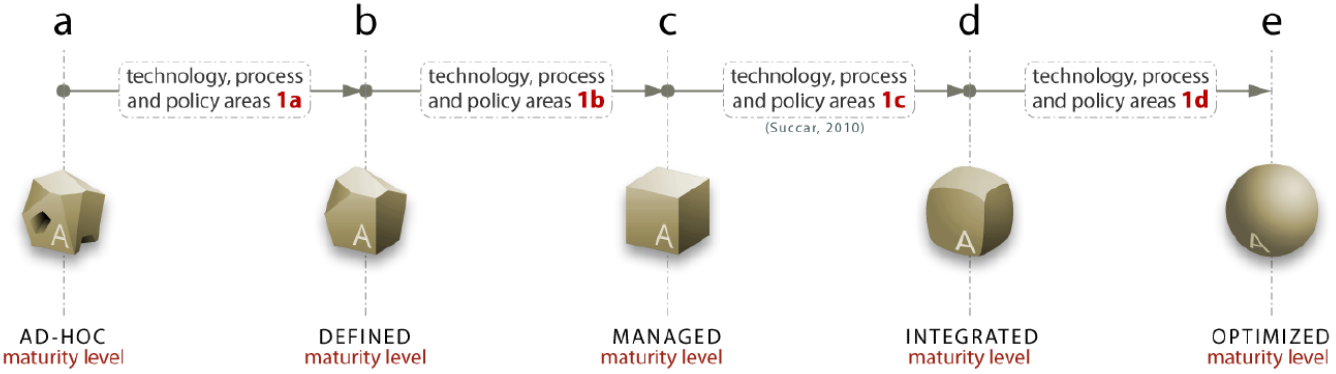
BIM Maturity Matrix – from initial to optimised

- Developed by Bilal Succar
- Technology
- Process
- Policy

Provides a good place to start for BIM Managers to assess an organisations maturity

PROCESS based on Capability Set v5.0

Key Maturity Areas at Granularity level 1	a INITIAL (score 0)	b DEFINED (max score 10)	c MANAGED (max score 20)	d INTEGRATED (max score 30)	e OPTIMIZED (max score 40)
Resources: Physical and knowledge infrastructure	The work environment is either not recognised as a factor in staff satisfaction or may not be conducive to productivity. Knowledge is not recognised as an asset; BIM knowledge is typically shared informally between staff (through tips, techniques and lessons learned). score	The work environment and workplace tools are identified as factors affecting motivation and productivity. Similarly, knowledge is recognised as an asset; shared knowledge is harvested, documented and thus transferred from tacit to explicit. score	The work environment is controlled, modified and its criteria managed to enhance staff motivation, satisfaction and productivity. Also, documented knowledge is adequately stored. score	Environmental factors are integrated into performance strategies. Knowledge is integrated into organisational systems; stored knowledge is made accessible and easily retrievable. score	Physical workplace factors are reviewed constantly to insure staff satisfaction and an environment conducive to productivity. Similarly, knowledge structures responsible for acquisition, representation and dissemination are systemically reviewed and enhanced. score
Activities & Workflows: Knowledge, skills, experience, roles and relevant dynamics	There is an absence of defined processes; roles are ambiguous and team structures/dynamics are inconsistent. Performance is unpredictable and productivity depends on individual heroics. A mentality of 'working 'around the system' flourishes. score	BIM roles are informally defined and teams are formed accordingly. Each BIM project is planned independently. BIM competency is identified and targeted; BIM heroism fades as competency increases but productivity is still unpredictable. score	Cooperation within organisations increases as tools for cross-project communication are made available. Flow of information steadies; BIM roles are visible and targets are achieved more consistently. score	BIM roles and competency targets are imbedded within the organisation. Traditional teams are replaced by BIM-oriented ones as new processes become part of organisation/ project team's culture. Productivity is now consistent and predictable. score	BIM competency targets are continuously upgraded to match technological advances and align with organisational objectives. Human resource practices are proactively reviewed to insure intellectual capital matches process needs. score
Products & Services: Specification, differentiation and R&D	3D models deliverables (a BIM product) suffer from too high, too low or inconsistent levels of detail. score	A "statement defining the object breakdown of the 3D model" is available. score	Adoption of product/ service specifications similar to Model Progression Specifications, BIPS 'information levels' or similar. score	Products and services are specified and differentiated according to Model Progression Specifications or similar. score	BIM products and services are constantly evaluated; feedback loops promote continuous improvement. score
Leadership & Management: Organisational, strategic, managerial and communicative attributes; innovation and renewal	Senior leaders/ managers have varied visions about BIM. BIM implementation (according to BIM Stage requirements) is conducted without a guiding strategy. At this maturity level, BIM is treated as a technology stream; innovation is not recognised as an independent value and business opportunities arising from BIM are not acknowledged. score	Senior leaders/managers adopt a common vision about BIM. BIM implementation strategy lacks actionable details. BIM is treated as a process-changing, technology stream. Product and process innovations are recognised; business opportunities arising from BIM are identified but not exploited. score	The vision to implement BIM is communicated and understood by most staff. BIM implementation strategy is coupled with detailed action plans and a monitoring regime. BIM is acknowledged as a series of technology, process and policy changes which need to be managed without hampering innovation. Business opportunities arising from BIM are acknowledged and used in marketing efforts. score	The vision is shared by staff across the organisation and/or project partners. BIM implementation, its requirements and process/ product innovation are integrated into organisational, strategic, managerial and communicative channels. Business opportunities arising from BIM are part of team, organisation or project-team's competitive advantage and are used to attract and keep clients. score	Stakeholders have internalised the BIM vision and are actively achieving it. BIM implementation strategy and its effects on organisational models are continuously revisited and realigned with other strategies. If alterations are needed, they are proactively implemented. Innovative product/ process solutions and business opportunities are sought-after and followed through relentlessly. score

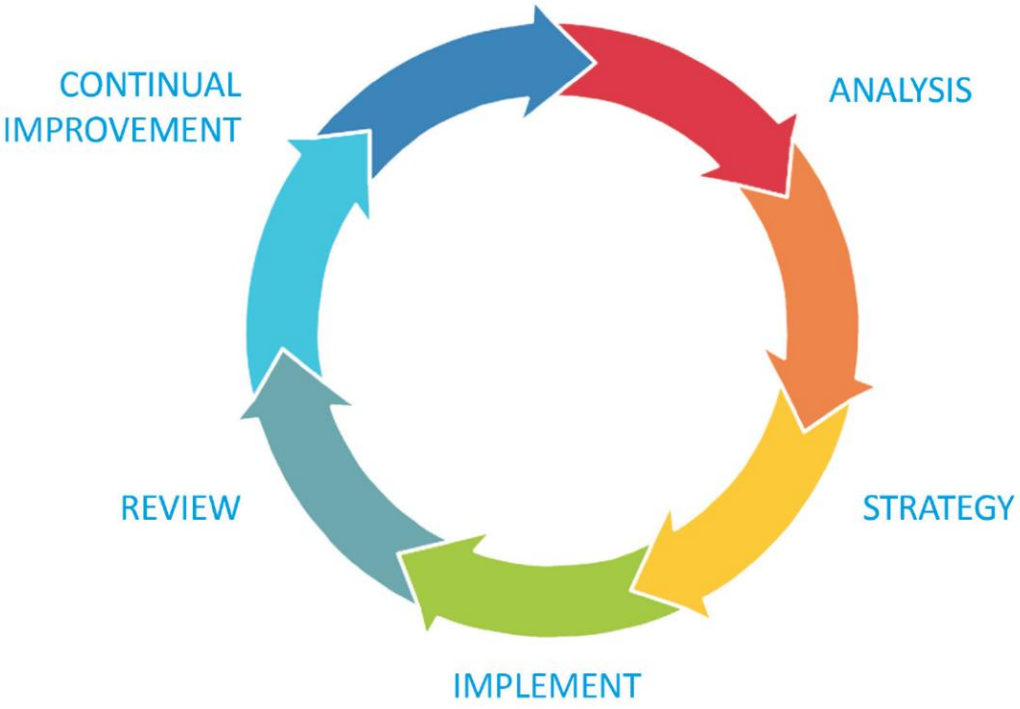


Reference Bilal Succar https://www.academia.edu/26882284/301in_BIM_Maturity_Matrix

BIM MANAGER APPROACH

Aim: to **improve** the following areas to support staff to be as **efficient** as possible;

1. Use BIM = ‘Better Information Management’
2. Identify **hardware** improvements
3. Identify **software** needs
4. Use, communicate and support use of **standards**
5. Confirm **BIM manager role** to teams
6. Develop, procure, deliver and support **training**
7. Work to a **programme**

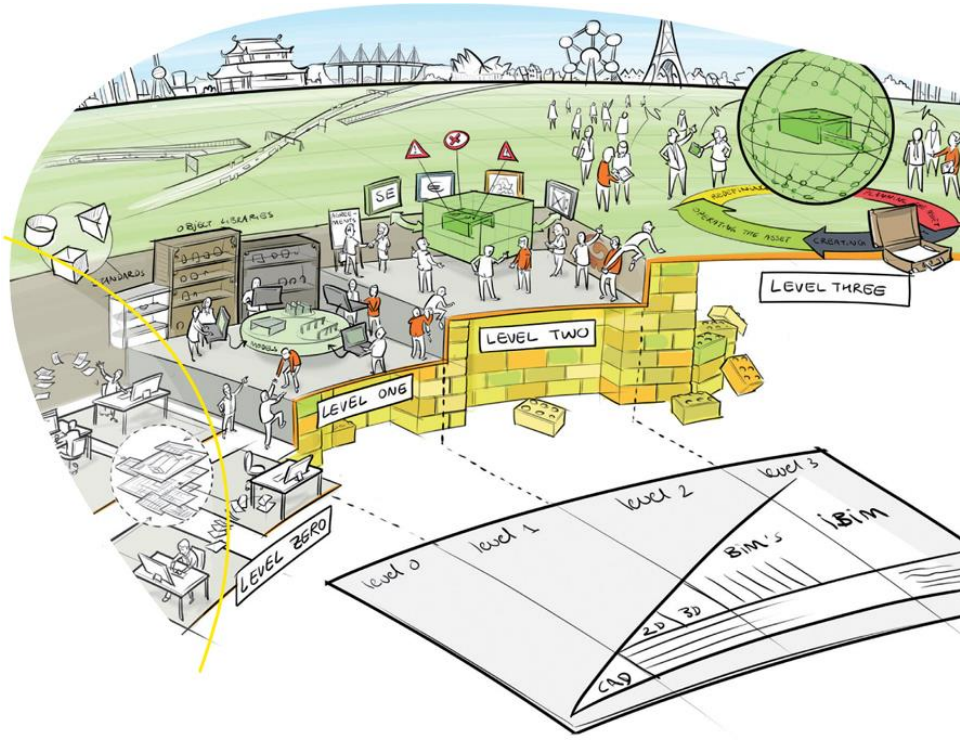


1. BETTER INFORMATION MANAGEMENT

- BIM is a set of **technologies, processes and polices** enabling multiple stakeholders to **collaboratively** design, construct and operate an asset over its lifecycle.
- The aim is to increase **productivity, lower costs** and **understand assets**.
- Government has identified that BIM can support **20% saving** in overall costs, and previous HCC projects using Revit have shown a **16% reduction** in fees alone.

But…

- Overall HCC is at **BIM Level 0** …



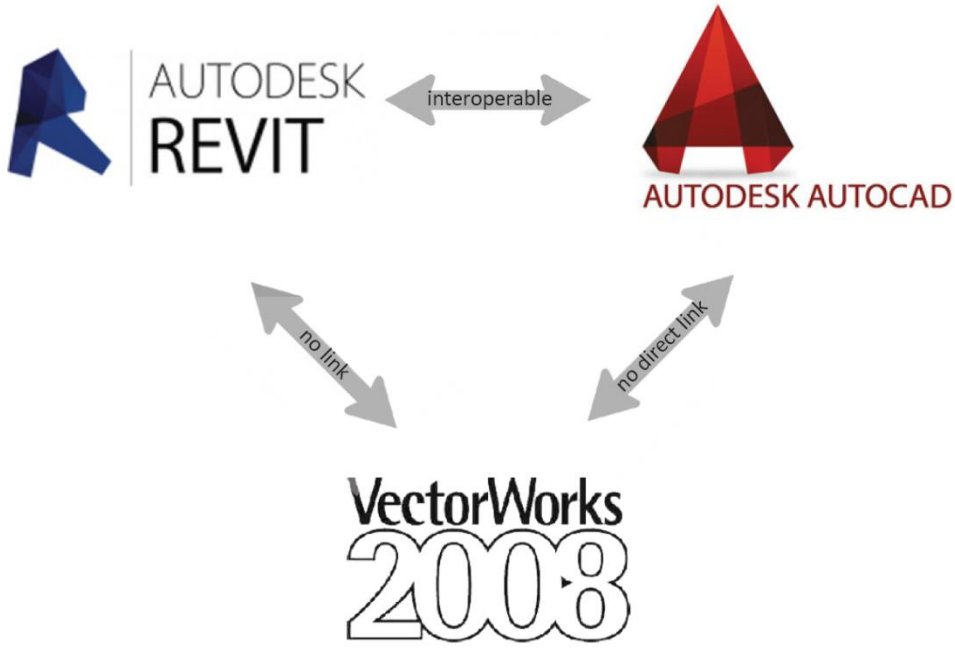
2. HARDWARE

Assessment required to improve:

- Virtual environment access
- PCs
- Laptops
- Mobile working to be supported

3. SOFTWARE

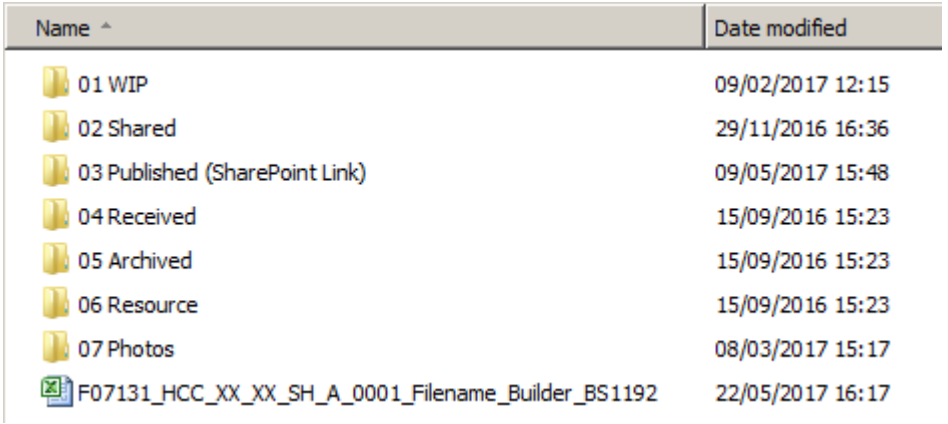
Current software		Future software
Vectorworks	⇨	AutoCAD
AutoCAD	⇨	AutoCAD
Revit	⇨	Revit
CATO	⇨	CostX
NBS Building	⇨	NBS Create
Photoshop Elements/CS	⇨	Photoshop Creative Suite
SketchUp pro7/8	⇨	SketchUp 2016



4. STANDARDS

Start with implementation of BIM Level 1

- Opportunity to create consistent approach using new software
- Utilise BS 1192 methods
- E.g. BIM Protocol, BIM Execution Plan, Revit Protocol, etc.
- Then move to BIM Level 2 once Level 1 established



5. BIM/CAD SUPPORT ROLES

BIM & CAD Team

Here to support teams **work effectively.**

Allister Lewis

- BIM & CAD strategy, project support, software support, training
- Coordination role with IT Services

Team

- CAD Manager to support software queries and bugs

IT Services

- If something isn't working, contact IT!
- Procuring and installing hardware
- Procuring and installing software requests
- Managing issues with hard and software not working

6. TRAINING

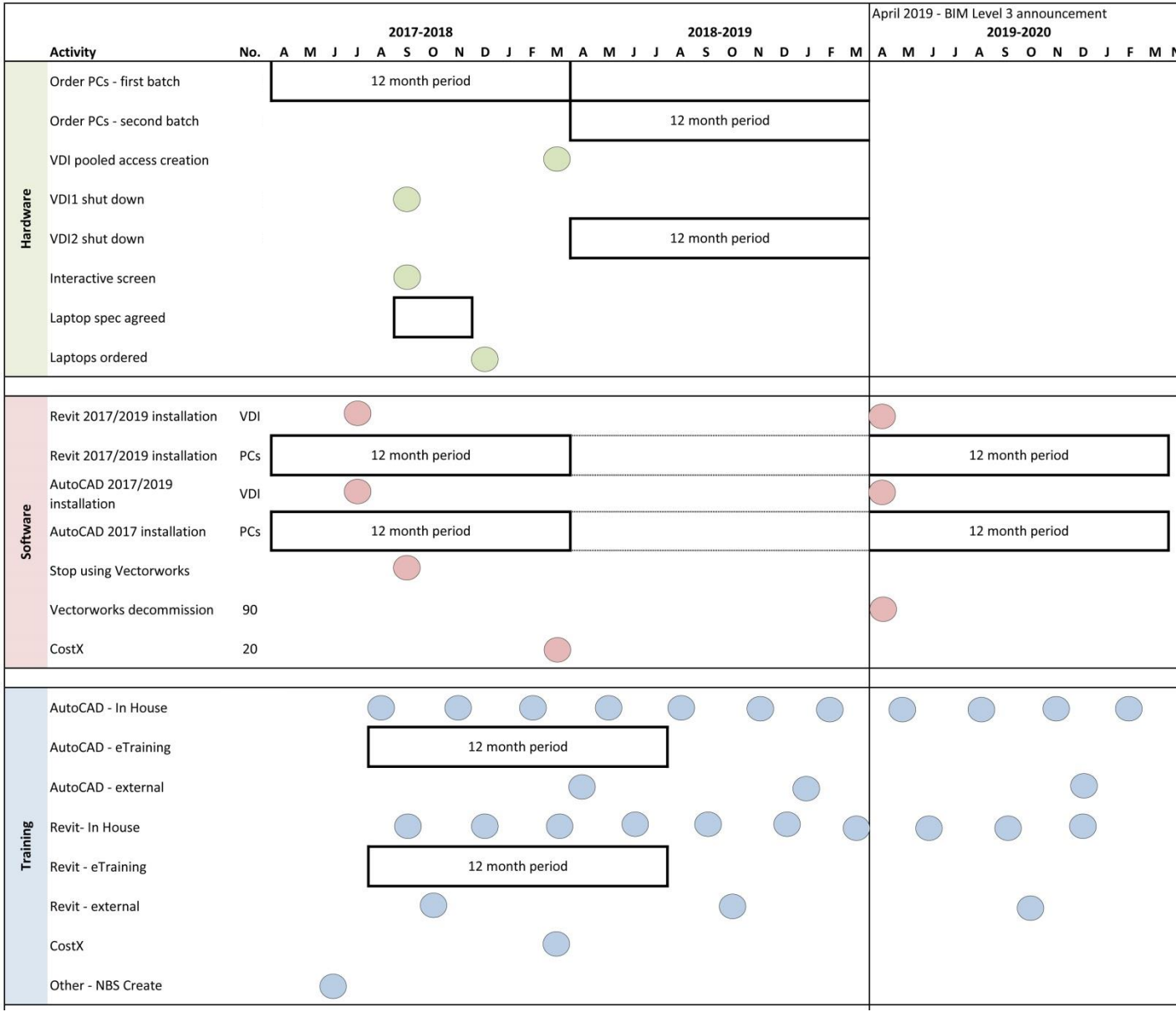
Targeted CAD & BIM training to include;

- Knowledge transfer with **in house training**
- Targeted **off site** training as required
- Flexible **online** training option available Global eTraining
- Monthly **drop in sessions**
- **CAD Group** and **Champions** within teams

7. PROGRAMME

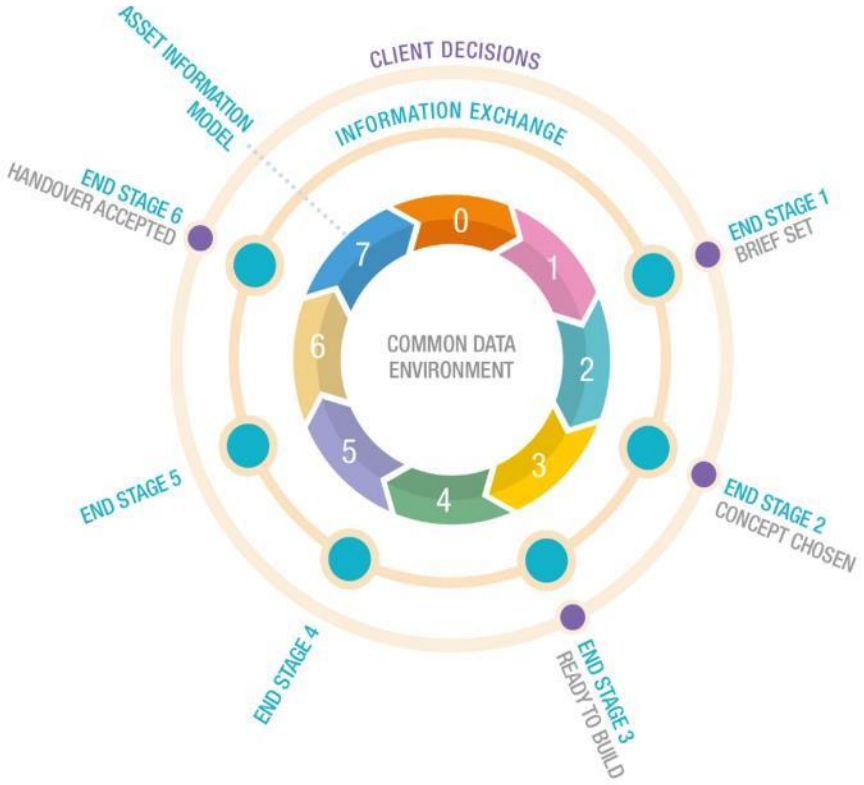
2017 – 2019

- BIM Level 1 implementation 2017
- Look to BIM Level 2 2018
- BIM Level 3 announced 2019



8. THE FUTURE

- Will the BIM Manager change to a role of an **“Information director”** who is an individual that will *“have the opportunity to become a **unique** entity who consults with architects, contractors, and facility managers”*?
- BIM Managers are *“valued for their empathetic subtlety”* when working with teams and that this is due to the requirement to work **proactively** with all people on a project to bring them together.
- How will the role be **formalised** and understood within the broader construction industry? A profession in itself?



For reference see; https://allisterlewisstudio.com/2017/01/10/is-a-bim-manager-role-required-certification-and-chartered-status-discussed/

MORGAN SINDALL
CONSTRUCTION INFRASTRUCTURE

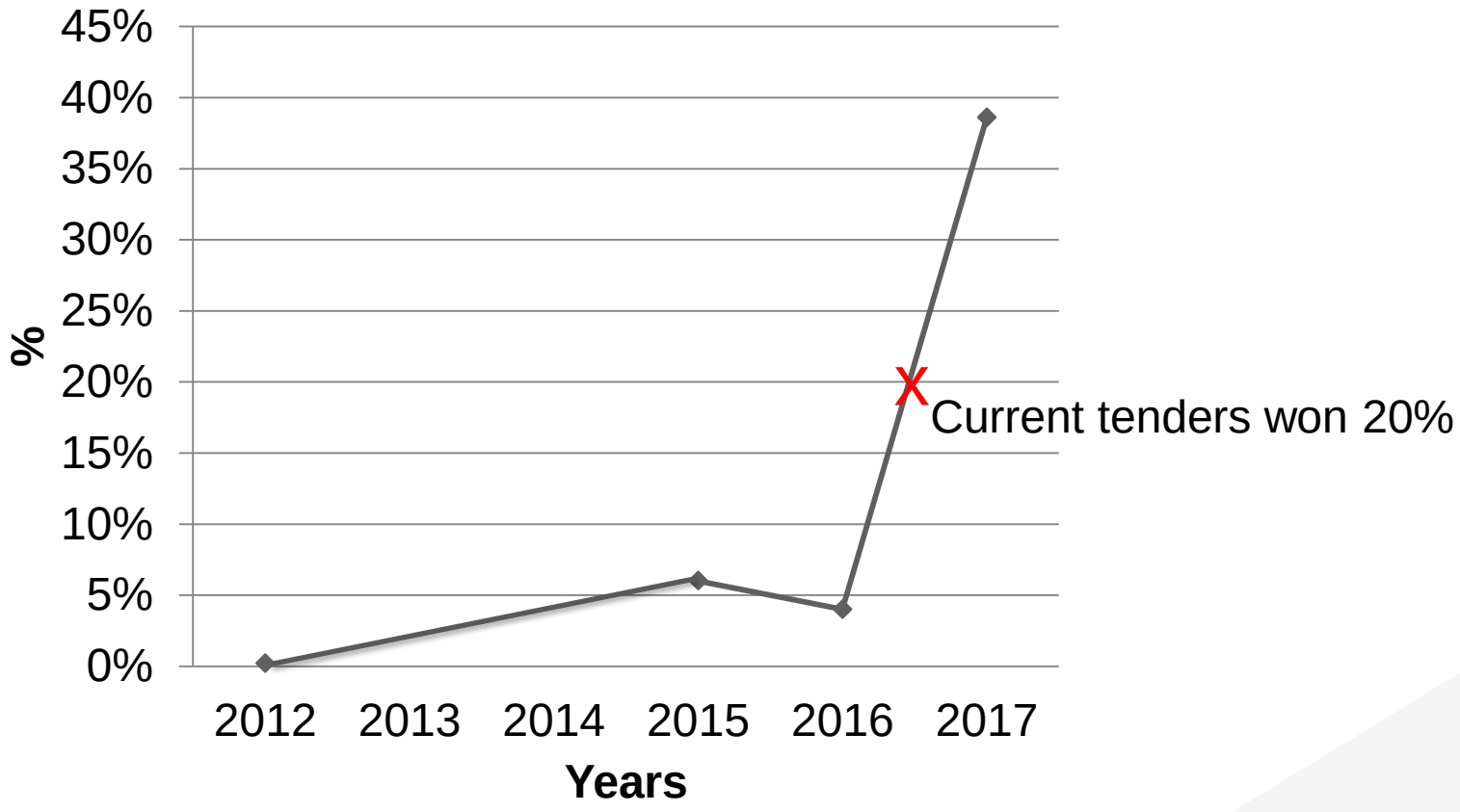
BIM Management

Supporting clients – BIM Management

Bridging the gap

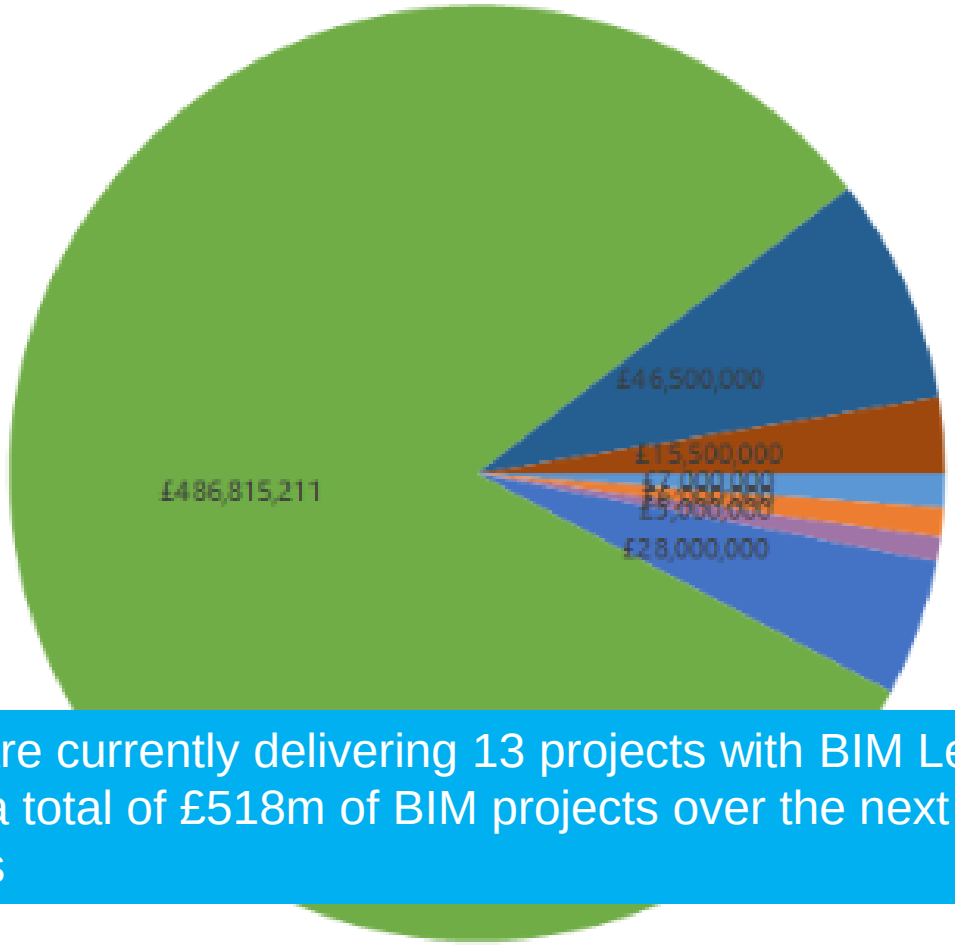
Client demand - Forecasting the growth

% BIM vs Non-BIM projects



Client demand - Forecasting the growth

Opportunities

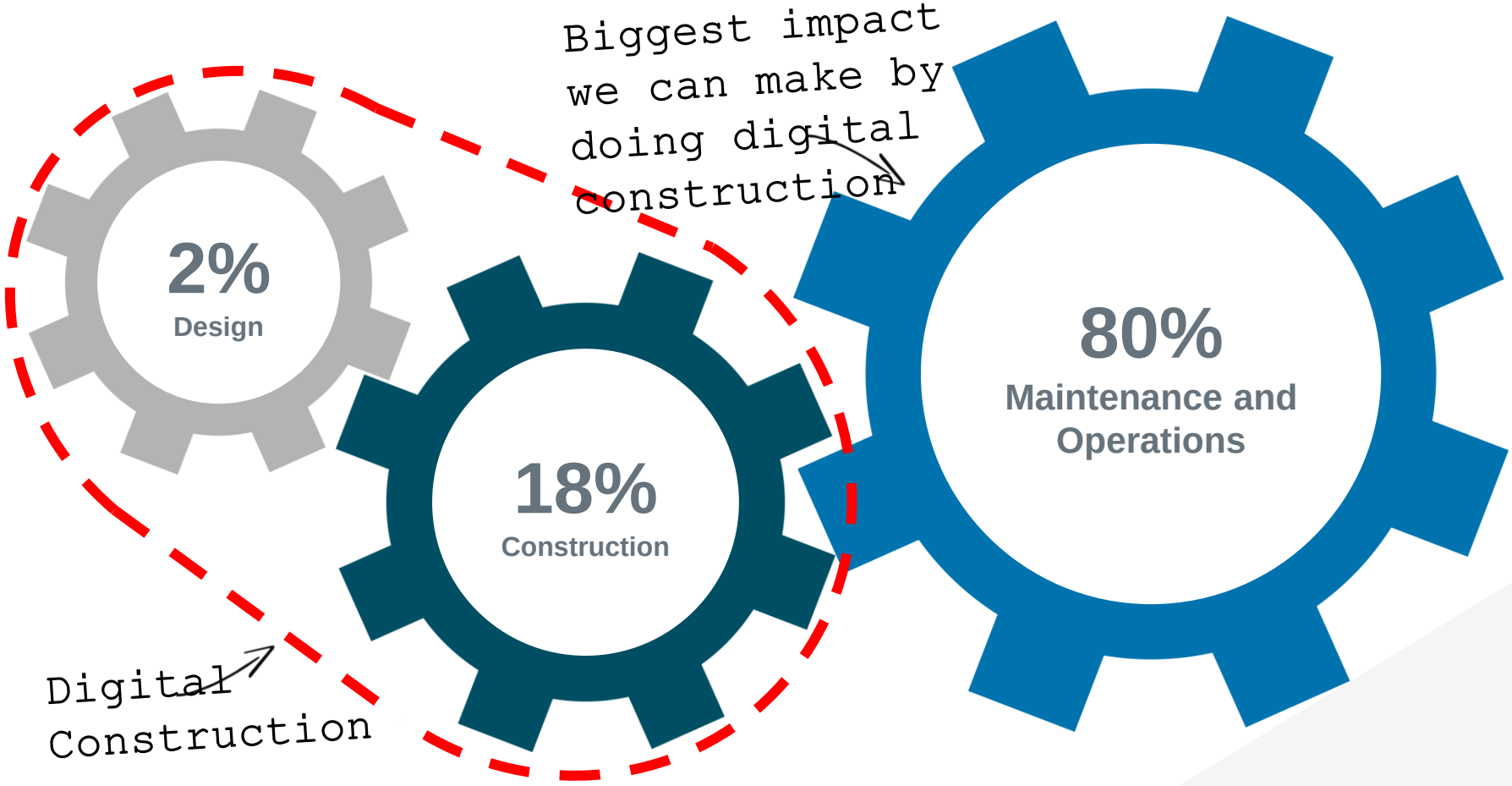


We are currently delivering 13 projects with BIM Level 2 and a total of £518m of BIM projects over the next two years

Where to start

Greatest Value

Typical life-cycle cost of a building



Built and Digital Asset

Benefits

Utilising BIM to digitally design, build and operate

and our clients can utilise the digital asset to aid the operation and maintenance of the built asset

Built Asset

Digital Asset

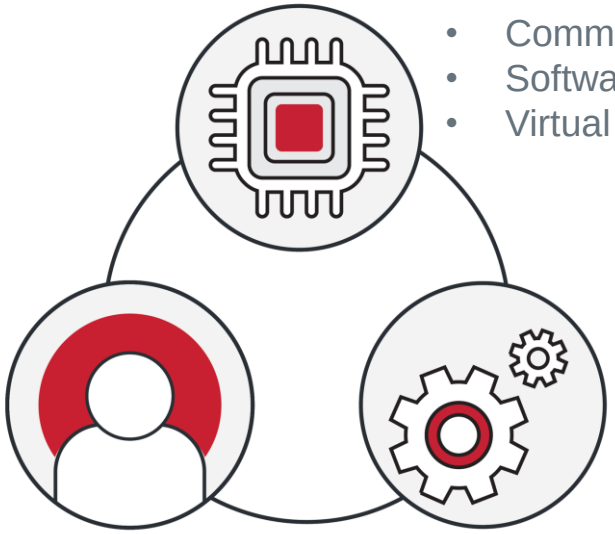
Digital Construction

The Basics

BIM is more than modelling, it's about people, process and technology

Technology

- Common Data Environment
- Software
- Virtual Reality



People

- Collaboration
- Culture
- New ways of working

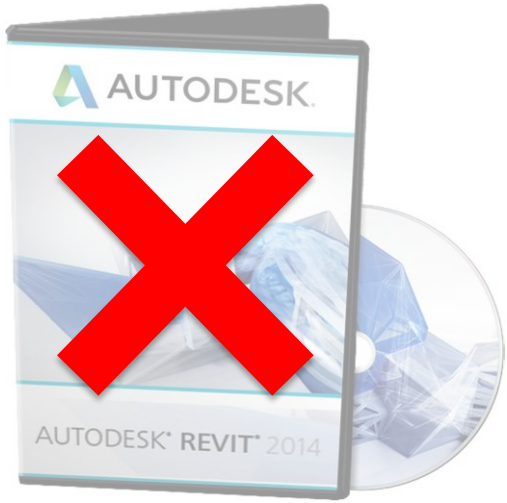
Process

- British Standards
- PAS 1192
- MS BIM Processes
- Quality Assurance

Digital Construction

Misconception

BIM is more than modelling, it's about people, process and technology

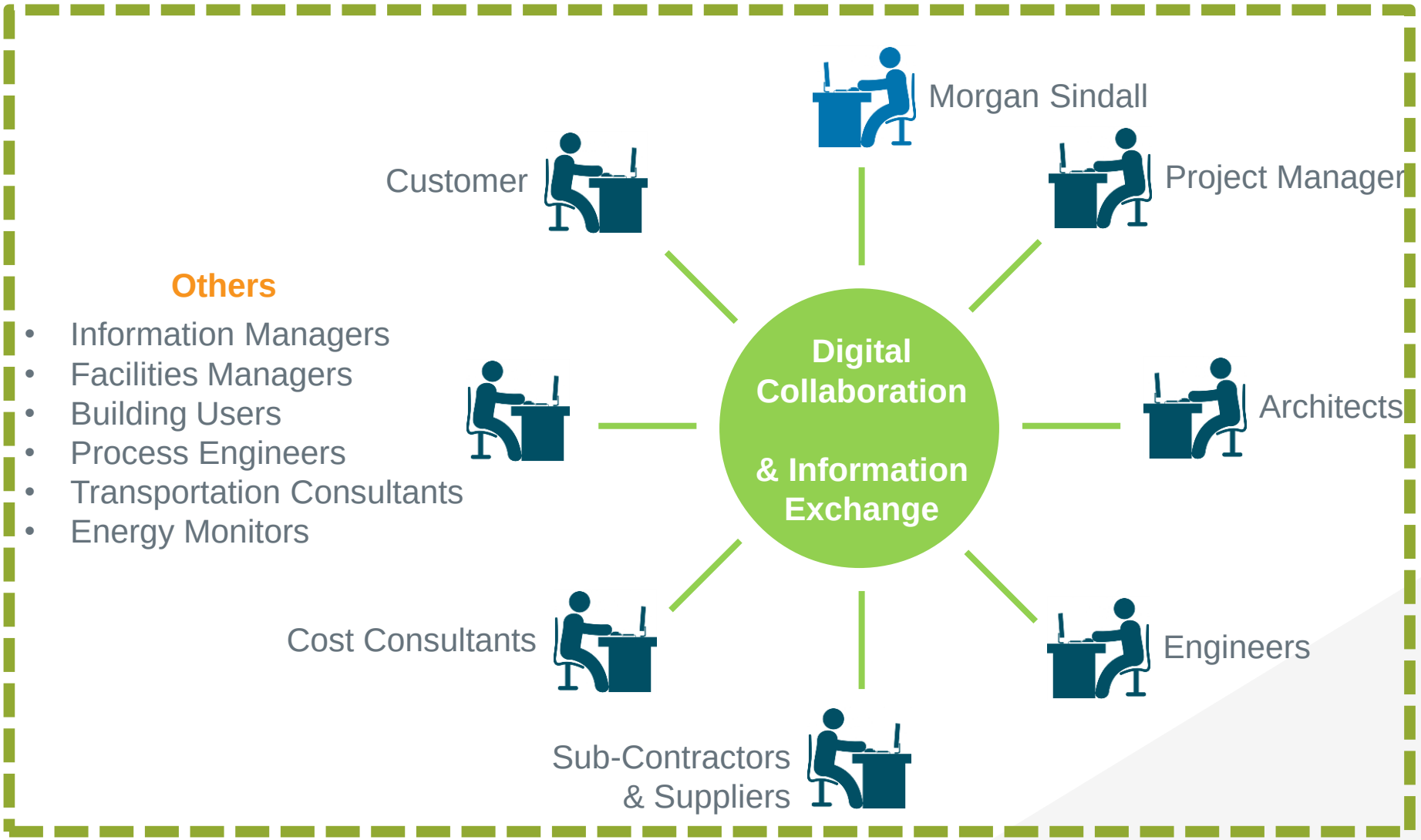


BIM doesn't come
in a Box !

Stakeholders

Collaboration

Scope of BIM management



Others

- Information Managers
- Facilities Managers
- Building Users
- Process Engineers
- Transportation Consultants
- Energy Monitors

Definition

Keep it simple

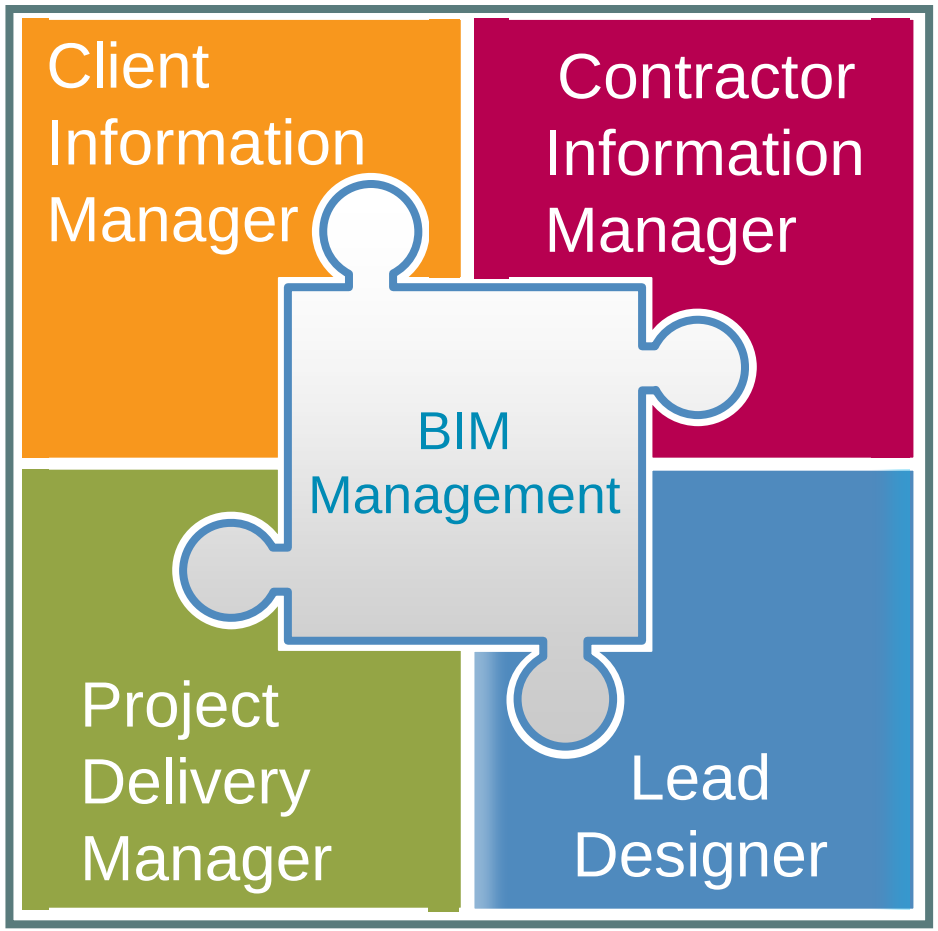
Fundamentals of Level 2
Employer’s Information Requirements
BIM Execution Plan
BIM Capability Assessments
Common Data Environment
Series of Federated 3D models
Services of Project Information Manager
Delivery of COBie data

MORGAN SINDALL

Information Management

BIM Management

Project and regional support

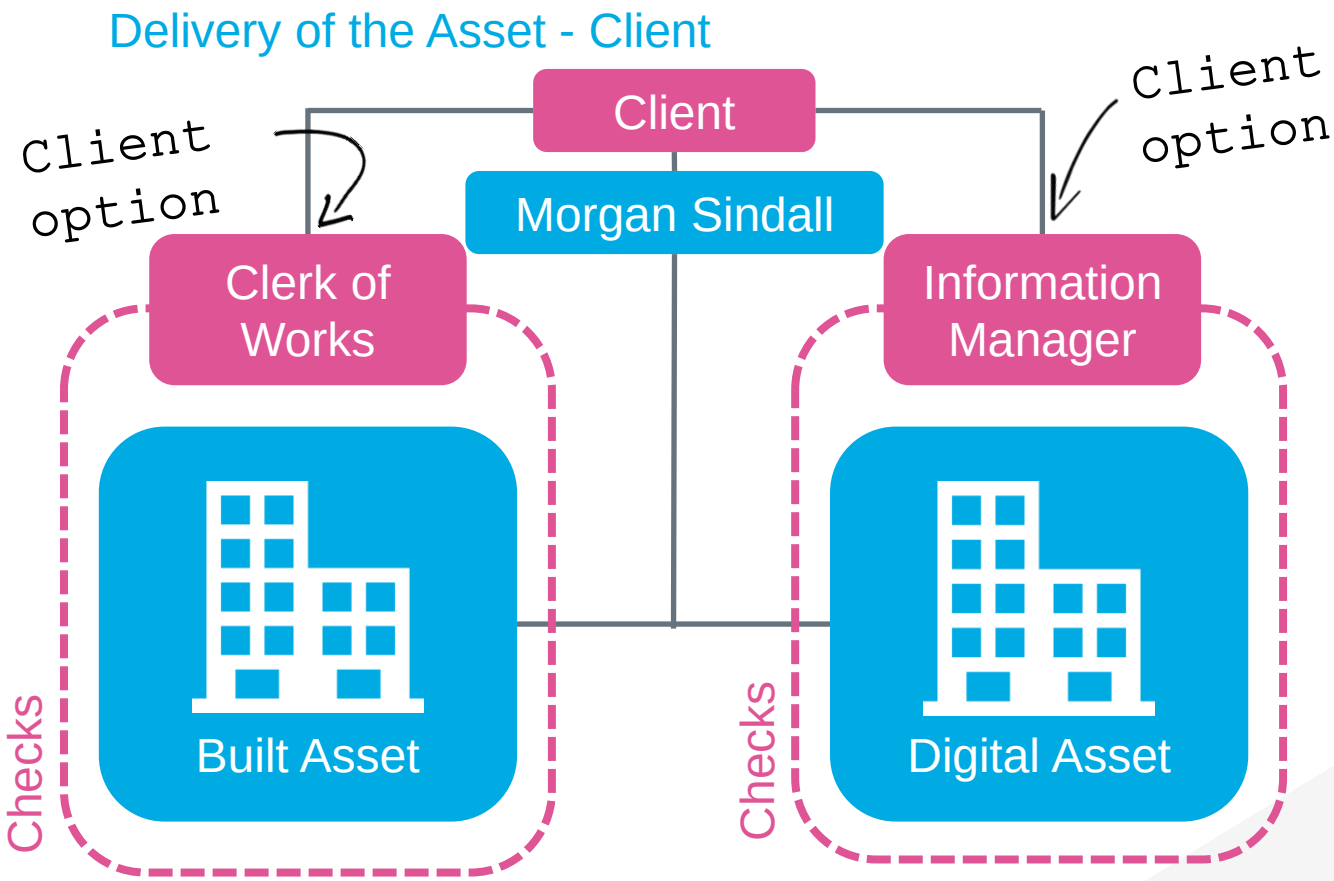


On Project

+ Regional BIM Implementation Manager (BIL)

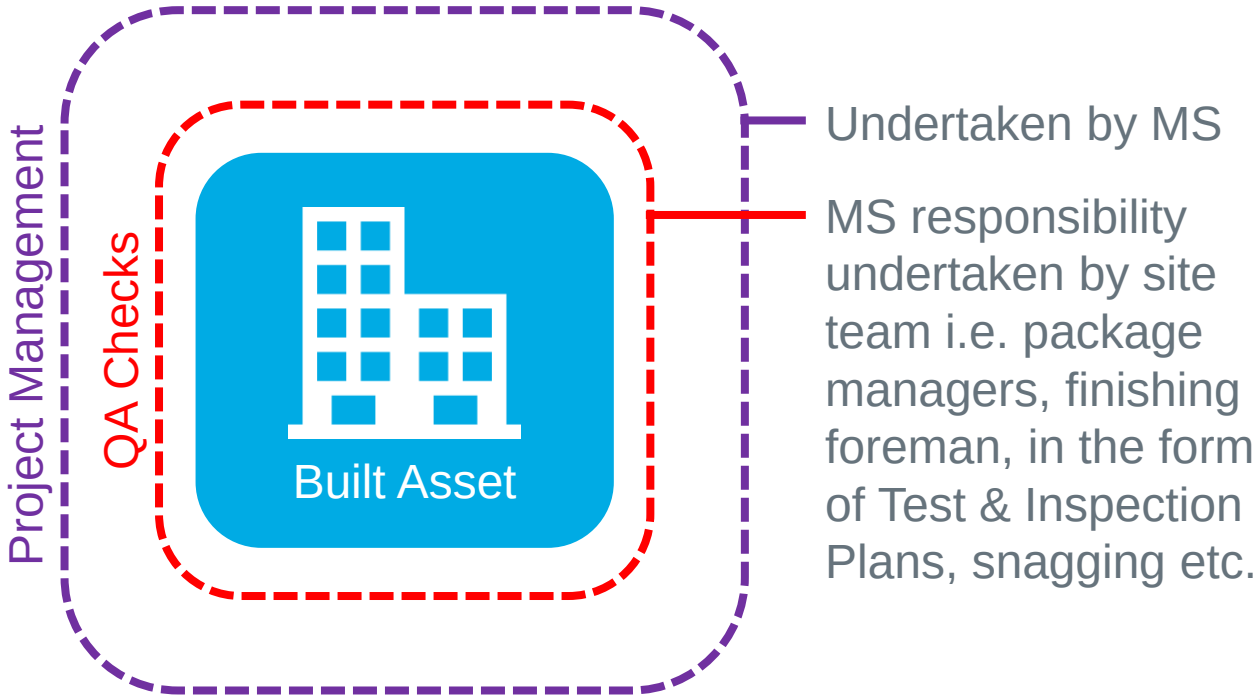
Delivery of the asset

Built and Digital



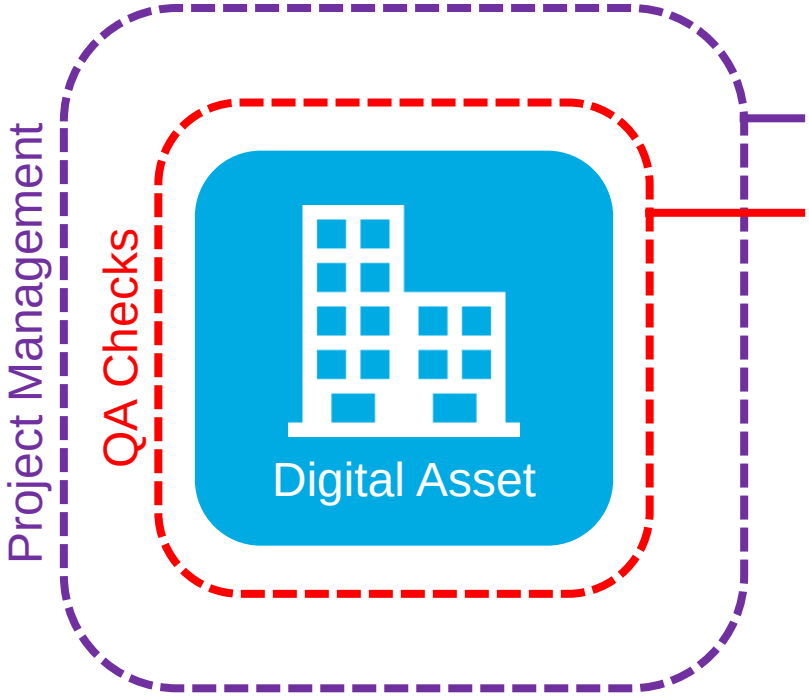
Delivery of the asset

Built Asset - Morgan Sindall



Delivery of the asset

Digital Asset - Morgan Sindall



Undertaken by MS

MS responsibility undertaken by an **Information Manager** in the form of Quality Assurance Reports which involve fully assessing the models completeness, data inputs etc.

Code	Description	Source Q
000	*Presentation*	
01	Project Name	
01.01	Substructure	
01.02	Superstructure	
01.03	Internal finishes	
01.04	Fittings, furnishing	
01.05	Services	
01.06	Prefabri	

MORGAN SINDALL

Roles & Authorities

Roles & Authorities

Who is the Information Manager **– Client Side**?

Traditional Role

- Technical Advisor

Scope of Work

- Sets BIM brief – OIR, AIR, EIR
- Checks model data for quality and consistency - Throughout
- Monitors progress
- BIM Management

Authorities

- Accept or reject information exchanges

Highlights issues, not problem solving

Roles & Authorities

Who is the Project Delivery Manager?

Traditional Role

- Design Manager

Scope of Work

- Facilitate delivery of information exchanges
- Confirm supplier's ability to deliver information requirements
- Update and maintain the MIDP and make available via the CDE platform. Responsible for management of the CDE environment
- BIM Management

Authorities

- Accept or reject
- Information exchanges

Roles & Authorities

Who are the Task Team Managers?

Traditional Role

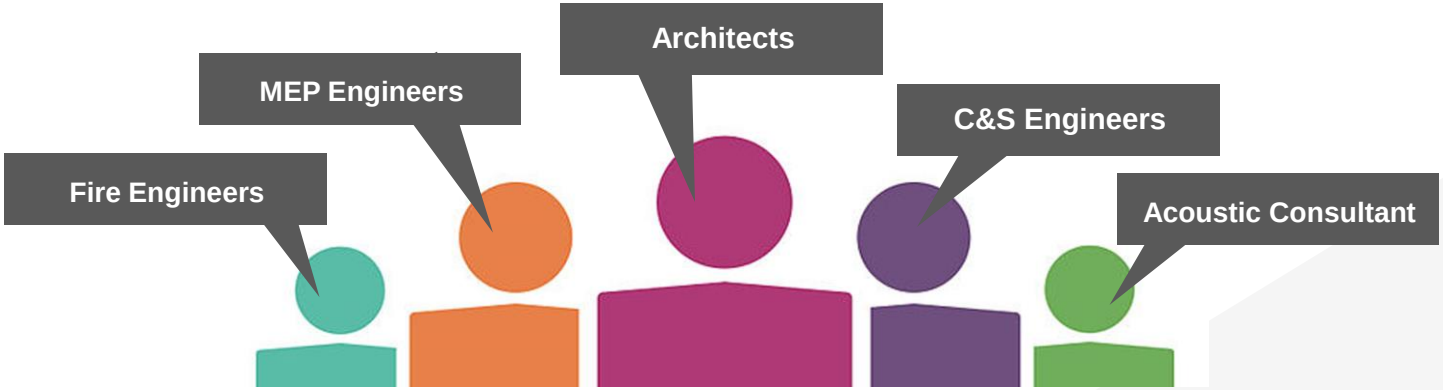
- Consultant & Supply Chain Project Leads

Scope of Work

- Enforce documentation standards for their Task Team information
- Issue approved information to the shared functional section
- BIM Management

Authorities

- Issue approved information to the shared area with the appropriate status code (status codes S1 and S2 only)



Roles & Authorities

Who is the Lead Designer?

Traditional Role

- Lead Designer

Scope of Work

- Coordination of all design information
- Manage information development and approvals at gateways
- Advise on design deliverables from other parties and overall lead for spatial coordination
- BIM Management

Authorities

- Confirm status & accepts information for use within the shared and published functional sections
- Propose design changes to resolve clashes

Lead Designer responsibility to coordinate design and

Roles & Authorities

Who is the Information Manager – **Contractor side**?

Traditional Role

- N/A New Role

Not the Lead Designer

Scope of Work

- Validates the Project Information Model to ensure deliverables follow the agreed protocols, that the data is to the defined levels in the BEP and is accurate
- Enforce the project BIM standards and ensure delivery of the requirements of the EIR
- BIM Management

Authorities

- Accept or reject information exchanges
- No design responsibility or right to issue instruction

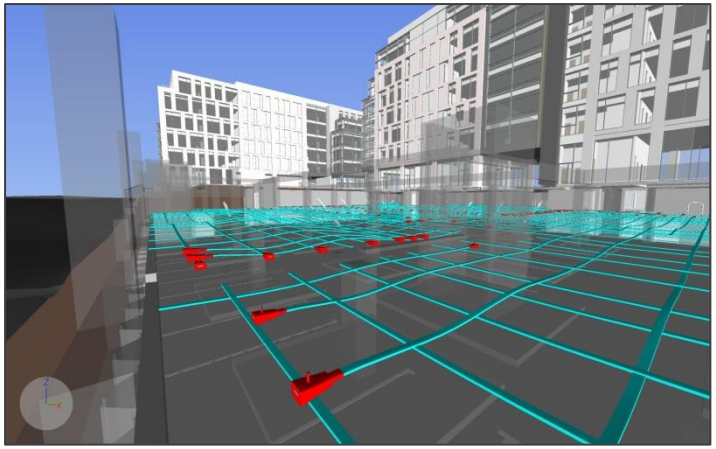
Lead Designer responsibility to coordinate design and resolve clashes

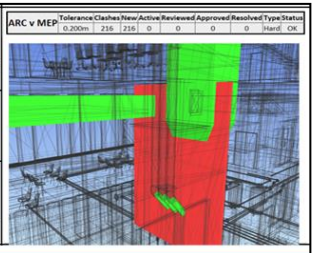
Roles & Authorities

Contractors Information Manager - Scope of Work

The primary scope of the Information Manager is to:

- Assess the models compliance with the EIRs & BEP
- Provide the PDM with Quality Assurance Reports (QARs)
- Highlights within the QARs deficiencies in the design
- Check that the lead designer is federating the models, clash detecting and assigning responsibilities to resolve clashes



13	Impact	Incorrect quantities, incorrect drawings and setting out	
	Issue	216 grouped clashes detected when clashing Arch and MEP models at 200mm tolerance	
	Proposal	Arch & MEP Eng to resolve as per report "30000686-MSPS-00-ZZ-CR-X-0002-ARCvMEP.html"	

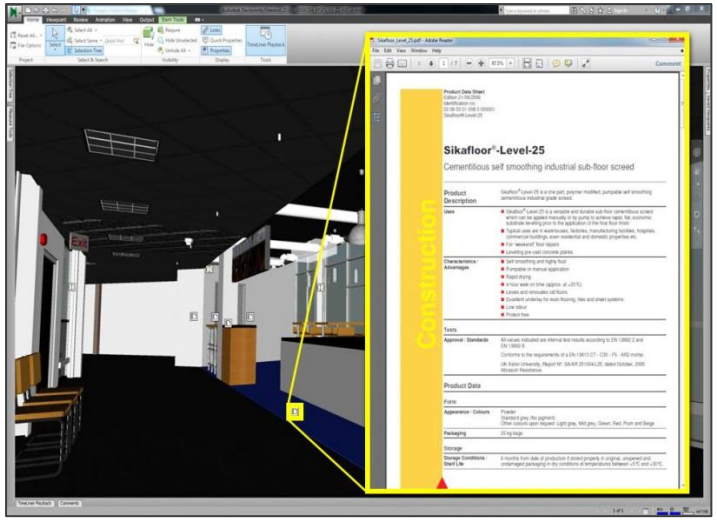
EIR/BEP Non Compliance		
E1	Issue	Elements in the model are mainly "Generic" or "Concept", LOD 1-2 with no LOI
E2	Issue	No object has been correctly classified (UniFormat 2015 according to the EIR)
E3	Issue	Cobie parameters have been created in the models, but no COBie data has been populated.
E4	Issue	Area & Volume computations not set as outlined in EIR (Section 2.10.4)
E5	Issue	Revit and AutoCAD links have not been removed prior to sharing

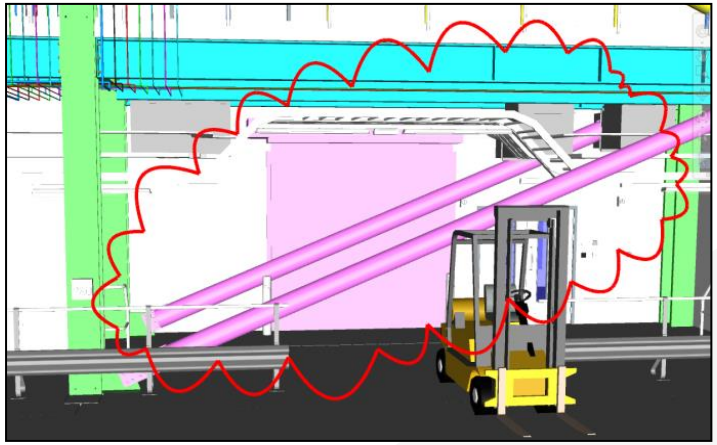
Roles & Authorities

Contractors Information Manager - Scope of Work

The primary scope of the Information Manager is to:

- Check the completion of information and detail within the model aligns with NBS Toolkit deliverables for the LOI & LOD stated within the BEP
- Federates models to extract the COBie data during the design development
- Undertakes checks and provides comments as models pass through the CDE





Roles & Authorities

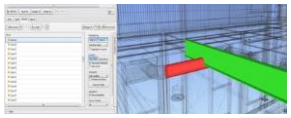
Information Manager Benefits

The main benefits of employing a Contractors Information Manager are:

- Ensures an achievable BIM scope avoiding unnecessary additional cost

- Reduces risk through managing delivery of contractual BIM obligations for both geometry and data

- Improves quality of models and data through model reviews and reports



- Reduces site issues through improving coordination and collaboration

- Ensures good data for customers to populate their systems post handover

Obligation

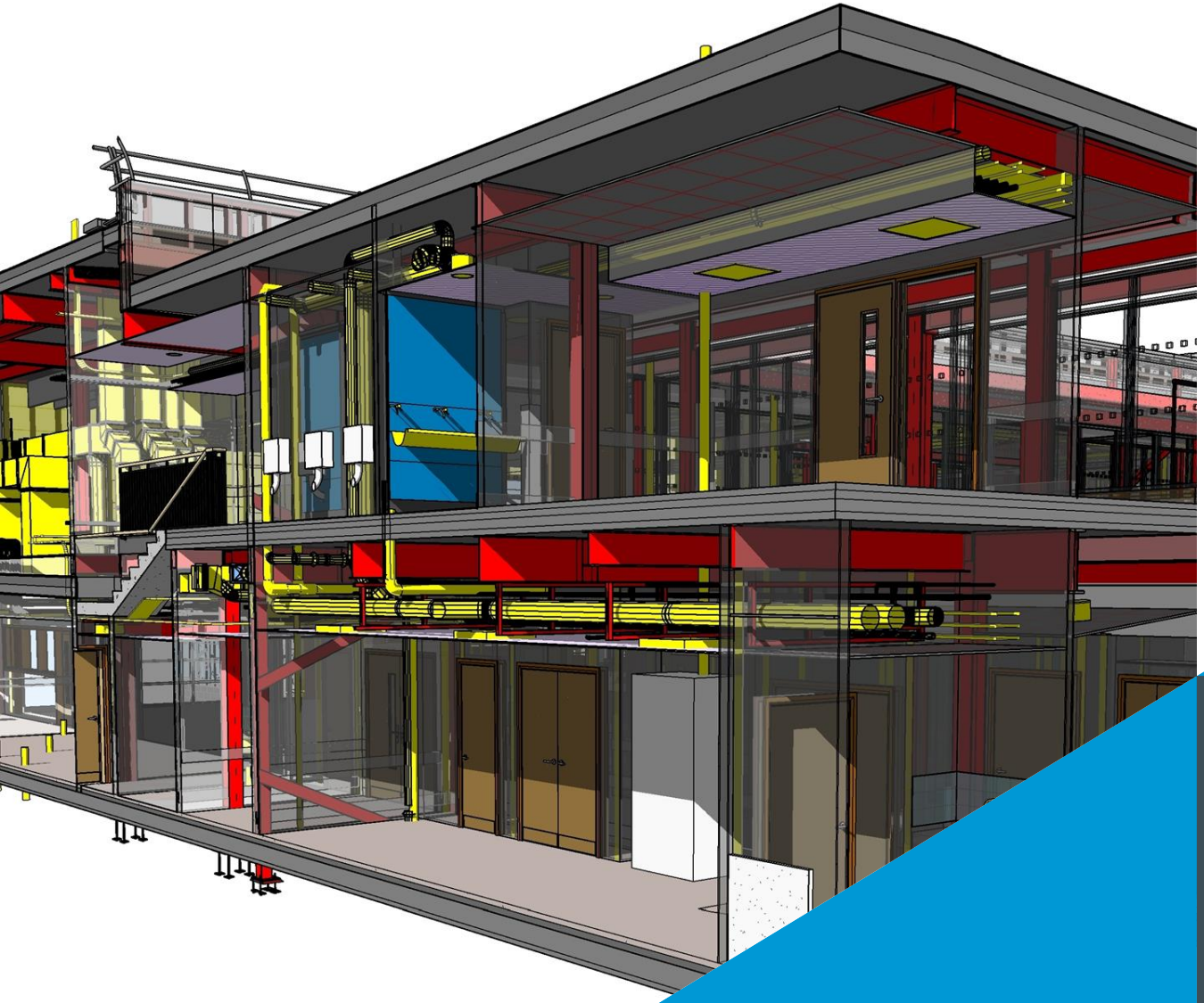
Built and Digital Asset

If we required to deliver a model at the end of a project we must ensure the digital asset has been verified

Built Asset **Digital Asset**

Client may appoint an Information Manager to review and approve models, data and O&M Manuals at

MORGAN SINDALL



Example of Challenges

The Brief

Challenges - COBie

Example of a Client Requesting High Amount of COBie Data

!! Component, Systems & Assembly Data !!

Data Drop 5 – Construction

Information Deliverables:

COBie Tabs	Architect	Structural Engineer	MEP	BIM Coordinator	Contractor
Contact				✓	✓
Facility	✓				
Floor	✓	✓	✓		✓
Space	✓				
Zones	✓				
Type					✓
Component					✓
Systems					✓
Assembly					✓
Connection					
Spare					✓
Resource					
Job					
Impact					
Document				✓	✓
Attribute					
Coordinate				✓	✓
Issue				✓	✓
Picklists?					

The Brief

Challenges - Model Production And Delivery Table

Example of a Client Requesting High Level of Detail

4.4 MIDP — The model production and delivery table is as follows (note: there is no requirement for BIM production at information exchange 1b): [amend the numerical references in red to reflect t additional BIMs to be provided]

	1	2		3	4	5	6	7
	1a	2a	2b	3	4	5	6	7
	Education Funding Agency/ TA				Contractor			
Digital 3D object oriented models to be created for:	**Collectively or singularly these models are to provide a visual representation of:**	LOD	LOD	LOD	LOD	LOD	LOD	LOD	LOD
Architectural design	1 Space arrangement and internal layouts				4	5	6	7
Structural design	2 The building(s) and the site in context				4	5	6	7
Civil engineering design	3 The external and internal				4	5	6	7
Mechanical, electrical and plumbing services design	4 Building and				4	5	6	7
Fixtures, fittings and equip	5				4	5	6	7
			2	3	4	5	6	7
	., within		2	3	4	5	6	7
	...ance and replacement				4	5	6	7
	...ation of construction and temporary works				4	5		
	10 Lighting arrangement and levels				4	5	6	
	Using the native models or interfacing software, the data within the models should support/enable:							
	A The validation of BREEAM compliance/attainment							
	B The calculation of utility services demand and supply							
	C Acoustic analysis							
	D Thermal analysis							
	E The production of room data sheets							
	F Lighting analysis							
	G Whole life analysis							

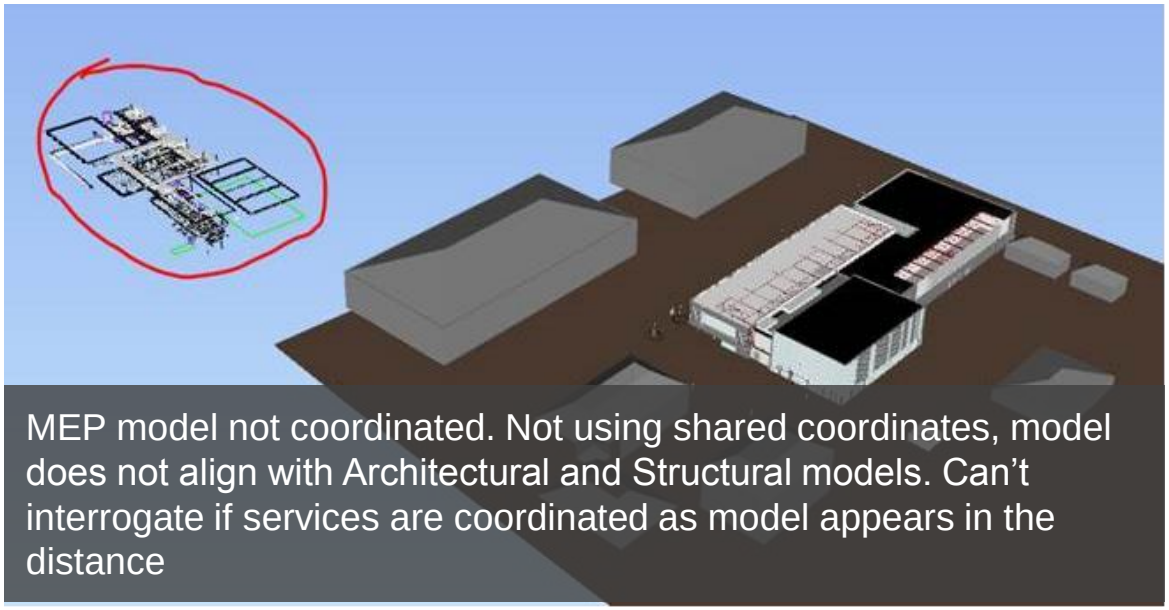
!! LOD number is linked to RIBA Stage !!
+ LOD 7?

Models

Challenges – Coordinates

Example Project

This is a Morgan Sindall BIM project at RIBA Stage 4 which had not employed an Information Manager



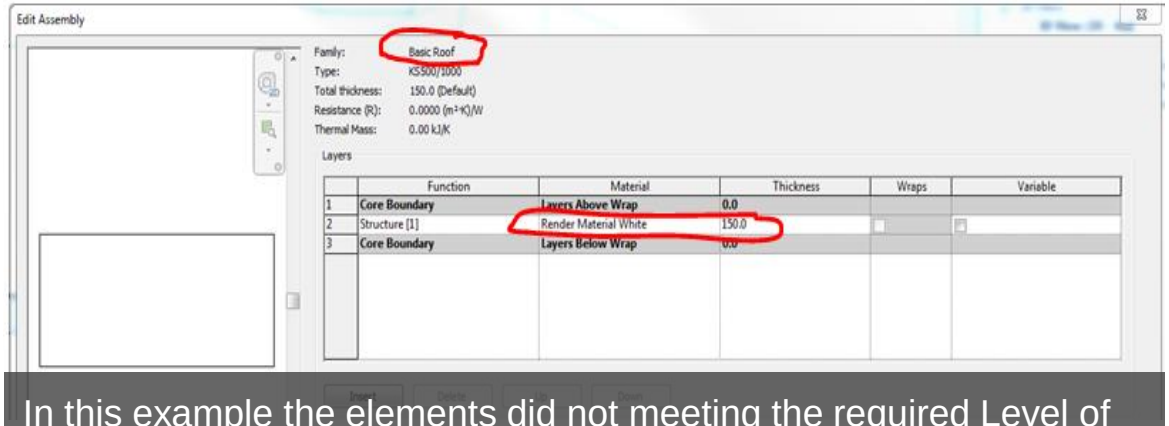
MEP model not coordinated. Not using shared coordinates, model does not align with Architectural and Structural models. Can't interrogate if services are coordinated as model appears in the distance

Models

Challenges – LOD and COBie

Example

This is a Morgan Sindall BIM project at RIBA Stage 4 which had not employed an Information Manager



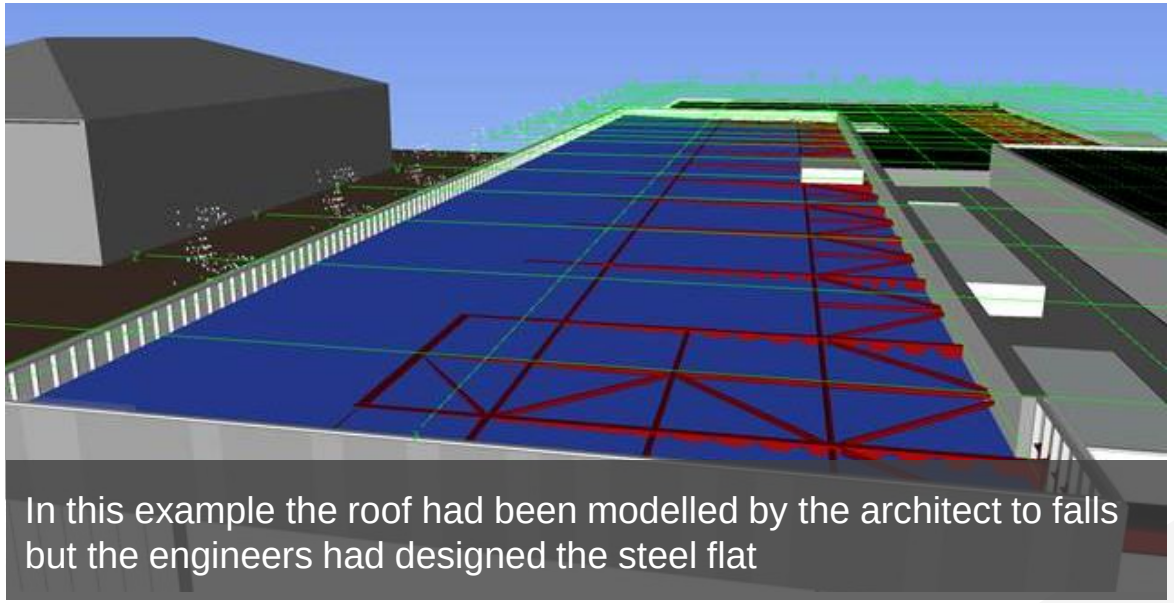
In this example the elements did not meeting the required Level of Detail for the project at Stage 3 e.g. the roof was modelled as 150mm thick render and no COBie data had been provided despite it being a requirement at this design stage

Models

Challenges – Collaboration and Coordination

Example

This is a Morgan Sindall BIM project at RIBA Stage 4 which had not employed an Information Manager



In this example the roof had been modelled by the architect to falls but the engineers had designed the steel flat

Summary

Why a Contractors Information Manager