BM6460 - How to Measure the Impact of Building Information Modelling on Your Business

Andrew Duncan and Graham Aldwinckle

BIM Development Managers, Arup Building Engineering, London UK

ARUP

BM6460 Class summary

Arup has developed a discipline-agnostic tool that seeks to measure just how much a project has used BIM and how successful this has been.

This session will detail why we chose to develop the tool; how it is actually used within the business; and how the data from it is used to focus our research, training, and software investment.

We have a version to share with you too.

Key learning objectives

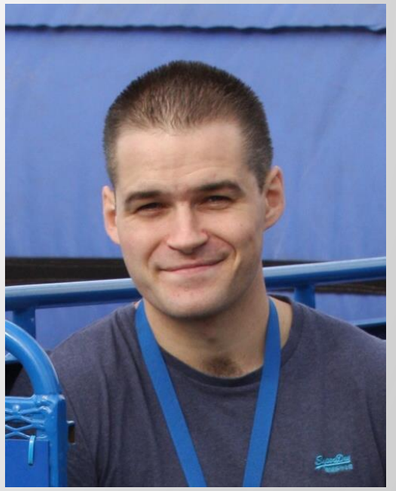
At the end of this class, you will be able to:

- Learn how to measure different aspects of BIM on a project
- Learn how to use data collected from measuring BIM implementation to shape future investment decisions
- Learn how to use data to identify gaps in your enterprise's BIM implementation strategy
- Learn how to benchmark a project's performance against another project's performance

Your presenters today

- Graham Aldwinckle
  - Joined Arup 1994
  - Structural Engineer
  - BIM Development Manager, based in London
  - Projects:
    - High Roller, Las Vegas
    - Bill & Melinda Gates Foundation HQ, Seattle
    - Leadenhall Building, London

- Andrew Duncan
  - Joined Arup 2005
  - MEP Technician
  - BIM Development Manager, based in London
  - Projects:
    - Project Ove
    - Signature Architects



Our Class Today

- **Part 1: The BIM Measurement Tool**
  - Handouts:
    - Guidance notes for end users
    - Guidance notes for company BIM managers
    - The Tool
- **Part 2: The Reporting Tool**
  - Arup's results from individual, diverse projects
  - See Arup's results so far broken down by sector and discipline.
  - No handouts for Part 2 – that's between you and us.

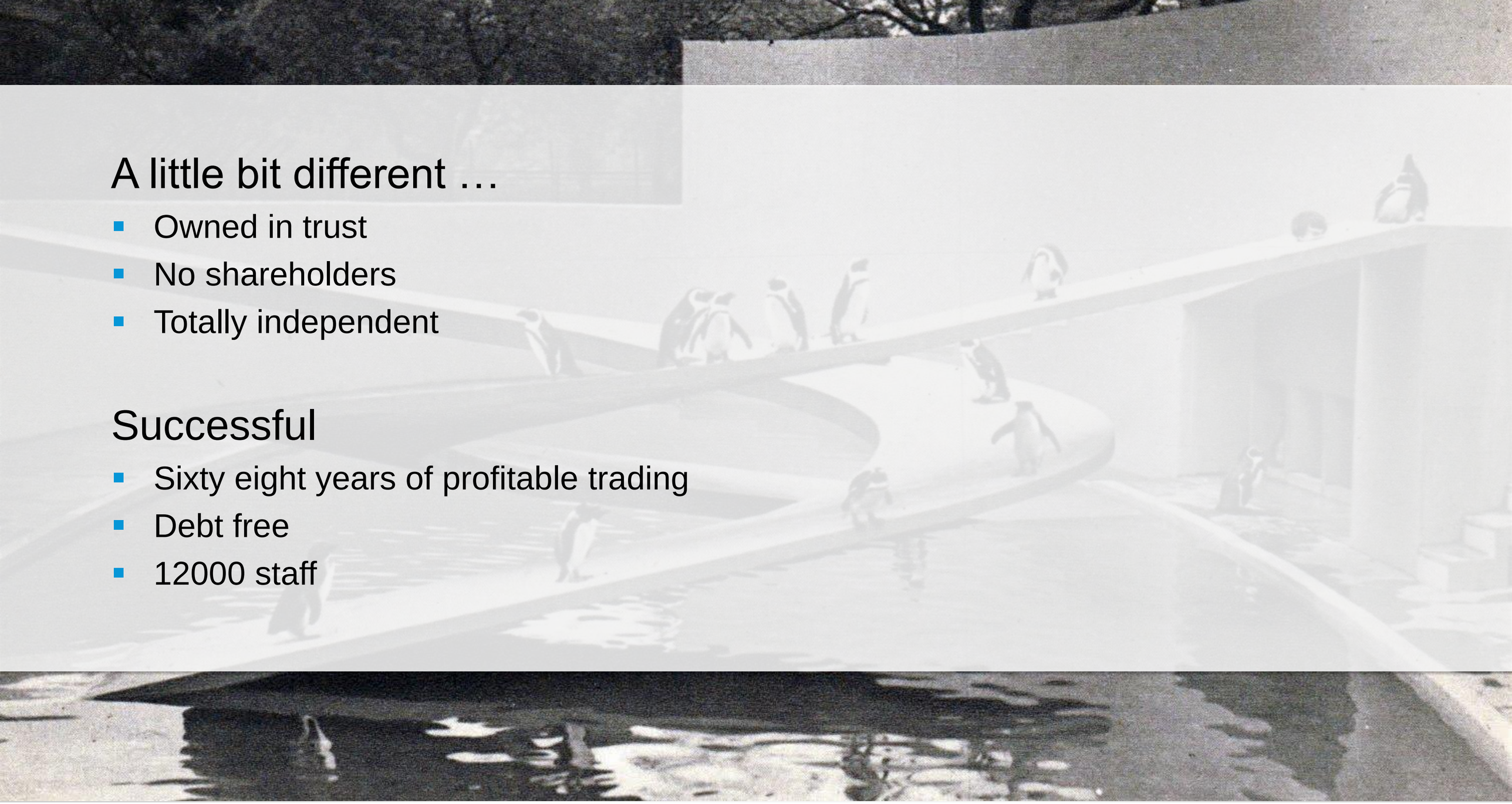
Part 1: The BIM Measurement Tool

Why Measure BIM Maturity?

Why Measure BIM Maturity

- Firstly, understand Arup

* Belfast, Bristol, Cardiff, Edinburgh, Glasgow, Leeds, Liverpool, Manchester, Midlands Campus, Newcastle, Nottingham, Sheffield, Winchester

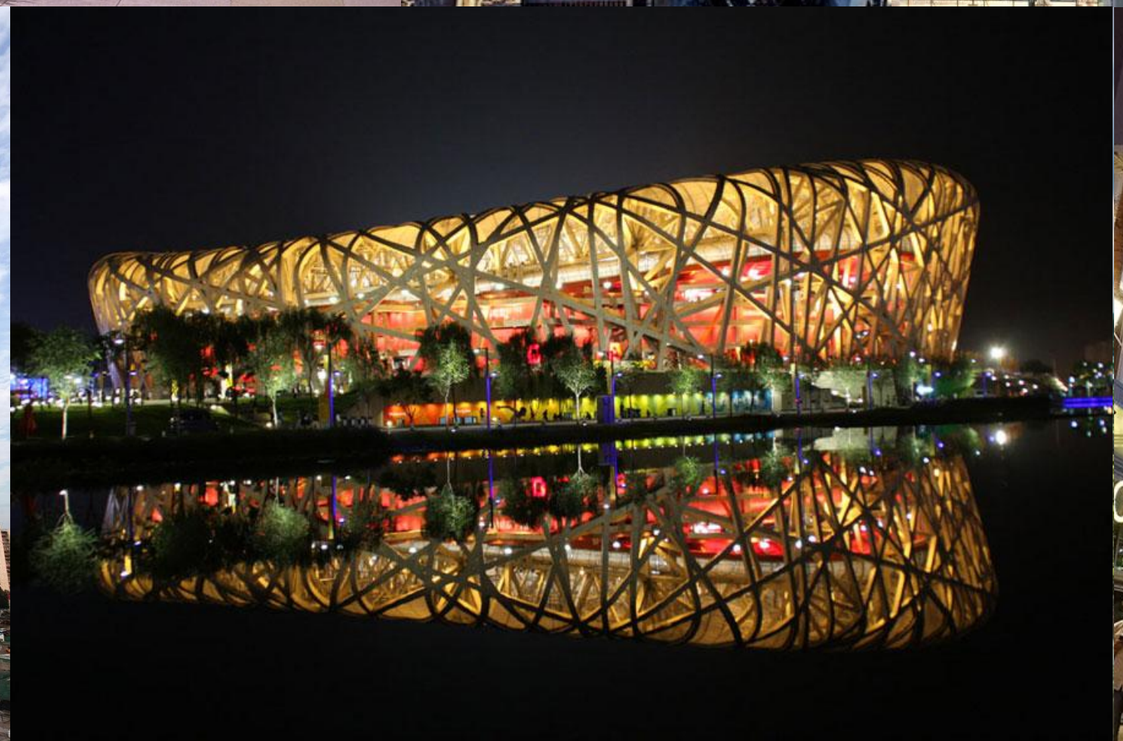


A little bit different …

- Owned in trust
- No shareholders
- Totally independent

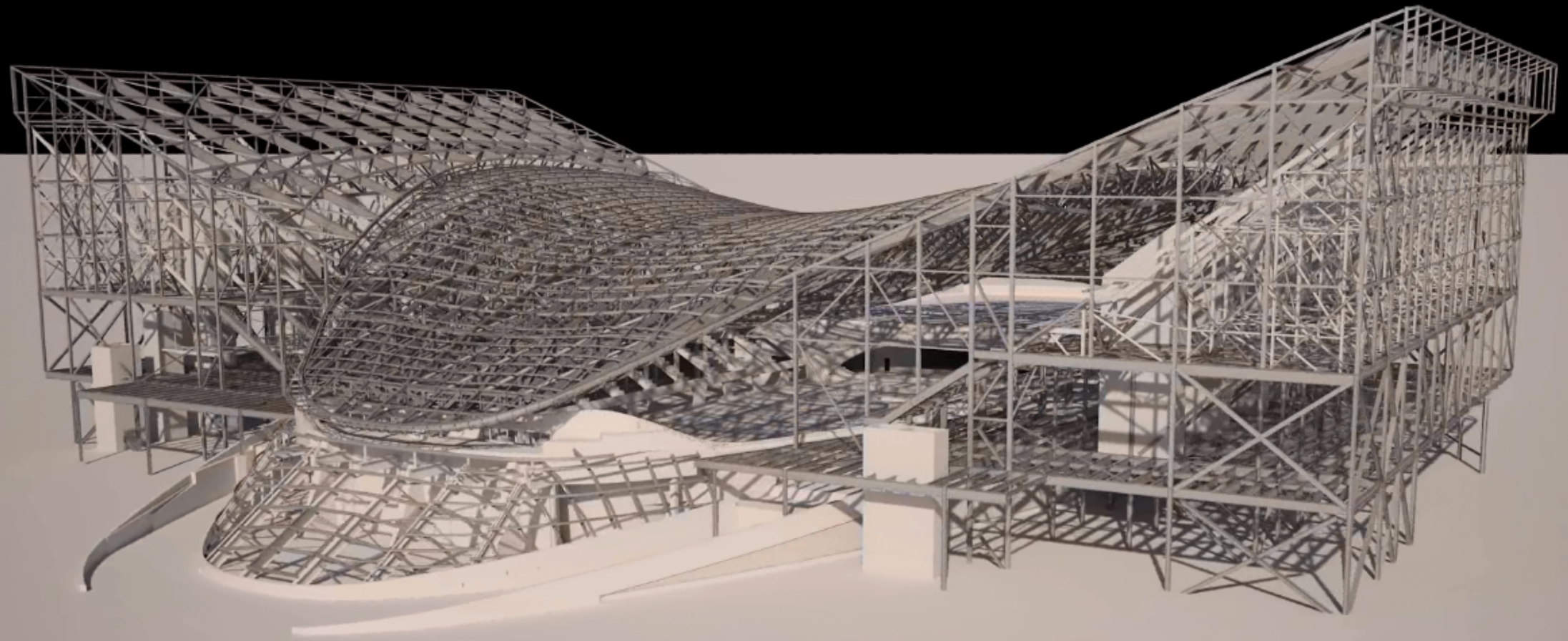
Successful

- Sixty eight years of profitable trading
- Debt free
- 12000 staff



Why Measure BIM Maturity

- Firstly, understand Arup
- Secondly, what actually constitutes BIM?



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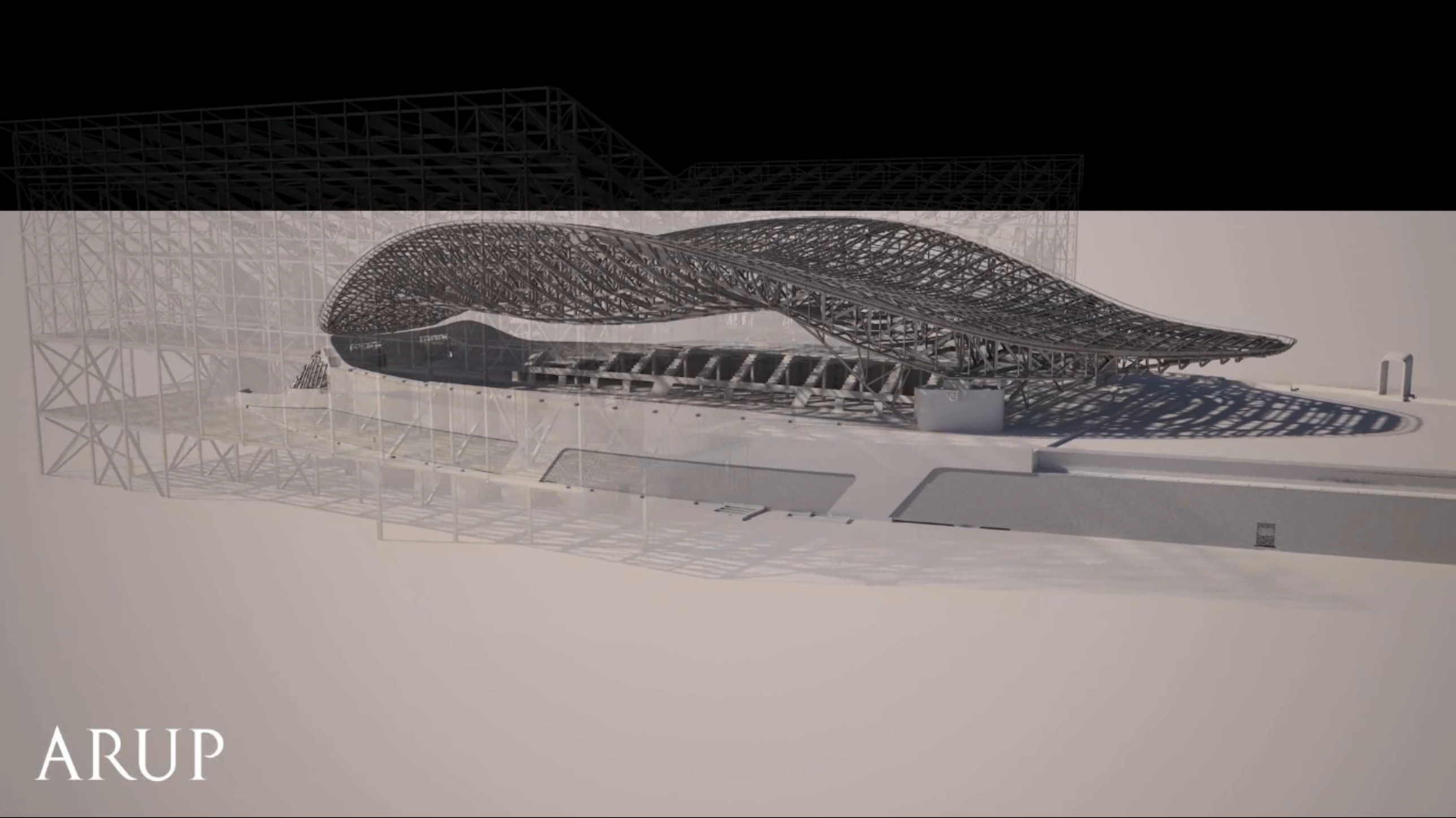

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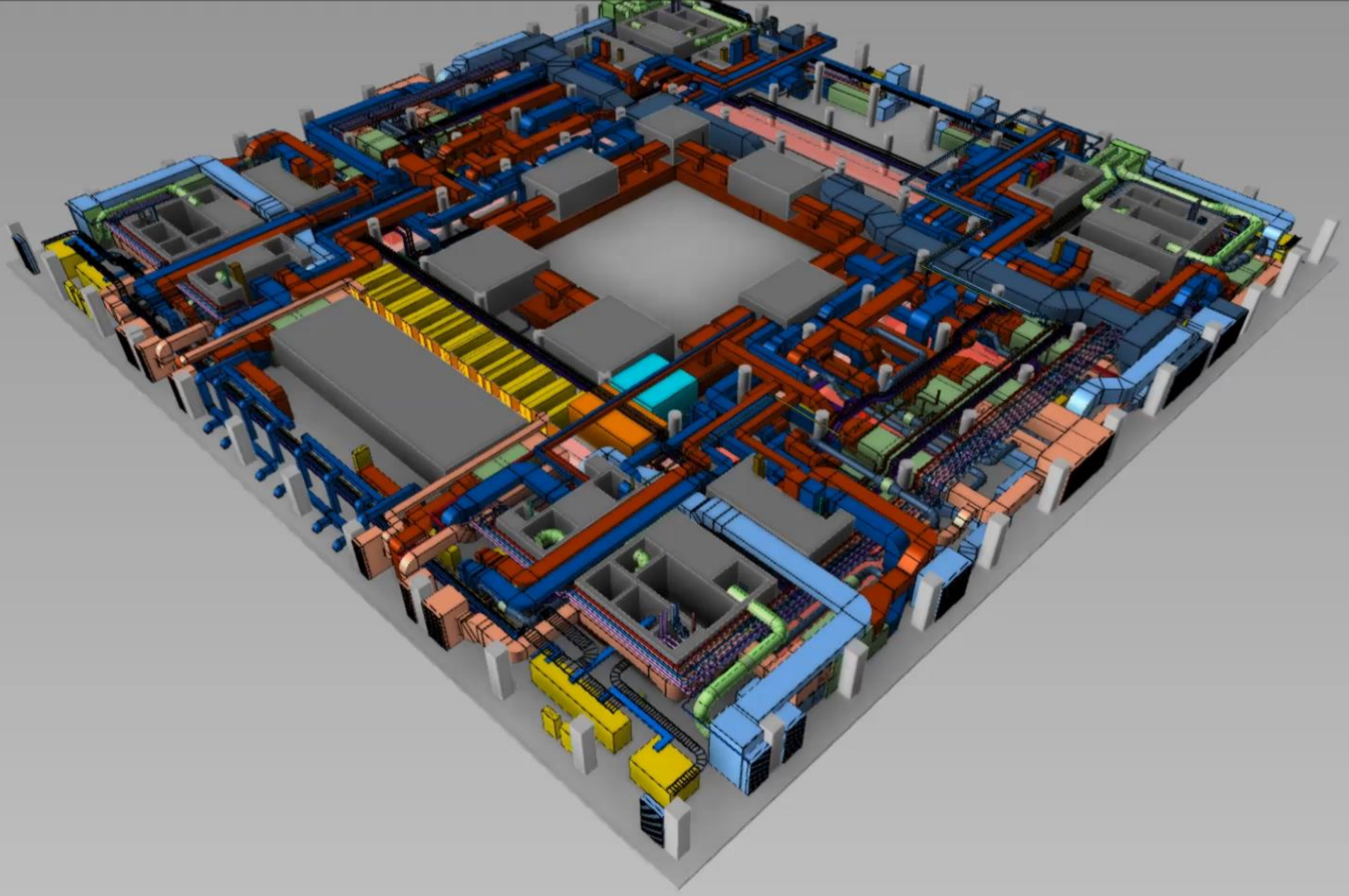

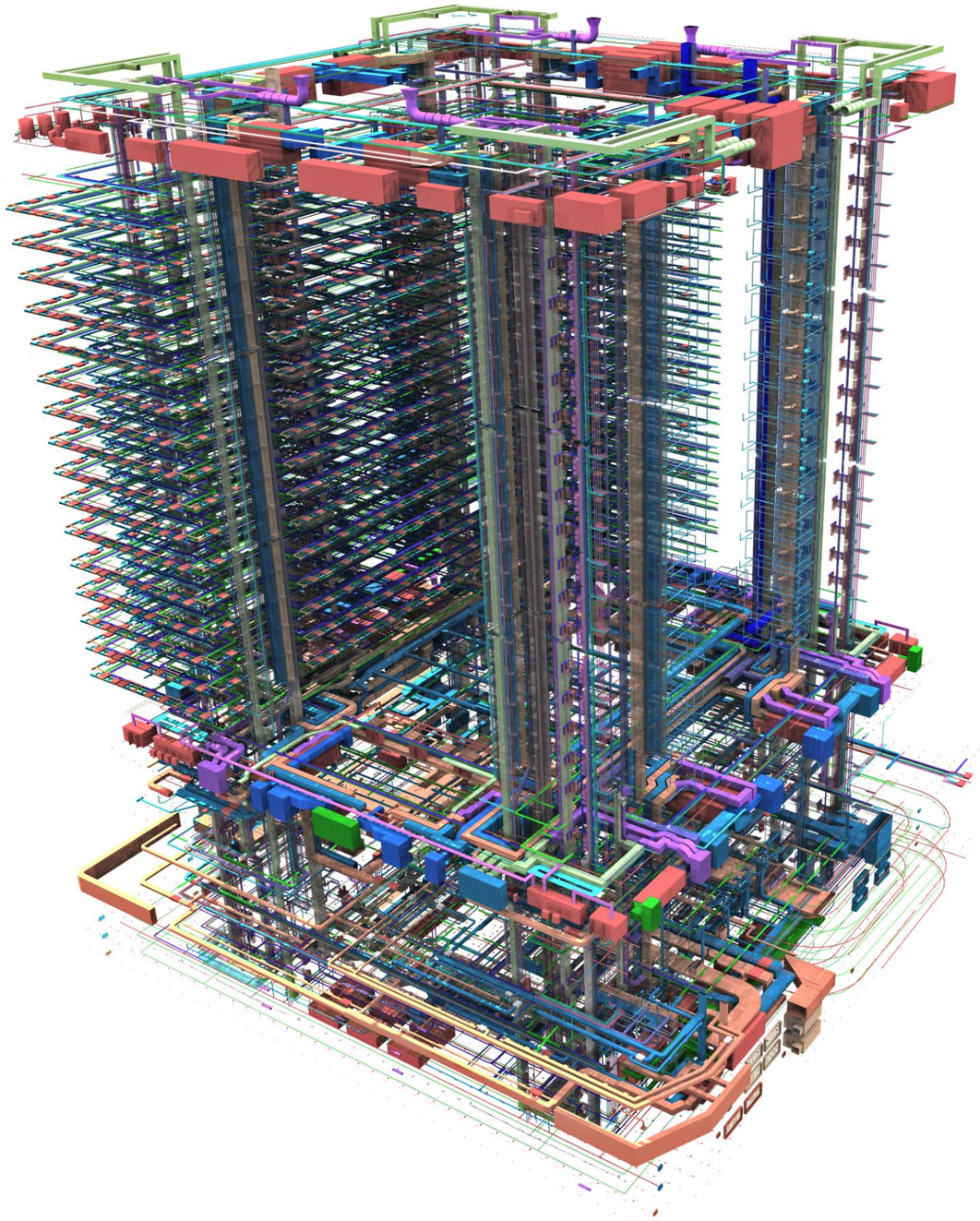


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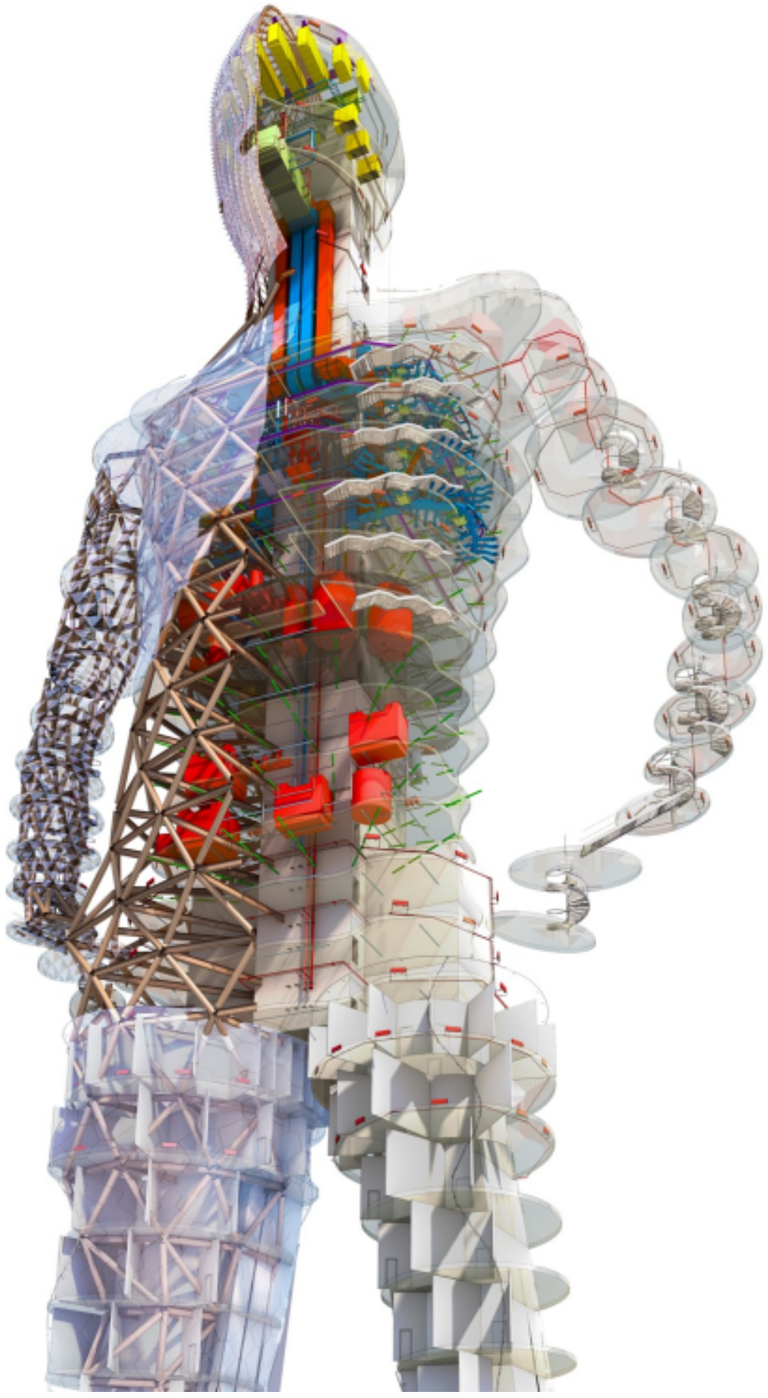
MP2845: Virtually Human:
Modeling the Human Body Inside and Out Using BIM Platforms



Why Measure BIM Maturity

- Firstly, understand Arup
- Secondly, what actually constitutes BIM?
- Thirdly, “BIM Wash”

BIM Wash

- Every company says they have high BIM credentials
- This doesn't help the average project to progress

- We want every project to be a showcase….
- We need to increase the average project's BIM maturity

Why Measure BIM Maturity

- Firstly, understand Arup
- Secondly, what actually constitutes BIM?
- Thirdly, “BIM Wash”
- Lastly, Arup will do BIM on >80% of design projects by April 2015, regardless of any client or government mandate

Arup – We need a better measure.

- More than just 3D – what else are we up to?
- Need for consistency in the message internally and externally
- What is our project-level engagement in BIM?
- Identify and share the successes (and failures!)

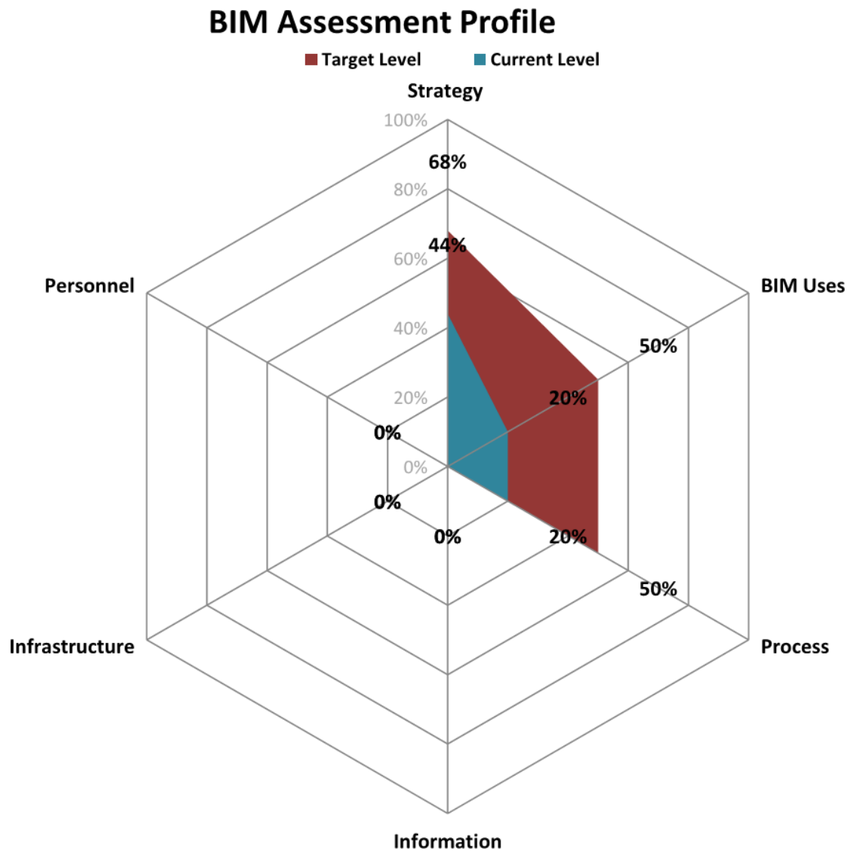
So how do we measure BIM Maturity?

What other tools would help measure this?

Measurement tools

- Penn State University
  - Organisational BIM Maturity

Organizational BIM Assessment Profile			
BIM Planning Element	Current Level	Target Level	Total Possible
Strategy	11	17	25
BIM Uses	2	5	10
Process	2	5	10
Information	0	0	15
Infrastructure	0	0	15
Personnel	0	0	25
Totals	13	22	90



Measurement tools

- Penn State University
  - Organisational BIM Maturity
- US National BIM standard
  - Capability Maturity Model

Tabular BIM Capability Maturity Model 5/4/2012

Maturity Level	A Data Richness	B Life-cycle Views	C Roles Or Disciplines	G Change Management	D Business process	F Timeliness/ Response	E Delivery Method	H Graphical Information	I Spatial Capability	J Information Accuracy	K Interoperability / IFC Support
1	Basic Core Data	No Complete Project Phase	No Single Role Fully Supported	No CM Capability	Separate Processes Not	Most Response Info manually re-	Single Point Access No IA	Primarily Text - No Technical Graphics	Not Spatially Located	No Ground Truth	No Interoperability
2	Expanded Data Set	Planning & Design	Only One Role Supported	Aware of CM	Few Bus Processes Collect Info	Most Response Info manually re-	Single Point Access w/ Limited IA	2D Non-Intelligent As Designed	Basic Spatial Location	Initial Ground Truth	Forced Interoperability
3	Enhanced Data Set	Add Construction/ Supply	Two Roles Partially Supported	Aware of CM and Root Cause Analysis	Some Bus Process Collect Info	Data Calls Not In BIM But Most Other Data Is	Network Access w/ Basic IA	NCS 2D Non-Intelligent As Designed	Spatially Located	Limited Ground Truth - Int Spaces	Limited Interoperability
4	Data Plus Some Information	Includes Construction/ Supply	Two Roles Fully Supported	Aware CM, RCA and Feedback	Most Bus Processes Collect Info	Limited Response Info Available In	Network Access w/ Full IA	NCS 2D Intelligent As Designed	Located w/ Limited Info Sharing	Full Ground Truth - Int Spaces	Limited Info Transfers Between COTS
5	Data Plus Expanded Information	Includes Constr/Supply & Fabrication	Partial Plan, Design&Constr Supported	Implementing CM	All Business Process(BP) Collect Info	Most Response Info Available In	Limited Web Enabled Services	NCS 2D Intelligent As-Builts	Spatially located w/Metadata	Limited Ground Truth - Int & Ext	Most Info Transfers Between COTS
6	Data w/Limited Authoritative Information	Add Limited Operations & Warranty	Plan, Design & Construction Supported	Initial CM process implemented	Few BP Collect & Maintain Info	All Response Info Available In BIM	Full Web Enabled Services	NCS 2D Intelligent And Current	Spatially located w/Full Info Share	Full Ground Truth - Int And Ext	Full Info Transfers Between COTS
7	Data w/ Mostly Authoritative Information	Includes Operations & Warranty	Partial Ops & Sustainment Supported	CM process in place and early implementatio	Some BP Collect & Maintain Info	All Response Info From BIM & Timely	Full Web Enabled Services	3D - Intelligent Graphics	Part of a limited GIS	Limited Comp Areas & Ground	Limited Info Uses IFC's For Interoperability
8	Completely Authoritative Information	Add Financial	Operations & Sustainment Supported	CM and RCA capability implemented	All BP Collect & Maintain Info	Limited Real Time Access From BIM	Web Enabled Services - Secure	3D - Current And Intelligent	Part of a more complete GIS	Full Computed Areas &	Expanded Info Uses IFC's For Interoperability
9	Limited Knowledge Management	Full Facility Life-cycle Collection	All Facility Life-Cycle Roles Supported	Business processes are sustained by CM using RCA and Feedback	Some BP Collect&Main t In Real Time	Full Real Time Access From BIM	Netcentric SOA Based CAC Access	4D - Add Time	Integrated into a complete GIS	Comp GT w/Limited Metrics	Most Info Uses IFC's For Interoperability
10	Full Knowledge Management	Supports External Efforts	Internal and External Roles	Business processes are	All BP Collect&Main	Real Time Access w/ Live	Netcentric SOA Role	nD - Time & Cost	Integrated into GIS w/	Computed Ground Truth	All Info Uses IFC's For Interoperability

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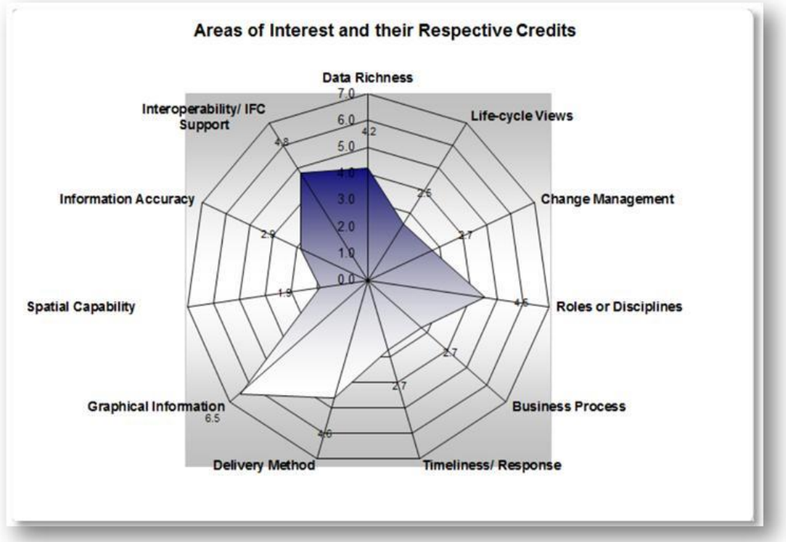
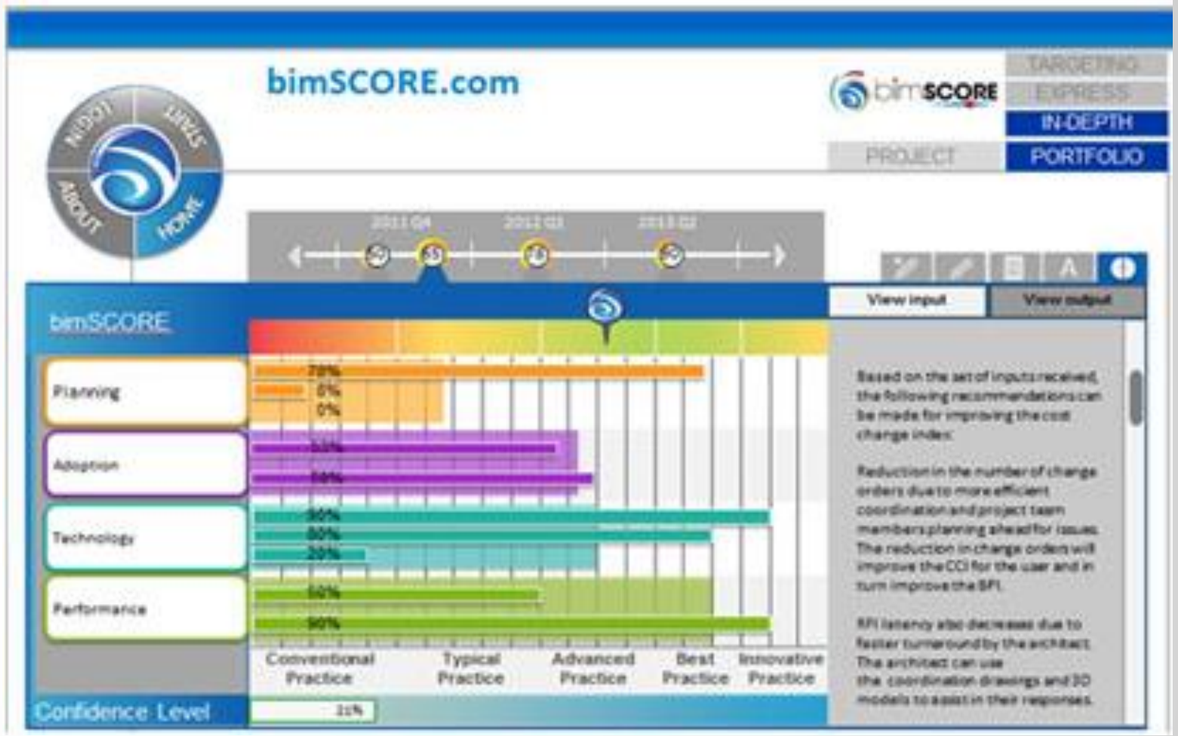


Measurement tools

- Penn State University
  - Organisational BIM Maturity
- US National BIM standard
  - Capability Maturity Model
- Web-based tools ($)
  - www.bimscore.com
  - www.bimexcellence.net



Measurement tools

- Penn State U
  - Organisation
- US National B
  - Capability Ma
- BIMScore
  - www.bimscor
  - www.bimexcellence.net
- Indiana University
  - Proficiency Matrix Spreadsheet

IU BIM Proficiency Matrix

Category / Number	A - Physical Accuracy of Model	B- IPD Methodology	C - Calculation Mentality	D - Location Awareness	E - Content Creation	F - Construction Data	G - As-Built Modeling	H- FM Data Richness
1	Basic Model Geometry A.1	Creation of A BIM Execution Plan B.1	Basic Model Information Export (Discipline) C.1	Site Orientation D.1	Geometrically Correct Content E.1	Quantity Takeoffs F.1	Post Bid Model Documentation G.1	Space Management Data H.1
	Point Achieved 0	Point Achieved 0	Point Achieved 0	Point Achieved 0	Point Achieved 0	Point Achieved 0	Point Achieved 0	Point Achieved 0
2	Design Requirements A.2	Introduction of Structural and MEP Model B.2	IPD Integration C.2	Existing Environment Awareness D.2	Manufacturer's Specific E.2	Object Scheduling F.2	Coordination Modeling G.2	Asset Management H.2
	Point Achieved 0	Point Achieved 0	Point Achieved 0	Point Achieved 0	Point Achieved 0	Point Achieved 0	Point Achieved 0	Point Achieved 0
3	Design Side Collision Detection A.3	Model Managers Role Defined B.3	Interdisciplinary Calculations C.3	Global Accuracy D.3	Design Intent E.3	Material Procurement F.3	Recapturing Design Intent G.3	Manufacturer Specific Information H.3
	Point Achieved 0	Point Achieved 0	Point Achieved 0	Point Achieved 0	Point Achieved 0	Point Achieved 0	Point Achieved 0	Point Achieved 0
4	Model Accuracy Innovation A.4	IPD Methodology Innovation B.4	Calculations Innovation C.4	Location Innovation D.4	Content Innovation E.4	Construction Innovation F.4	As-Built Innovation G.4	FM Data Innovation H.4
	Point Achieved 0	Point Achieved 0	Point Achieved 0	Point Achieved 0	Point Achieved 0	Point Achieved 0	Point Achieved 0	Point Achieved 0

BIM Maturity

Category	Points Achieved	BIM Maturity Score	BIM Standard		
A - Physical Accuracy of Model	0	0	BIM Score Between 0-12	=	Working Towards BIM
B- IPD Methodology	0		BIM Score Between 13-18	=	Certified BIM
C - Calculation Mentality	0		BIM Score Between 19-24	=	Silver
D - Location Awareness	0		BIM Score Between 25-28	=	Gold
E - Content Creation	0		BIM Score Between 29-32	=	Ideal
F - Construction Data	0				
G - As-Built Modeling	0				
H- FM Data Richness	0				

Why did Arup want something else?

Measurement tools

- Other Measurement tools are broadly:
  - High-level overview
  - Typically only filled in for high-achieving projects
  - Subjective – less easy to compare projects
- Arup wanted a tool that would:
  - Allow comparisons across all projects quickly
  - Help to identify trends or training needs
  - Be quick to fill out

Introducing the Arup BIM Maturity Measure

Introducing the *BIM Maturity Measure (BIMmm)*

- Comprehensive
- Project level interrogation
- User-friendly
- Multiple-choice responses
- Objective
- Collatable
- Shareable

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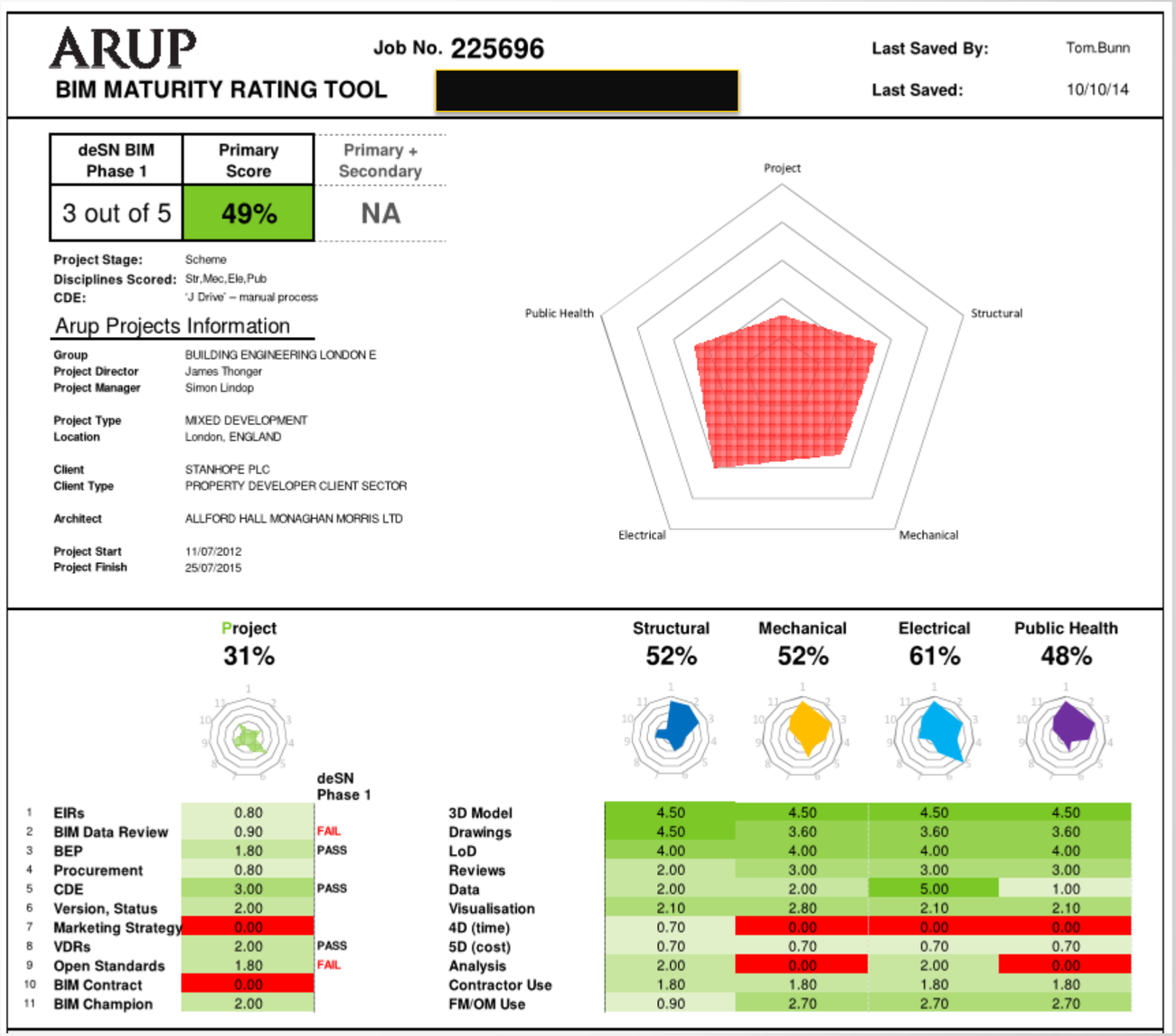

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BIM MATURITY RATING TOOL

Job No. 225696

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Last Saved By: Tom.Bunn

Last Saved: 10/10/14

deSN BIM Phase 1	Primary Score	Primary + Secondary
3 out of 5	49%	NA

Project Stage: Scheme
Disciplines Scored: Str,Mec,Ele,Pub
CDE: 'J Drive' – manual process

Arup Projects Information

Group: BUILDING ENGINEERING LONDON E
Project Director: James Thonger
Project Manager: Simon Lindop

Project Type: MIXED DEVELOPMENT
Location: London, ENGLAND

Client: STANHOPE PLC
Client Type: PROPERTY DEVELOPER CLIENT SECTOR

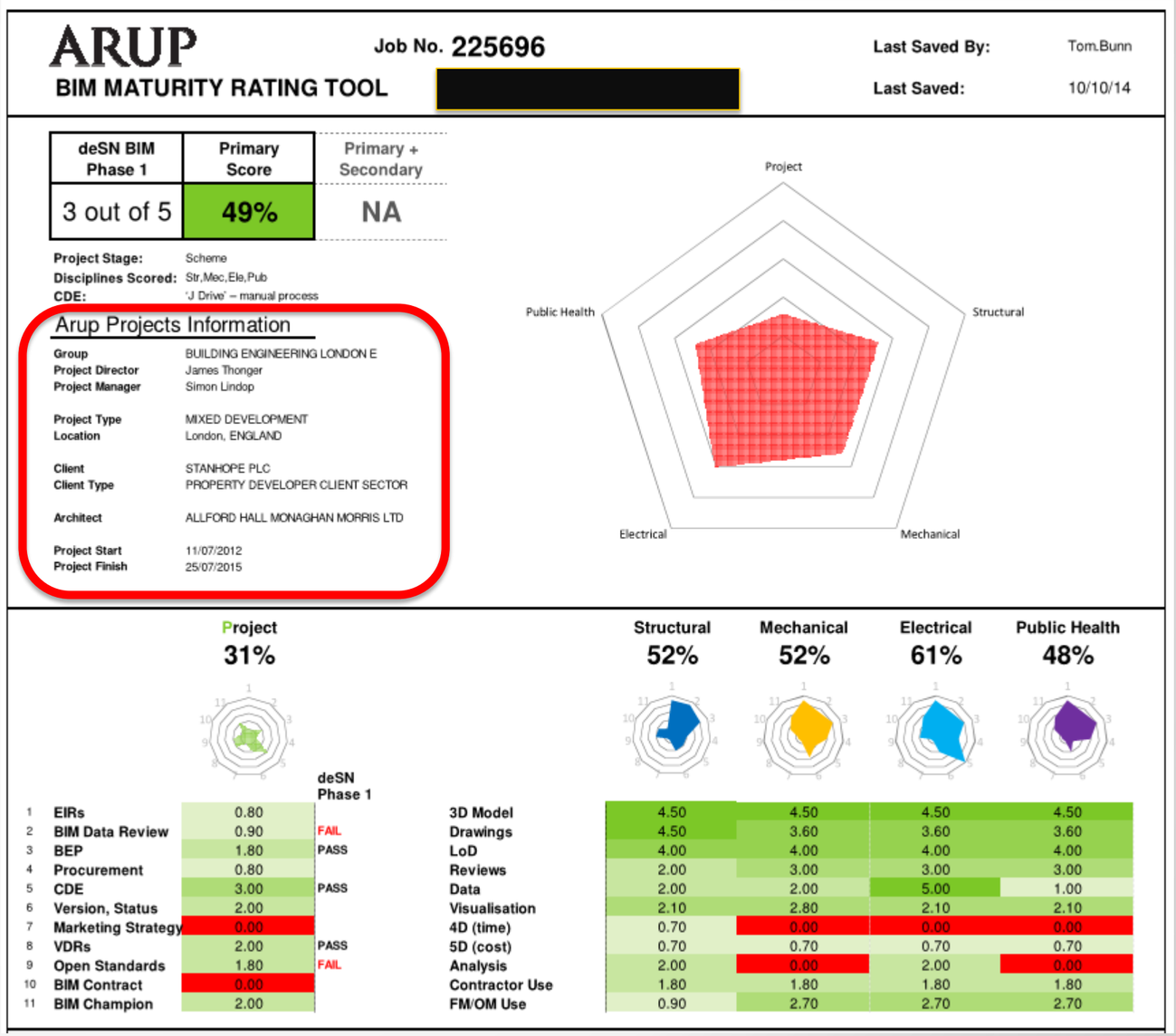
Architect: ALLFORD HALL MONAGHAN MORRIS LTD

Project Start: 11/07/2012
Project Finish: 25/07/2015

	Project 31%	deSN Phase 1		Structural 52%	Mechanical 52%	Electrical 61%	Public Health 48%
1	EIRs	0.80		3D Model	4.50	4.50	4.50	4.50
2	BIM Data Review	0.90	FAIL	Drawings	4.50	3.60	3.60	3.60
3	BEP	1.80	PASS	LoD	4.00	4.00	4.00	4.00
4	Procurement	0.80		Reviews	2.00	3.00	3.00	3.00
5	CDE	3.00	PASS	Data	2.00	2.00	5.00	1.00
6	Version, Status	2.00		Visualisation	2.10	2.80	2.10	2.10
7	Marketing Strategy	0.00		4D (time)	0.70	0.00	0.00	0.00
8	VDRs	2.00	PASS	5D (cost)	0.70	0.70	0.70	0.70
9	Open Standards	1.80	FAIL	Analysis	2.00	0.00	2.00	0.00
10	BIM Contract	0.00		Contractor Use	1.80	1.80	1.80	1.80
11	BIM Champion	2.00		FM/OM Use	0.90	2.70	2.70	2.70

Introducing the *BIM Maturity Measure (BIMmm)*

- Features:
  - Project information directly filled in



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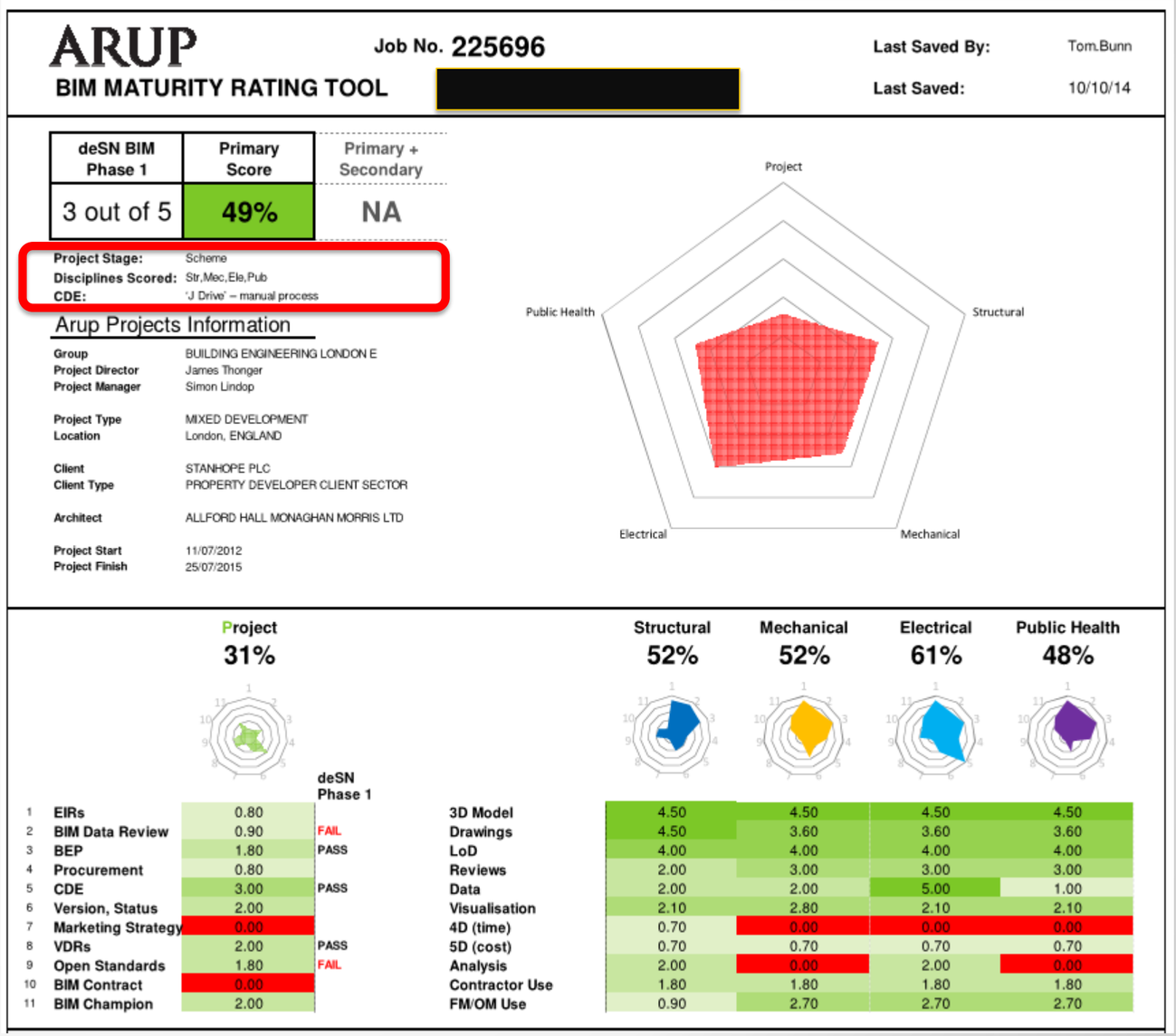
- Features:
  - Project information directly filled in
  - Tracks:
    - Project stage
    - Disciplines scored
    - Extranet/CDE used



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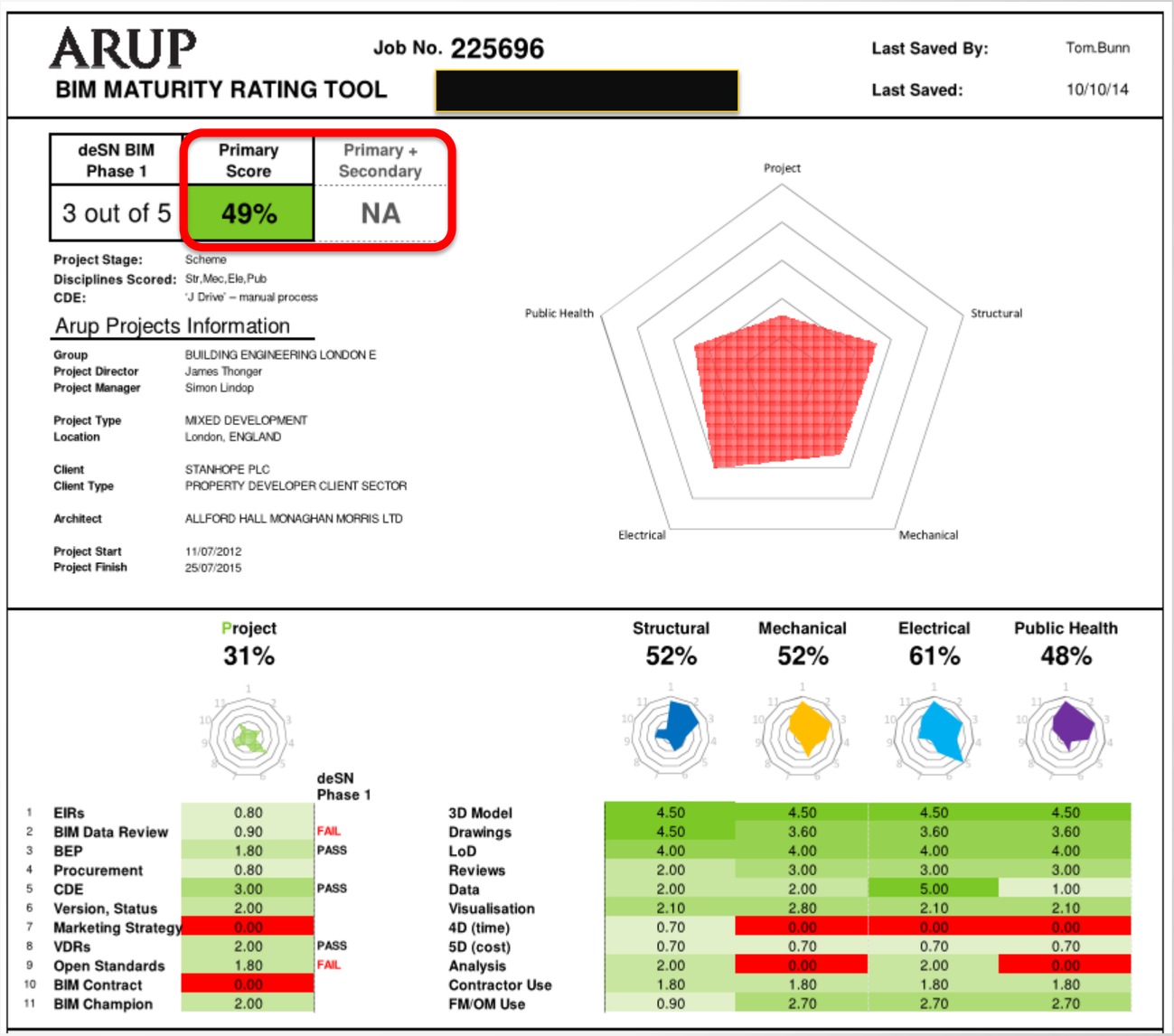
- Features:
  - Project information directly filled in
  - Tracks:
    - Project stage
    - Disciplines scored
    - Extranet/CDE used
  - Scores:
    - Primary BIM Disciplines
    - Primary + Secondary



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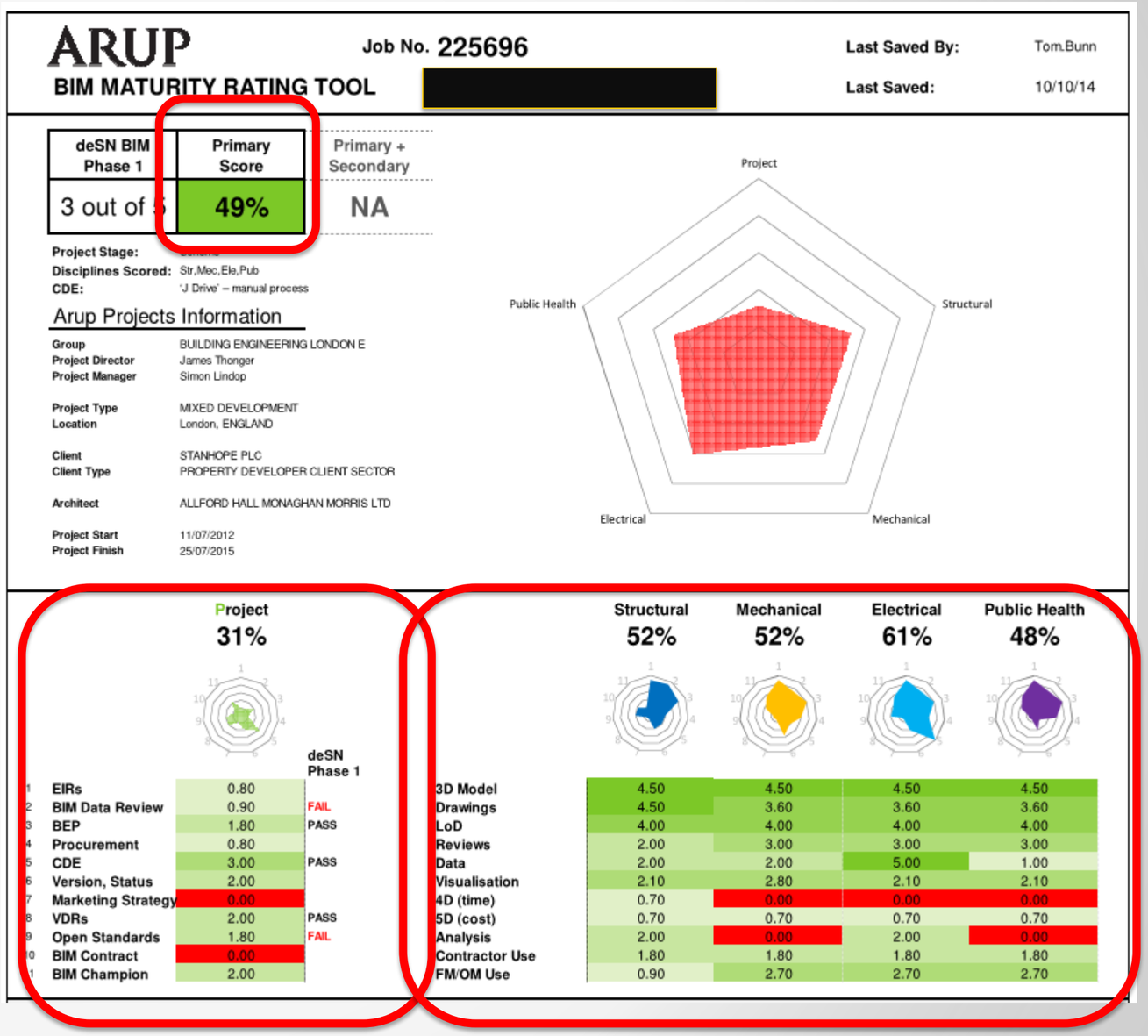
Introducing the *BIM Maturity Measure (BIMmm)*

- Features:
  - Primary Scores based on
    - Project Information Management
    - Up to 4 ‘Primary’ Disciplines (eg: SMEP)



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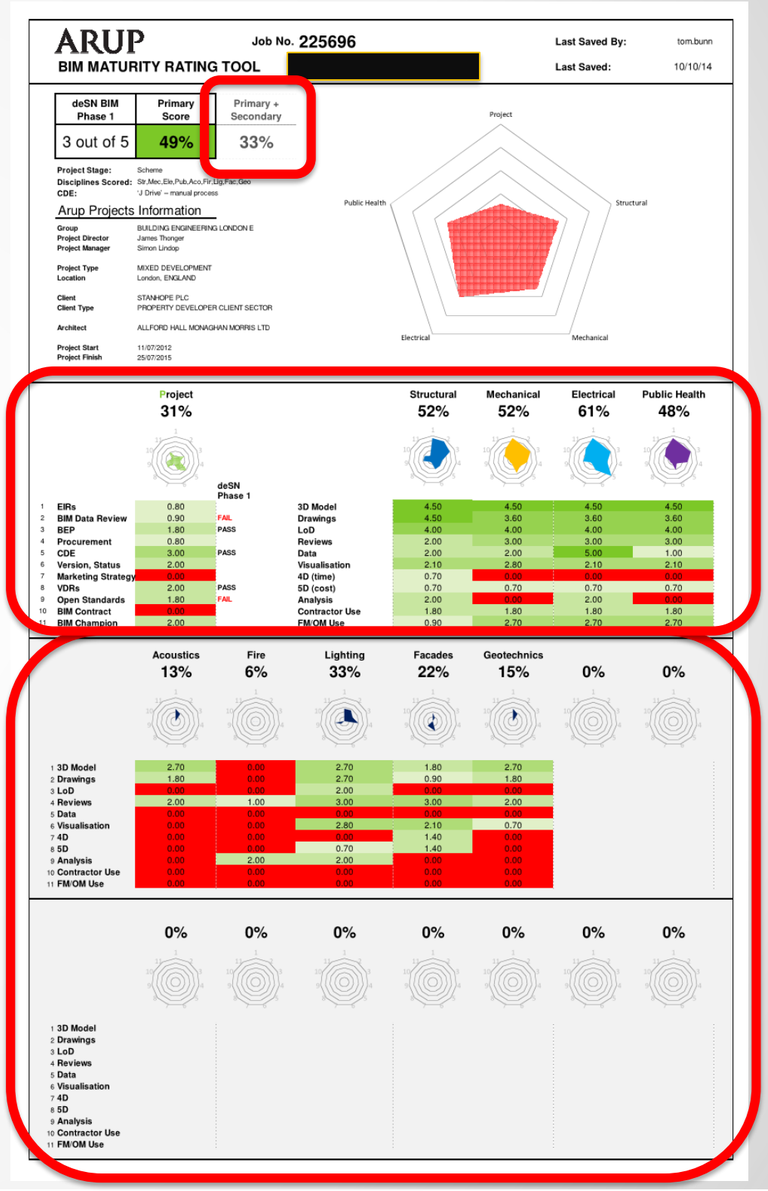
Project 31%

	deSN Phase 1	
1 EIRs	0.80	
2 BIM Data Review	0.90	FAIL
3 BEP	1.80	PASS
4 Procurement	0.80	
5 CDE	3.00	PASS
6 Version, Status	2.00	
7 Marketing Strategy	0.00	
8 VDRs	2.00	PASS
9 Open Standards	1.80	FAIL
10 BIM Contract	0.00	
11 BIM Champion	2.00	

	Structural 52%	Mechanical 52%	Electrical 61%	Public Health 48%
3D Model	4.50	4.50	4.50	4.50
Drawings	4.50	3.60	3.60	3.60
LoD	4.00	4.00	4.00	4.00
Reviews	2.00	3.00	3.00	3.00
Data	2.00	2.00	5.00	1.00
Visualisation	2.10	2.80	2.10	2.10
4D (time)	0.70	0.00	0.00	0.00
5D (cost)	0.70	0.70	0.70	0.70
Analysis	2.00	0.00	2.00	0.00
Contractor Use	1.80	1.80	1.80	1.80
FM/OM Use	0.90	2.70	2.70	2.70

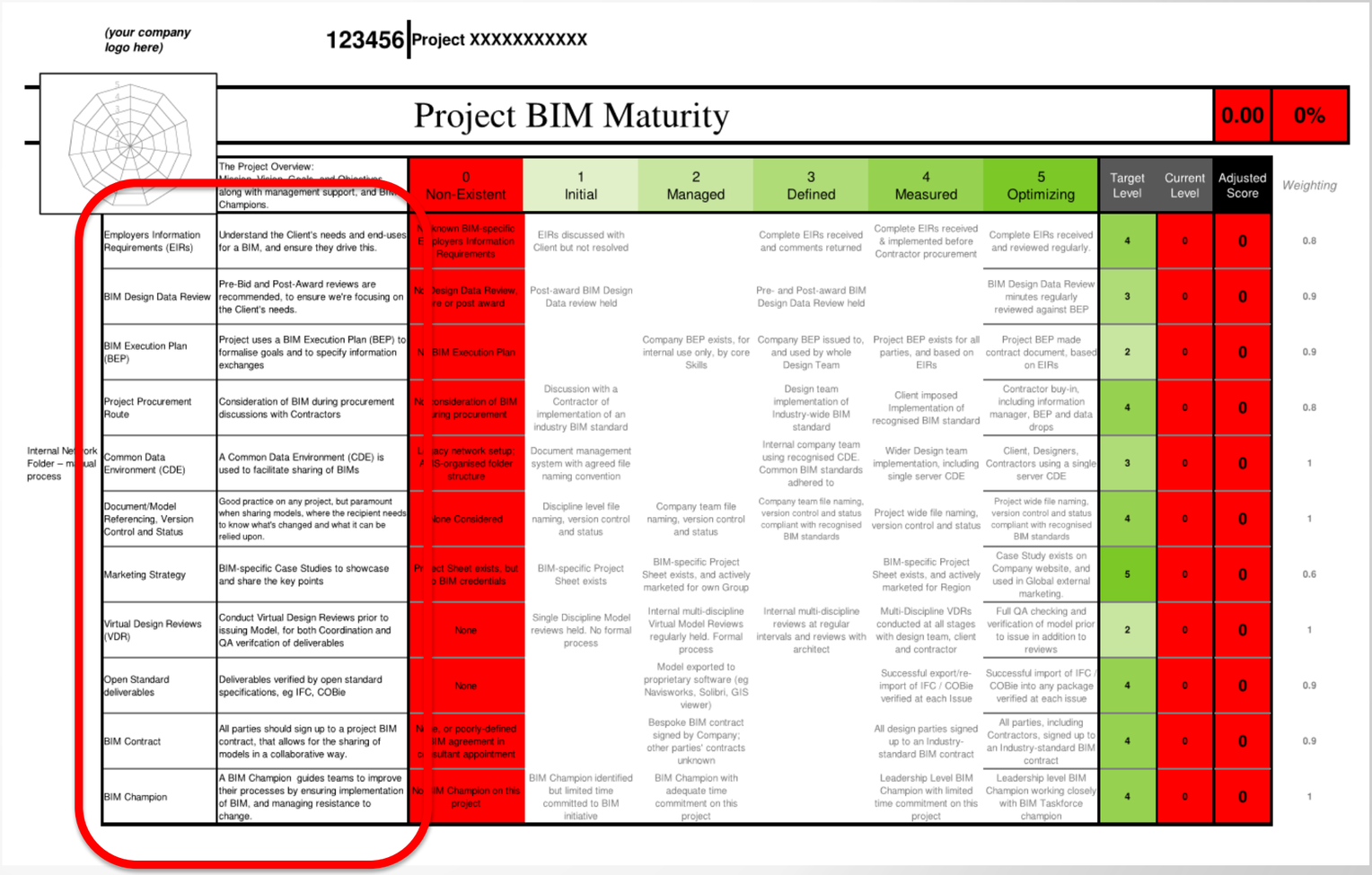
Introducing the *BIM Maturity Measure (BIMmm)*

- Features:
  - Primary + Secondary
    Scores based on
    - Project Information Management
    - Up to 4 ‘Primary’ Disciplines (eg: SMEP)
    - Plus:
      Up to 21 ‘Secondary’ Disciplines, eg Lighting



BIM Maturity Measure

- Project Information Management
  - 11 questions



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123456 Project XXXXXXXXXX

Project BIM Maturity

0.00 **0%**

		0 Non-Existent	1 Initial	2 Managed	3 Defined	4 Measured	5 Optimizing	Target Level	Current Level	Adjusted Score	*Weighting*
	The Project Overview: Mission, Vision, Goals and Objectives along with management support, and BIM Champions.										
Employers Information Requirements (EIRs)	Understand the Client's needs and end-uses for a BIM, and ensure they drive this.	known BIM-specific ployers Information Requirements	EIRs discussed with Client but not resolved		Complete EIRs received and comments returned	Complete EIRs received & implemented before Contractor procurement	Complete EIRs received and reviewed regularly.	4	0	0	0.8
BIM Design Data Review	Pre-Bid and Post-Award reviews are recommended, to ensure we're focusing on the Client's needs.	esign Data Review; re or post award	Post-award BIM Design Data review held		Pre- and Post-award BIM Design Data Review held		BIM Design Data Review minutes regularly reviewed against BEP	3	0	0	0.9
BIM Execution Plan (BEP)	Project uses a BIM Execution Plan (BEP) to formalise goals and to specify information exchanges	BIM Execution Plan		Company BEP exists, for internal use only, by core Skills	Company BEP issued to, and used by whole Design Team	Project BEP exists for all parties, and based on EIRs	Project BEP made contract document, based on EIRs	2	0	0	0.9
Project Procurement Route	Consideration of BIM during procurement discussions with Contractors	onsideration of BIM uring procurement	Discussion with a Contractor of implementation of an industry BIM standard		Design team implementation of Industry-wide BIM standard	Client imposed Implementation of recognised BIM standard	Contractor buy-in, including information manager, BEP and data drops	4	0	0	0.8
Common Data Environment (CDE)	A Common Data Environment (CDE) is used to facilitate sharing of BIMs	acy network setup; S-organised folder structure	Document management system with agreed file naming convention		Internal company team using recognised CDE. Common BIM standards adhered to	Wider Design team implementation, including single server CDE	Client, Designers, Contractors using a single server CDE	3	0	0	1
Document/Model Referencing, Version Control and Status	Good practice on any project, but paramount when sharing models, where the recipient needs to know what's changed and what it can be relied upon.	None Considered	Discipline level file naming, version control and status	Company team file naming, version control and status	Company team file naming, version control and status compliant with recognised BIM standards	Project wide file naming, version control and status	Project wide file naming, version control and status compliant with recognised BIM standards	4	0	0	1
Marketing Strategy	BIM-specific Case Studies to showcase and share the key points	ct Sheet exists, but BIM credentials	BIM-specific Project Sheet exists	BIM-specific Project Sheet exists, and actively marketed for own Group		BIM-specific Project Sheet exists, and actively marketed for Region	Case Study exists on Company website, and used in Global external marketing.	5	0	0	0.6
Virtual Design Reviews (VDR)	Conduct Virtual Design Reviews prior to issuing Model, for both Coordination and QA verifcation of deliverables	None	Single Discipline Model reviews held. No formal process	Internal multi-discipline Virtual Model Reviews regularly held. Formal process	Internal multi-discipline reviews at regular intervals and reviews with architect	Multi-Discipline VDRs conducted at all stages with design team, client and contractor	Full QA checking and verification of model prior to issue in addition to reviews	2	0	0	1
Open Standard deliverables	Deliverables verified by open standard specifications, eg IFC, COBie	None		Model exported to proprietary software (eg Navisworks, Solibri, GIS viewer)		Successful export/re-import of IFC / COBie verified at each Issue	Successful import of IFC / COBie into any package verified at each issue	4	0	0	0.9
BIM Contract	All parties should sign up to a project BIM contract, that allows for the sharing of models in a collaborative way.	e, or poorly-defined IM agreement in sultant appointment		Bespoke BIM contract signed by Company; other parties' contracts unknown		All design parties signed up to an Industry-standard BIM contract	All parties, including Contractors, signed up to an Industry-standard BIM contract	4	0	0	0.9
BIM Champion	A BIM Champion guides teams to improve their processes by ensuring implementation of BIM, and managing resistance to change.	IM Champion on this project	BIM Champion identified but limited time committed to BIM initiative	BIM Champion with adequate time commitment on this project		Leadership Level BIM Champion with limited time commitment on this project	Leadership level BIM Champion working closely with BIM Taskforce champion	4	0	0	1

Internal Network Folder – manual process

BIM Maturity Measure

- Project Information Management
  - 11 questions
  - 6 possible responses

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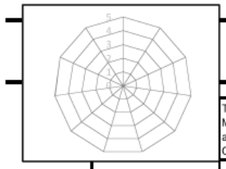

Project BIM Maturity

0.00 **0%**

		The Project Overview: Mission, Vision, Goals, and Objectives, along with management support, and BIM Champions.	0 Non-Existent	1 Initial	2 Managed	3 Defined	4 Measured	5 Optimizing	Target Level	Current Level	Adjusted Score	*Weighting*
Internal Network Folder – manual process	Employers Information Requirements (EIRs)	Understand the Client's needs and en uses for a BIM, and ensure they drive this.	No known BIM-specific Employers Information Requirements	EIRs discussed with Client but not resolved		Complete EIRs received and comments returned	Complete EIRs received & implemented before Contractor procurement	Complete EIRs received and reviewed regularly.	4	0	0	0.8
	BIM Design Data Review	Pre-Bid and Post-Award reviews are recommended, to ensure we're focus g on the Client's needs.	No Design Data Review, pre or post award	Post-award BIM Design Data review held		Pre- and Post-award BIM Design Data Review held		BIM Design Data Review minutes regularly reviewed against BEP	3	0	0	0.9
	BIM Execution Plan (BEP)	Project uses a BIM Execution Plan (B P) to formalise goals and to specify inform on exchanges	No BIM Execution Plan		Company BEP exists, for internal use only, by core Skills	Company BEP issued to, and used by whole Design Team	Project BEP exists for all parties, and based on EIRs	Project BEP made contract document, based on EIRs	2	0	0	0.9
	Project Procurement Route	Consideration of BIM during procure nt discussions with Contractors	No consideration of BIM during procurement	Discussion with a Contractor of implementation of an industry BIM standard		Design team implementation of Industry-wide BIM standard	Client imposed Implementation of recognised BIM standard	Contractor buy-in, including information manager, BEP and data drops	4	0	0	0.8
	Common Data Environment (CDE)	A Common Data Environment (CDE) used to facilitate sharing of BIMs	Legacy network setup; AMS-organised folder structure	Document management system with agreed file naming convention		Internal company team using recognised CDE. Common BIM standards adhered to	Wider Design team implementation, including single server CDE	Client, Designers, Contractors using a single server CDE	3	0	0	1
	Document/Model Referencing, Version Control and Status	Good practice on any project, but param nt when sharing models, where the recipien needs to know what's changed and what it can relied upon.	None Considered	Discipline level file naming, version control and status	Company team file naming, version control and status	Company team file naming, version control and status compliant with recognised BIM standards	Project wide file naming, version control and status	Project wide file naming, version control and status compliant with recognised BIM standards	4	0	0	1
	Marketing Strategy	BIM-specific Case Studies to showca and share the key points	Project Sheet exists, but no BIM credentials	BIM-specific Project Sheet exists	BIM-specific Project Sheet exists, and actively marketed for own Group		BIM-specific Project Sheet exists, and actively marketed for Region	Case Study exists on Company website, and used in Global external marketing.	5	0	0	0.6
	Virtual Design Reviews (VDR)	Conduct Virtual Design Reviews prior issuing Model, for both Coordination a d QA verifcation of deliverables	None	Single Discipline Model reviews held. No formal process	Internal multi-discipline Virtual Model Reviews regularly held. Formal process	Internal multi-discipline reviews at regular intervals and reviews with architect	Multi-Discipline VDRs conducted at all stages with design team, client and contractor	Full QA checking and verification of model prior to issue in addition to reviews	2	0	0	1
	Open Standard deliverables	Deliverables verified by open standar specifications, eg IFC, COBie	None		Model exported to proprietary software (eg Navisworks, Solibri, GIS viewer)		Successful export/re-import of IFC / COBie verified at each Issue	Successful import of IFC / COBie into any package verified at each issue	4	0	0	0.9
	BIM Contract	All parties should sign up to a project IM contract, that allows for the sharing o models in a collaborative way.	None, or poorly-defined BIM agreement in consultant appointment		Bespoke BIM contract signed by Company; other parties' contracts unknown		All design parties signed up to an Industry-standard BIM contract	All parties, including Contractors, signed up to an Industry-standard BIM contract	4	0	0	0.9
	BIM Champion	A BIM Champion guides teams to imp ve their processes by ensuring implementa n of BIM, and managing resistance to change.	No BIM Champion on this project	BIM Champion identified but limited time committed to BIM initiative	BIM Champion with adequate time commitment on this project		Leadership Level BIM Champion with limited time commitment on this project	Leadership level BIM Champion working closely with BIM Taskforce champion	4	0	0	1

BIM Maturity Measure

- Project Information Management
  - 11 questions
  - 6 possible responses
  - Suggested Target

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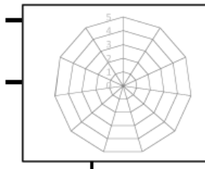

Project BIM Maturity

0.00 **0%**

		The Project Overview: Mission, Vision, Goals, and Objectives, along with management support, and BIM Champions.	0 Non-Existent	1 Initial	2 Managed	3 Defined	4 Measured	5 Optimizing	Target Level	Current Level	Adjusted Score	Weighting
Internal Network Folder – manual process	Employers Information Requirements (EIRs)	Understand the Client's needs and end-uses for a BIM, and ensure they drive this.	No known BIM-specific Employers Information Requirements	EIRs discussed with Client but not resolved		Complete EIRs received and comments returned	Complete EIRs received & implemented before Contractor procurement	Complete EIRs received and reviewed regularly.	4	0	0	0.8
	BIM Design Data Review	Pre-Bid and Post-Award reviews are recommended, to ensure we're focusing on the Client's needs.	No Design Data Review, pre or post award	Post-award BIM Design Data review held		Pre- and Post-award BIM Design Data Review held		BIM Design Data Review minutes regularly reviewed against BEP	3	0	0	0.9
	BIM Execution Plan (BEP)	Project uses a BIM Execution Plan (BEP) to formalise goals and to specify information exchanges	No BIM Execution Plan		Company BEP exists, for internal use only, by core Skills	Company BEP issued to, and used by whole Design Team	Project BEP exists for all parties, and based on EIRs	Project BEP made contract document, based on EIRs	2	0	0	0.9
	Project Procurement Route	Consideration of BIM during procurement discussions with Contractors	No consideration of BIM during procurement	Discussion with a Contractor of implementation of an industry BIM standard		Design team implementation of Industry-wide BIM standard	Client imposed Implementation of recognised BIM standard	Contractor buy-in, including information manager, BEP and data drops	4	0	0	0.8
	Common Data Environment (CDE)	A Common Data Environment (CDE) is used to facilitate sharing of BIMs	Legacy network setup; AMS-organised folder structure	Document management system with agreed file naming convention		Internal company team using recognised CDE. Common BIM standards adhered to	Wider Design team implementation, including single server CDE	Client, Designers, Contractors using single server CDE	3	0	0	1
	Document/Model Referencing, Version Control and Status	Good practice on any project, but paramount when sharing models, where the recipient needs to know what's changed and what it can be relied upon.	None Considered	Discipline level file naming, version control and status	Company team file naming, version control and status	Company team file naming, version control and status compliant with recognised BIM standards	Project wide file naming, version control and status	Project wide file naming, version control and status compliant with recognised BIM standards	4	0	0	1
	Marketing Strategy	BIM-specific Case Studies to showcase and share the key points	Project Sheet exists, but no BIM credentials	BIM-specific Project Sheet exists	BIM-specific Project Sheet exists, and actively marketed for own Group		BIM-specific Project Sheet exists, and actively marketed for Region	Case Study exists on Company website, and used in Global external marketing	5	0	0	0.6
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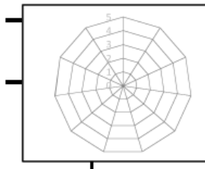
	Open Standard deliverables	Deliverables verified by open standard specifications, eg IFC, COBie	None		Model exported to proprietary software (eg Navisworks, Solibri, GIS viewer)		Successful export/re-import of IFC / COBie verified at each Issue	Successful import of IFC / COBie into any package verified at each issue	4	0	0	0.9
	BIM Contract	All parties should sign up to a project BIM contract, that allows for the sharing of models in a collaborative way.	None, or poorly-defined BIM agreement in consultant appointment		Bespoke BIM contract signed by Company; other parties' contracts unknown		All design parties signed up to an Industry-standard BIM contract	All parties, including Contractors, signed up to an Industry-standard BIM contract	4	0	0	0.9
	BIM Champion	A BIM Champion guides teams to improve their processes by ensuring implementation of BIM, and managing resistance to change.	No BIM Champion on this project	BIM Champion identified but limited time committed to BIM initiative	BIM Champion with adequate time commitment on this project		Leadership Level BIM Champion with limited time commitment on this project	Leadership level BIM Champion working closely with BIM Taskforce champion	4	0	0	1

BIM Maturity Measure

- Project Information Management
  - 11 questions
  - 6 possible responses
  - Suggested Target
  - Score 0 – 5

(your company logo here)

123456 Project XXXXXXXXXX



Project BIM Maturity

0.00 **0%**

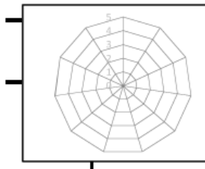
		The Project Overview: Mission, Vision, Goals, and Objectives, along with management support, and BIM Champions.	0 Non-Existent	1 Initial	2 Managed	3 Defined	4 Measured	5 Optimizing	Target Level	Current Level	Adjusted Score	Weighting
Internal Network Folder – manual process	Employers Information Requirements (EIRs)	Understand the Client's needs and end-uses for a BIM, and ensure they drive this.	No known BIM-specific Employers Information Requirements	EIRs discussed with Client but not resolved		Complete EIRs received and comments returned	Complete EIRs received & implemented before Contractor procurement	Complete EIRs received and reviewed regularly.	4	0		0.8
	BIM Design Data Review	Pre-Bid and Post-Award reviews are recommended, to ensure we're focusing on the Client's needs.	No Design Data Review, pre or post award	Post-award BIM Design Data review held		Pre- and Post-award BIM Design Data Review held		BIM Design Data Review minutes regularly reviewed against BEP	3	0		0.9
	BIM Execution Plan (BEP)	Project uses a BIM Execution Plan (BEP) to formalise goals and to specify information exchanges	No BIM Execution Plan		Company BEP exists, for internal use only, by core Skills	Company BEP issued to, and used by whole Design Team	Project BEP exists for all parties, and based on EIRs	Project BEP made contract document, based on EIRs	2	0		0.9
	Project Procurement Route	Consideration of BIM during procurement discussions with Contractors	No consideration of BIM during procurement	Discussion with a Contractor of implementation of an industry BIM standard		Design team implementation of Industry-wide BIM standard	Client imposed Implementation of recognised BIM standard	Contractor buy-in, including information manager, BEP and data drops	4	0		0.8
	Common Data Environment (CDE)	A Common Data Environment (CDE) is used to facilitate sharing of BIMs	Legacy network setup; AMS-organised folder structure	Document management system with agreed file naming convention		Internal company team using recognised CDE. Common BIM standards adhered to	Wider Design team implementation, including single server CDE	Client, Designers, Contractors using a single server CDE	3	0		1
	Document/Model Referencing, Version Control and Status	Good practice on any project, but paramount when sharing models, where the recipient needs to know what's changed and what it can be relied upon.	None Considered	Discipline level file naming, version control and status	Company team file naming, version control and status	Company team file naming, version control and status compliant with recognised BIM standards	Project wide file naming, version control and status	Project wide file naming, version control and status compliant with recognised BIM standards	4	0		1
	Marketing Strategy	BIM-specific Case Studies to showcase and share the key points	Project Sheet exists, but no BIM credentials	BIM-specific Project Sheet exists	BIM-specific Project Sheet exists, and actively marketed for own Group		BIM-specific Project Sheet exists, and actively marketed for Region	Case Study exists on Company website, and used in Global external marketing.	5	0		0.6
	Virtual Design Reviews (VDR)	Conduct Virtual Design Reviews prior to issuing Model, for both Coordination and QA verifcation of deliverables	None	Single Discipline Model reviews held. No formal process	Internal multi-discipline Virtual Model Reviews regularly held. Formal process	Internal multi-discipline reviews at regular intervals and reviews with architect	Multi-Discipline VDRs conducted at all stages with design team, client and contractor	Full QA checking and verification of model prior to issue in addition to reviews	2	0		1
	Open Standard deliverables	Deliverables verified by open standard specifications, eg IFC, COBie	None		Model exported to proprietary software (eg Navisworks, Solibri, GIS viewer)		Successful export/re-import of IFC / COBie verified at each Issue	Successful import of IFC / COBie into any package verified at each issue	4	0		0.9
	BIM Contract	All parties should sign up to a project BIM contract, that allows for the sharing of models in a collaborative way.	None, or poorly-defined BIM agreement in consultant appointment		Bespoke BIM contract signed by Company; other parties' contracts unknown		All design parties signed up to an Industry-standard BIM contract	All parties, including Contractors, signed up to an Industry-standard BIM contract	4	0		0.9
	BIM Champion	A BIM Champion guides teams to improve their processes by ensuring implementation of BIM, and managing resistance to change.	No BIM Champion on this project	BIM Champion identified but limited time committed to BIM initiative	BIM Champion with adequate time commitment on this project		Leadership Level BIM Champion with limited time commitment on this project	Leadership level BIM Champion working closely with BIM Taskforce champion	4	0		1

BIM Maturity Measure

- Project Information Management
  - 11 questions
  - 6 possible responses
  - Suggested Target
  - Score 0 – 5
  - Weighting applied

(your company logo here)

123456 Project XXXXXXXXXX



Project BIM Maturity

0.00 | **0%**

		The Project Overview: Mission, Vision, Goals, and Objectives, along with management support, and BIM Champions.	0 Non-Existent	1 Initial	2 Managed	3 Defined	4 Measured	5 Optimizing	Target Level	Current Level	Adjusted Score	Weighting
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	BIM Design Data Review	Pre-Bid and Post-Award reviews are recommended, to ensure we're focusing on the Client's needs.	No Design Data Review, pre or post award	Post-award BIM Design Data review held		Pre- and Post-award BIM Design Data Review held		BIM Design Data Review minutes regularly reviewed against BEP	3	0	0	0.9
	BIM Execution Plan (BEP)	Project uses a BIM Execution Plan (BEP) to formalise goals and to specify information exchanges	No BIM Execution Plan		Company BEP exists, for internal use only, by core Skills	Company BEP issued to, and used by whole Design Team	Project BEP exists for all parties, and based on EIRs	Project BEP made contract document, based on EIRs	2	0	0	0.9
	Project Procurement Route	Consideration of BIM during procurement discussions with Contractors	No consideration of BIM during procurement	Discussion with a Contractor of implementation of an industry BIM standard		Design team implementation of Industry-wide BIM standard	Client imposed Implementation of recognised BIM standard	Contractor buy-in, including information manager, BEP and data drops	4	0	0	0.8
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	Document/Model Referencing, Version Control and Status	Good practice on any project, but paramount when sharing models, where the recipient needs to know what's changed and what it can be relied upon.	None Considered	Discipline level file naming, version control and status	Company team file naming, version control and status	Company team file naming, version control and status compliant with recognised BIM standards	Project wide file naming, version control and status	Project wide file naming, version control and status compliant with recognised BIM standards	4	0	0	1
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	Open Standard deliverables	Deliverables verified by open standard specifications, eg IFC, COBie	None		Model exported to proprietary software (eg Navisworks, Solibri, GIS viewer)		Successful export/re-import of IFC / COBie verified at each Issue	Successful import of IFC / COBie into any package verified at each issue	4	0	0	0.9
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BIM Maturity Measure

- Project Information Management
  - 11 questions
  - 6 possible responses
  - Suggested Target
  - Score 0 – 5
  - Weighting applied
  - Overall Percentage

(your company logo here)

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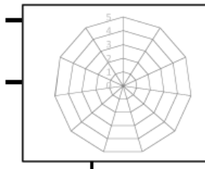
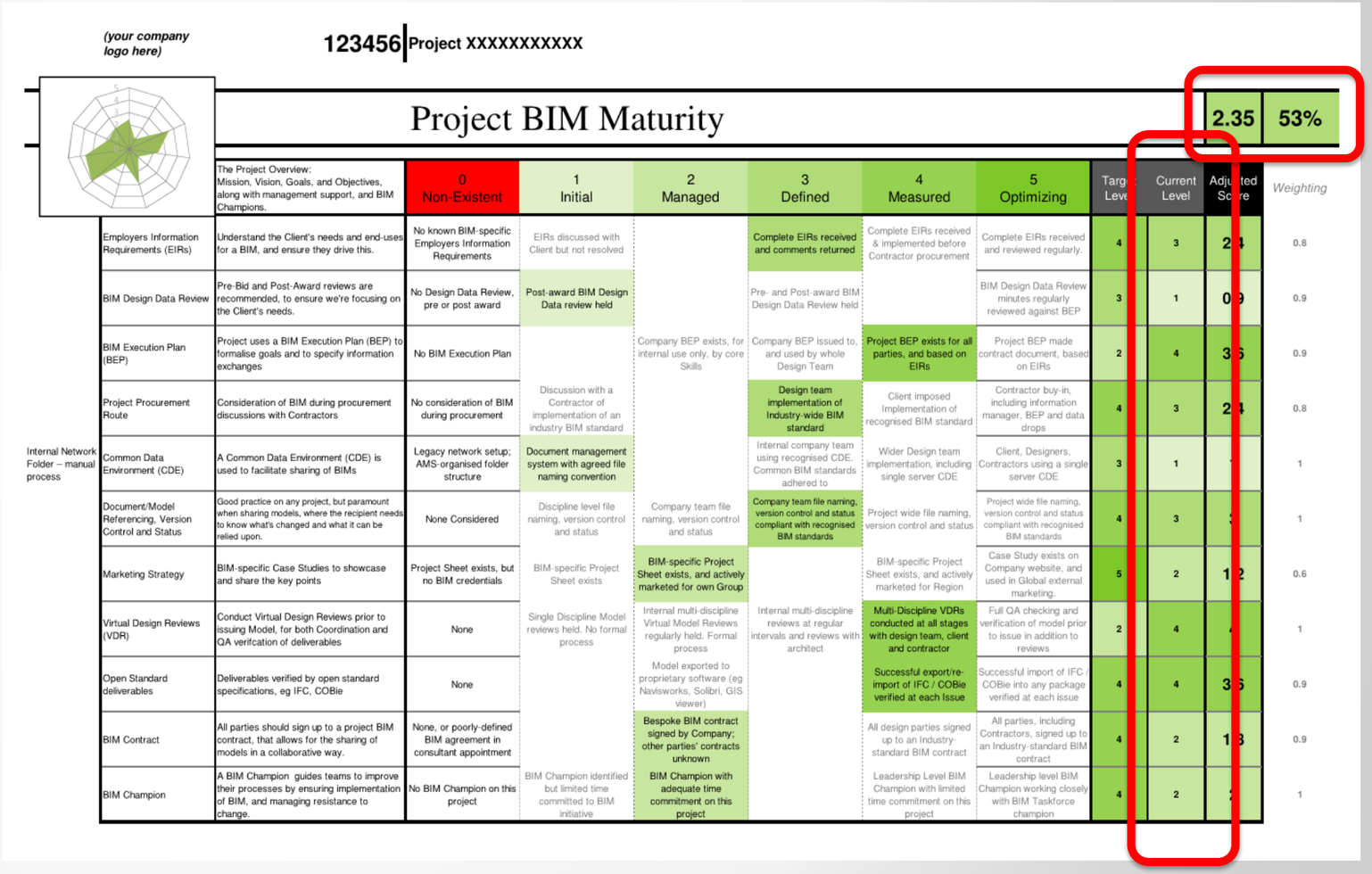


Project BIM Maturity

			0 Non-Existent	1 Initial	2 Managed	3 Defined	4 Measured	5 Optimizing	Target Level	Current Level	Adjusted Score	Weighting
		The Project Overview: Mission, Vision, Goals, and Objectives, along with management support, and BIM Champions.									**0.00**	**0%**
Internal Network Folder – manual process	Employers Information Requirements (EIRs)	Understand the Client's needs and end-uses for a BIM, and ensure they drive this.	No known BIM-specific Employers Information Requirements	EIRs discussed with Client but not resolved		Complete EIRs received and comments returned	Complete EIRs received & implemented before Contractor procurement	Complete EIRs received and reviewed regularly.	4	0	0	0.8
	BIM Design Data Review	Pre-Bid and Post-Award reviews are recommended, to ensure we're focusing on the Client's needs.	No Design Data Review, pre or post award	Post-award BIM Design Data review held		Pre- and Post-award BIM Design Data Review held		BIM Design Data Review minutes regularly reviewed against BEP	3	0	0	0.9
	BIM Execution Plan (BEP)	Project uses a BIM Execution Plan (BEP) to formalise goals and to specify information exchanges	No BIM Execution Plan		Company BEP exists, for internal use only, by core Skills	Company BEP issued to, and used by whole Design Team	Project BEP exists for all parties, and based on EIRs	Project BEP made contract document, based on EIRs	2	0	0	0.9
	Project Procurement Route	Consideration of BIM during procurement discussions with Contractors	No consideration of BIM during procurement	Discussion with a Contractor of implementation of an industry BIM standard		Design team implementation of Industry-wide BIM standard	Client imposed Implementation of recognised BIM standard	Contractor buy-in, including information manager, BEP and data drops	4	0	0	0.8
	Common Data Environment (CDE)	A Common Data Environment (CDE) is used to facilitate sharing of BIMs	Legacy network setup; AMS-organised folder structure	Document management system with agreed file naming convention		Internal company team using recognised CDE. Common BIM standards adhered to	Wider Design team implementation, including single server CDE	Client, Designers, Contractors using a single server CDE	3	0	0	1
	Document/Model Referencing, Version Control and Status	Good practice on any project, but paramount when sharing models, where the recipient needs to know what's changed and what it can be relied upon.	None Considered	Discipline level file naming, version control and status	Company team file naming, version control and status	Company team file naming, version control and status compliant with recognised BIM standards	Project wide file naming, version control and status	Project wide file naming, version control and status compliant with recognised BIM standards	4	0	0	1
	Marketing Strategy	BIM-specific Case Studies to showcase and share the key points	Project Sheet exists, but no BIM credentials	BIM-specific Project Sheet exists	BIM-specific Project Sheet exists, and actively marketed for own Group		BIM-specific Project Sheet exists, and actively marketed for Region	Case Study exists on Company website, and used in Global external marketing.	5	0	0	0.6
	Virtual Design Reviews (VDR)	Conduct Virtual Design Reviews prior to issuing Model, for both Coordination and QA verifcation of deliverables	None	Single Discipline Model reviews held. No formal process	Internal multi-discipline Virtual Model Reviews regularly held. Formal process	Internal multi-discipline reviews at regular intervals and reviews with architect	Multi-Discipline VDRs conducted at all stages with design team, client and contractor	Full QA checking and verification of model prior to issue in addition to reviews	2	0	0	1
	Open Standard deliverables	Deliverables verified by open standard specifications, eg IFC, COBie	None		Model exported to proprietary software (eg Navisworks, Solibri, GIS viewer)		Successful export/re-import of IFC / COBie verified at each Issue	Successful import of IFC / COBie into any package verified at each issue	4	0	0	0.9
	BIM Contract	All parties should sign up to a project BIM contract, that allows for the sharing of models in a collaborative way.	None, or poorly-defined BIM agreement in consultant appointment		Bespoke BIM contract signed by Company; other parties' contracts unknown		All design parties signed up to an Industry-standard BIM contract	All parties, including Contractors, signed up to an Industry-standard BIM contract	4	0	0	0.9
	BIM Champion	A BIM Champion guides teams to improve their processes by ensuring implementation of BIM, and managing resistance to change.	No BIM Champion on this project	BIM Champion identified but limited time committed to BIM initiative	BIM Champion with adequate time commitment on this project		Leadership Level BIM Champion with limited time commitment on this project	Leadership level BIM Champion working closely with BIM Taskforce champion	4	0	0	1

BIM Maturity Measure

- Project Information Management
  - And filled in…
  - eg: 53%
    (that's a high score!)



(your company logo here)

123456 Project XXXXXXXXXX

Project BIM Maturity

2.35 **53%**

		The Project Overview: Mission, Vision, Goals, and Objectives, along with management support, and BIM Champions.	0 Non-Existent	1 Initial	2 Managed	3 Defined	4 Measured	5 Optimizing	Target Level	Current Level	Adjusted Score	Weighting
Internal Network Folder – manual process	Employers Information Requirements (EIRs)	Understand the Client's needs and end-uses for a BIM, and ensure they drive this.	No known BIM-specific Employers Information Requirements	EIRs discussed with Client but not resolved	Company BEP exists, for internal use only, by core Skills	Complete EIRs received and comments returned	Complete EIRs received & implemented before Contractor procurement	Complete EIRs received and reviewed regularly.	4	3	2.4	0.8
	BIM Design Data Review	Pre-Bid and Post-Award reviews are recommended, to ensure we're focusing on the Client's needs.	No Design Data Review, pre or post award	Post-award BIM Design Data review held		Pre- and Post-award BIM Design Data Review held		BIM Design Data Review minutes regularly reviewed against BEP	3	1	0.9	0.9
	BIM Execution Plan (BEP)	Project uses a BIM Execution Plan (BEP) to formalise goals and to specify information exchanges	No BIM Execution Plan			Company BEP issued to, and used by whole Design Team	Project BEP exists for all parties, and based on EIRs	Project BEP made contract document, based on EIRs	2	4	3.6	0.9
	Project Procurement Route	Consideration of BIM during procurement discussions with Contractors	No consideration of BIM during procurement	Discussion with a Contractor of implementation of an industry BIM standard		Design team implementation of Industry-wide BIM standard	Client imposed Implementation of recognised BIM standard	Contractor buy-in, including information manager, BEP and data drops	4	3	2.4	0.8
	Common Data Environment (CDE)	A Common Data Environment (CDE) is used to facilitate sharing of BIMs	Legacy network setup; AMS-organised folder structure	Document management system with agreed file naming convention		Internal company team using recognised CDE. Common BIM standards adhered to	Wider Design team implementation, including single server CDE	Client, Designers, Contractors using a single server CDE	3	1	1	1
	Document/Model Referencing, Version Control and Status	Good practice on any project, but paramount when sharing models, where the recipient needs to know what's changed and what it can be relied upon.	None Considered	Discipline level file naming, version control and status	Company team file naming, version control and status	Company team file naming, version control and status compliant with recognised BIM standards	Project wide file naming, version control and status	Project wide file naming, version control and status compliant with recognised BIM standards	4	3	3	1
	Marketing Strategy	BIM-specific Case Studies to showcase and share the key points	Project Sheet exists, but no BIM credentials	BIM-specific Project Sheet exists	BIM-specific Project Sheet exists, and actively marketed for own Group		BIM-specific Project Sheet exists, and actively marketed for Region	Case Study exists on Company website, and used in Global external marketing.	5	2	1.2	0.6
	Virtual Design Reviews (VDR)	Conduct Virtual Design Reviews prior to issuing Model, for both Coordination and QA verifcation of deliverables	None	Single Discipline Model reviews held. No formal process	Internal multi-discipline Virtual Model Reviews regularly held. Formal process	Internal multi-discipline reviews at regular intervals and reviews with architect	Multi-Discipline VDRs conducted at all stages with design team, client and contractor	Full QA checking and verification of model prior to issue in addition to reviews	2	4	4	1
	Open Standard deliverables	Deliverables verified by open standard specifications, eg IFC, COBie	None		Model exported to proprietary software (eg Navisworks, Solibri, GIS viewer)		Successful export/re-import of IFC / COBie verified at each Issue	Successful import of IFC / COBie into any package verified at each issue	4	4	3.6	0.9
	BIM Contract	All parties should sign up to a project BIM contract, that allows for the sharing of models in a collaborative way.	None, or poorly-defined BIM agreement in consultant appointment		Bespoke BIM contract signed by Company; other parties' contracts unknown		All design parties signed up to an Industry-standard BIM contract	All parties, including Contractors, signed up to an Industry-standard BIM contract	4	2	1.8	0.9
	BIM Champion	A BIM Champion guides teams to improve their processes by ensuring implementation of BIM, and managing resistance to change.	No BIM Champion on this project	BIM Champion identified but limited time committed to BIM initiative	BIM Champion with adequate time commitment on this project		Leadership Level BIM Champion with limited time commitment on this project	Leadership level BIM Champion working closely with BIM Taskforce champion	4	2	2	1

BIM Maturity Measure

- Discipline Tabs, eg:
  - Structural
  - Mechanical
  - Electrical
  - Public Health
  - Facades
  - Geotecnics
  - Lighting

And now to our live demo…

BIM Maturity Measure – Company set up

- Refer to handouts for specific instructions
  - Unprotect the spreadsheet (pwd = Arup)
  - Amend the email address for submission of scores
  - Update your company targets and weightings
  - Review specific data targets for each discipline
  - Add a company logo
  - Re-protect the spreadsheet (change the pwd if you must)
  - Roll it out

Top Tips for filling in the Tool

- Don’t think too hard about the answers. If you/your PMs/discipline-leads don’t understand the terms, chances are you’re scoring 0 or 1. Take the hint, and swot up on BIM!
- Scores should not be subjective – eg, you’re either able to score a 3 or you are not.
- Don’t worry about low scores.
- Don’t expect the tool to be absolutely perfect and applicable to 100% of all your projects.

Top Tips for filling in the Tool

- Do ask for scores to be submitted at each key project stage.
- Resubmit a project score as often as needed.
- Don’t forget to use the Submit button on the cover page so someone can collate the scores.
- The target scores are not, currently, definable by project stage. Next version.
- Enter the project stage, then fill in based on the snapshot of what you have done to this point.

Time to get on board with BIM

How can you get the BIM Maturity Measurement tool?

- From Arup.com:
  - www.arup.com/Services/Building_Modelling.aspx

Session Feedback

- Via the Survey Stations, email or mobile device
- AU 2015 passes given out each day!
- Best to do it right after the session
- Instructors see results in real-time