BIM4Civils ?

Name	CreatedBy	CreatedOn	Category	ComponentName	ExtSystem	ExtObject	ExtIdentifier	Description
FFE	nn@aec	##########	4A1: Fittings and Fixtures ar	Cell Bed family:Cell Bed family:Cell Bed family:211786				FFE
FFE	nn@aec	##########	4A1: Fittings and Fixtures ar	Cell Desk:Desk Whitewood:Desk Whitewood:211787				FFE
FFE	nn@aec	##########	4A1: Fittings and Fixtures ar	Cell Locker:Cell Locker:Cell Locker:211789				FFE
FFE	nn@aec	##########	4A1: Fittings and Fixtures ar	Safer Seat:Safer Seat:Safer Seat:211791				FFE
FFE	nn@aec	##########	4A1: Fittings and Fixtures ar	Safer Seat:Safer Seat:Safer Seat:211803				FFE
FFE	nn@aec	##########	4A1: Fittings and Fixtures ar	Cell Bed family:Cell Bed family:Cell Bed family:211804				FFE
FFE	nn@aec	##########	4A1: Fittings and Fixtures ar	Cell Desk:Desk Whitewood:Desk Whitewood:211805				FFE
FFE	nn@aec	##########	4A1: Fittings and Fixtures ar	Cell Locker:Cell Locker:Cell Locker:211806				FFE
Internal fabric 1	nn@aec	##########	2H1: Internal Doors	Generic Int DD 1610 x 2110mm:1610 x 2110mm:211738				Internal fabric for Level 1
Internal fabric 1	nn@aec	##########	2H1: Internal Doors	Generic Int D Cell Door: 790 x 2110mm 3:790 x 2110mm 3:211814				Internal fabric for Level 1
Internal fabric 1	nn@aec	##########	2H1: Internal Doors	Generic Int D Cell Door: 790 x 2110mm 3:790 x 2110mm 3:211815				Internal fabric for Level 1
Internal fabric 1	nn@aec	##########	2G1: Internal Walls and Part	Basic Wall:Generic Ext - 150mm:211792				Internal fabric for Level 1
Internal fabric 1	nn@aec	##########	2G1: Internal Walls and Part	Basic Wall:Generic Ext - 150mm:211793				Internal fabric for Level 1
Internal fabric 1	nn@aec	##########	2G1: Internal Walls and Part	Basic Wall:Generic Ext - 150mm:211794				Internal fabric for Level 1
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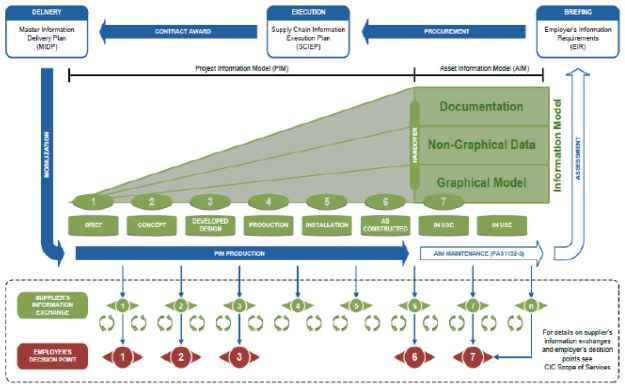
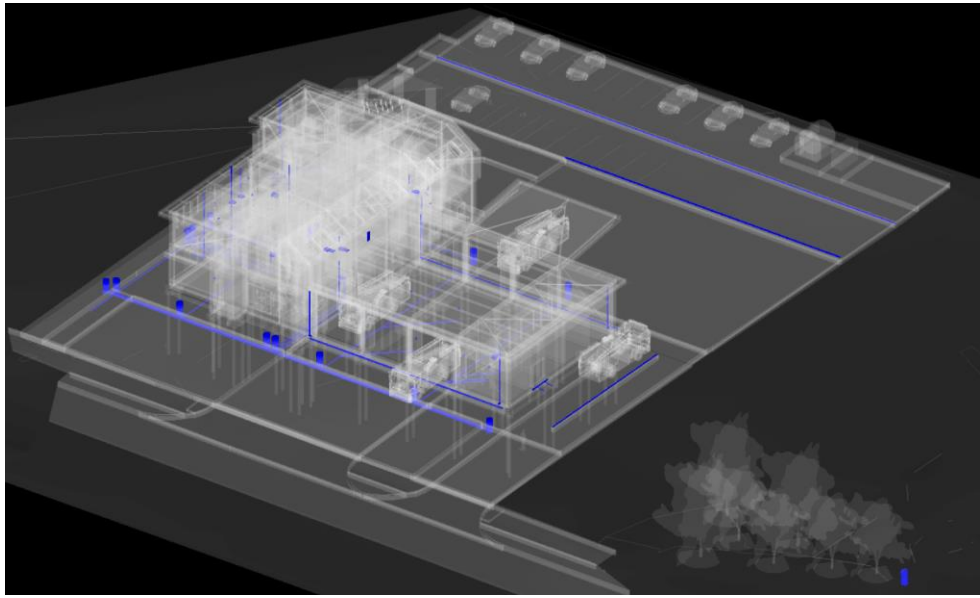
Internal fabric 1	nn@aec	##########	2G1: Internal Walls and Part	Basic Wall:Generic Ext - 150mm:211796				Internal fabric for Level 1
Internal fabric 1	nn@aec	##########	2G1: Internal Walls and Part	Basic Wall:Generic Ext - 150mm:211797				Internal fabric for Level 1
Internal fabric 1	nn@aec	##########	2G1: Internal Walls and Part	Basic Wall:Generic Ext - 80mm:211799				Internal fabric for Level 1
Internal fabric 1	nn@aec	##########	2G1: Internal Walls and Part	Basic Wall:Generic Ext - 80mm:211800				Internal fabric for Level 1
Internal fabric 1	nn@aec	##########	2G1: Internal Walls and Part	Basic Wall:Generic Ext - 80mm:211801				Internal fabric for Level 1
Internal fabric 1	nn@aec	##########	2G1: Internal Walls and Part	Basic Wall:Generic Ext - 80mm:211802				Internal fabric for Level 1
Plumbing 1	nn@aec	##########	SC1: Internal Drainage	Plumbing SVP 1:Plumbing SVP 1:Plumbing SVP 1:211824				Plumbing for Level 1
Plumbing 1	nn@aec	##########	5A1: Sanitaryware	WC Pan:510 x 510mm:510 x 510mm:211790				Plumbing for Level 1
Plumbing 1	nn@aec	##########	5A1: Sanitaryware	Wallgate ALS180 Basin:470w x 300d:470w x 300d:211813				Plumbing for Level 1
Plumbing 1	nn@aec	##########	5A1: Sanitaryware	WC Pan:510 x 510mm 2:510 x 510mm 2:211807				Plumbing for Level 1
Plumbing 1	nn@aec	##########	5A1: Sanitaryware	Wallgate ALS180 Basin:470w x 300d:470w x 300d:211808				Plumbing for Level 1





Introduction & Housekeeping

- No planned fire alarm
- Fire exits
- Facilities
- Brews and breaks

- House rules – making the most of your day

BIM4Civils

- Agenda
- 8.00 - registration & Coffee
- 8.30 – introduction
- 8.40 – BIM context, standards and Civils
- 09.45– Case Study Northumbria Water and Mott McDonald
- 10.30 Brew and comfort break
- 10.45 – Live Modelling exemplar
- 12.30 – Lunch - Safe Home

Professor Andrew Thomas

BIM4sme

Diligentia

&

University of Ulster

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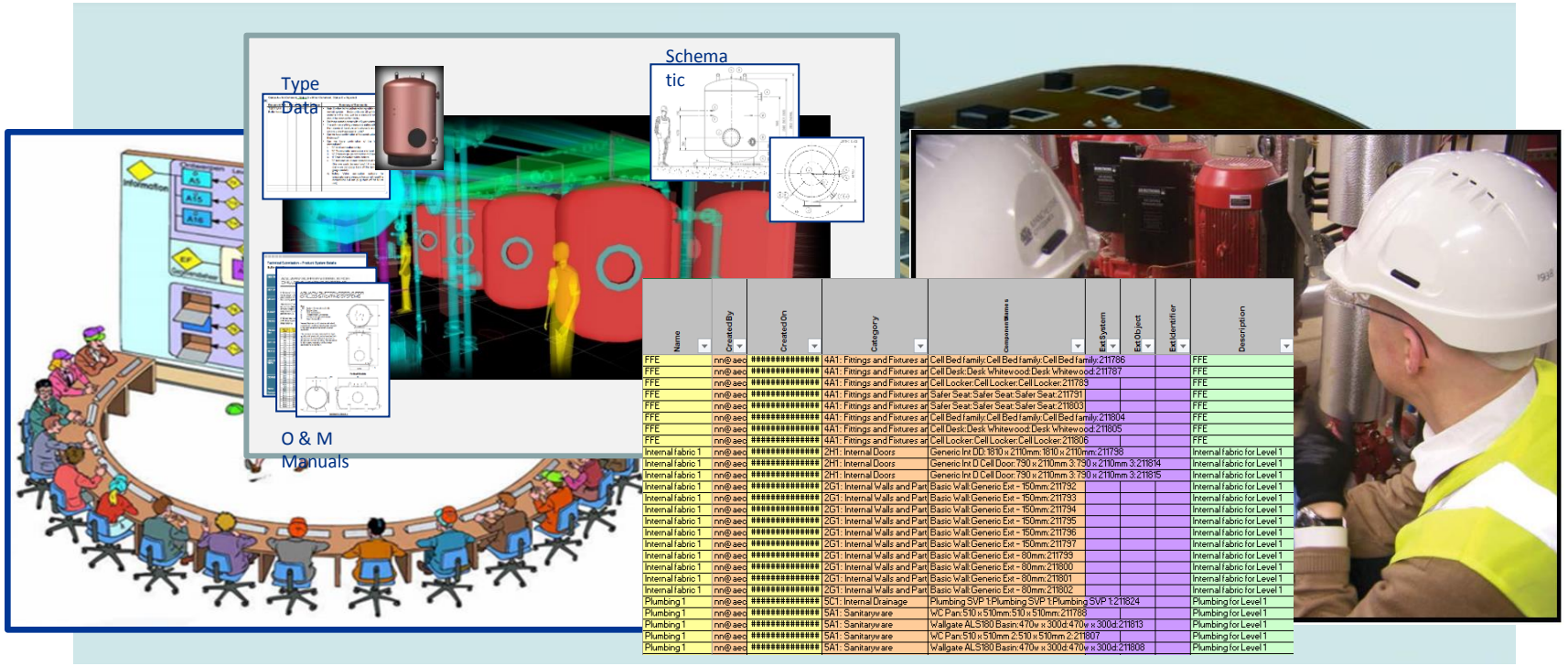
What is BIM?

- A geometric representation of the components of an asset
- A process for collaboratively creating, operating & disposing of the asset
- The ability to access asset component information in-situ
- One view of data, documents & images
- A reliable and trusted enterprise asset information store



Name	CreatedBy	CreatedOn	Category	ComponentNames	ExtSystem	ExtObject	ExtIdentifier	Description
FFE	nn@aec	##########	4A1: Fittings and Fixtures ar	Cell Bed family:Cell Bed family:Cell Bed family:211786				FFE
FFE	nn@aec	##########	4A1: Fittings and Fixtures ar	Cell Desk:Desk Whitewood:Desk Whitewood:211787				FFE
FFE	nn@aec	##########	4A1: Fittings and Fixtures ar	Cell Locker:Cell Locker:Cell Locker:211789				FFE
FFE	nn@aec	##########	4A1: Fittings and Fixtures ar	Safer Seat:Safer Seat:Safer Seat:211791				FFE
FFE	nn@aec	##########	4A1: Fittings and Fixtures ar	Safer Seat:Safer Seat:Safer Seat:211803				FFE
FFE	nn@aec	##########	4A1: Fittings and Fixtures ar	Cell Bed family:Cell Bed family:Cell Bed family:211804				FFE
FFE	nn@aec	##########	4A1: Fittings and Fixtures ar	Cell Desk:Desk Whitewood:Desk Whitewood:211805				FFE
FFE	nn@aec	##########	4A1: Fittings and Fixtures ar	Cell Locker:Cell Locker:Cell Locker:211806				FFE
Internal fabric 1	nn@aec	##########	2H1: Internal Doors	Generic Int OD:1810 x 2110mm:1810 x 2110mm:211798				Internal fabric for Level 1
Internal fabric 1	nn@aec	##########	2H1: Internal Doors	Generic Int D Cell Door:730 x 2110mm 3:730 x 2110mm 3:211814				Internal fabric for Level 1
Internal fabric 1	nn@aec	##########	2H1: Internal Doors	Generic Int D Cell Door:730 x 2110mm 3:730 x 2110mm 3:211815				Internal fabric for Level 1
Internal fabric 1	nn@aec	##########	2G1: Internal Walls and Part	Basic Wall:Generic Ext - 150mm:211732				Internal fabric for Level 1
Internal fabric 1	nn@aec	##########	2G1: Internal Walls and Part	Basic Wall:Generic Ext - 150mm:211733				Internal fabric for Level 1
Internal fabric 1	nn@aec	##########	2G1: Internal Walls and Part	Basic Wall:Generic Ext - 150mm:211734				Internal fabric for Level 1
Internal fabric 1	nn@aec	##########	2G1: Internal Walls and Part	Basic Wall:Generic Ext - 150mm:211735				Internal fabric for Level 1
Internal fabric 1	nn@aec	##########	2G1: Internal Walls and Part	Basic Wall:Generic Ext - 150mm:211736				Internal fabric for Level 1
Internal fabric 1	nn@aec	##########	2G1: Internal Walls and Part	Basic Wall:Generic Ext - 150mm:211737				Internal fabric for Level 1
Internal fabric 1	nn@aec	##########	2G1: Internal Walls and Part	Basic Wall:Generic Ext - 80mm:211799				Internal fabric for Level 1
Internal fabric 1	nn@aec	##########	2G1: Internal Walls and Part	Basic Wall:Generic Ext - 80mm:211800				Internal fabric for Level 1
Internal fabric 1	nn@aec	##########	2G1: Internal Walls and Part	Basic Wall:Generic Ext - 80mm:211801				Internal fabric for Level 1
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Plumbing 1	nn@aec	##########	5C1: Internal Drainage	Plumbing SVP 1:Plumbing SVP 1:Plumbing SVP 1:211824				Plumbing for Level 1
Plumbing 1	nn@aec	##########	5A1: Sanitaryware	WC Pan:510 x 510mm:510 x 510mm:211788				Plumbing for Level 1
Plumbing 1	nn@aec	##########	5A1: Sanitaryware	Wallgate ALS180 Basin:470w x 300d:470w x 300d:211813				Plumbing for Level 1
Plumbing 1	nn@aec	##########	5A1: Sanitaryware	WC Pan:510 x 510mm 2:510 x 510mm 2:211807				Plumbing for Level 1
Plumbing 1	nn@aec	##########	5A1: Sanitaryware	Wallgate ALS180 Basin:470w x 300d:470w x 300d:211808				Plumbing for Level 1

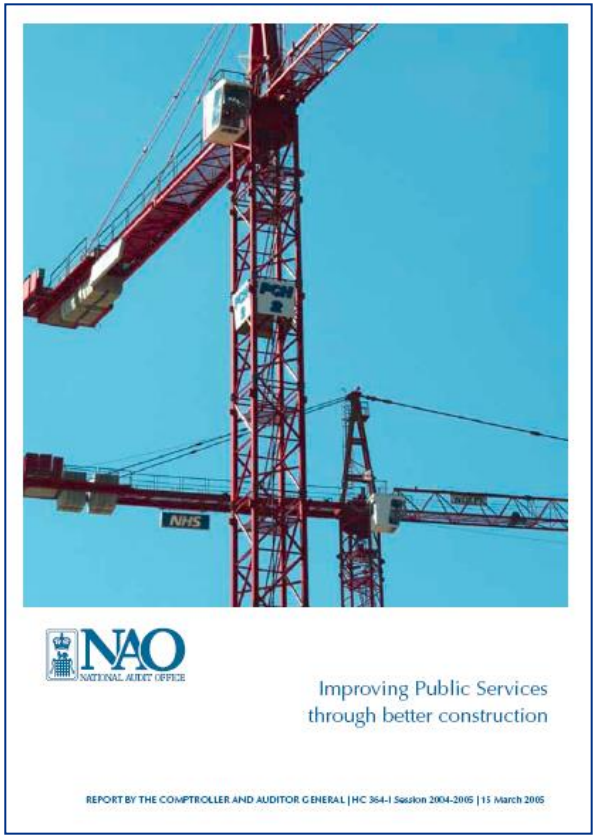
Outstanding Industry performance

National Audit Office Report and Analysis

UK construction spend £ 55 billion p.a.

80% influenced by Public Purse

Performance	1999
On Budget	25%
On Time	34%

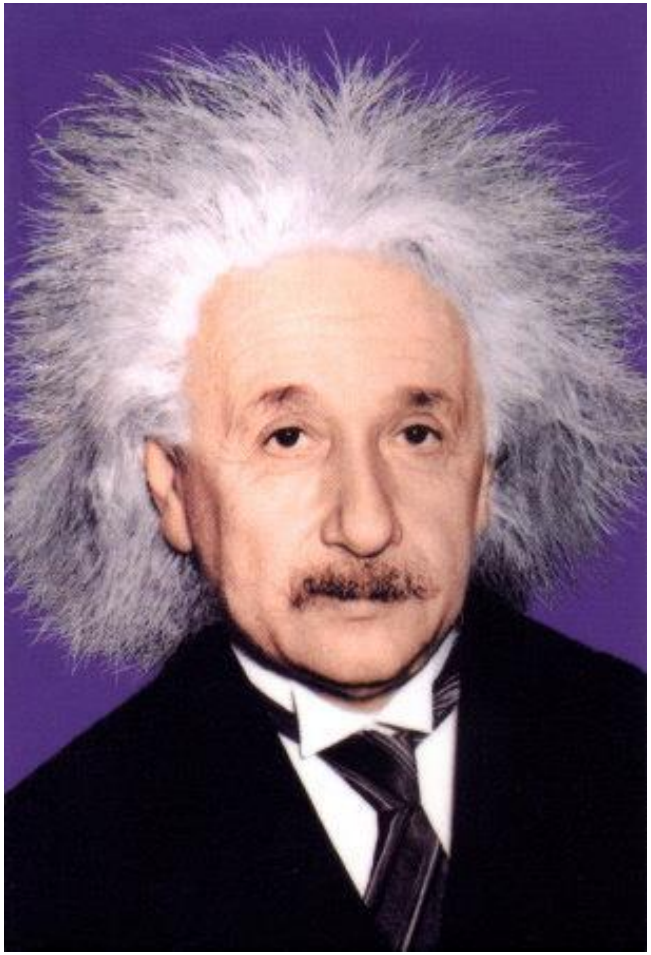


2011 KPI statistics – 56% of UK projects on Time and Budget

Sustainable Construction and Buildings

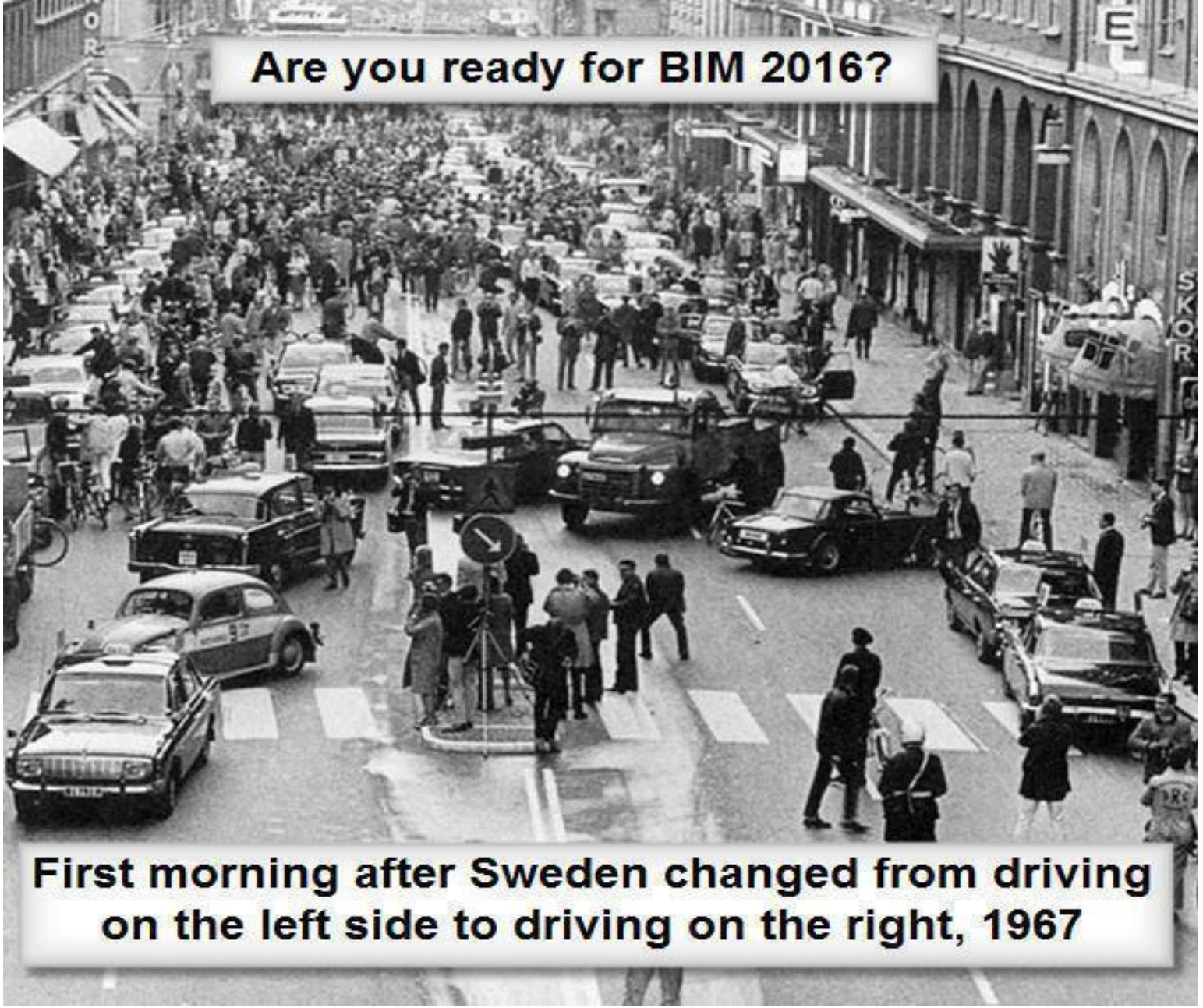
- Buildings use 46% of all energy – up to 70% in major cities
- Construction uses 53% of primary materials
- Construction has second biggest environmental footprint after food
- 90 million tonnes of waste = 3 times domestic output
- 21% of all hazardous waste in UK is construction waste
- 13 million tonnes of materials delivered and **not used**

Someone thought it was time for change……



“Insanity: Doing the same thing over and over again and expecting different results.”

Albert Einstein



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Hypothesis

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

Joined up approach for Efficiency -

Govt Construction Strategy launched 31st May
20% cost savings to be achieved
BIM named as essential to delivery and to be mandated

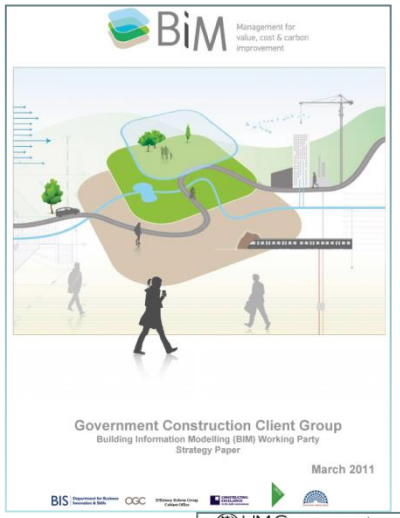
*07/13 – Govt Const Strategy 2025 – **33% reductions** !*
CAPEx and OPEX 15/18%

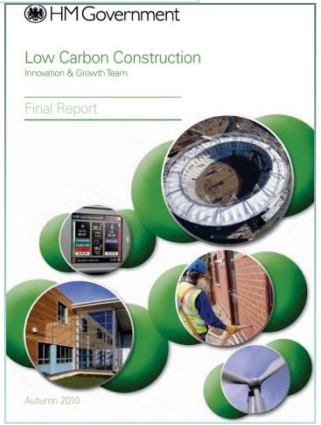
BIM strategy and report published June 2011
BIM to be adopted on Govt projects - March 2016

IGT Low Carbon Construction response June 2011
Carbon reduction from sector
26% carbon reduction by 2020,
80% by 2050 (1990 baseline)

BIM named as essential to delivery and to be mandated

"integration [and collaborative working] is key"





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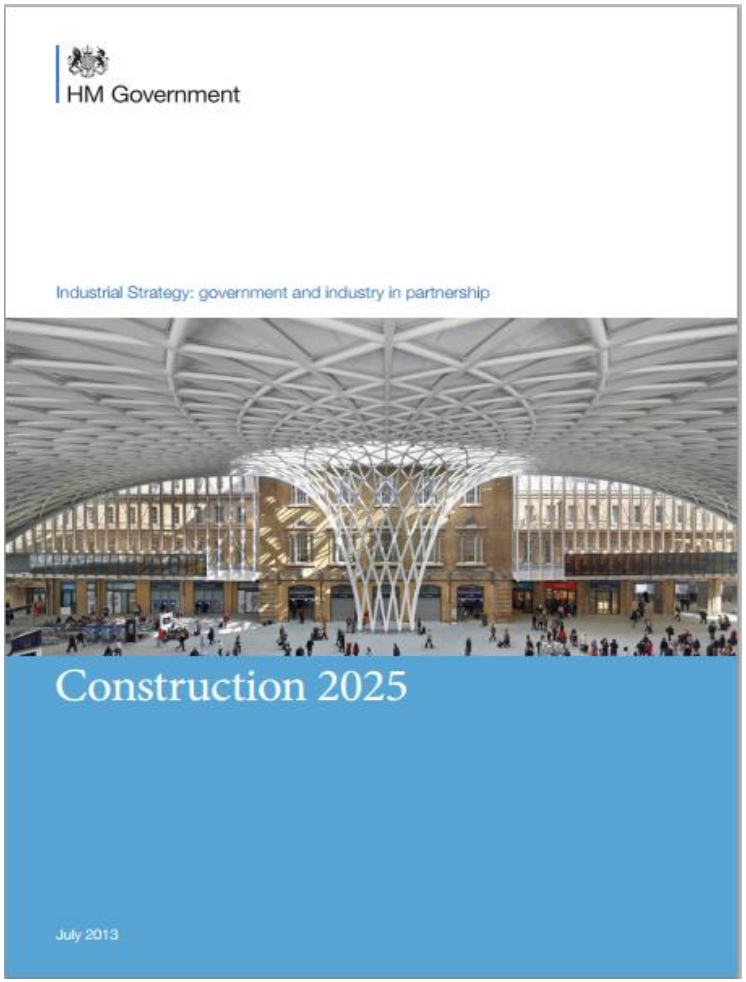
Construction 2025 - aspirations

HM Government 2013



Industrial Strategy: government and industry in partnership

Lower costs

33% Whole Life Costs

reduction in the initial cost of construction and the whole life cost of built assets

Faster delivery

50% Inception 2 Operation

reduction in the overall time, from inception to completion, for newbuild and refurbished assets

Lower emissions

50% Greenhouse Gasses

reduction in greenhouse gas emissions in the built environment

Improvement in exports

50% Exports vs Imports

reduction in the trade gap between total exports and total imports for construction products and materials

Towards a Digital Built Britain.

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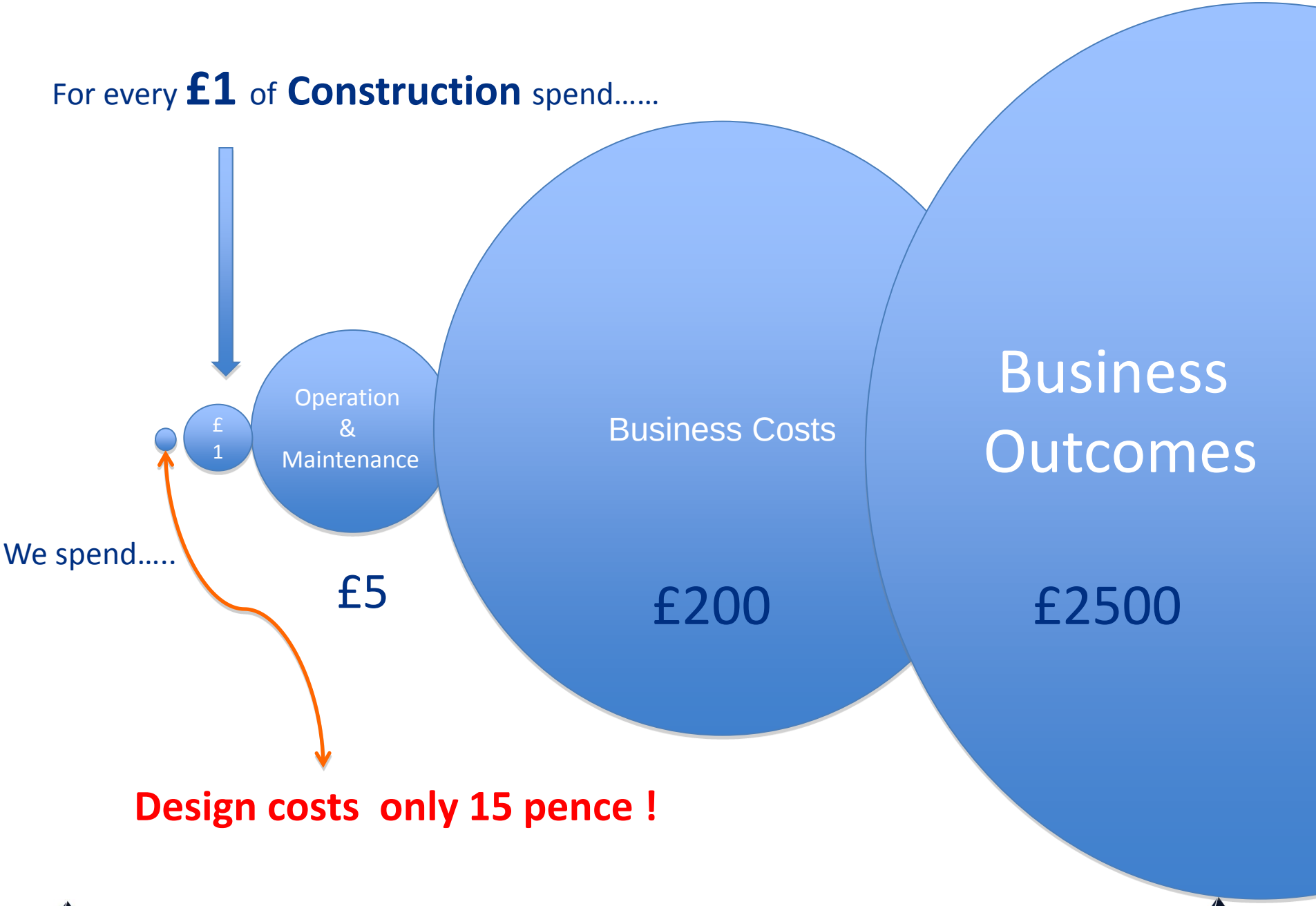
For every **£1** of **Construction** spend……



Design costs only 15 pence !

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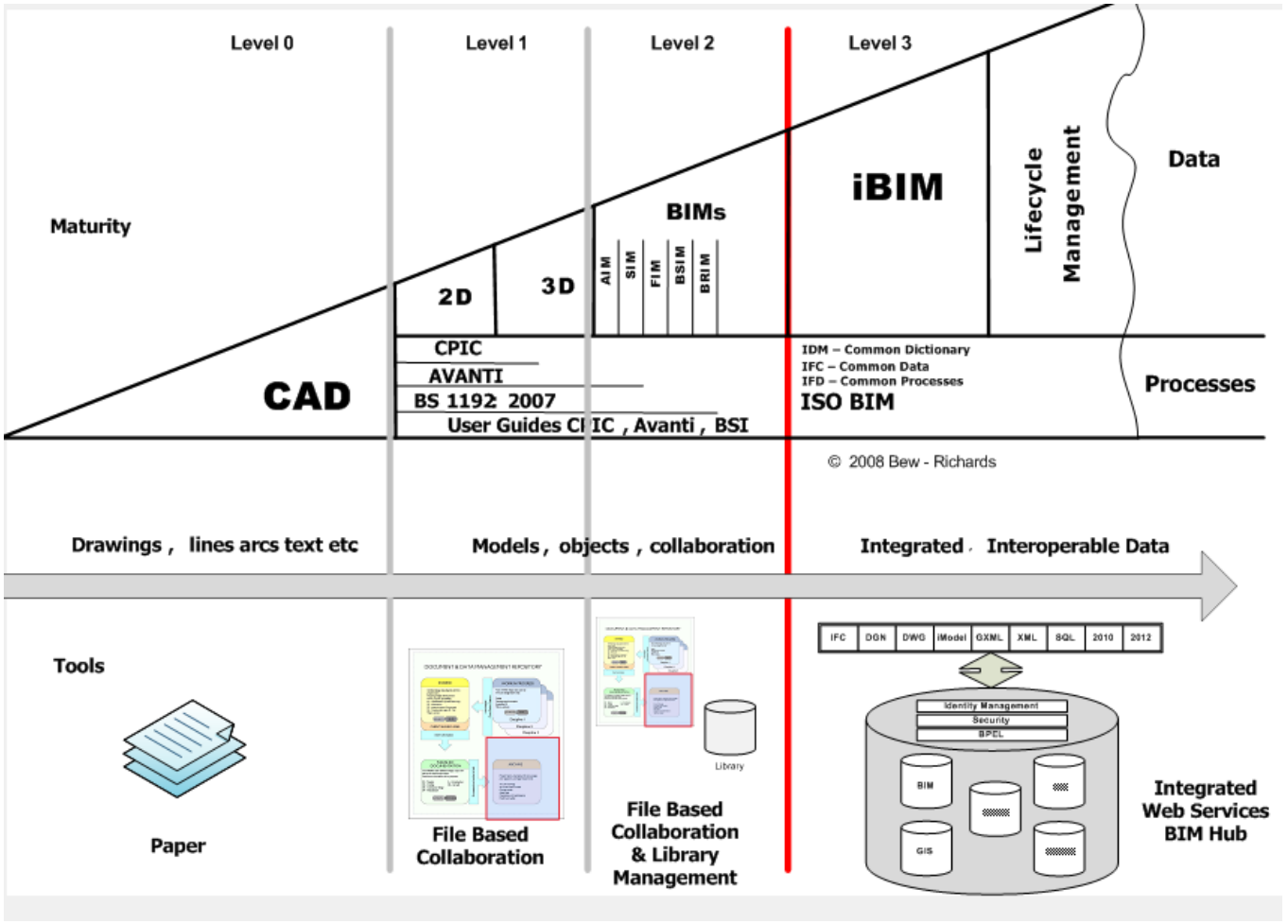
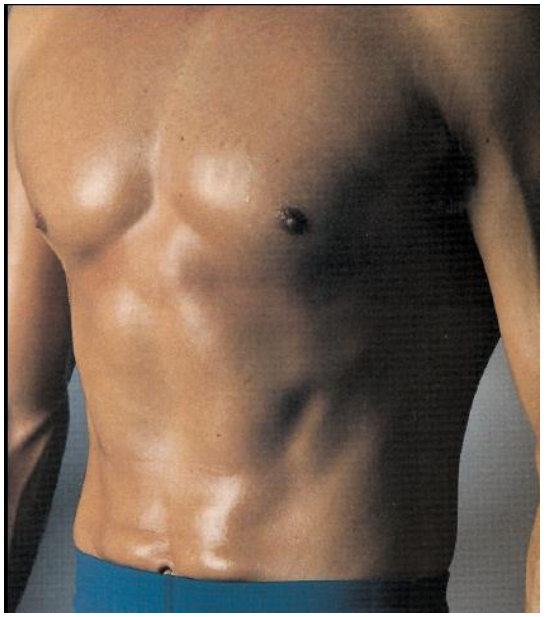
Cash vs Carbon

Cash vs Carbon


Level 0
Level 1
Level 2
Level 3
Maturity
2D
3D
BIMs
AIM
SIM
FIM
BSIM
BRIM
iBIM
Lifecycle Management
Data
CAD
CPIC
AVANTI
BS 1192 2007
User Guides CPIC , Avanti , BSI
IDM – Common Dictionary
IFC – Common Data
IFD – Common Processes
ISO BIM
Processes
© 2008 Bew - Richards
Drawings , lines arcs text etc
Models , objects , collaboration
Integrated . Interoperable Data
Tools
Paper
File Based Collaboration
Library
File Based Collaboration & Library Management
IFC
DGN
DWG
iModel
GXML
XML
SQL
2010
2012
Identity Management
Security
BPEL
BIM
GIS
Integrated Web Services BIM Hub

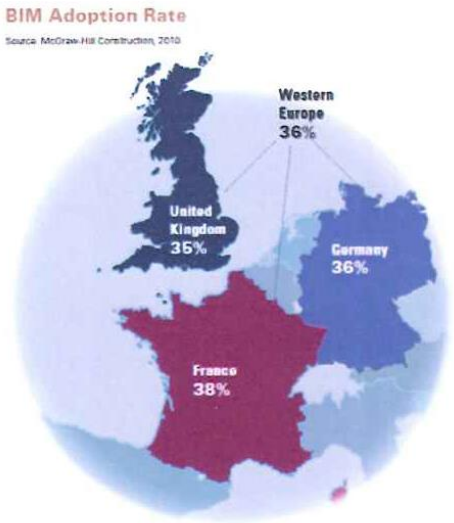
Market readiness ?

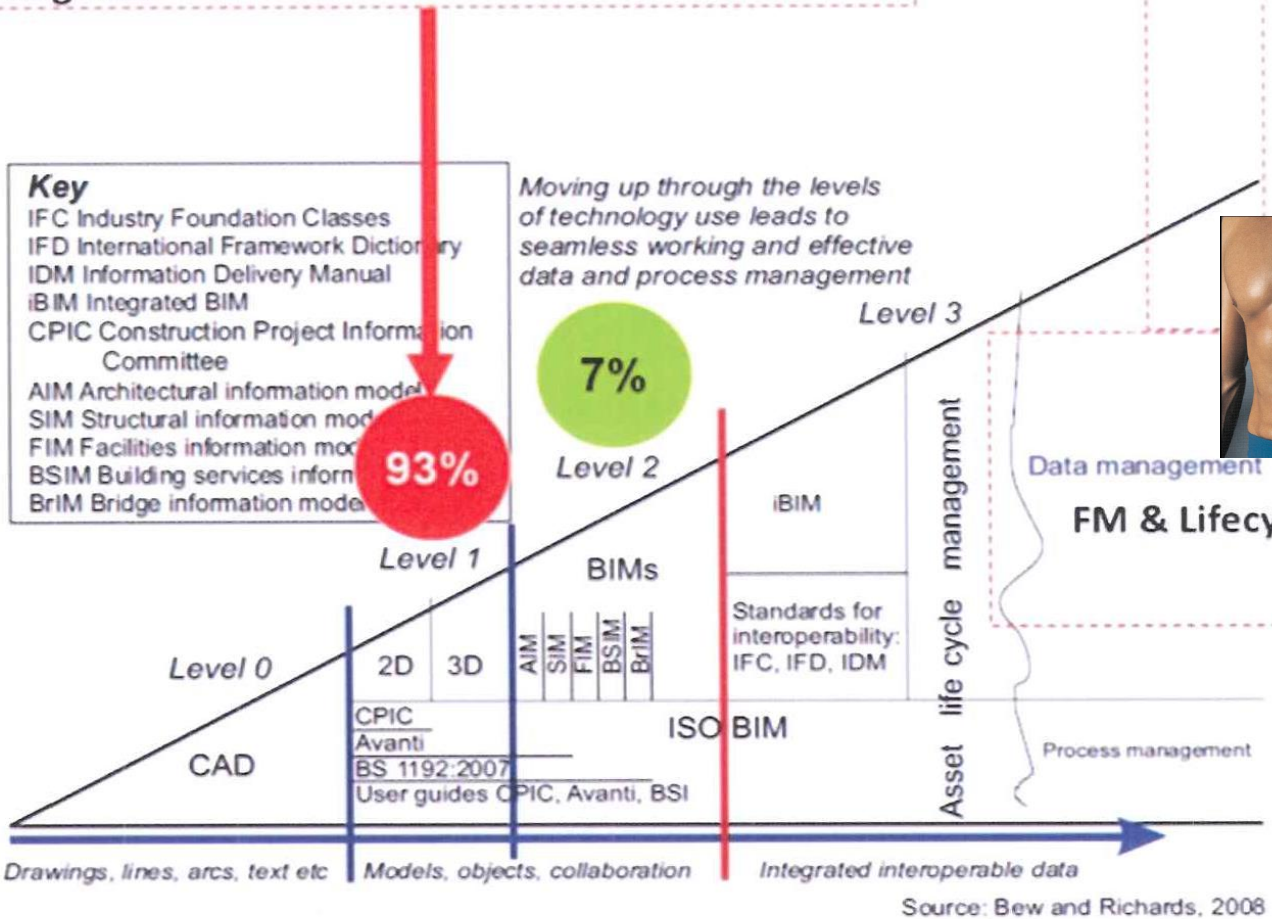


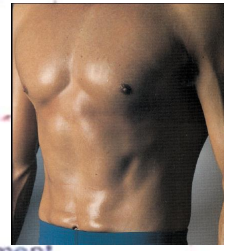
Most of Us

In the IDEAL world a BIM is a fully detailed product model of a Building

In the REAL world most so-called "BIMs" (93%) are spatially accurate 3D models with no intelligence







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Good News ….

We are not here !

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Things to learn…

Market reality…..

Perception

Not what you are,
But what you are seen to be ?
Or what you think you are ?

Awareness

Understanding

Practice & Process

Experience & Wisdom

Estate Information Visibility

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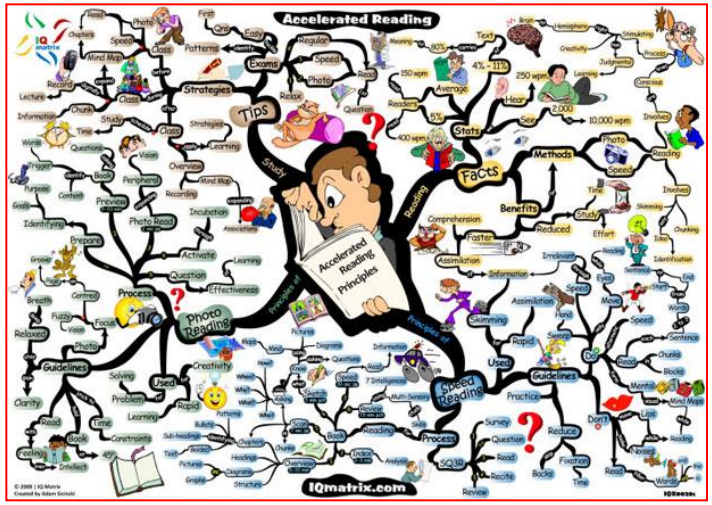
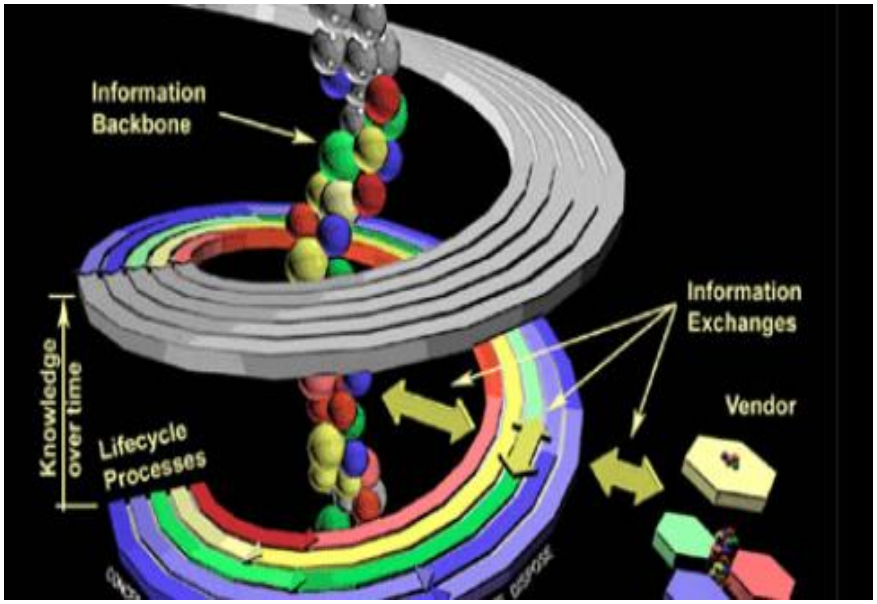


Information is a **GOOD** thing

Information without order is a **BAD** thing

Information at the heart of projects and assets

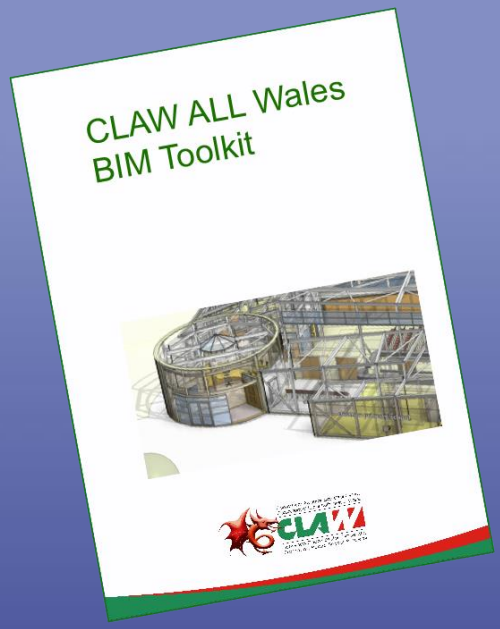


Today and tomorrows decisions….

rely on yesterdays information

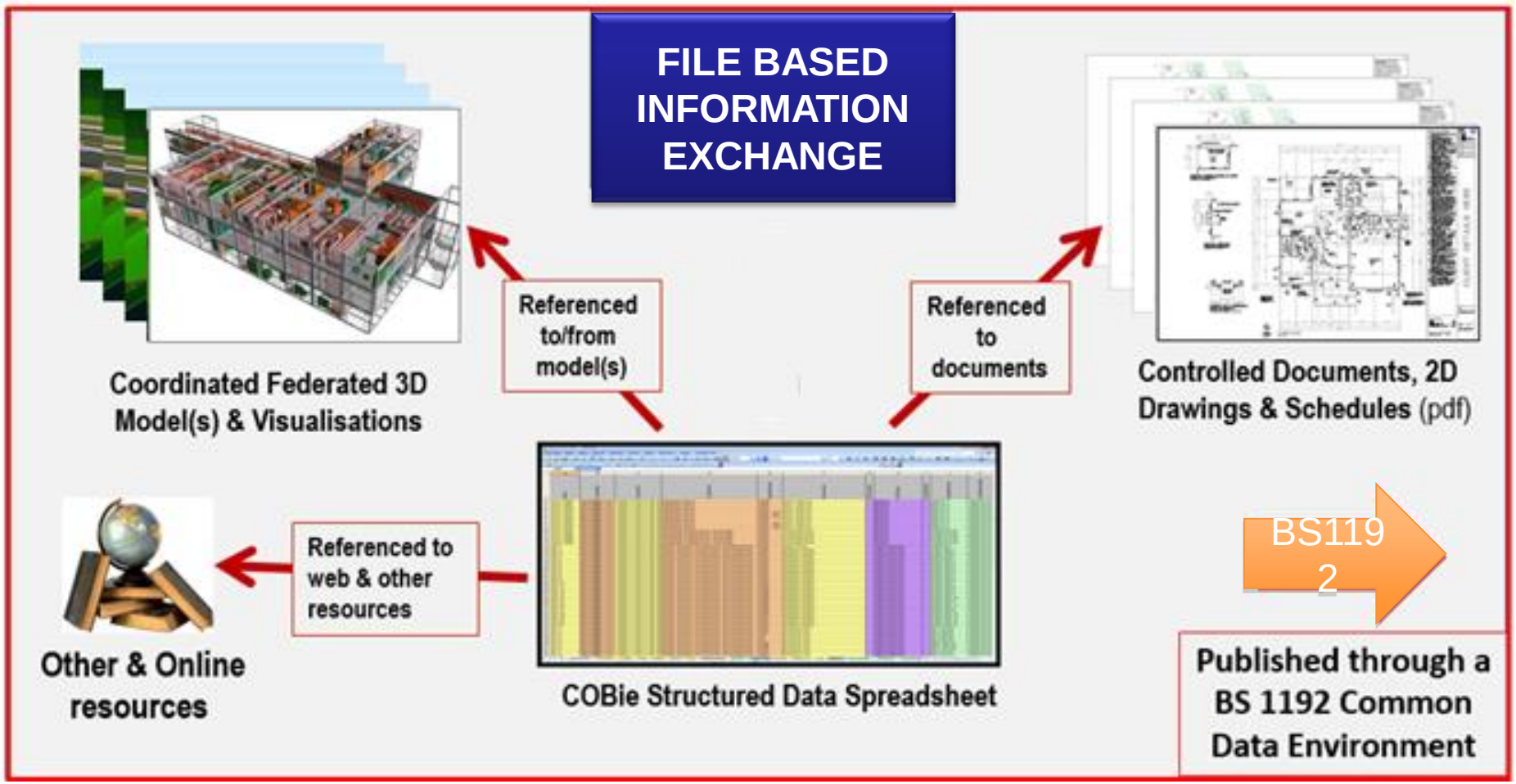
Traditional projects **Bleed** Information

- Business case for BIM
- BIM specific Procurement guidance and tools
- Example Employers Information Requirements
- BIM flyer
- EIR Guidance notes
- BIM and GSL guidance note
- Collaborative Maturity Assessment tools
- Glossary of terms and Acronym key
- Reference points for standards and protocols

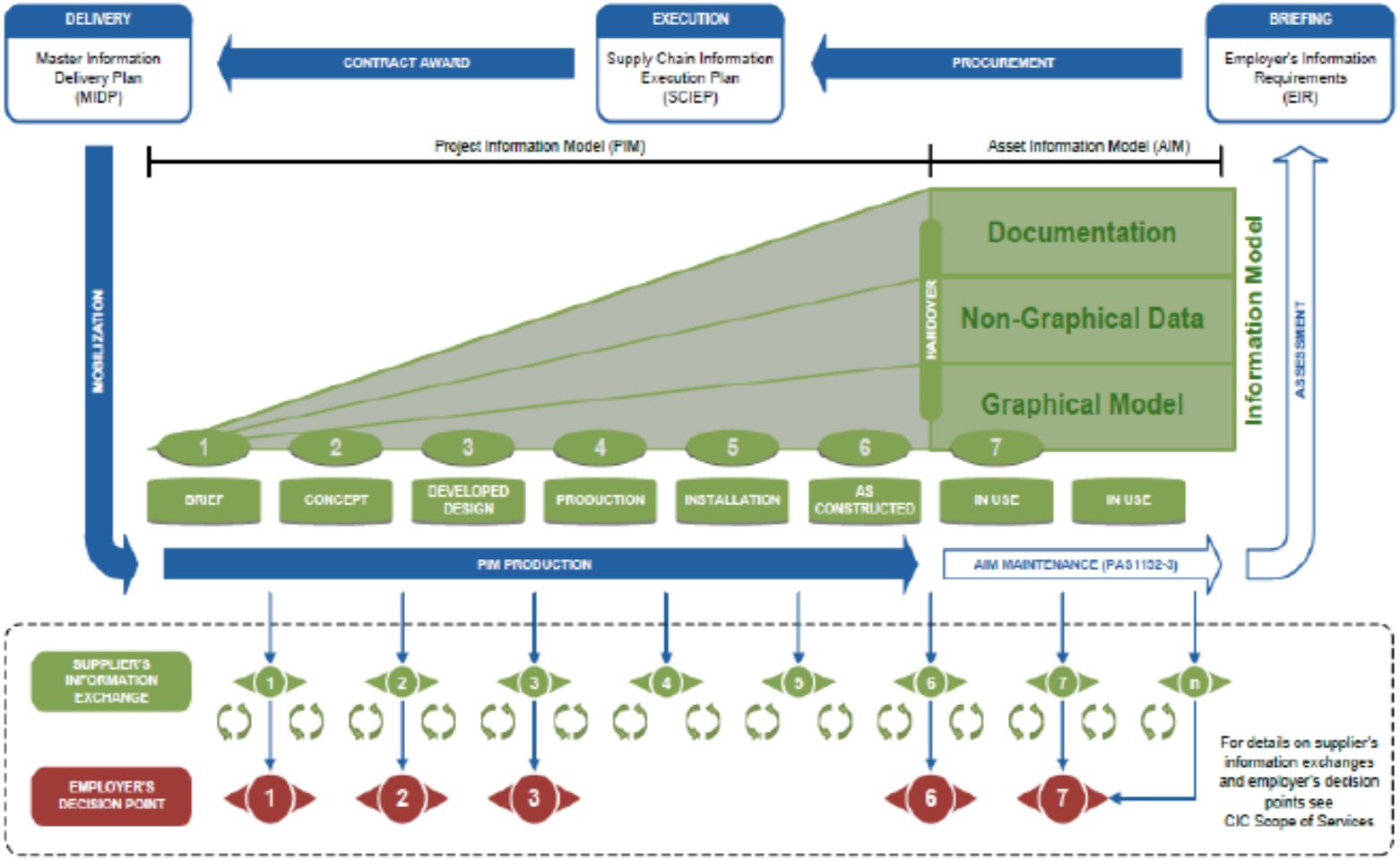


BIM Basics - Level 2 File Exchange

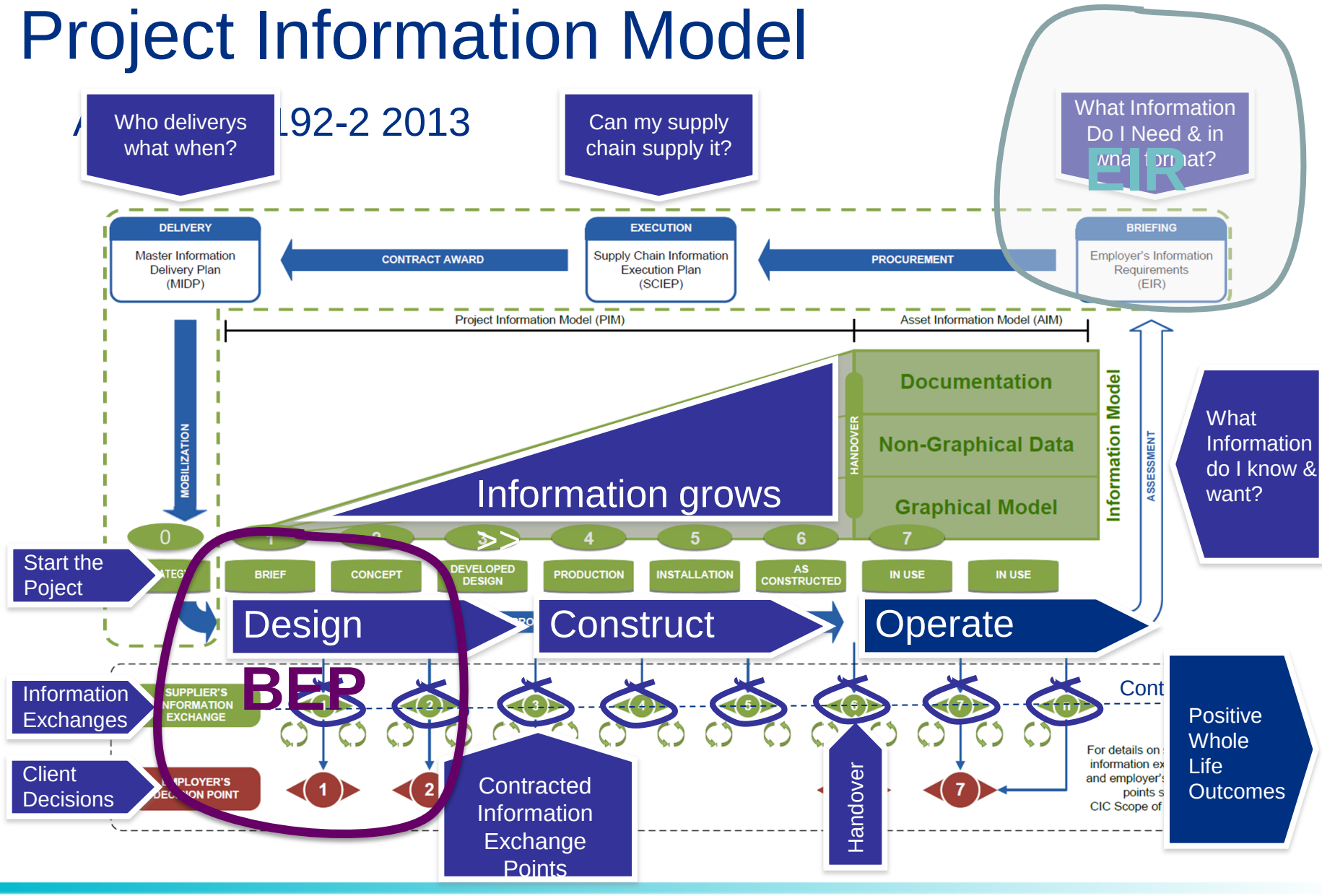
The key to good information exchange is defined exchange formats. Level 2 is electronic file based and the client needs to define what is needed at each stage.



PAS 1192 standard ? Data flow model

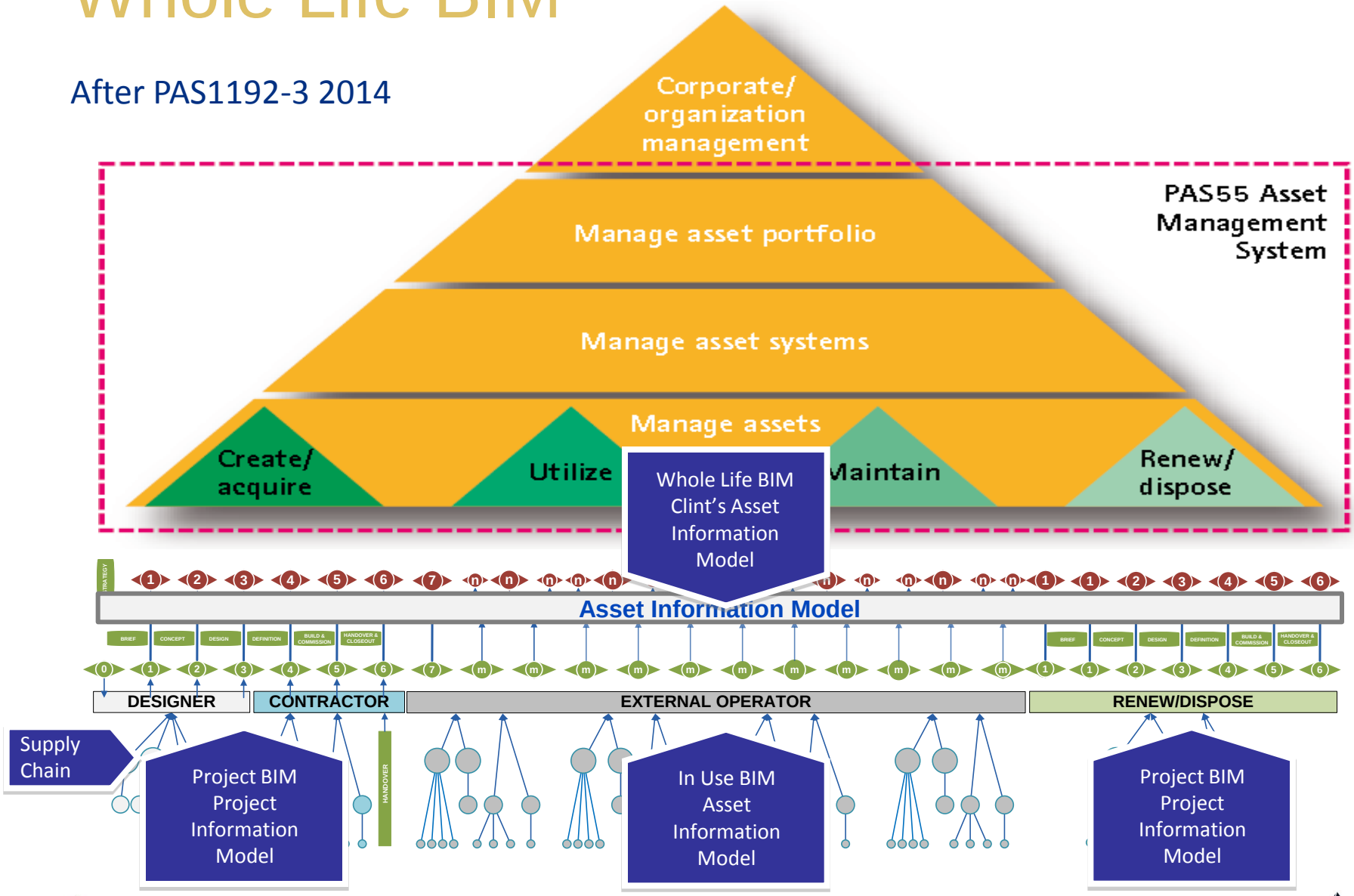


Project Information Model



Whole Life BIM

After PAS1192-3 2014



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Level 2 now Defined by the Standards

BIM Level 2 Dirivation

GCS 2.27
..identify, establish & report on pilot projects

GCS 2.32
Government requires fully collaborative BIM (all project and asset information, documentation & data being electronic)

Standards

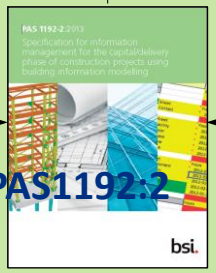
BS1192:2007
Collaborative production of AEC Information

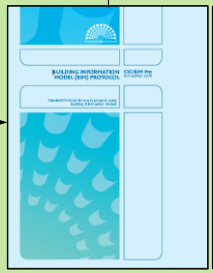
GCS 2.28
PAS91 mandated for Government Work

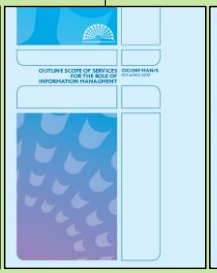
CIC/BIM Protocol

CIC/INF MAN/S

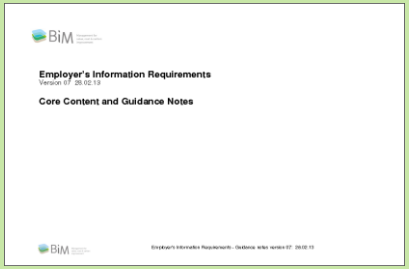
CIC BIM/ INS





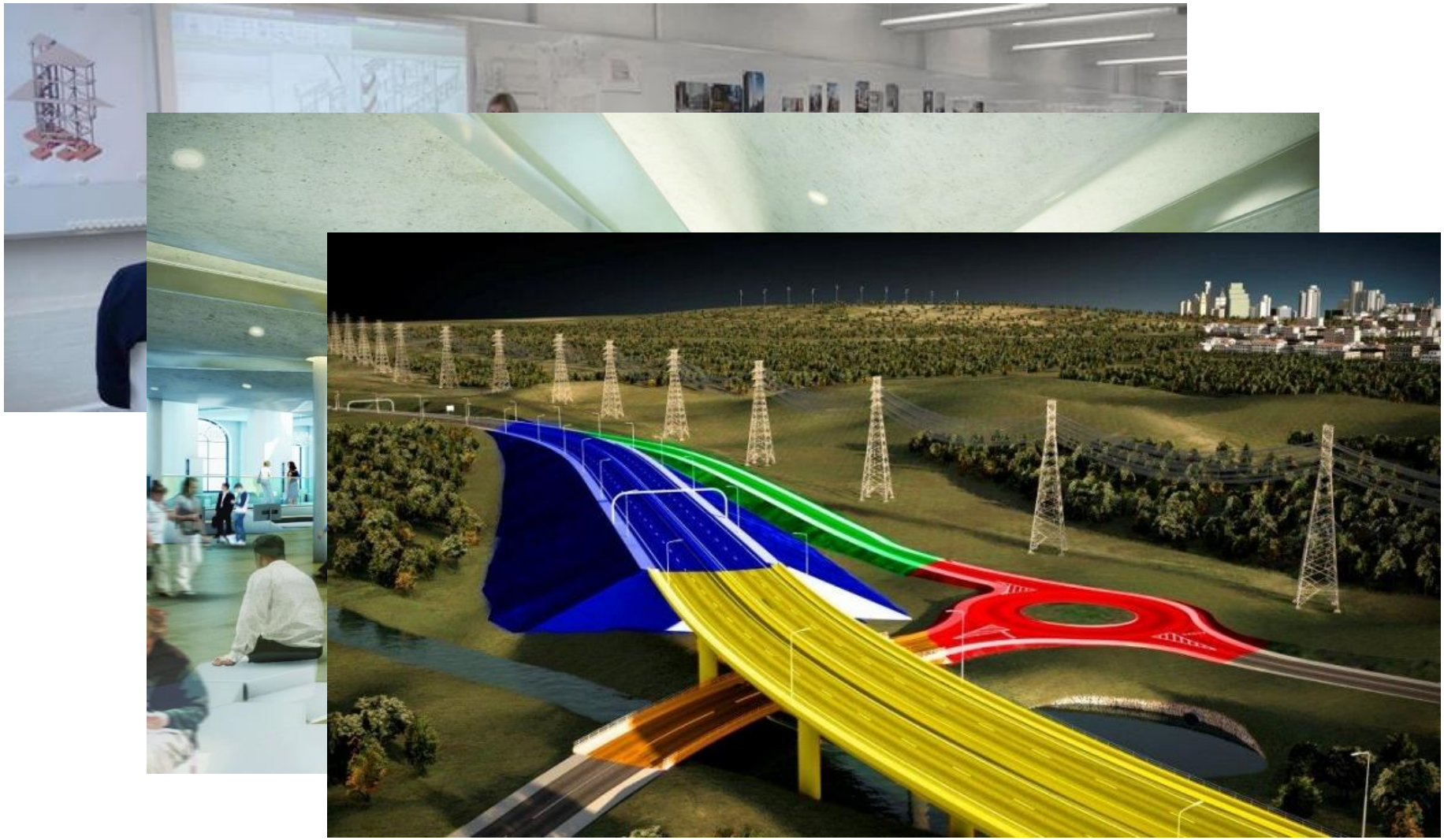


Model Documents & Guides



- ✓ PAS91 PQQ & BIM Protocol to procure direct supplier appointments
- ✓ EIR by Employer & responding BIM Execution Plans by direct appointments
- ✓ Agreed Plan of Work, Employer Decision Gates, Plain Language Questions & Information detail.
- ✓ Agreed collaborative digital information exchange process & protocol to PAS1192:2.
- ✓ Agreed exchange file set: Native & Federation models, drawings & documents, & COBie data.
- ✓ End to End Assigned Roles: Information Manager; Design, Contractor & Operator Lead

Managing, Operating & Infrastructure BIM



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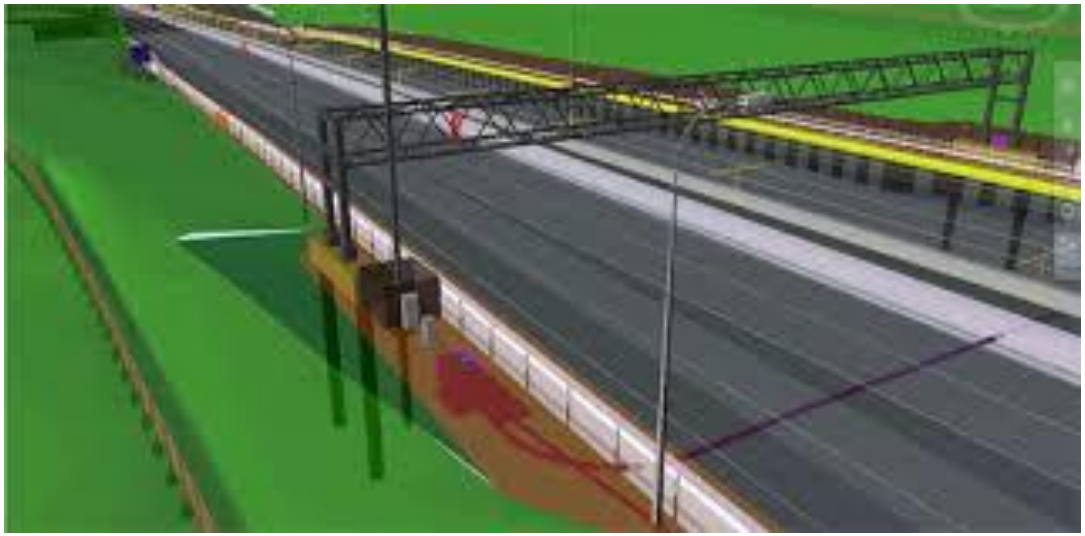
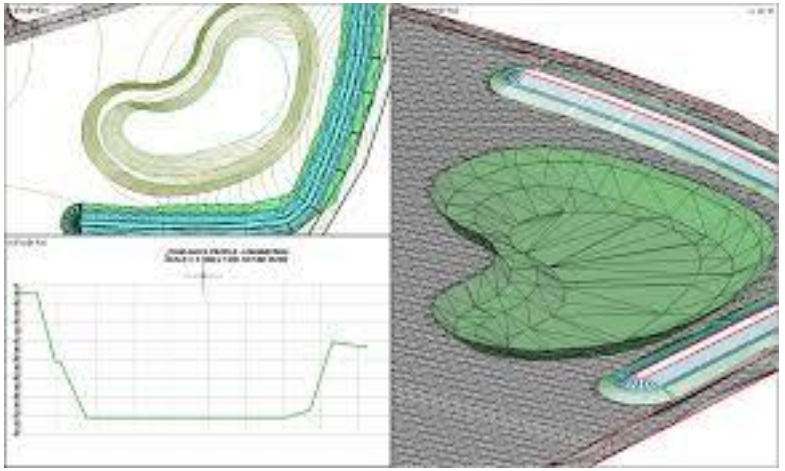
BIM

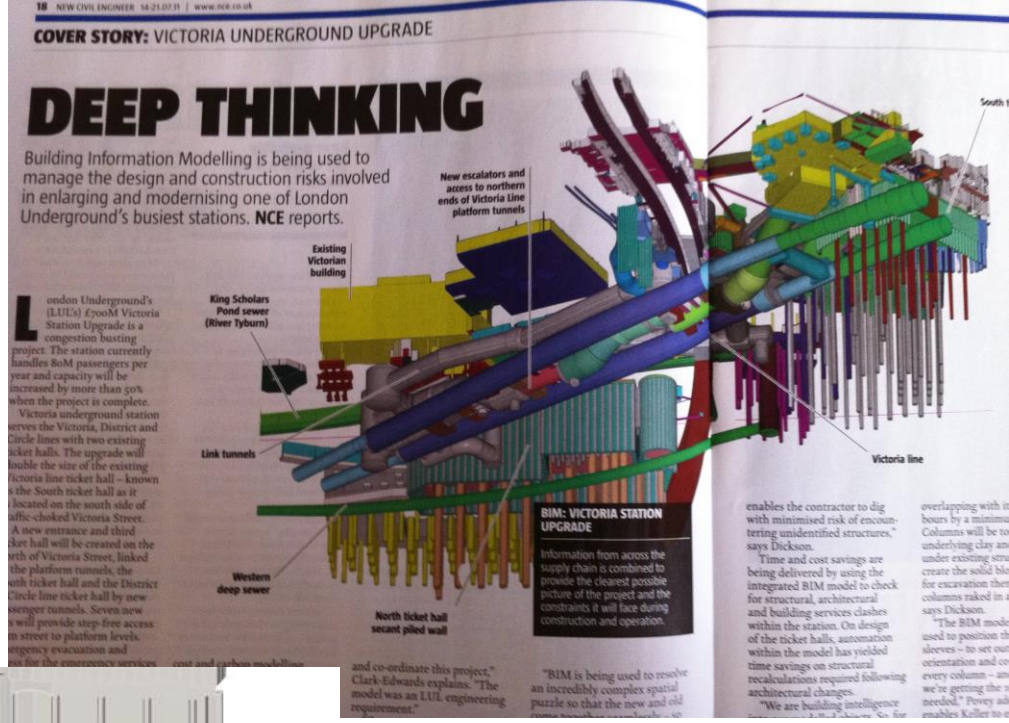
It’s all about Buildings ?

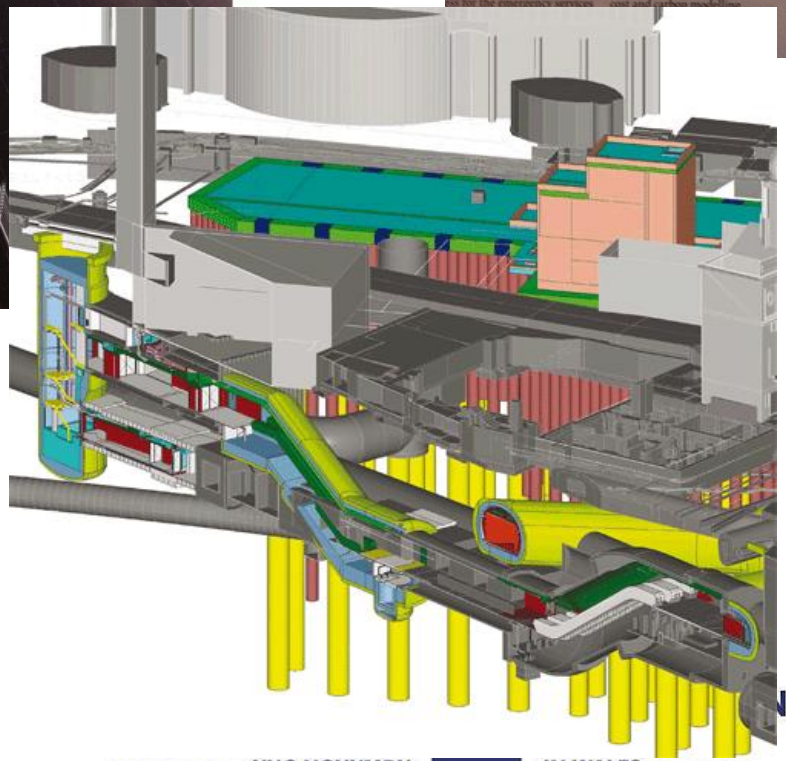
ice
Institution of Civil Engineers



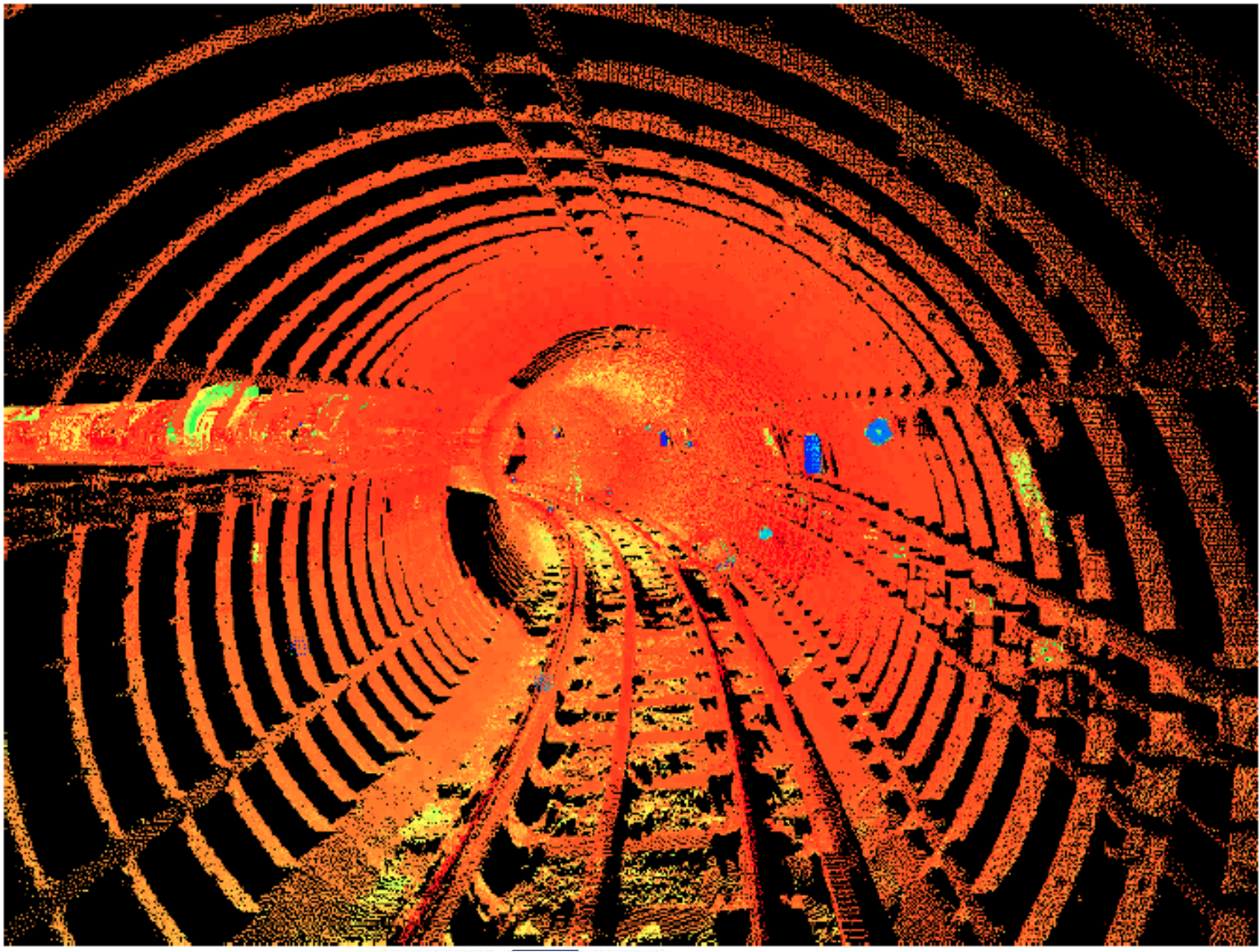



New Civil Engineer
nce
www.nce.co.uk
PLANT SPECIAL
p20
DUTCH COLLAPSE
NEWS p05
LONDON TAKEOVER
ANALYSIS p11
NCE.CO.UK
MODEL TECHNIQUE
WITH BUILDING INFORMATION MODELLING SET TO BECOME COMPULSORY ON PUBLIC PROJECTS, NCE EXAMINES ITS USE ON LONDON'S VICTORIA TUBE STATION UPGRADE

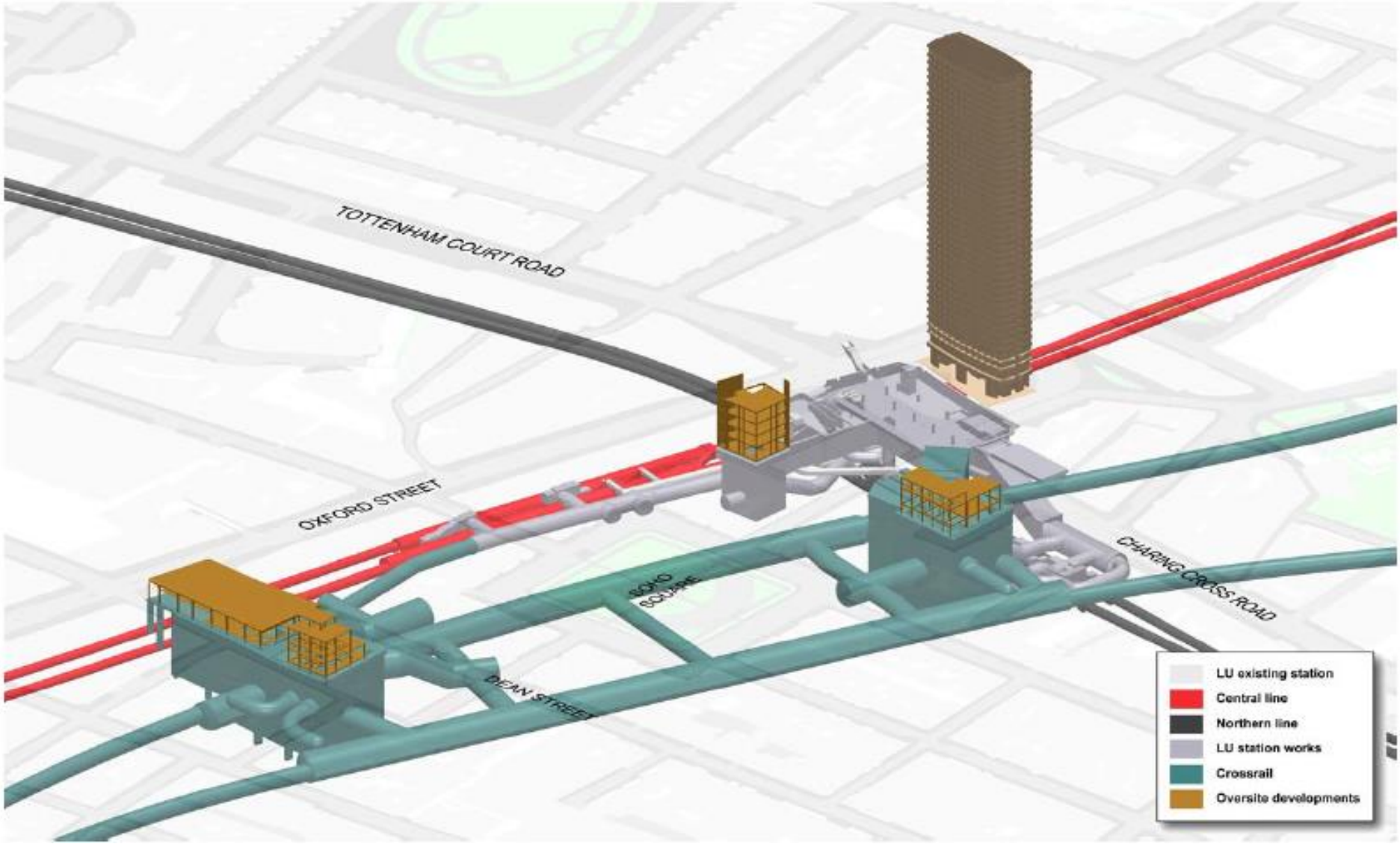

18 NEW CIVIL ENGINEER
COVER STORY: VICTORIA UNDERGROUND UPGRADE
DEEP THINKING
Building Information Modelling is being used to manage the design and construction risks involved in enlarging and modernising one of London Underground's busiest stations. NCE reports.
New escalators and access to northern ends of Victoria Line platform tunnels
Existing Victorian building
King Scholars Pond sewer (River Tyburn)
Link tunnels
Western deep sewer
North ticket hall secant piled wall
Victoria line
BIM: VICTORIA STATION UPGRADE
Information from across the supply chain is combined to provide the clearest possible picture of the project and the constraints it will face during construction and operation.



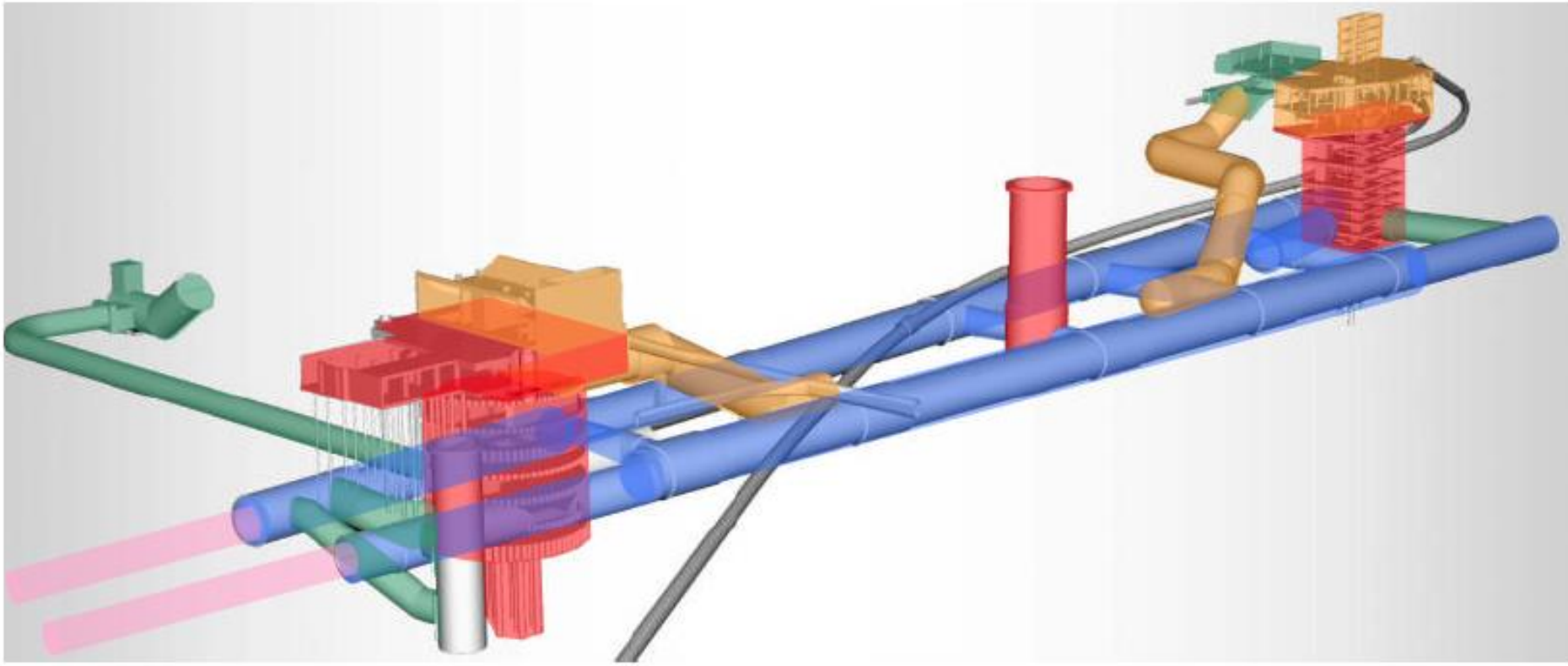
Data Collected – Cloud Point Surveys



Spatial & Integration Complexity



Construction Complexity



Stage 1
- Shafts and boxes

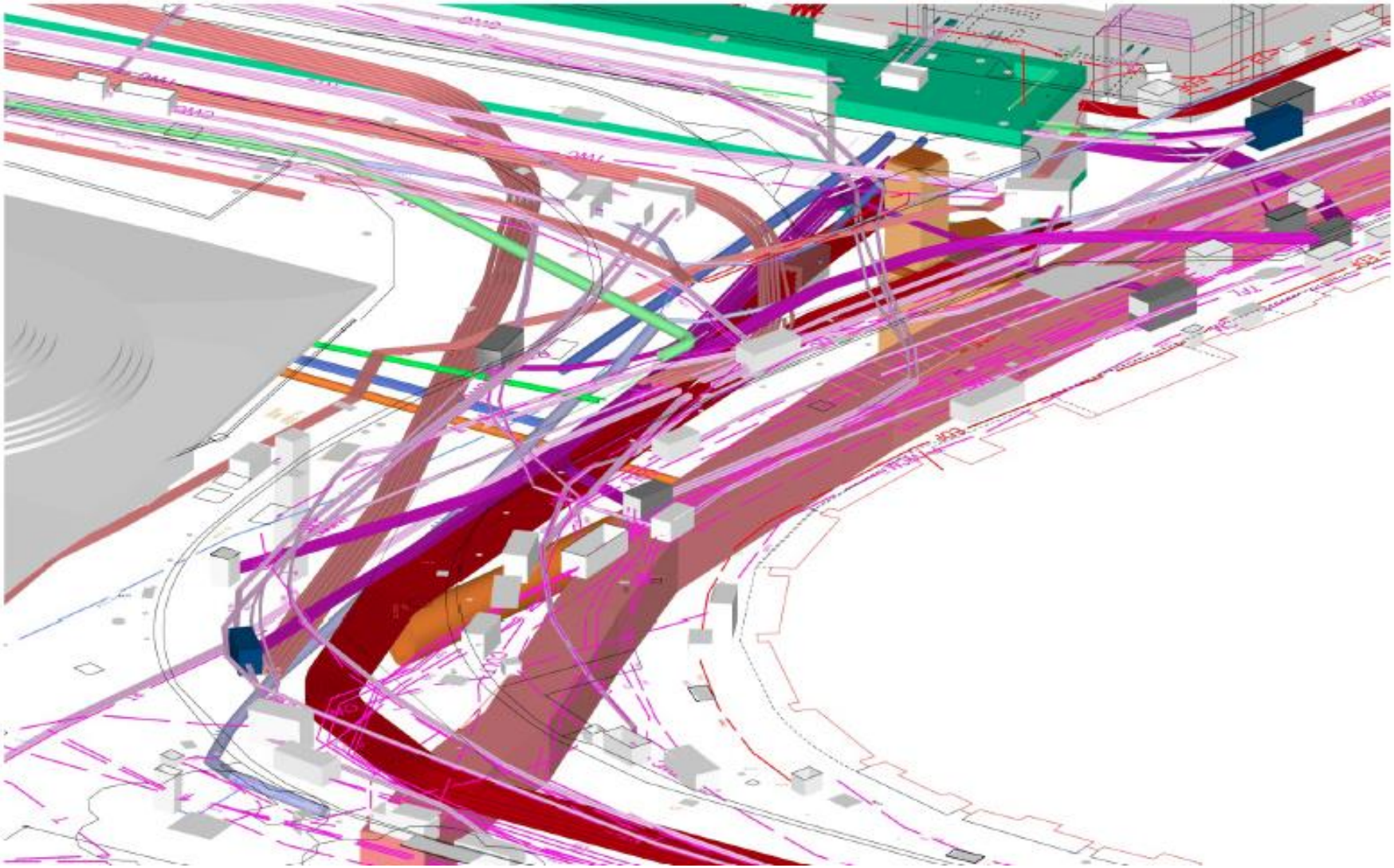
Stage 2
- Platform Tunnels
- Cross Passages

Stage 3
- Vent adits
- Links

Stage 4
- Escalator Shafts
- Ticket Halls

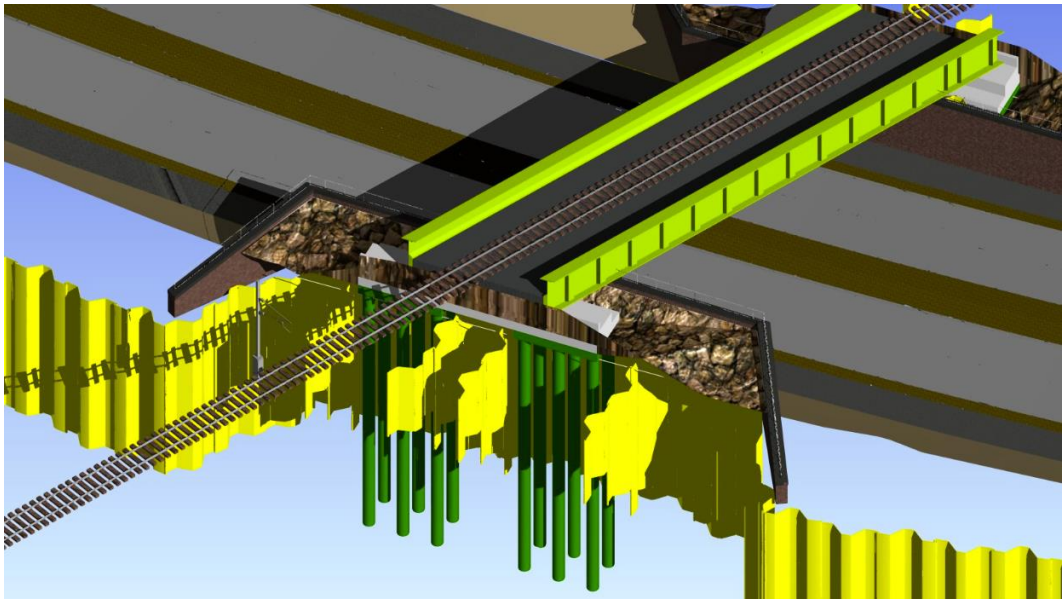
Stage 5
- Running Tunnels

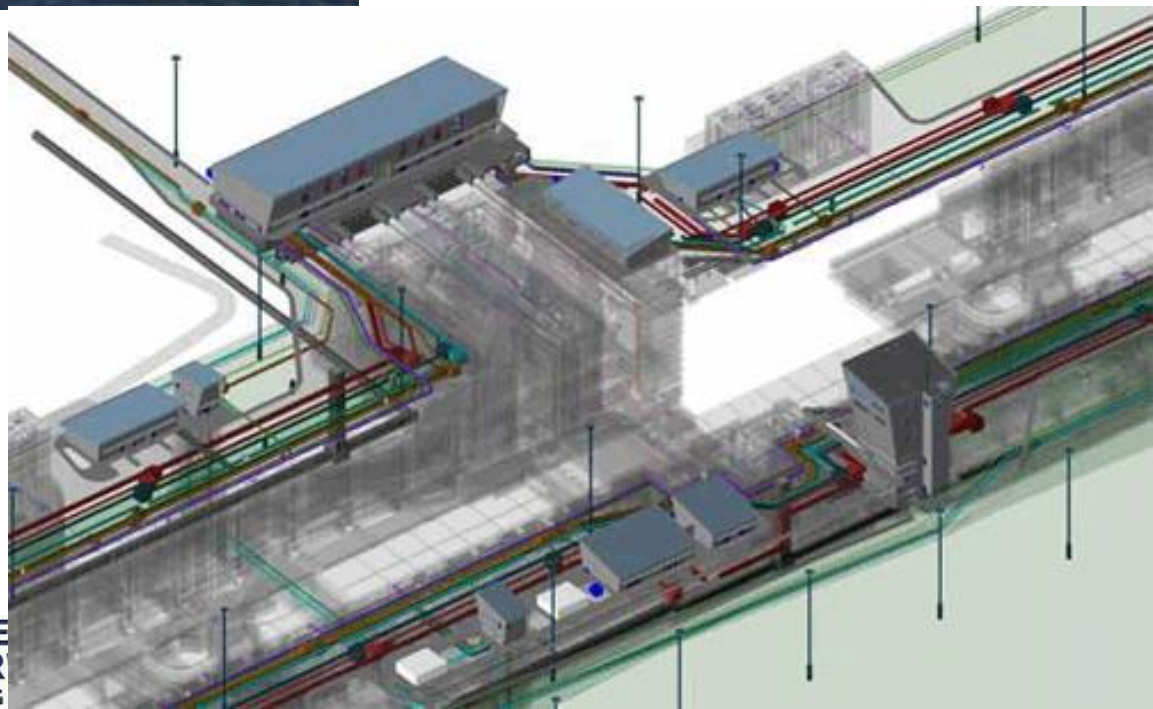
Data Collected – Public Utilities



BIM

It’s all about Buildings ?





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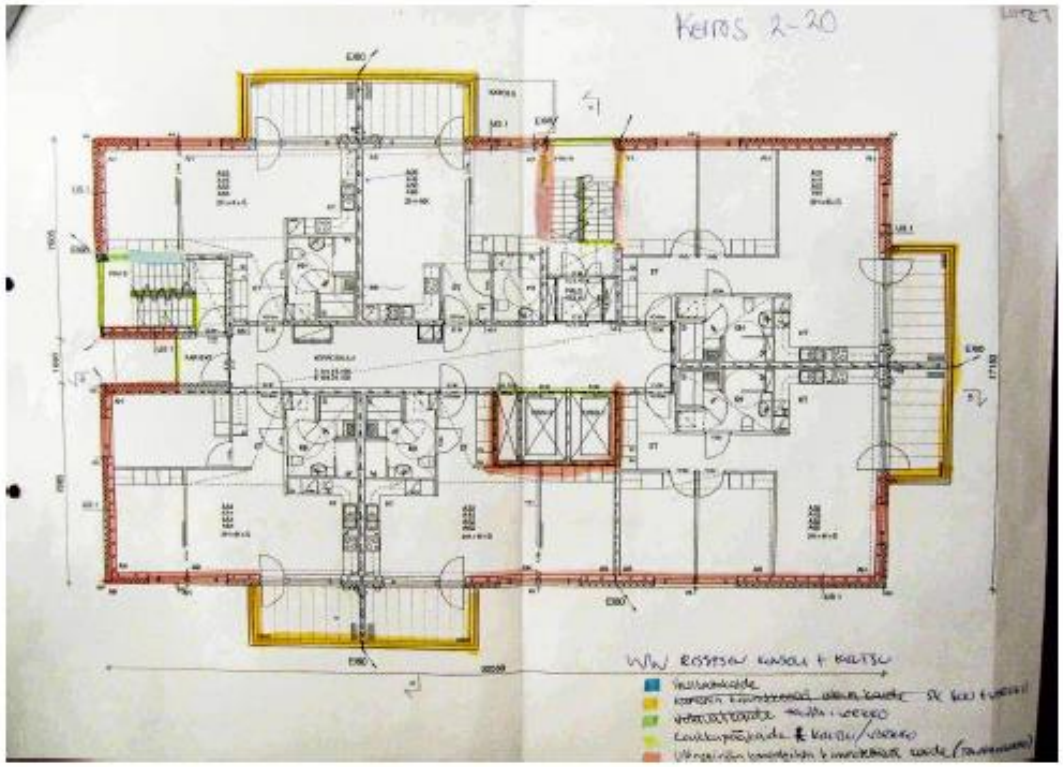
ADE
ARBENIGR
YNG

Easy to Understand ?



Really Easy to understand !

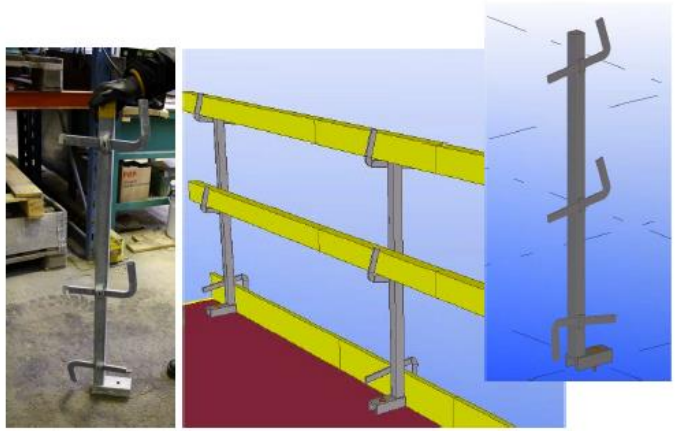
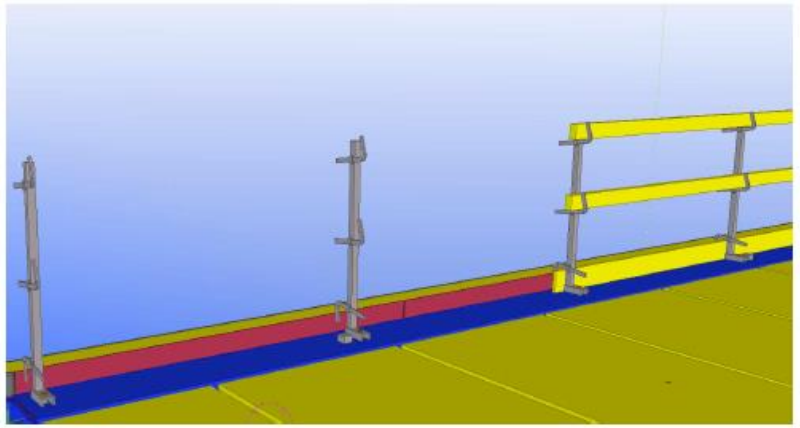
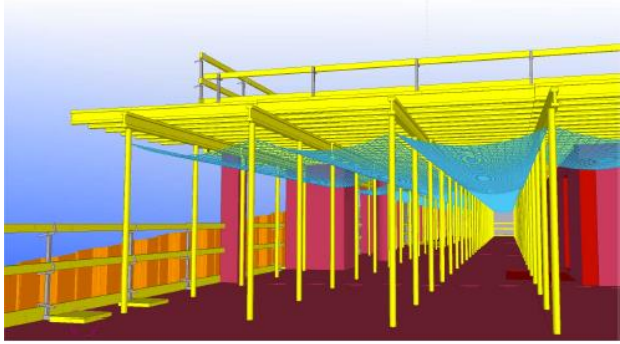


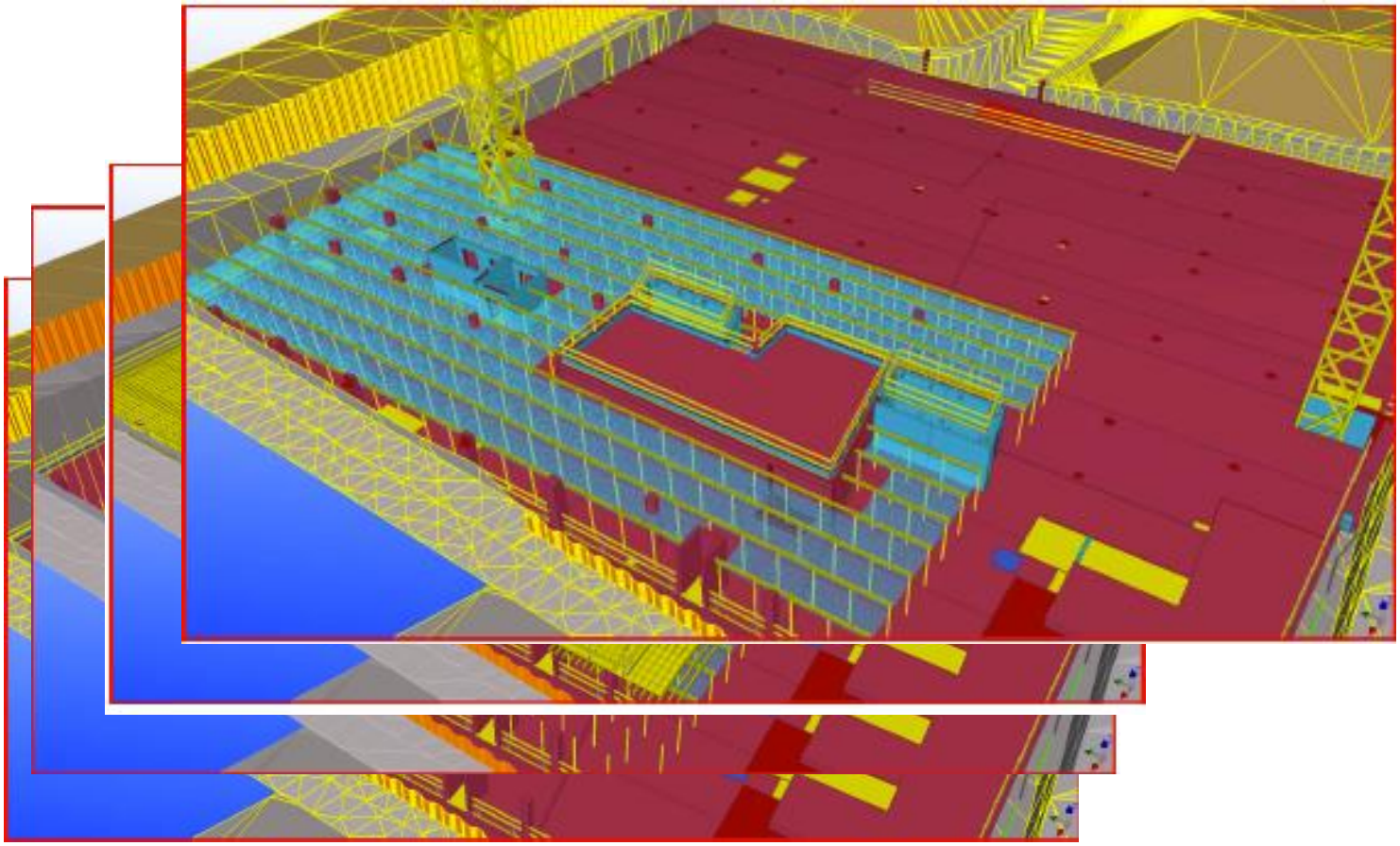
Figure 3. Safety railing equipment modelled for the first pilot project (guardrail post for surface installation used together with timber railings).



HSE
Health & Safety Executive

Progressive Process Interogation





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CONSTRUCTING EXCELLENCE IN WALES

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Overswing areas……..


BIM Manager
Wanted!

B.I.M. Manager

What my colleagues think I do

What my friends think I do

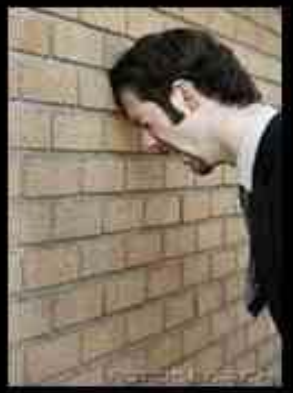
What my boss thinks I do

What CAD users think I do

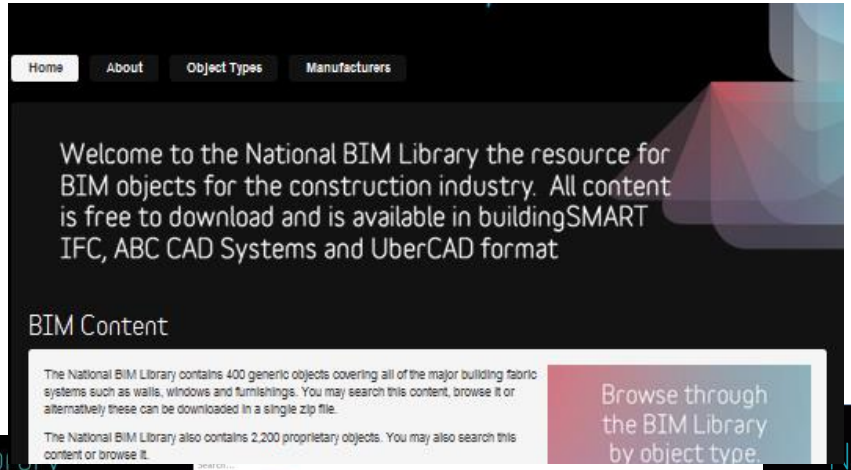
?

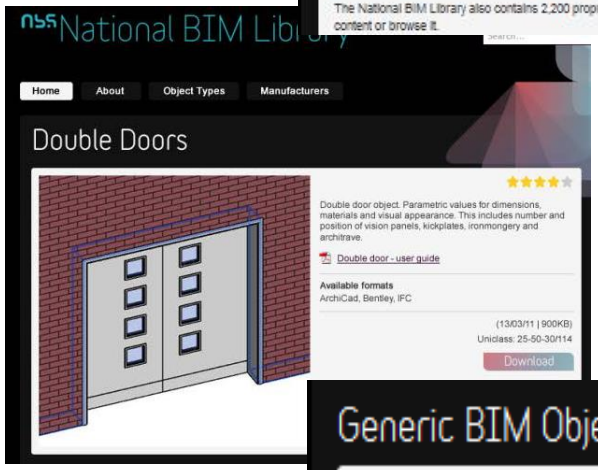
What I think I do

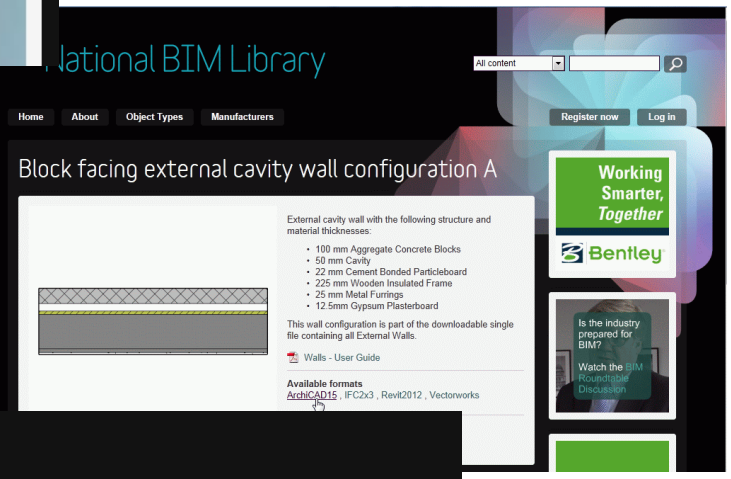
What I actually I do

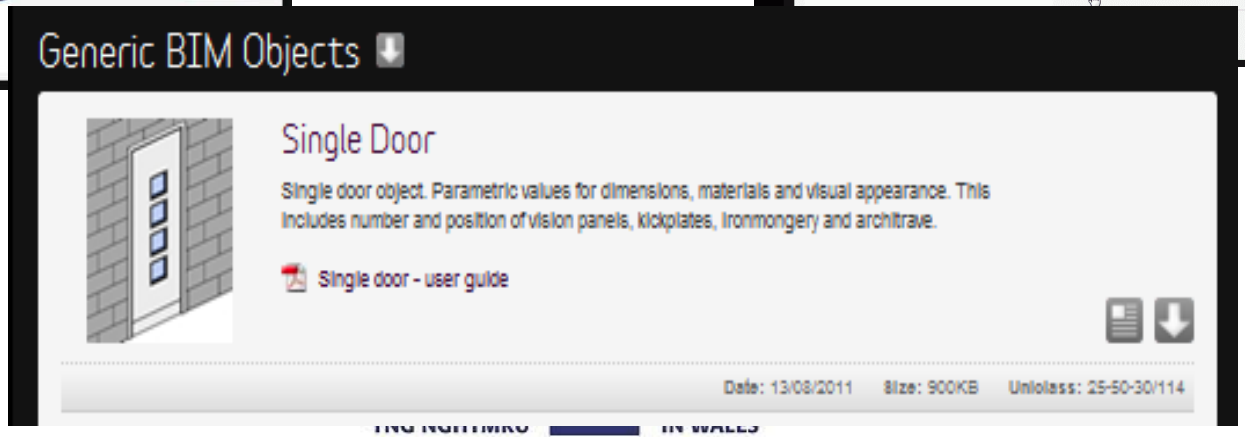


Library objects









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Manufacturers & Intelligent components

ServiceLifeType	expectedservicelife	The typical service life that is quoted for an artefact under reference operating conditions.
ServiceLifeDuration	40	The length or duration of a service life.

Pset_TypeObject - Properties for BeamType (IfcPropertySet)

Name	Value	Description
Update	2012-03-01	Date of update
Tag	Kingspan AWP-KS1000MR-80 Composite Panel Cladding system	Tag
ElementType	External Wall Cladding	ElementType
PredefinedType	USERDEFINED	PredefinedType

Pset_MetalCompositePanelCladding_UK - Properties for BeamType (IfcPropertySet)

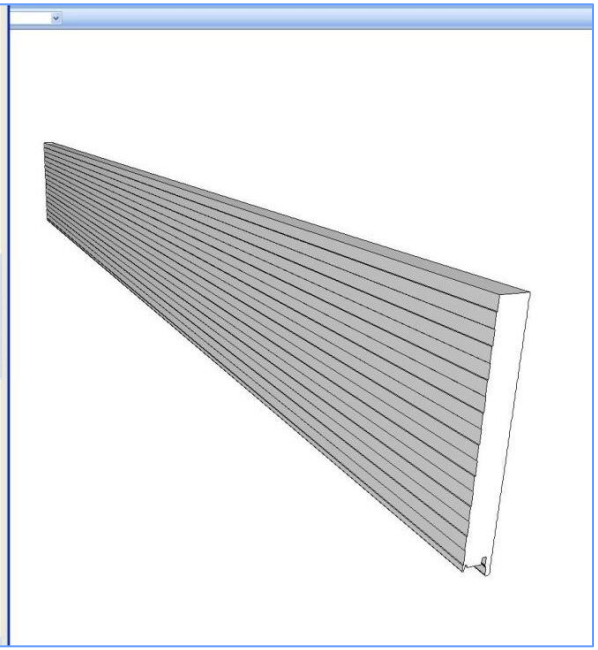
Name	Value	Description
Update	2012-03-01	Date of update
System manufacturer	Kingspan Ltd	System manufacturer : [...
Cladding panels	AWP-KS1000MR-80	Cladding panels
Panel type	Aluminium composite panels.	Panel type : Aluminium composite panels. : Carbon steel composite panels. : Stainless steel composite panels.
Panel fasteners	carbon steel stand-off screws and washers.	Panel fasteners : Carbon steel stand-off screws and washers.
End and side laps	notpolyisobutylene-based tapes. defined	End and side laps : Butyl-based sealant tapes. : Cross linked butyl rubber sealant tapes. : Partially cross linked butyl rubber sealant tapes. : Polyisobutylene-based tapes.
Continuity thermal insulation	rigid polyisocyanurate foam (pir).	Continuity thermal insulation : Mineral fibre batts. : Rigid polyeocyanurate foam (PIR).
Submittals	information submittals.	Submittals : Control samples. : Information submittals. : Preliminary installation.
System accessories	cold formed flashings and trims. ,	System accessories : Butt straps. : Cold formed flashings and trims. : Isolating tape. : Closed cell cross linked EP profile fillers. : Closed cell EPDM synthetic rubber profile fillers. : EP faced with EPDM profile fillers. : Fire resisting profile filler adhesive. : Penetration edge reinforcement. : Push on screw head covers. : Sealed aluminium rivets for flashings and trims. : Self-adhesive tape. : Structural movement joints.

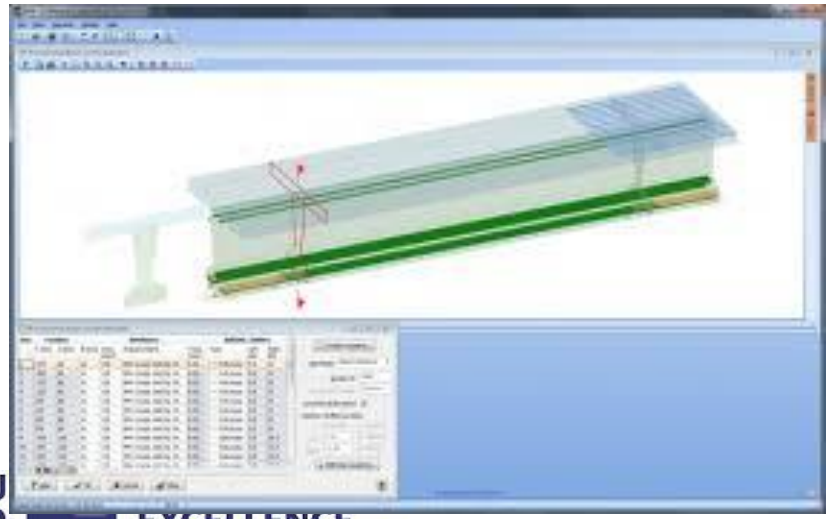
Pset_WallCommon - Properties for BeamType (IfcPropertySet)

Name	Value	Description
Update	2012-03-01	
Reference	25-80-52-A	Reference ID for this specified type in this project (e.g. type 'A-1'), provided, if there is no classification reference to a recognized classification system used.
AcousticRating	24	Acoustic rating for this object. It is provided according to the national building code. It indicates the sound transmission resistance of this object by an index ratio (instead of providing full sound absorbtion values).
FireRating	30	Fire rating given according to the national fire safety classification.
Combustible	False	Indication whether the object is made from combustible material (TRUE) or not (FALSE).
SurfaceSpreadOfFlame	1	Indication on how the flames spread around the surface. It is given according to the national building code that governs the fire behaviour for materials.
ThermalTransmittance	0.27	Thermal transmittance coefficient (U-Value) of a material. Here the total thermal transmittance coefficient through the wall (including all materials).
IsExternal	True	Indication whether the element is designed for use in the exterior (TRUE) or not (FALSE). If (TRUE) it is an external element and faces the outside of the building.
ExtendToStructure	False	Indicates whether the object extend to the structure above (TRUE) or not (FALSE).
LoadBearing	False	Indicates whether the object is intended to carry loads (TRUE) or not (FALSE).
Compartmentation	False	Indication whether the object is designed to serve as a fire compartmentation (TRUE) or not (FALSE).

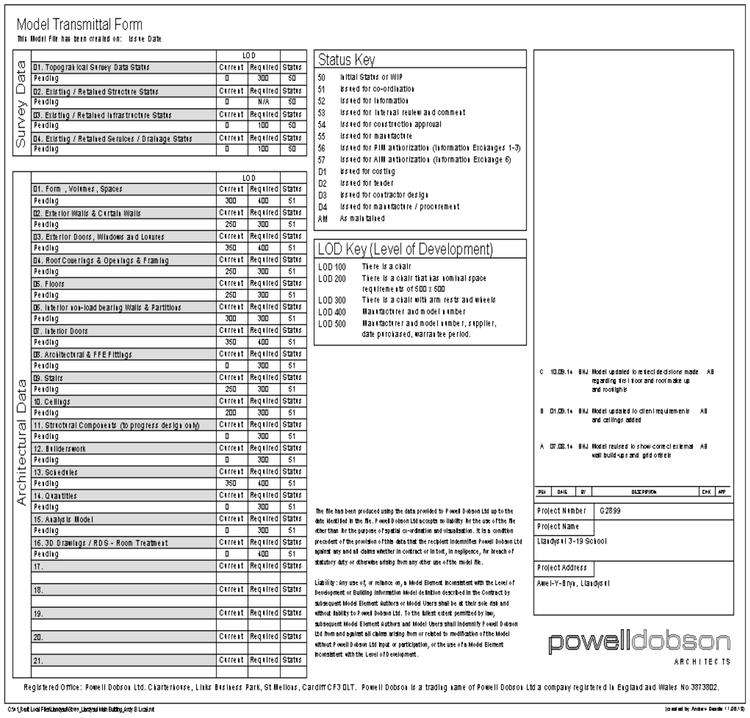
Pset_Specification - Properties for BeamType (IfcPropertySet)

Name	Value	Description
Update	2012-03-01	Date of update
Documentation	http://www.wbdg.org/unknown.pdf	Location (Uniform Resource Information) for further product information





LEVEL OF DETAIL / DEVELOPMENT (LOD)



Model Transmittal Form

This Model File has been created on: Issue Date

Survey Data

	LOD		
01. Topographical Survey Data Status	Current	Required	Status
Pending	0	300	50
02. Existing / Retained Structure Status	Current	Required	Status
Pending	0	N/A	50
03. Existing / Retained Infrastructure Status	Current	Required	Status
Pending	0	100	50
04. Existing / Retained Services / Drainage Status	Current	Required	Status
Pending	0	100	50

Architectural Data

	LOD		
01. Form , Volumes , Spaces	Current	Required	Status
Pending	300	400	51
02. Exterior Walls & Curtain Walls	Current	Required	Status
Pending	250	300	51
03. Exterior Doors, Windows and Louvres	Current	Required	Status
Pending	350	400	51
04. Roof Coverings & Openings & Framing	Current	Required	Status
Pending	250	300	51
05. Floors	Current	Required	Status
Pending	250	300	51
06. Interior non-load bearing Walls & Partitions	Current	Required	Status
Pending	300	300	51
07. Interior Doors	Current	Required	Status
Pending	350	400	51
08. Architectural & FFE Fittings	Current	Required	Status
Pending	0	300	51
09. Stairs	Current	Required	Status
Pending	250	300	51
10. Ceilings	Current	Required	Status
Pending	200	300	51
11. Structural Components (to progress design only)	Current	Required	Status
Pending	0	300	51
12. Builderswork	Current	Required	Status
Pending	0	300	51
13. Schedules	Current	Required	Status
Pending	350	400	51
14. Quantities	Current	Required	Status
Pending	0	300	51
15. Analysis Model	Current	Required	Status
Pending	0	300	51
16. 3D Drawings / RDS - Room Treatment	Current	Required	Status
Pending	0	400	51
17.	Current	Required	Status
18.	Current	Required	Status
19.	Current	Required	Status
20.	Current	Required	Status
21.	Current	Required	Status

Status Key

50	Initial Status or WIP
51	Issued for co-ordination
52	Issued for information
53	Issued for internal review and comment
54	Issued for construction approval
55	Issued for manufacture
56	Issued for PIM authorization (Information Exchanges 1-3)
57	Issued for AIM authorization (Information Exchange 6)
D1	Issued for costing
D2	Issued for tender
D3	Issued for contractor design
D4	Issued for manufacture / procurement
AM	As maintained

LOD Key (Level of Development)

LOD 100	There is a chair
LOD 200	There is a chair that has nominal space requirements of 500 x 500
LOD 300	There is a chair with arm rests and wheels
LOD 400	Manufacturer and model number
LOD 500	Manufacturer and model number, supplier, date purchased, warrantee period.

REV	DATE	BY	DESCRIPTION	CHK	APP
C	10.09.14	BHJ	Model updated to reflect decisions made regarding first floor and roof make up and rooflights	AB	
B	01.09.14	BHJ	Model updated to client requirements and ceilings added	AB	
A	07.08.14	BHJ	Model revised to show correct external wall build-ups and grid offsets	AB	

The file has been produced using the data provided to Powell Dobson Ltd up to the date identified in the file. Powell Dobson Ltd accepts no liability for the use of the file other than for the purpose of spatial co-ordination and visualisation. It is a condition precedent of the provision of this data that the recipient indemnifies Powell Dobson Ltd against any and all claims whether in contract or in tort, in negligence, for breach of statutory duty or otherwise arising from any other use of the model file.

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Project Number: G2899

Project Name: Llandysul 3-19 School

Project Address: Awel-Y-Bryn, Llandysul

powelldobson ARCHITECTS

Registered Office: Powell Dobson Ltd. Charterhouse, Links Business Park, St Mellons, Cardiff CF3 0LT. Powell Dobson is a trading name of Powell Dobson Ltd a company registered in England and Wales No 3873802.

- LOD 100 – Placeholder
- LOD 200 – Basic Geometry
- LOD 300 – Detailed Geometry
- LOD 400 – Actual Geometry & Description
- LOD 500 – As above with detailed embedded information – i.e. Manufacturer, Warrantee period, date purchased.

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CONSTRUCTING EXCELLENCE IN WALES

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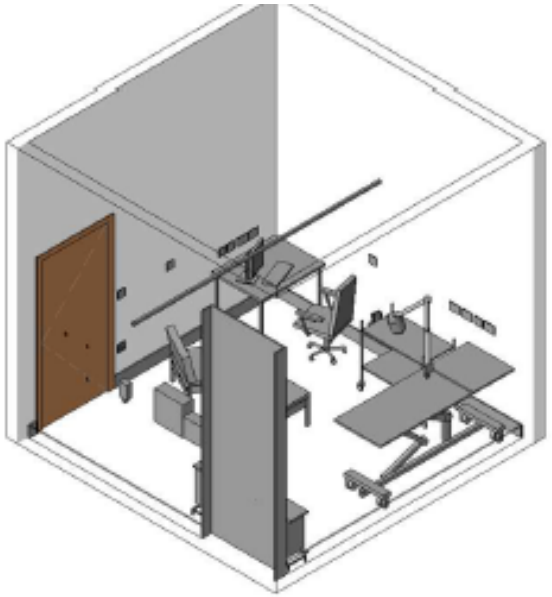
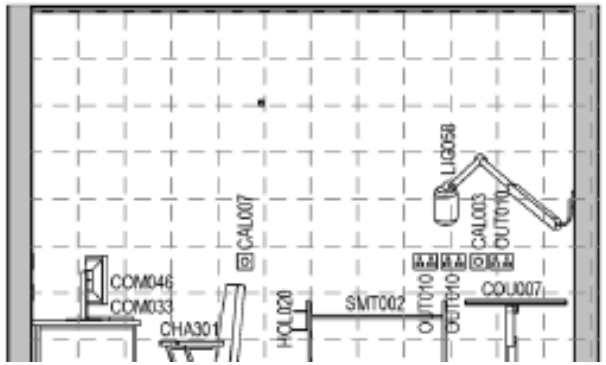
Intelligent object clusters…. Standard rooms





- Catalogue of generic BIM room models based on NHS ADB component schedules and HBN or www.spaceforhealth.nhs.uk guidance on standard room layouts and activity space.

Image courtesy of Aedas

Right First Time ?

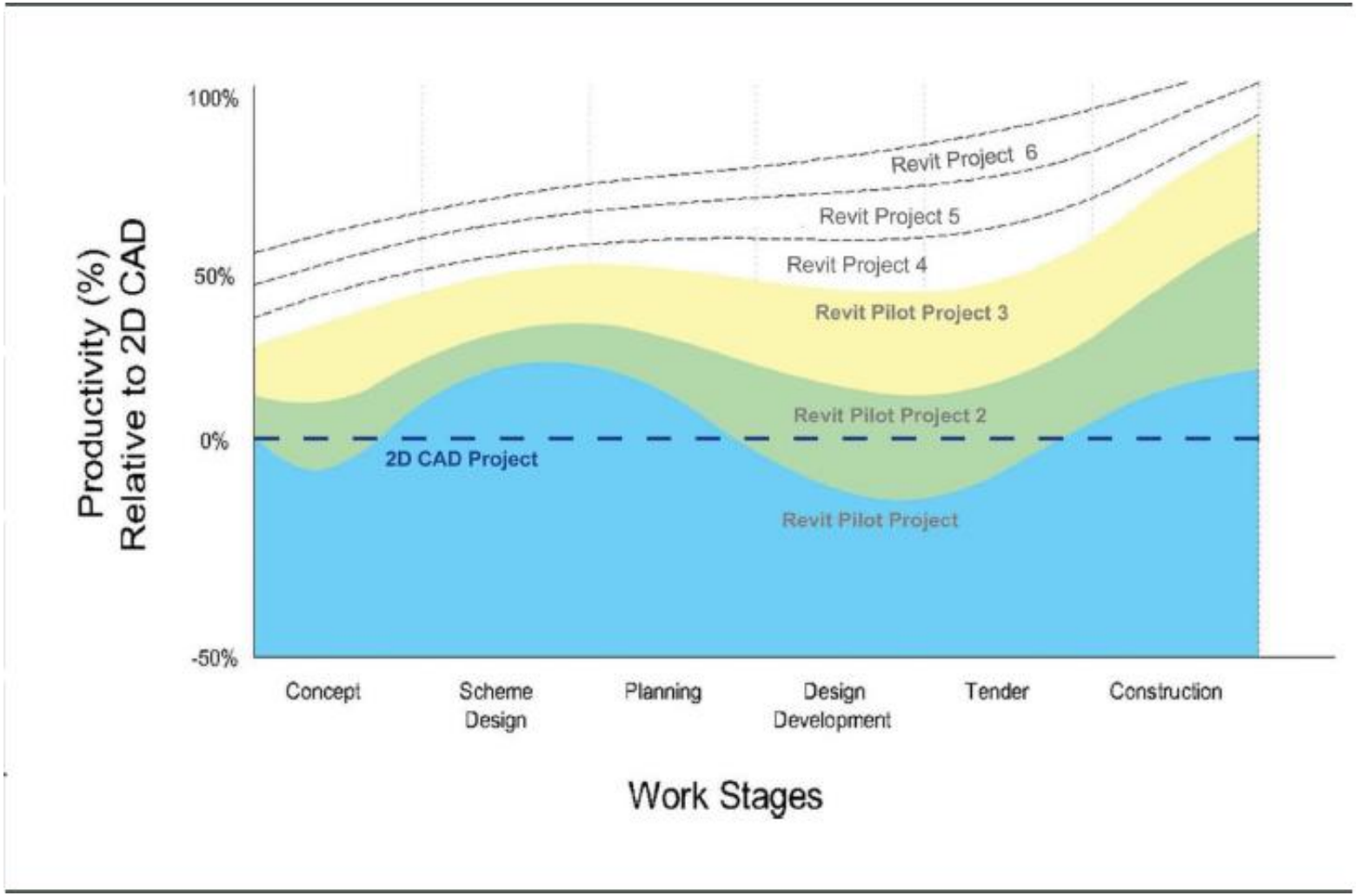


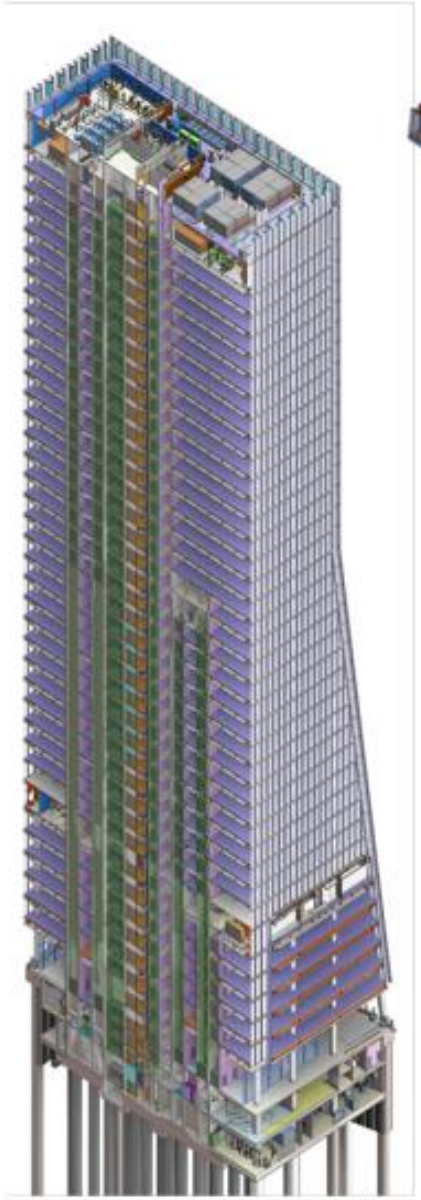
Image courtesy of Aedas

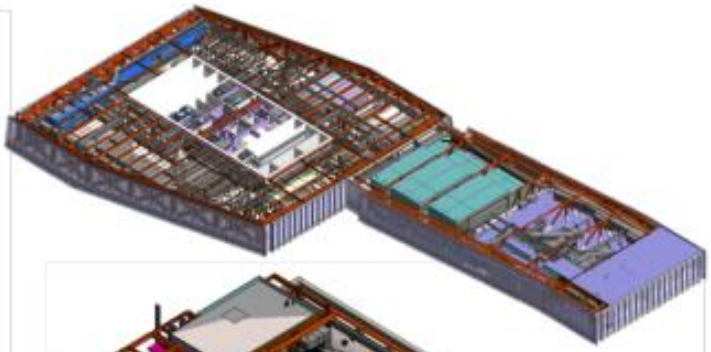
Its All about Communication…

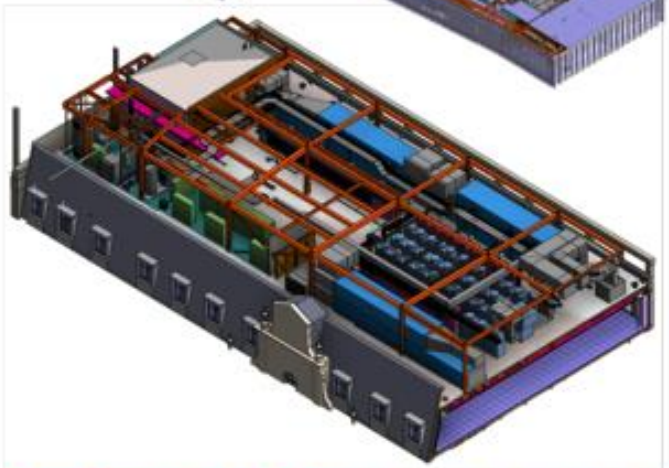
and Information….

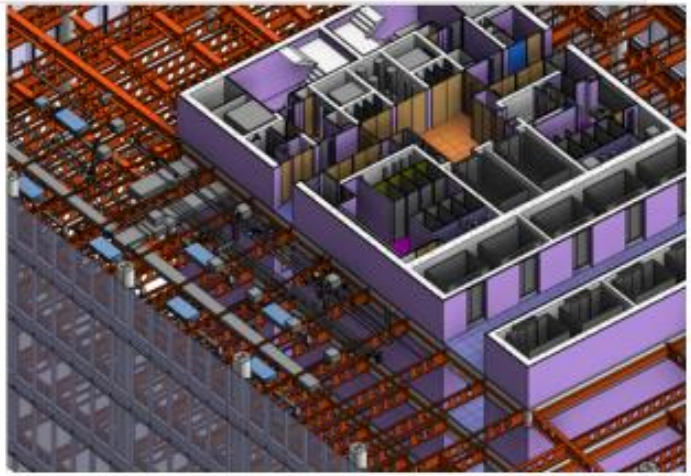
Leadenhall – The Cheesegrater Building

A tale of BIM reality……









Open

Shareable

Information

????

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CONSTRUCTING EXCELLENCE IN WALES

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Procuring and Tendering….. with BIM

Are You ready for this ?

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CONSTRUCTING EXCELLENCE IN WALES

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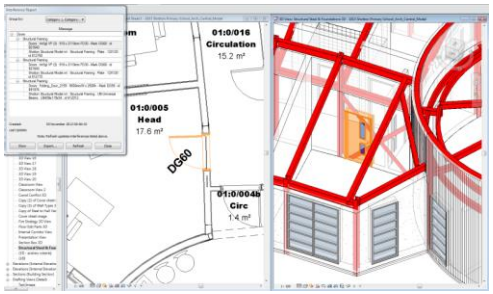
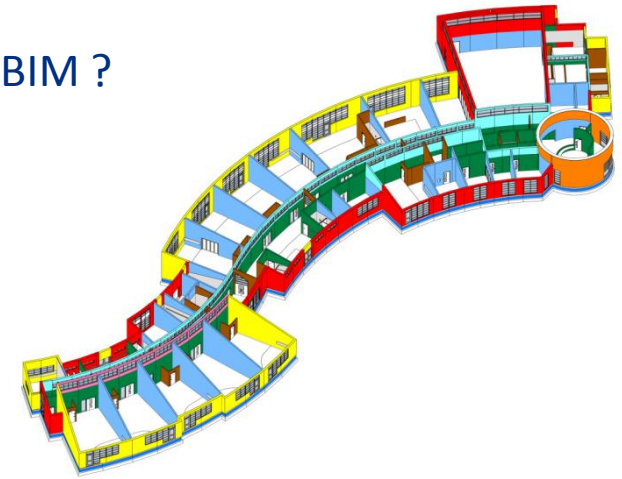
2011 BIM Procurement – simple questions in Tenders

How many BIM licences does your Company have ?

Explain how you will deliver Level 2 BIM on our project ?

Explain your companies experience and understanding of BIM ?





Frameworks – 48 months now exceeds Mandation date of 2016
How do you test Competency now ?
…and still keep it local ……

Question	Description
Note	The question set is optional. Scoring: INFORMATION ONLY
Note	Exemption: The questions in this module need not be completed if your organisation holds a third party certificate of compliance with BS EN PAS 1192:2:2013 from an organisation with a related UKAS accreditation, or equivalent.

Question	Description	Question Type	Mandatory
9-O4-Q1	Are you claiming exemption?	Yes/No Value	No
9-O4-Q1-1	If yes, please provide a copy of the certificate	Attachment	No
9-O4-Q2	Do you have the capability of working with a project using a "Common Data Environment" as described in PAS 1192:2:2013?	Yes/No Value	No
9-O4-Q2-1	You will be expected to demonstrate that your organisation understands the concept of a "Common Data Environment" as described in PAS 1192:2:2013 and is able to exchange information between supply chain members in an efficient and collaborative manner. If you have delivered a project in this way, you may use this to demonstrate your capability. Your explanation should be clear and concise. If 'yes', please provide details	Attachment	No
9-O4-Q3	Do you have documented policy, systems and procedures to achieve "Level 2 BIM" maturity as defined in the government's BIM Strategy?	Yes/No Value	No
9-O4-Q3-1	You will be expected to provide evidence that you or your organisation has a policy authorised by the Chief Executive or equivalent and regularly reviewed. The policy and procedures should be able to be applied to both large and small projects efficiently. If 'yes', please provide details	Attachment	No
9-O4-Q4	Do you have the capability of developing and delivering or working to (depending up the role(s) that this PQQ covers) a BIM Execution Plan (BEP) as described in PAS 1192:2:2013?	Yes/No Value	No
9-O4-Q4-1	You will be expected to demonstrate that your organisation understands the requirements of PAS 1192:2:2013, in particular with respect to BEP. This will include how to create reliable information and exchange it between supply chain members in an efficient and collaborative manner, and where appropriate, to the client, in the form specified (EG in accordance with the COBie UK 2012 standard and other typical client's information requirements). If you have delivered a project in this way, you may present an example BEP. If 'yes', please provide details	Attachment	No
9-O4-Q5	Do you have arrangements for training employees in BIM related skills and do you assess their capabilities?	Yes/No Value	No
9-O4-Q5-1	You will be expected to demonstrate that your organisation has in place training arrangements to ensure that its staff/workforce have sufficient skills and understanding to implement and deliver projects in accordance with the policy and procedures established to achieve "Level 2 BIM" maturity. Completed Construction Project Information Exchange (CPIx) templates referred to in the Project Implementation Plan (PIP), part of the BEP defined in PAS 1192:2 would be considered If this PQQ is for the first such project that you have considered undertaking, a training plan and evidence of how prior training outcomes in other areas have been assessed, would be considered. If yes, please provide details	Attachment	No

Education Funding Agency

Framework PQQ

BIM Section

Dec 2013

constructionline
U.K. REGISTER OF QUALIFIED CONSTRUCTION SERVICES

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Contractors BIM Process

Pre appointment BEP and assesment matrix

DES.G.30.BIM.APPENDIX.B.Level.Delivery.Agreement[1].pdf

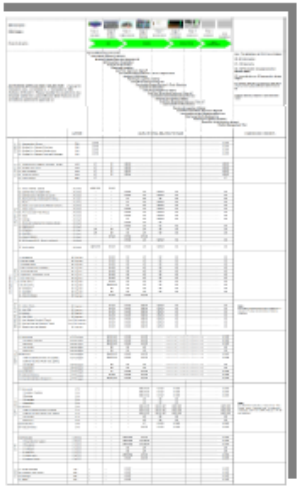
1 / 41 62.6%

Process: Functional Content | Document owner: Design | Document type: Guidance (G)

BIM Protocol – Level of Delivery Agreement Appendix B

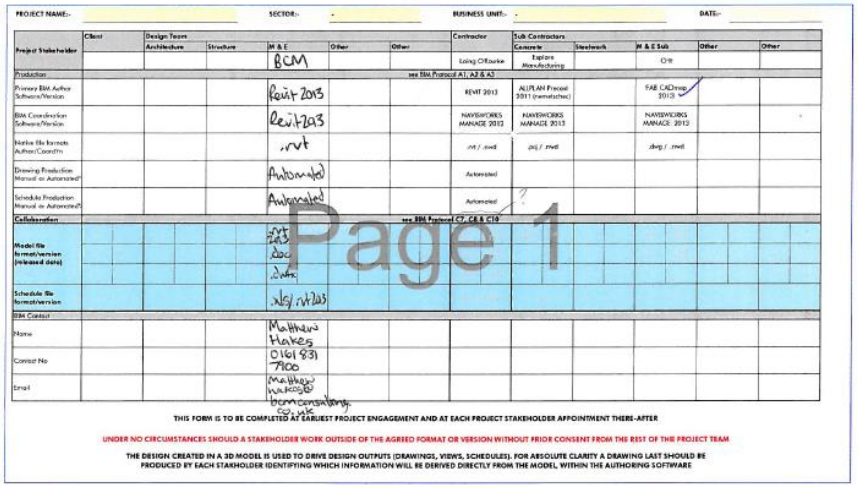
PROJECT NAME:-	
BUSINESS UNIT:-	
SECTOR:-	
DATE:-	

This document is to be used when identifying and referencing the designer's and contractor's detailed scope of service with respect to BIM Modelling duties. The form is to be utilised by Commercial, Design and BIM management teams on each project. The form is to be read in conjunction with the contract documentation and the Laing O'Rourke (LOR) document 'BIM Protocol – Level of Delivery Overview A3'



PARTY	OWNER	SIGN OFF DATE	REVISION
LOR BIM ENGINEER			
LOR COMMERCIAL MANAGER			
LOR DESIGN MANAGER			
ARCHITECT			
STRUCTURAL ENGINEER			
MEP DESIGN			
MEP CONTRACTOR			
FIRE PROTECTION			
CIVIL ENGINEER			
EXPLORE MANUFACTURING			

The LOR Way | DES.G.30.BIM.APPENDIX.B.Level.Delivery.Agreement(Revision P8 Dec 2012) | Copyright © Laing O'Rourke 2009 All rights reserved. Document uncontrolled when printed | Page Number 1 of 41



PROJECT NAME:- SECTOR:- BUSINESS UNIT:- DATE:-

BIM Protocol – Stakeholder Software Review

Page 1

THIS FORM IS TO BE COMPLETED AT EARLIEST PROJECT ENGAGEMENT AND AT EACH PROJECT STAKEHOLDER APPOINTMENT THERE-AFTER

UNDER NO CIRCUMSTANCES SHOULD A STAKEHOLDER WORK OUTSIDE OF THE AGREED FORMAT OR VERSION WITHOUT PRIOR CONSENT FROM THE REST OF THE PROJECT TEAM

THE DESIGN CREATED IN A 3D MODEL IS USED TO DRIVE DESIGN OUTPUTS (DRAWINGS, VIEWS, SCHEDULES). FOR ABSOLUTE CLARITY A DRAWING LAST SHOULD BE PRODUCED BY EACH STAKEHOLDER IDENTIFYING WHICH INFORMATION WILL BE DERIVED DIRECTLY FROM THE MODEL, WITHIN THE AUTHORING SOFTWARE

The LOR Way | DES.G.30.BIM.A4.Software Review (Revision P8 Dec 2012) | Copyright © Laing O'Rourke 2009 All rights reserved. Document uncontrolled when printed | Page Number 1 of 1

Process: Functional Content | Document owner: Design | Document type: A4 Guidance (G)

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CONSTRUCTING EXCELLENCE IN WALES

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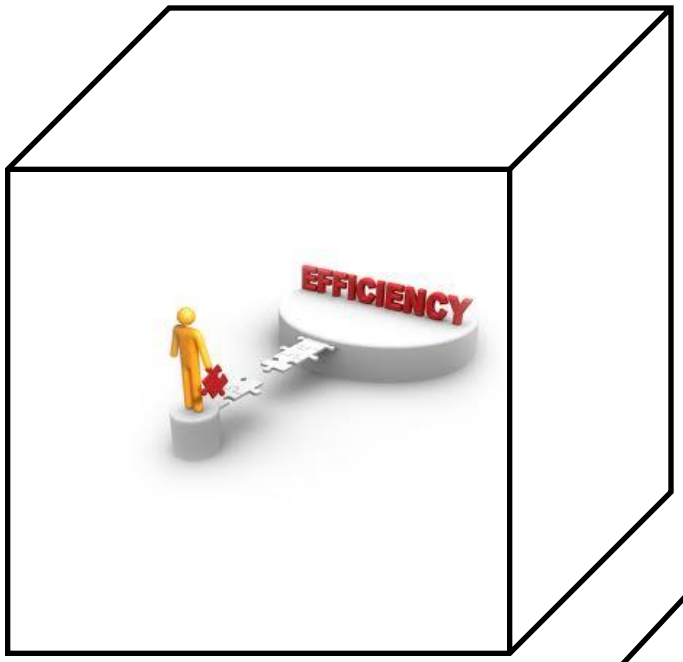
Things to learn…

Market reality…..



LEADERSHIP
Commitment

100%

Contribution

100%

TRAINING & LICENCES

Competence 100%

The cube represents maximum efficiency

Calculated by: Commitment X Contribution X Competence

Therefore: 10 X 10 X 10 = 1000 (100%)

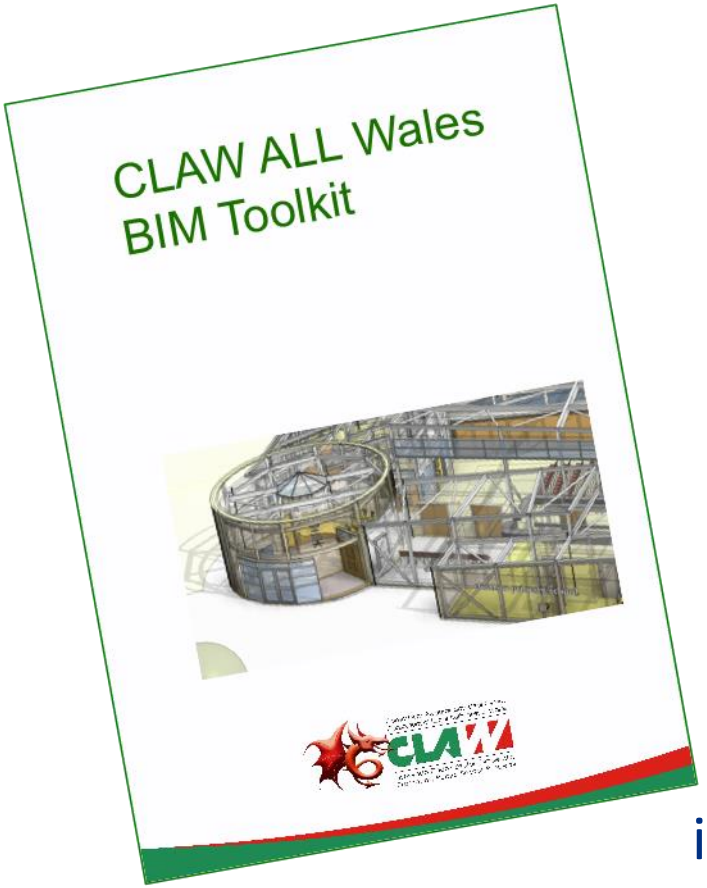
Assuming maximum commitment, consider the consequence of only minor changes to Competence and Contribution?

10 X 9 X 9 = 810 (81%)

10 X 8 X 8 = 640 (64%)

10 X 5 X 5 = 250 (25%)

Competence and Contribution are influenced by the quality of the training and implementation program



The CLAW ALL Wales BIM toolkit has been created to assist procuring and commissioning officers

in justifying the business case for BIM internally, and engaging with the market place

in the way that is most likely to deliver maximum benefits from BIM enabled working.

The CLAW All Wales BIM Toolkit includes :

- Business case for BIM incl ICT
- BIM specific Procurement guidance and tools
- Example Employers Information Requirements for BIM
- BIM flyer
- EIR Guidance notes
- BIM and GSL guidance note
- Collaborative Maturity Assessment tools
- Glossary of terms and Acronym key
- Reference points for standards and protocols

For application on Buildings and Civils projects

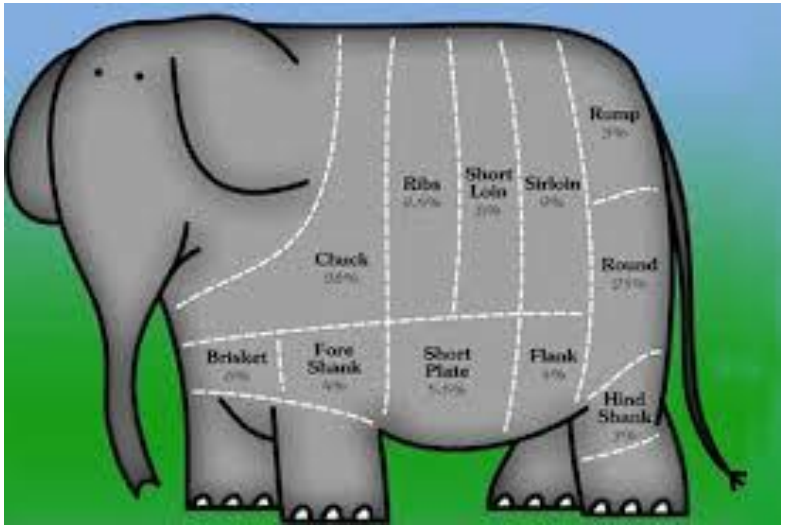
CLAW/BIM Toolkit

View Upcoming Events

20th January 2013

Enjoy your Elephant !

Got the appetite !



& a meal Plan ?....

Help can be found at

www.bim4sme.org

www.bimtaskgroup.org

On line Maturity assessment
http://room4.checkboxonline.com/NFBBIMdiagnostic.aspx

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CONSTRUCTING EXCELLENCE IN WALES

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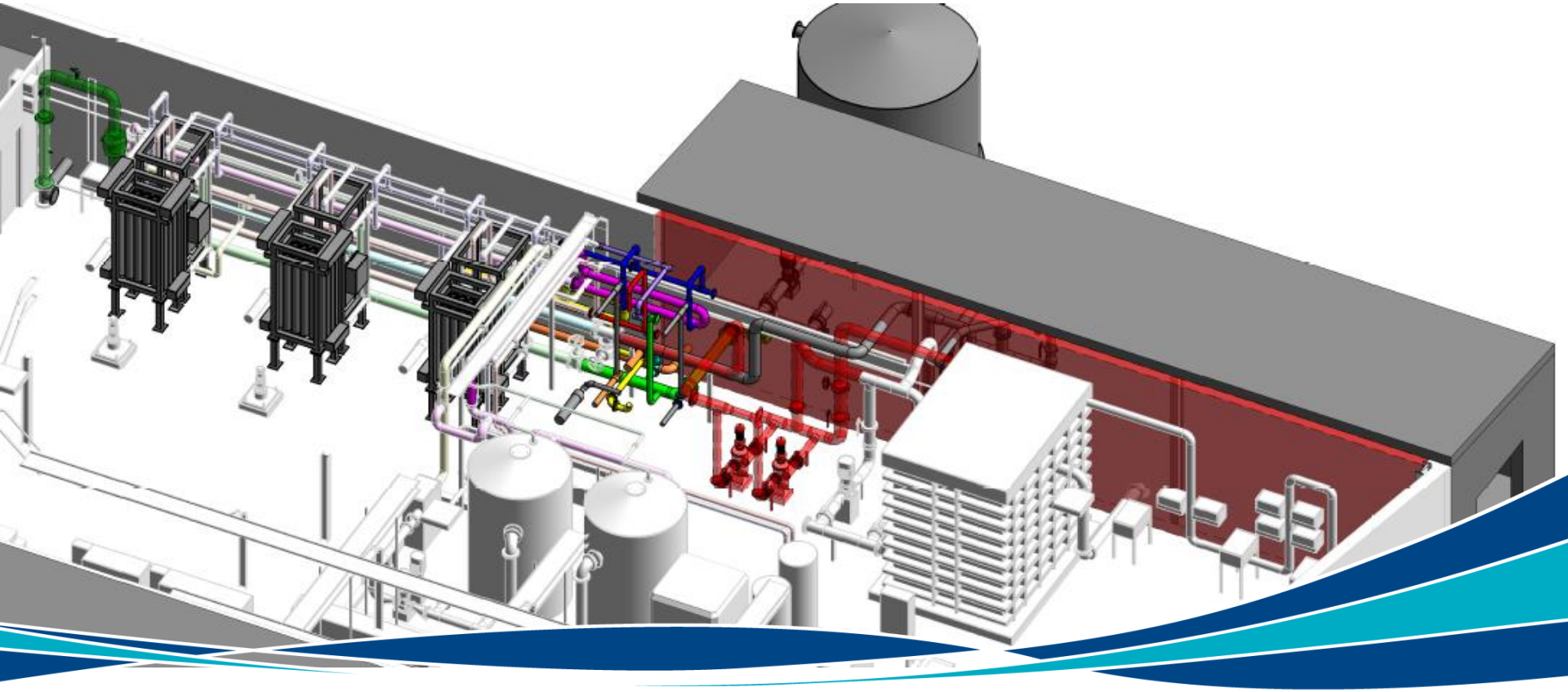
Open discussion



Constructing Excellence BIM4Civils

- alan.hymers@mottmac.com

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BIM - not just about market-leading software…

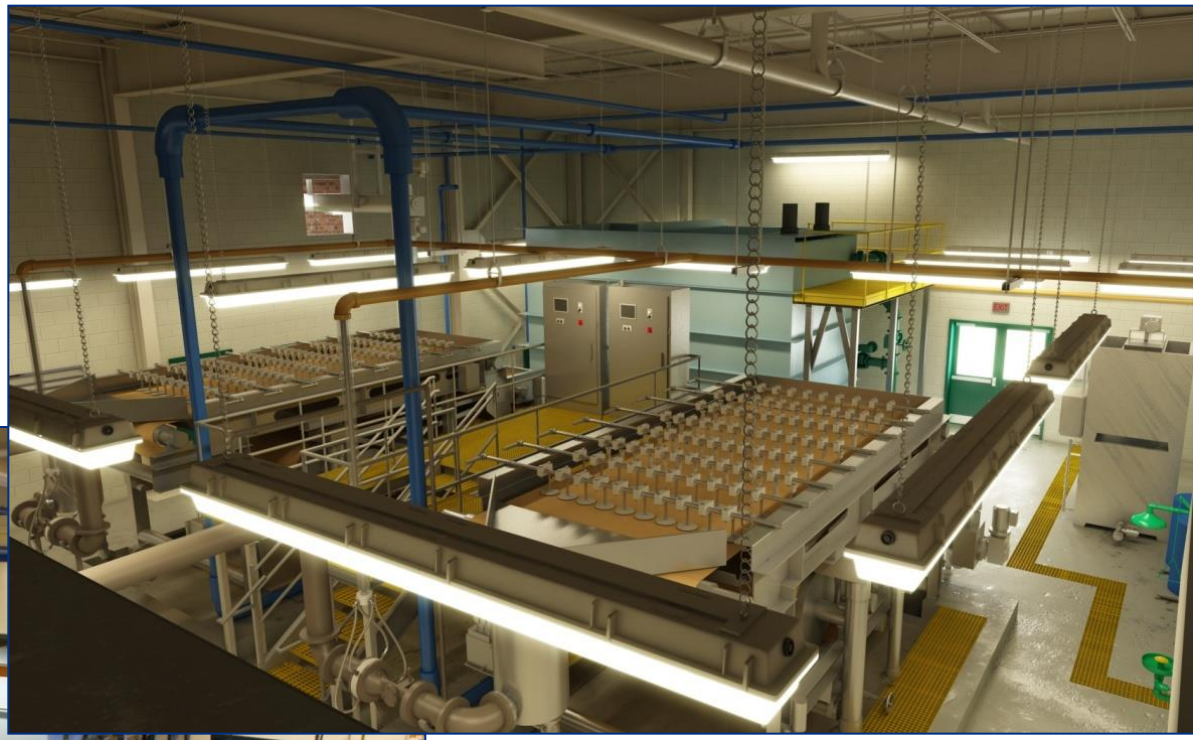
Autodesk®

Bentley®

Sustaining Infrastructure

…..more than just 3D…

Virtual world



Real world

Mott MacDonald

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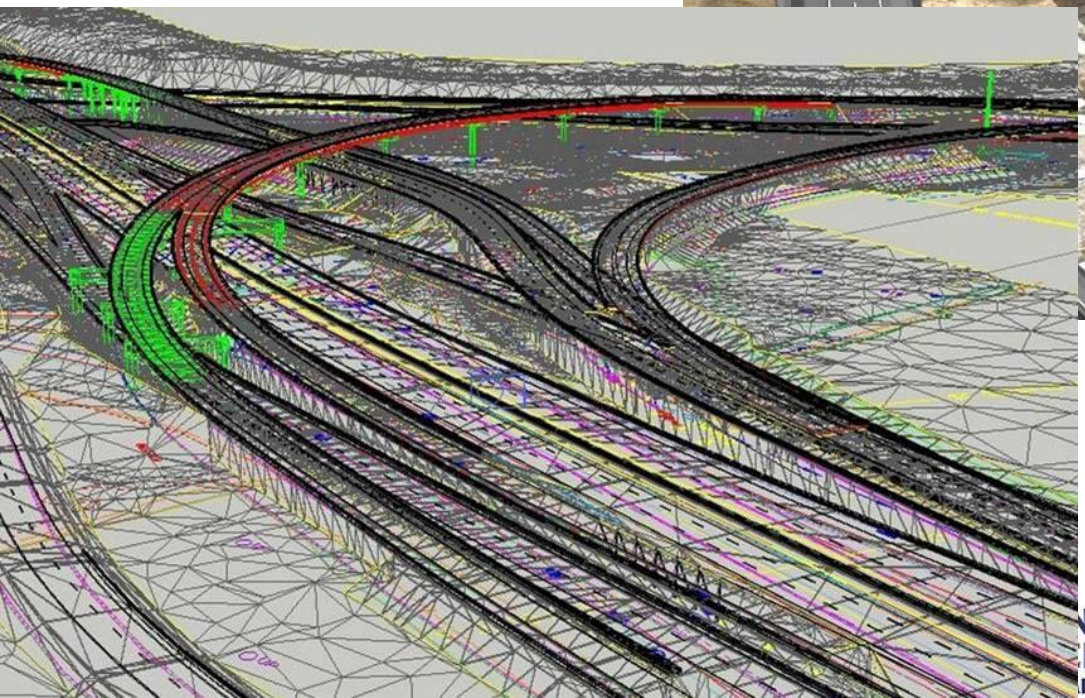
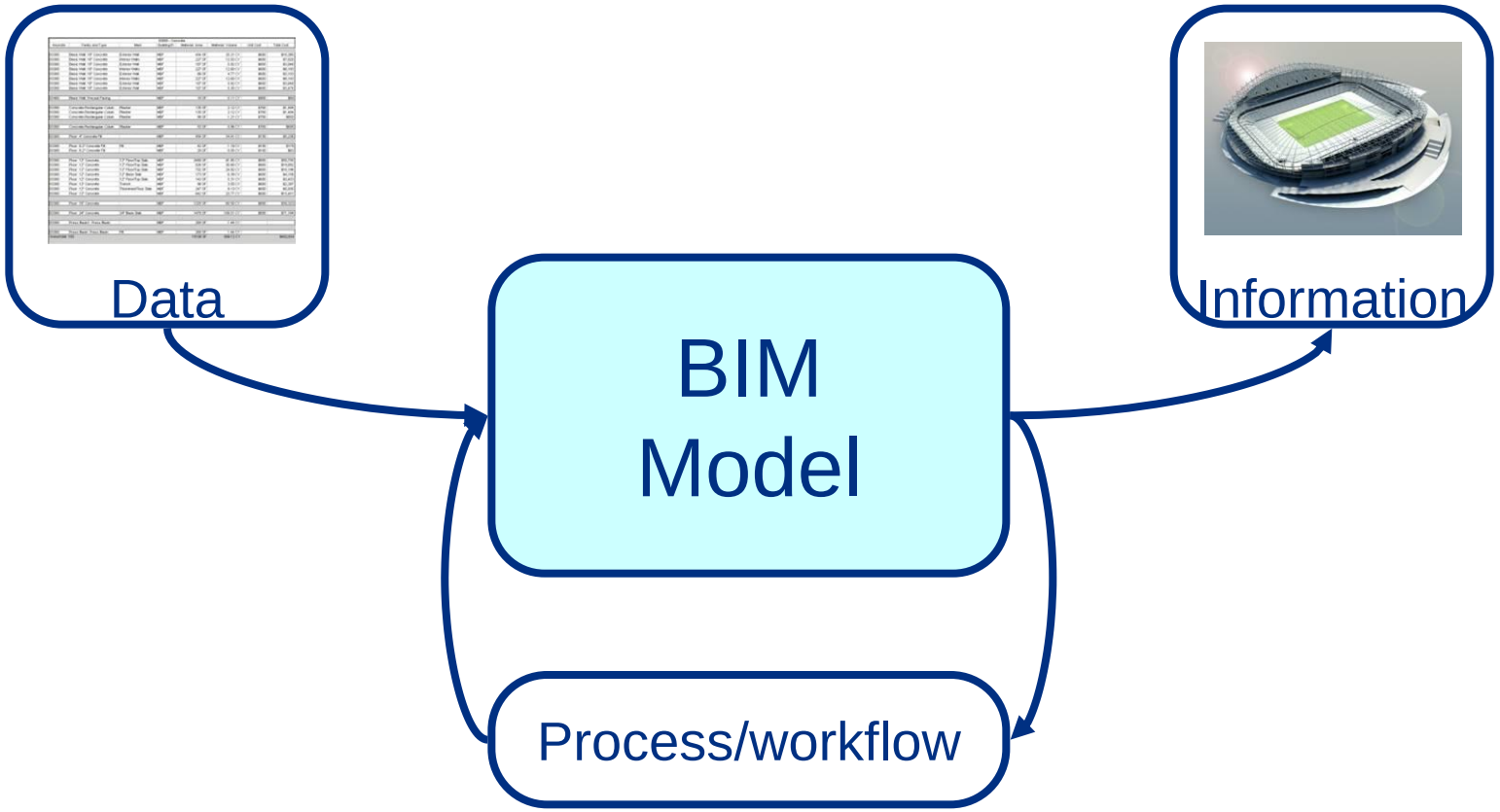
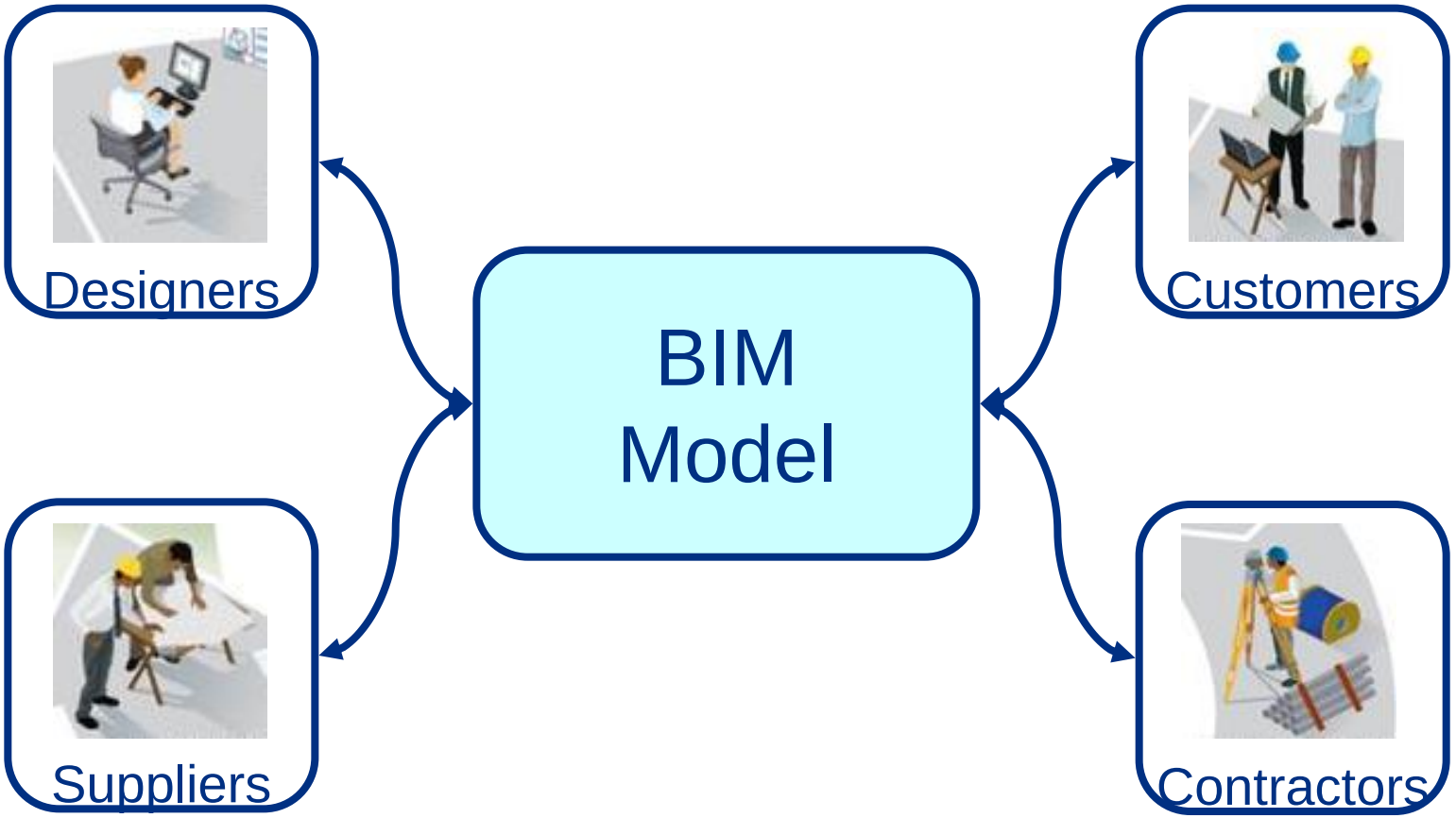
….not just about buildings…



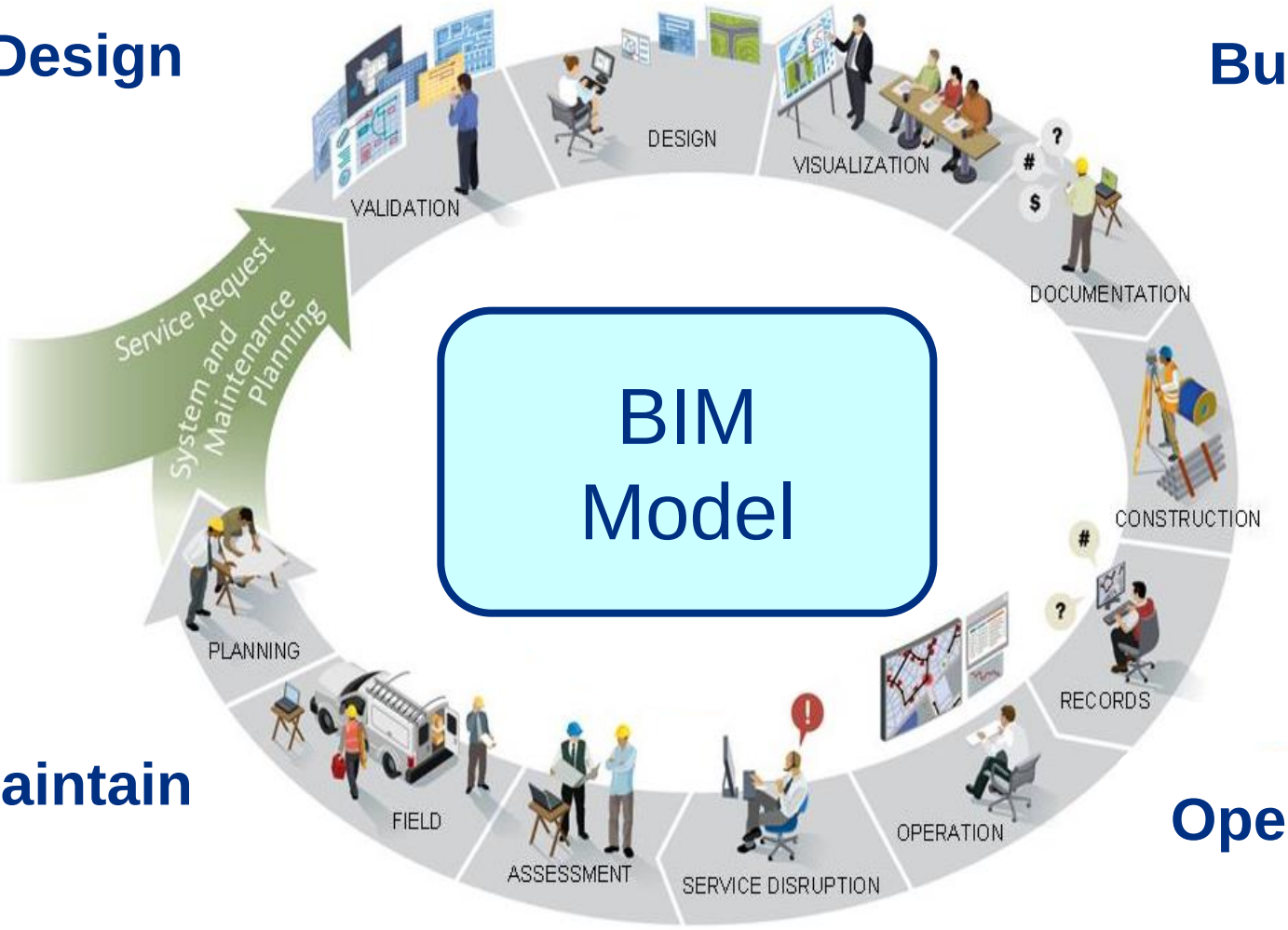
BIM - all about information



BIM is about collaboration



BIM is for the whole lifecycle



Source: Autodesk

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CONSTRUCTING EXCELLENCE IN WALES

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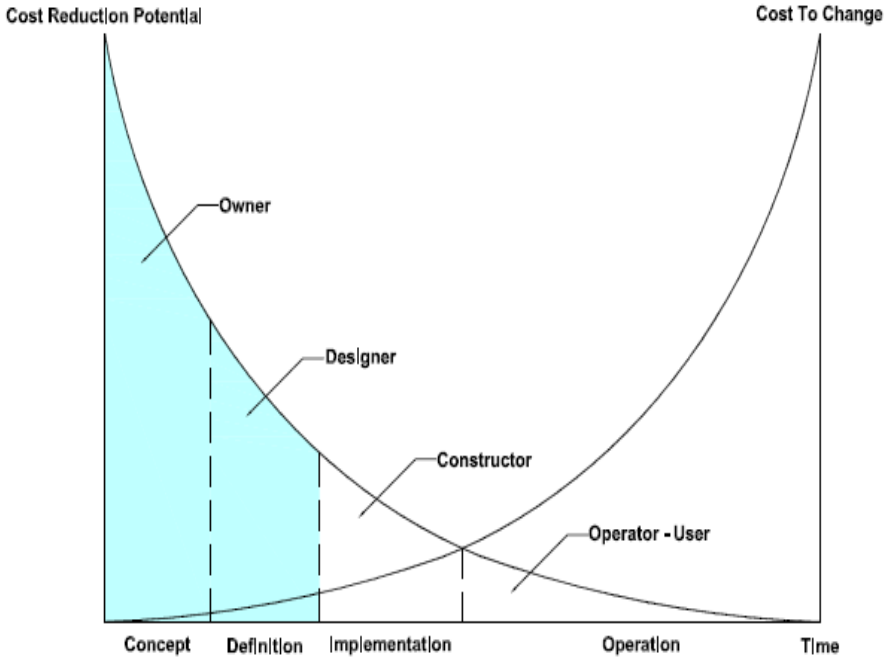
Why BIM for MM and NWL ?

Challenge from our Clients

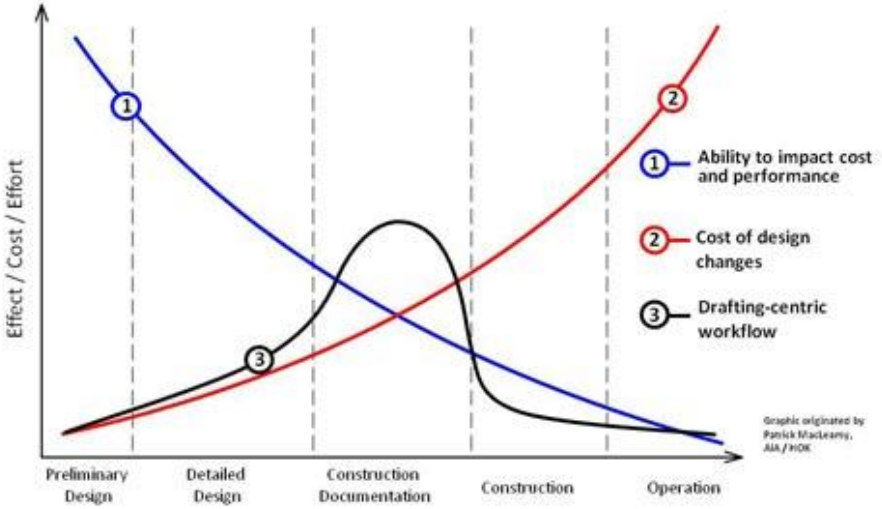
- UK is 5th in productivity league
- 50% of UK projects overspend
- A 15% reduction is possible



DILIGENTIA

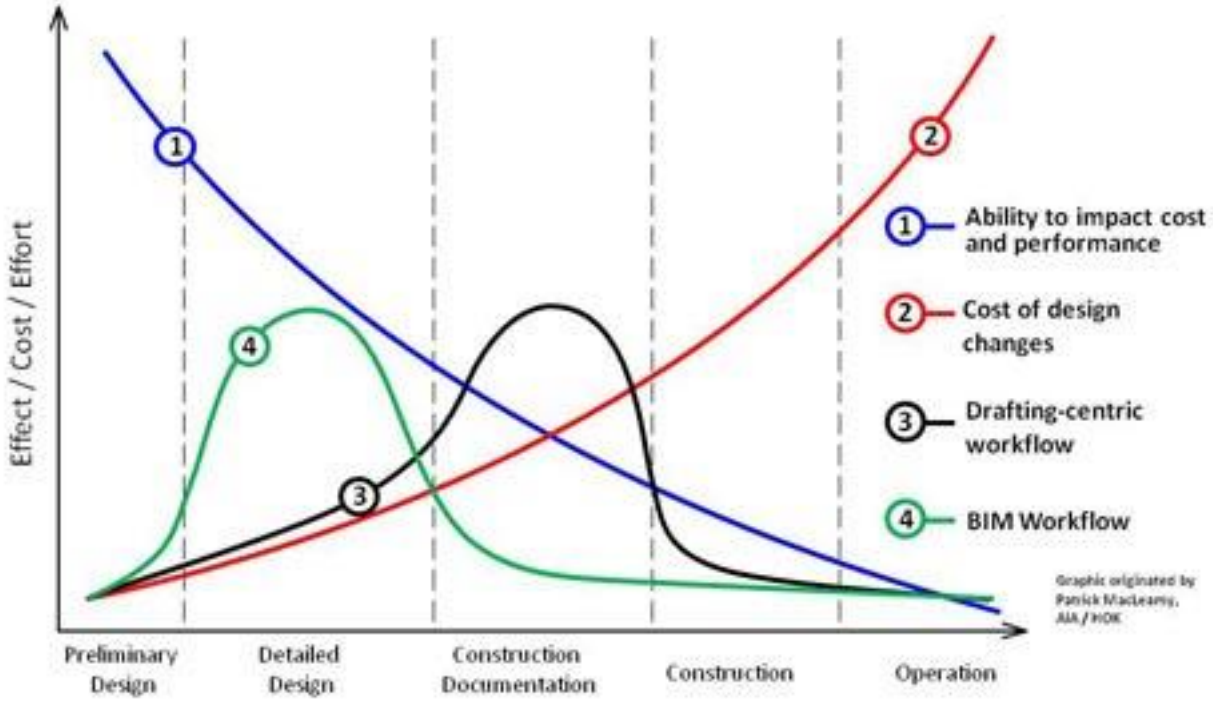
ADEILADU ARBENIGRWYDD YNG NGHYMRU | CONSTRUCTING EXCELLENCE IN WALES

DILIGENTIA

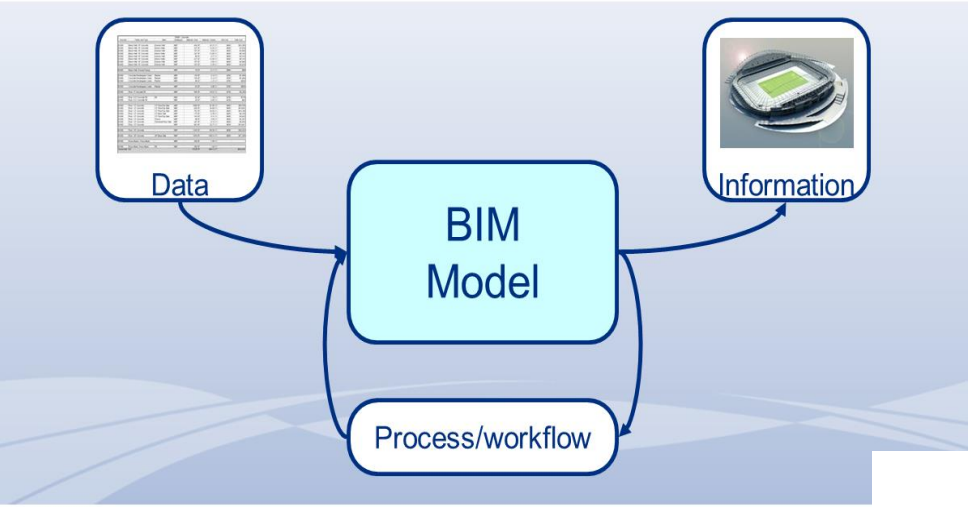


Construction Workflow

BIM Workflow Model

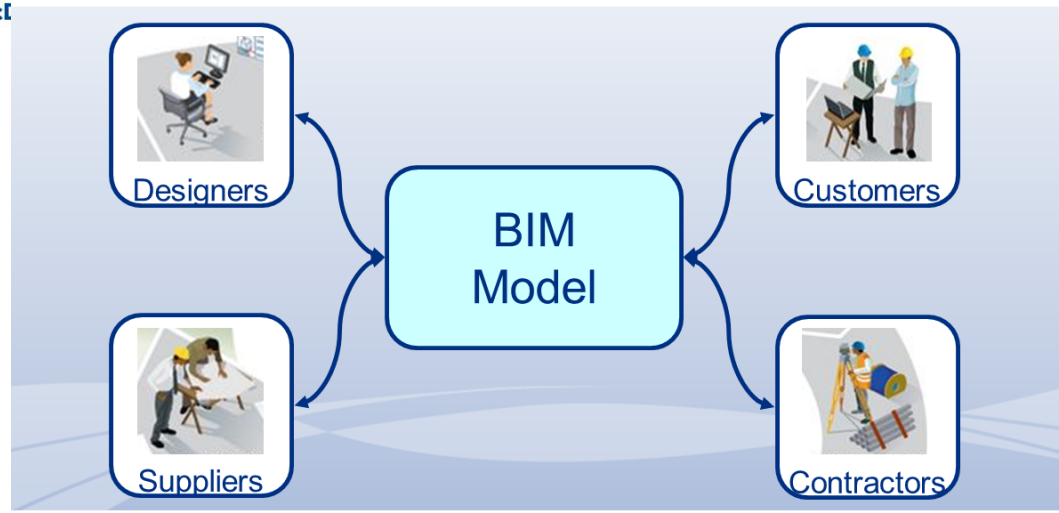


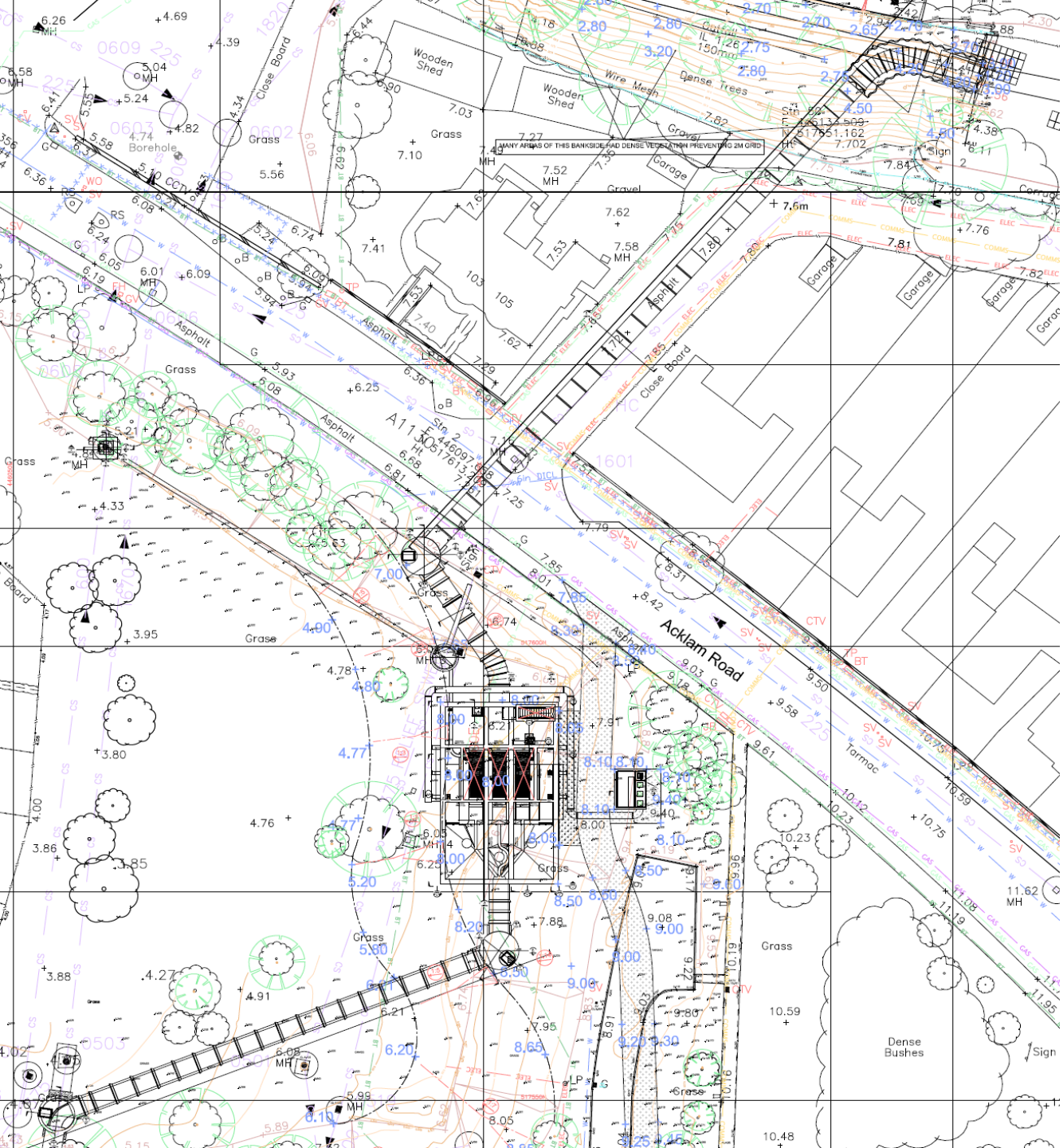
BIM - all about information



BIM can help…

BIM is about collaboration





2D CAD or……

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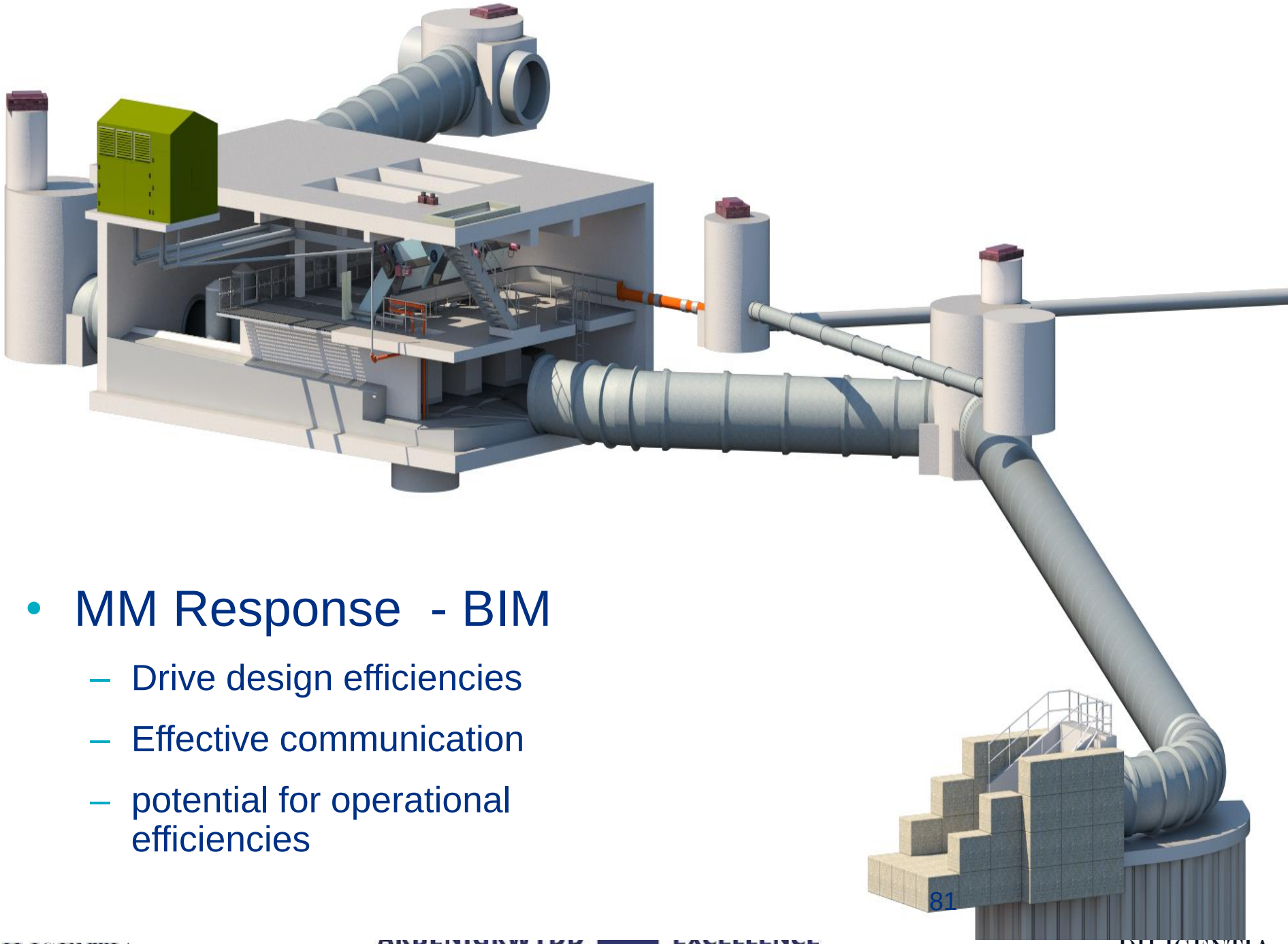


- MM Response - BIM
  - Drive design efficiencies
  - Effective communication
  - potential for operational efficiencies

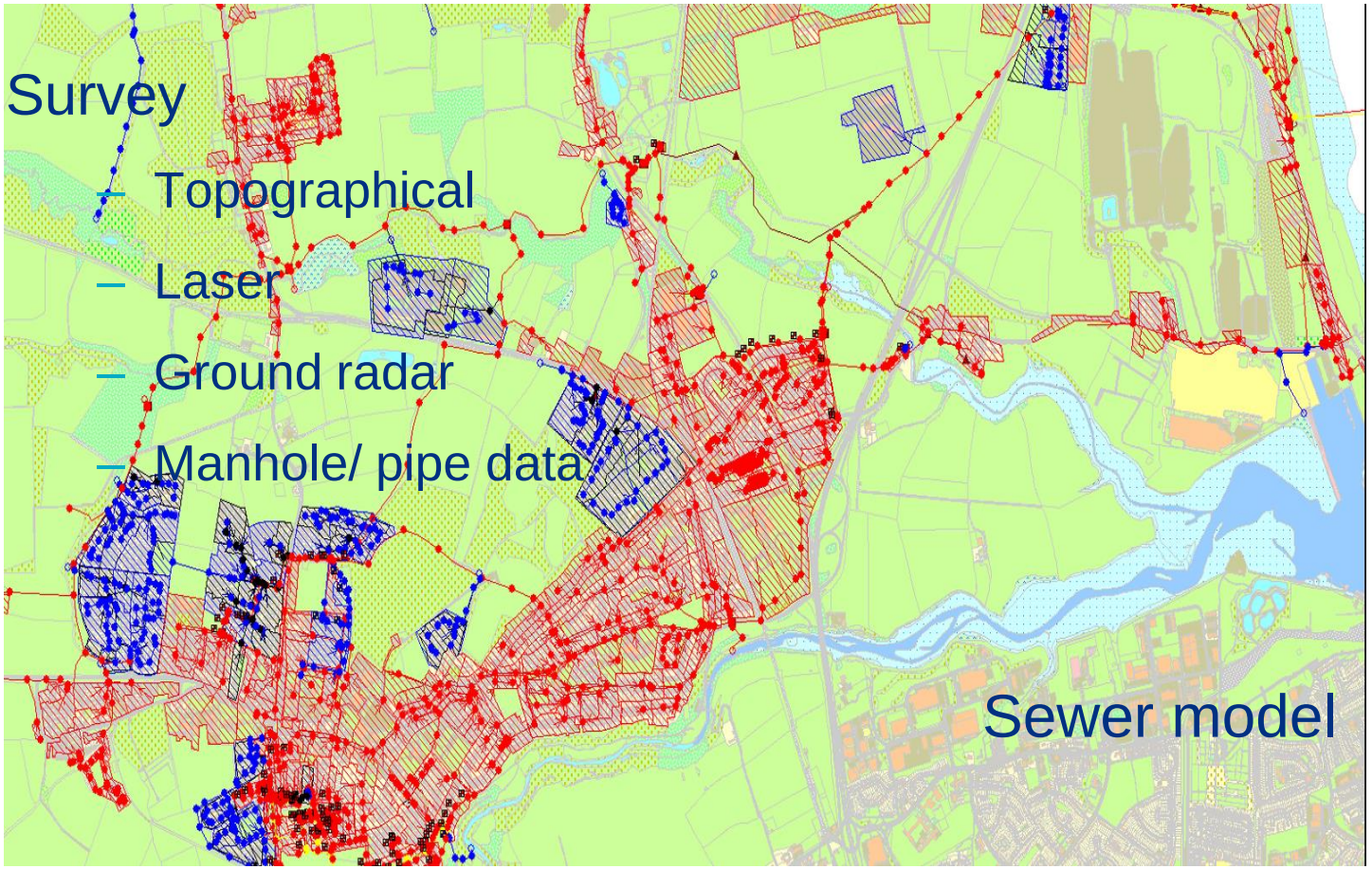
BIM Development

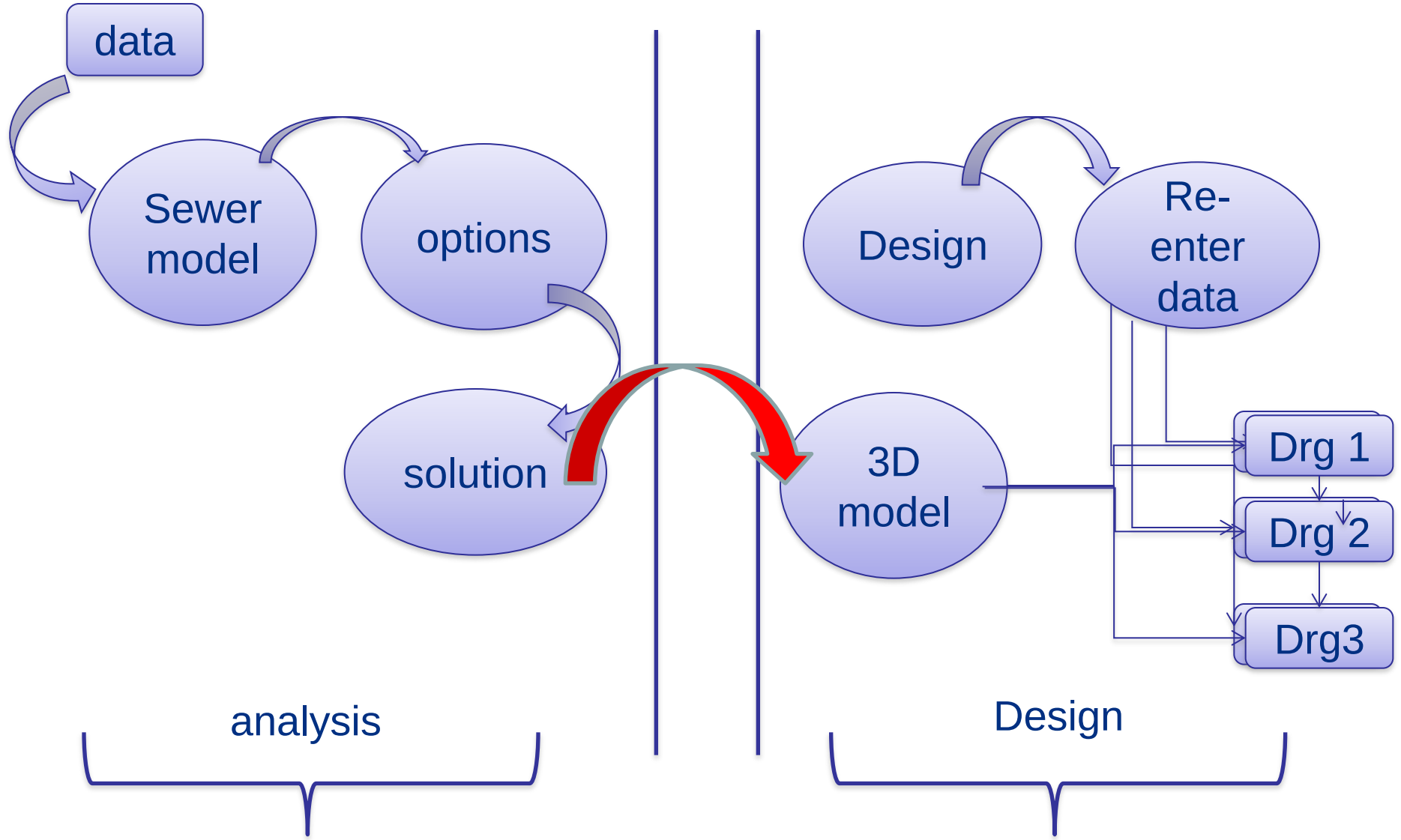
- **Our workload** -
  - Programme over a number of years
  - A number of projects live at any one time
  - Varying complexity and cost
- **Our Approach** -
  - Study our workflows
  - Identify gaps/breaks in dataflow
  - Try out new processes via trial projects

Pilot project – Newcastle

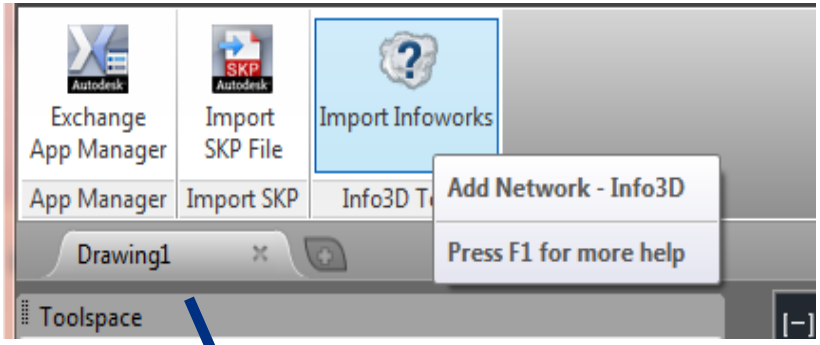
Pilot project – Newcastle

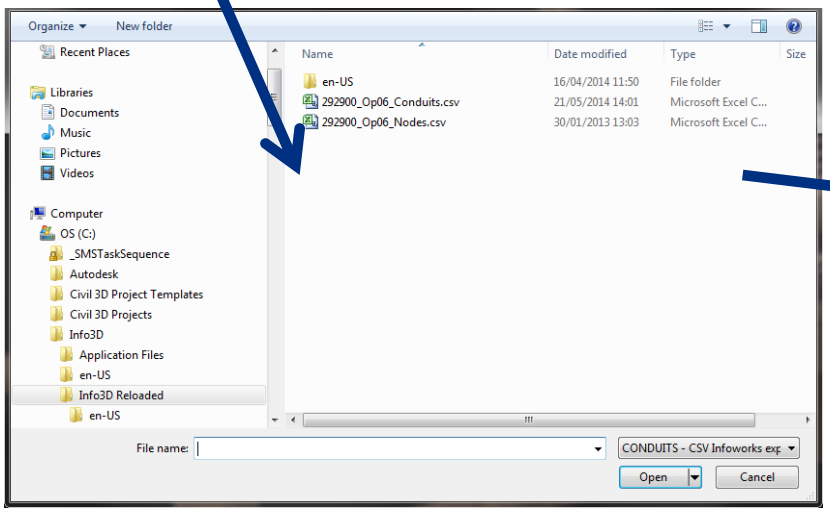
Data

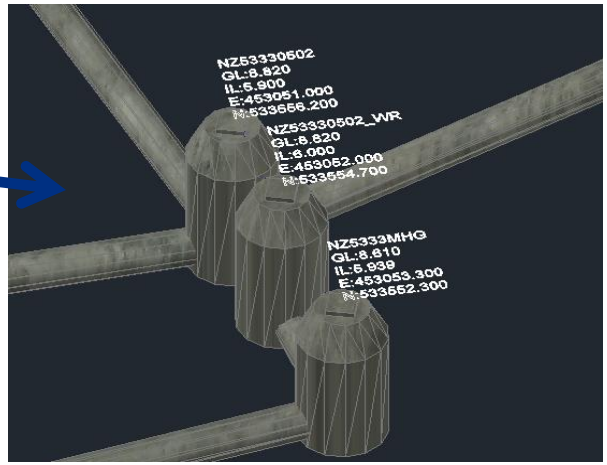

Survey
– Topographical
– Laser
– Ground radar
– Manhole/ pipe data
Sewer model


data
Sewer model
options
solution
3D model
Design
Re-enter data
Drg 1
Drg 2
Drg3
analysis
Design

Closing the gaps

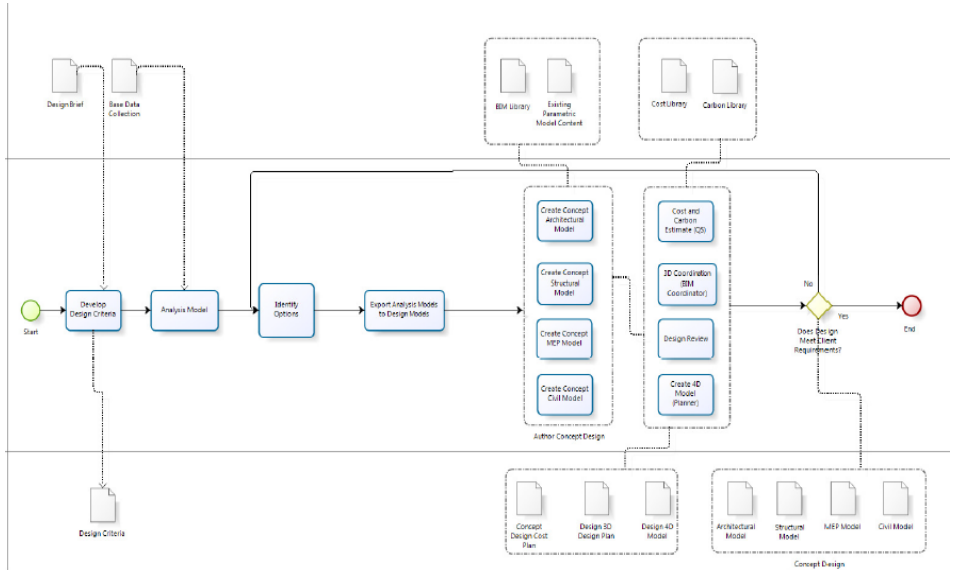






Process and Workflow…

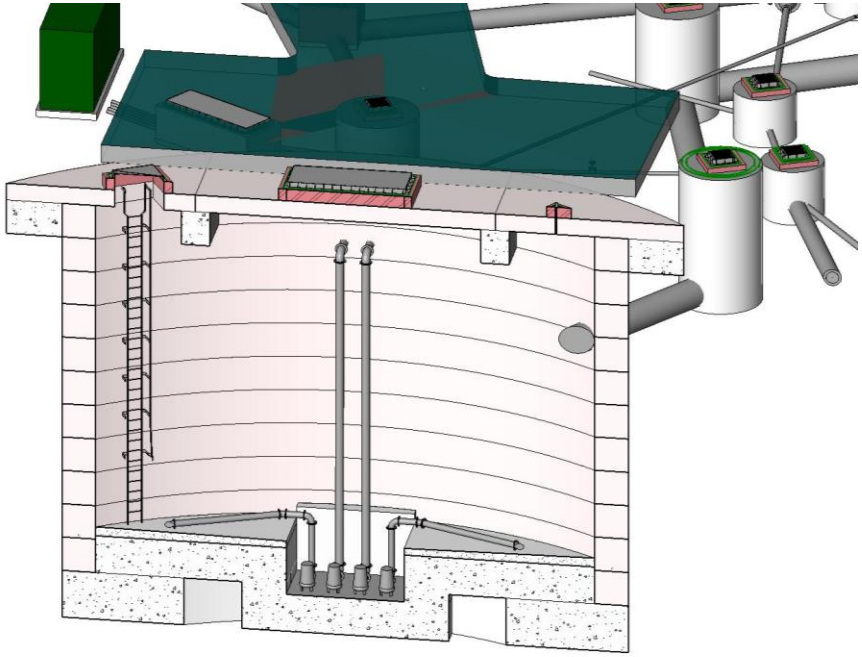
- Reviewing how we work …

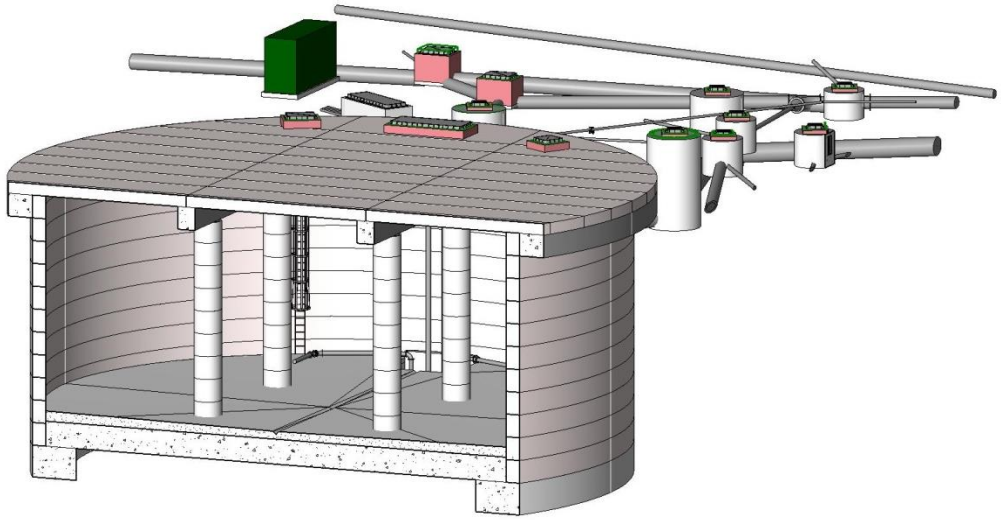


Different Workstreams-Different Approach

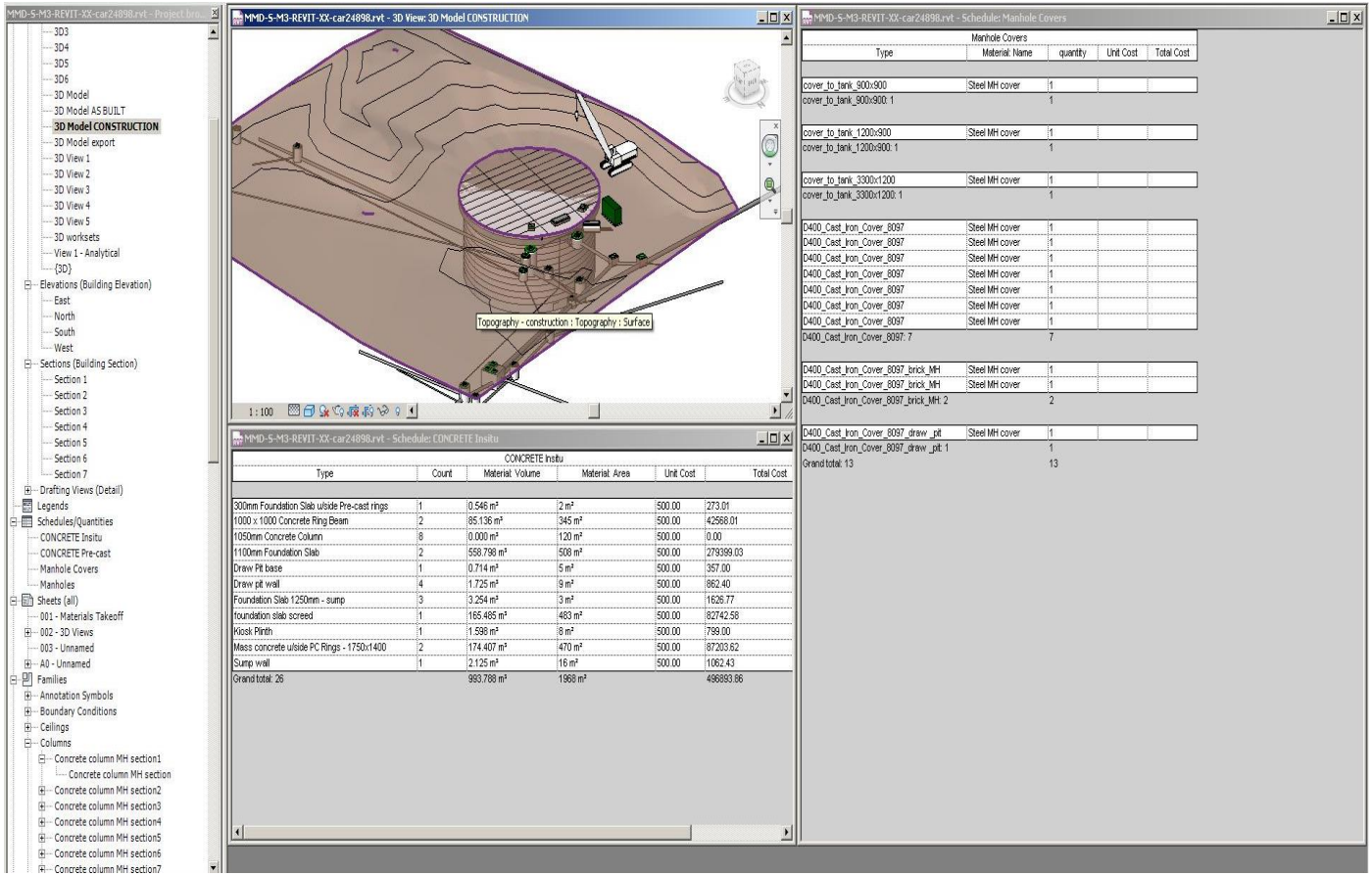
- Additional trial projects required ….

Additional Pilot Projects





5D – cost information

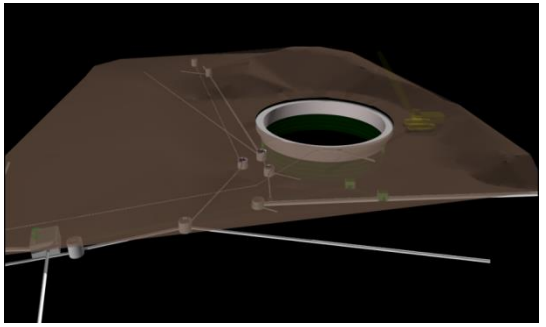


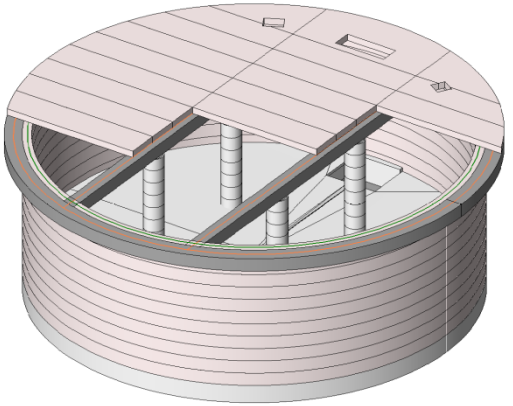
CONCRETE Insitu

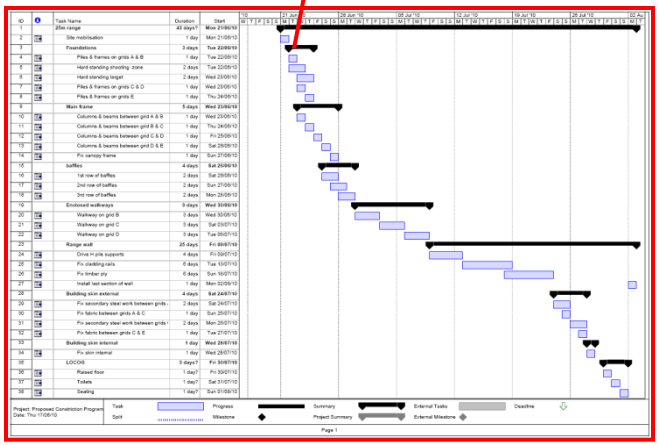
Type	Count	Material: Volume	Material: Area	Unit Cost	Total Cost
300mm Foundation Slab u/side Pre-cast rings	1	0.546 m³	2 m²	500.00	273.01
1000 x 1000 Concrete Ring Beam	2	85.136 m³	345 m²	500.00	42568.01
1050mm Concrete Column	8	0.000 m³	120 m²	500.00	0.00
1100mm Foundation Slab	2	558.798 m³	508 m²	500.00	279399.03
Draw Pit base	1	0.714 m³	5 m²	500.00	357.00
Draw pit wall	4	1.725 m³	9 m²	500.00	862.40
Foundation Slab 1250mm - sump	3	3.254 m³	3 m²	500.00	1626.77
foundation slab screed	1	165.485 m³	483 m²	500.00	82742.58
Kiosk Plinth	1	1.598 m³	8 m²	500.00	799.00
Mass concrete u/side PC Rings - 1750x1400	2	174.407 m³	470 m²	500.00	87203.62
Sump wall	1	2.125 m³	16 m²	500.00	1062.43
Grand total: 26		993.788 m³	1968 m²		496893.86

Manhole Covers

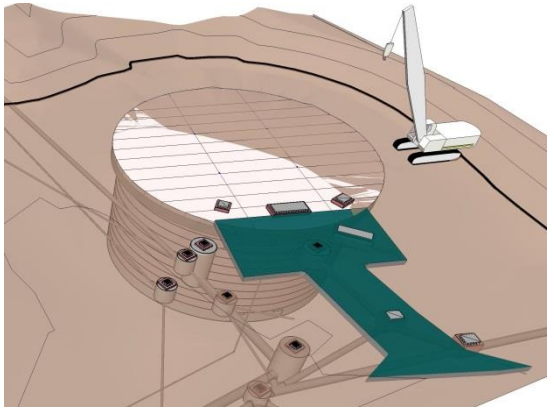
Type	Material: Name	quantity	Unit Cost	Total Cost
cover_to_tank_900x900	Steel MH cover	1		
cover_to_tank_900x900: 1		1		
cover_to_tank_1200x900	Steel MH cover	1		
cover_to_tank_1200x900: 1		1		
cover_to_tank_3300x1200	Steel MH cover	1		
cover_to_tank_3300x1200: 1		1		
D400_Cast_Iron_Cover_8097	Steel MH cover	1		
D400_Cast_Iron_Cover_8097	Steel MH cover	1		
D400_Cast_Iron_Cover_8097	Steel MH cover	1		
D400_Cast_Iron_Cover_8097	Steel MH cover	1		
D400_Cast_Iron_Cover_8097	Steel MH cover	1		
D400_Cast_Iron_Cover_8097	Steel MH cover	1		
D400_Cast_Iron_Cover_8097	Steel MH cover	1		
D400_Cast_Iron_Cover_8097: 7		7		
D400_Cast_Iron_Cover_8097_brick_MH	Steel MH cover	1		
D400_Cast_Iron_Cover_8097_brick_MH	Steel MH cover	1		
D400_Cast_Iron_Cover_8097_brick_MH: 2		2		
D400_Cast_Iron_Cover_8097_draw _pit	Steel MH cover	1		
D400_Cast_Iron_Cover_8097_draw _pit: 1		1		
Grand total: 13		13		





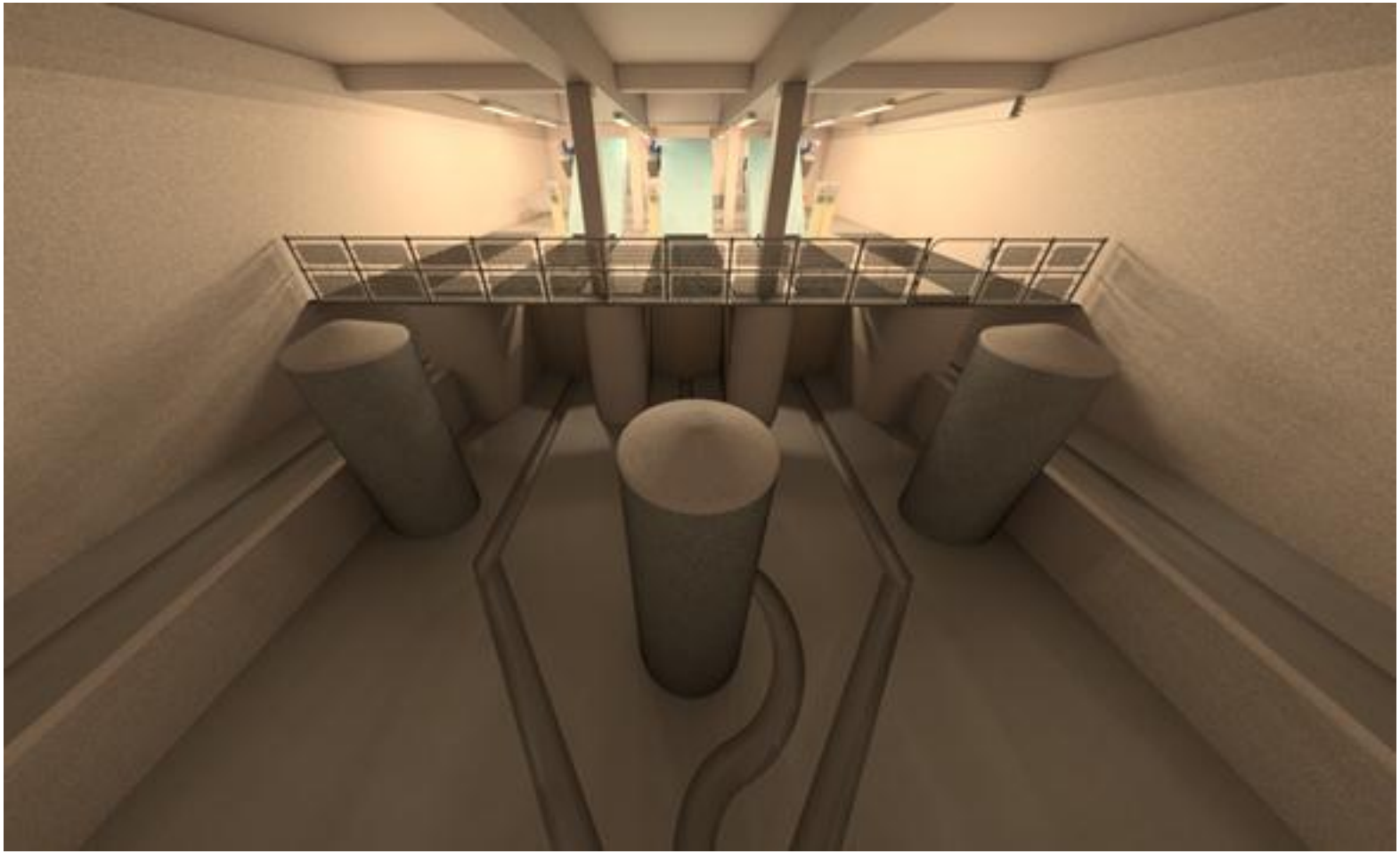


From the 4D BIM model……..

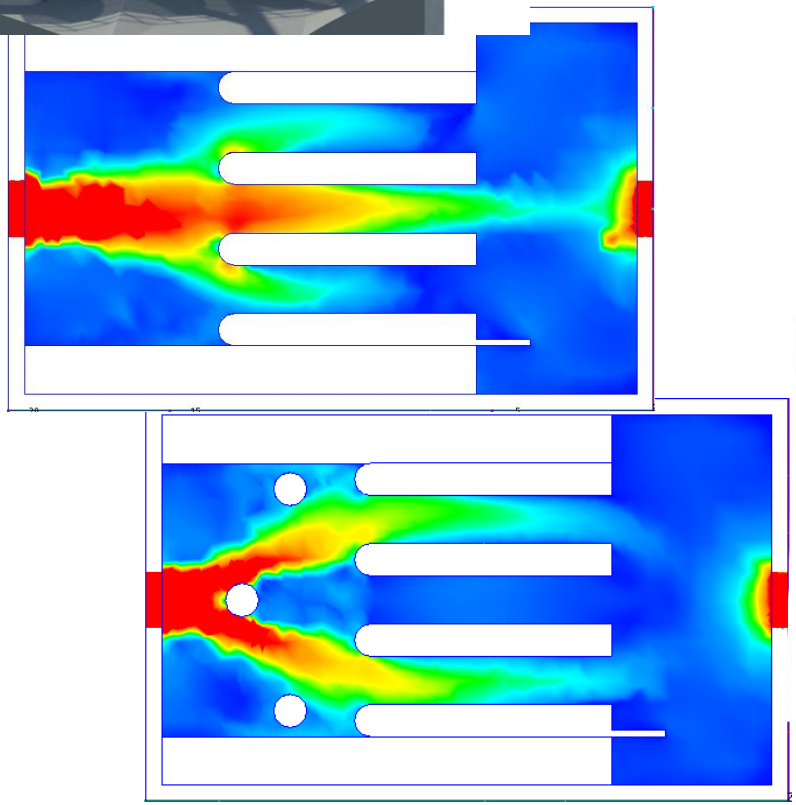


Construction Programme linked to model

Other Model Uses

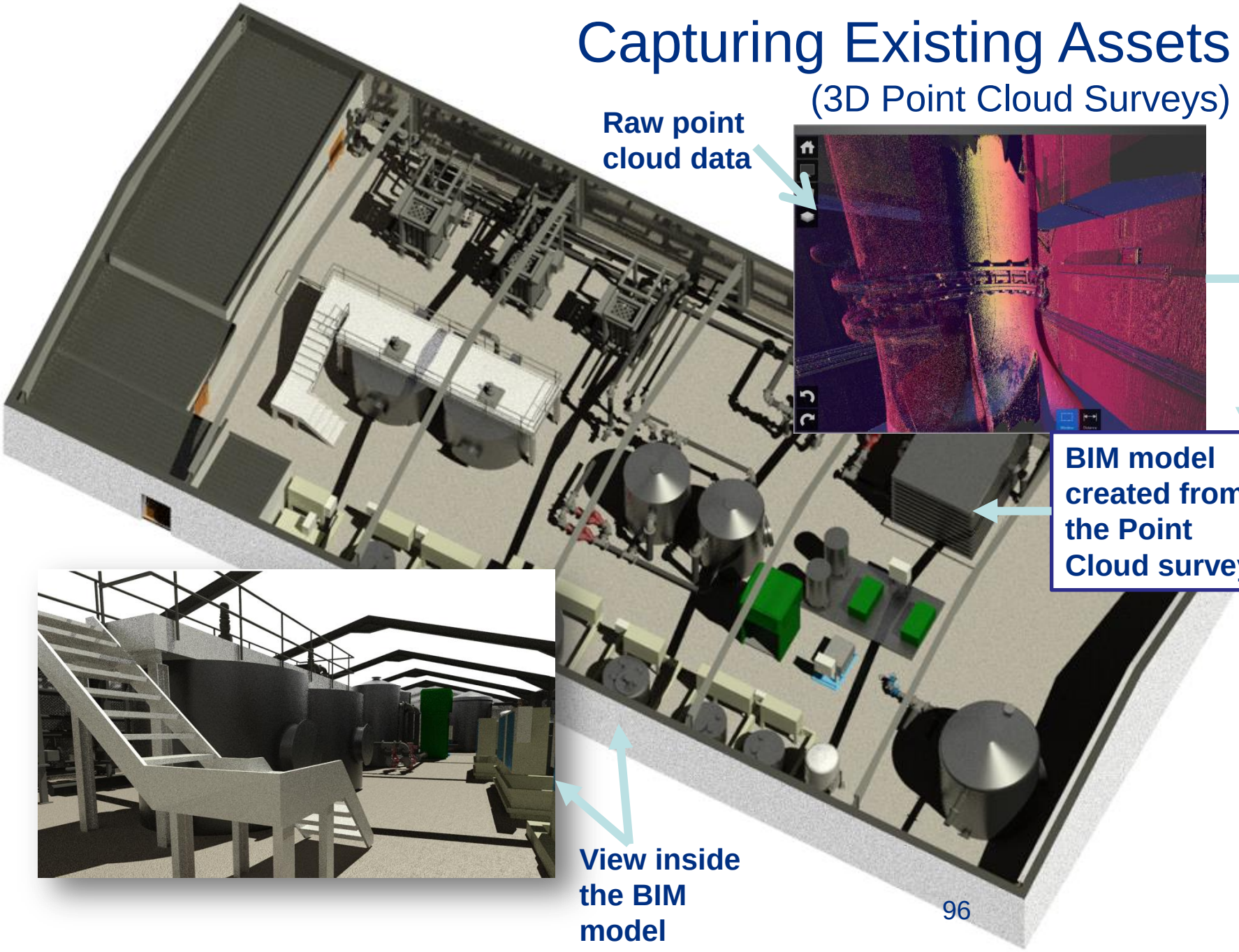


BIM model to aide analysis



Capturing Existing Assets

(3D Point Cloud Surveys)



Raw point cloud data

BIM model created from the Point Cloud survey

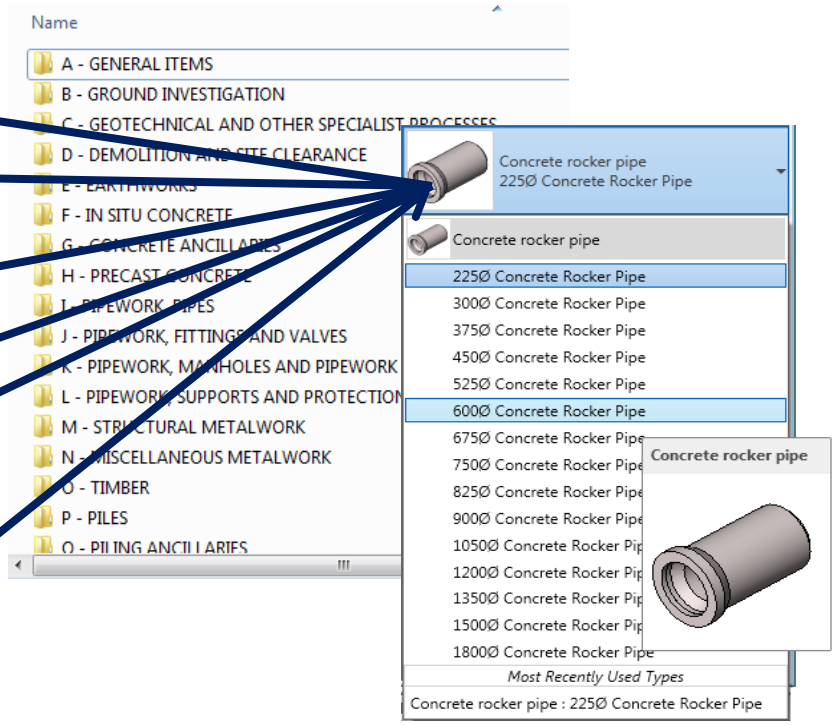
View inside the BIM model

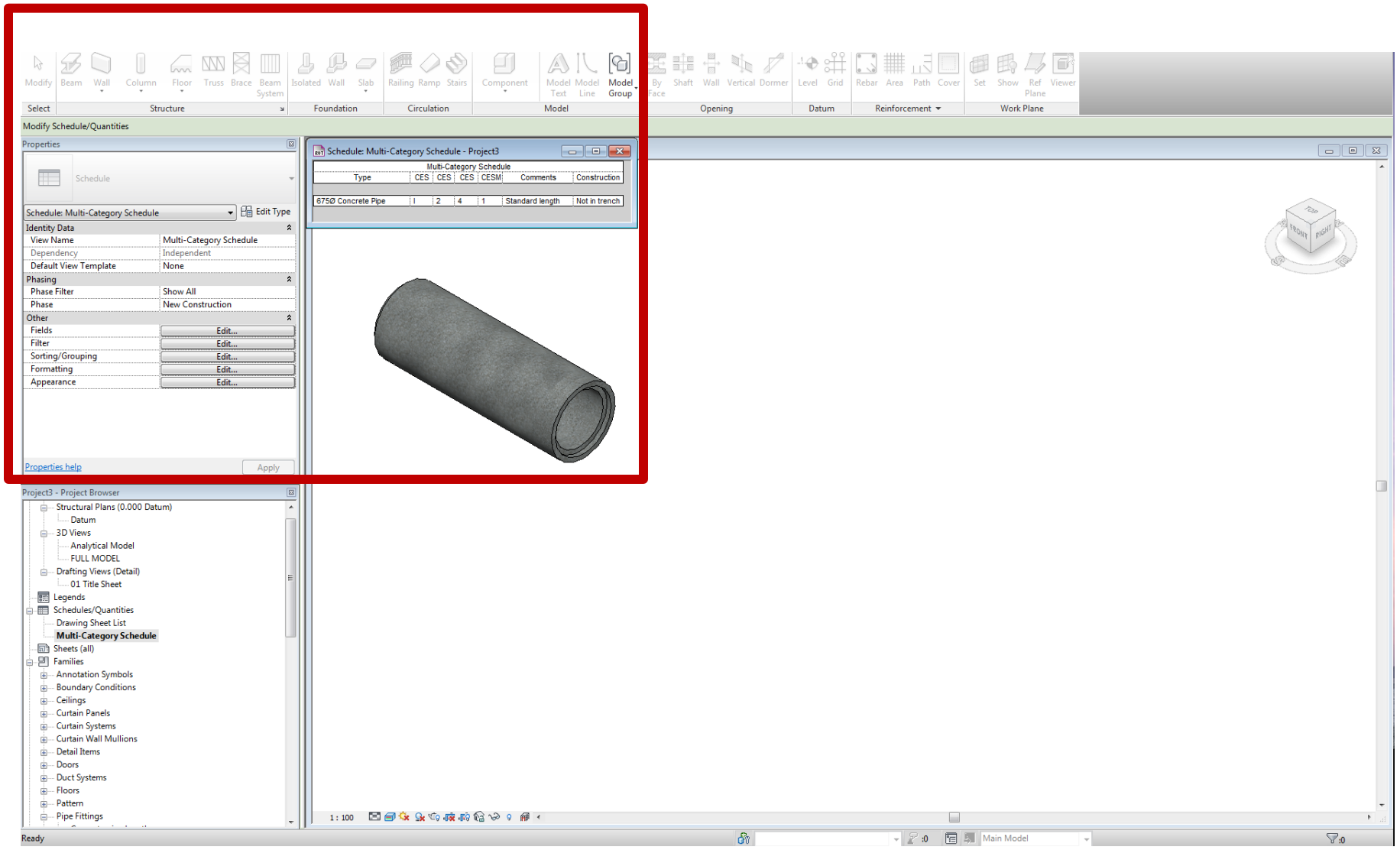
Outputs

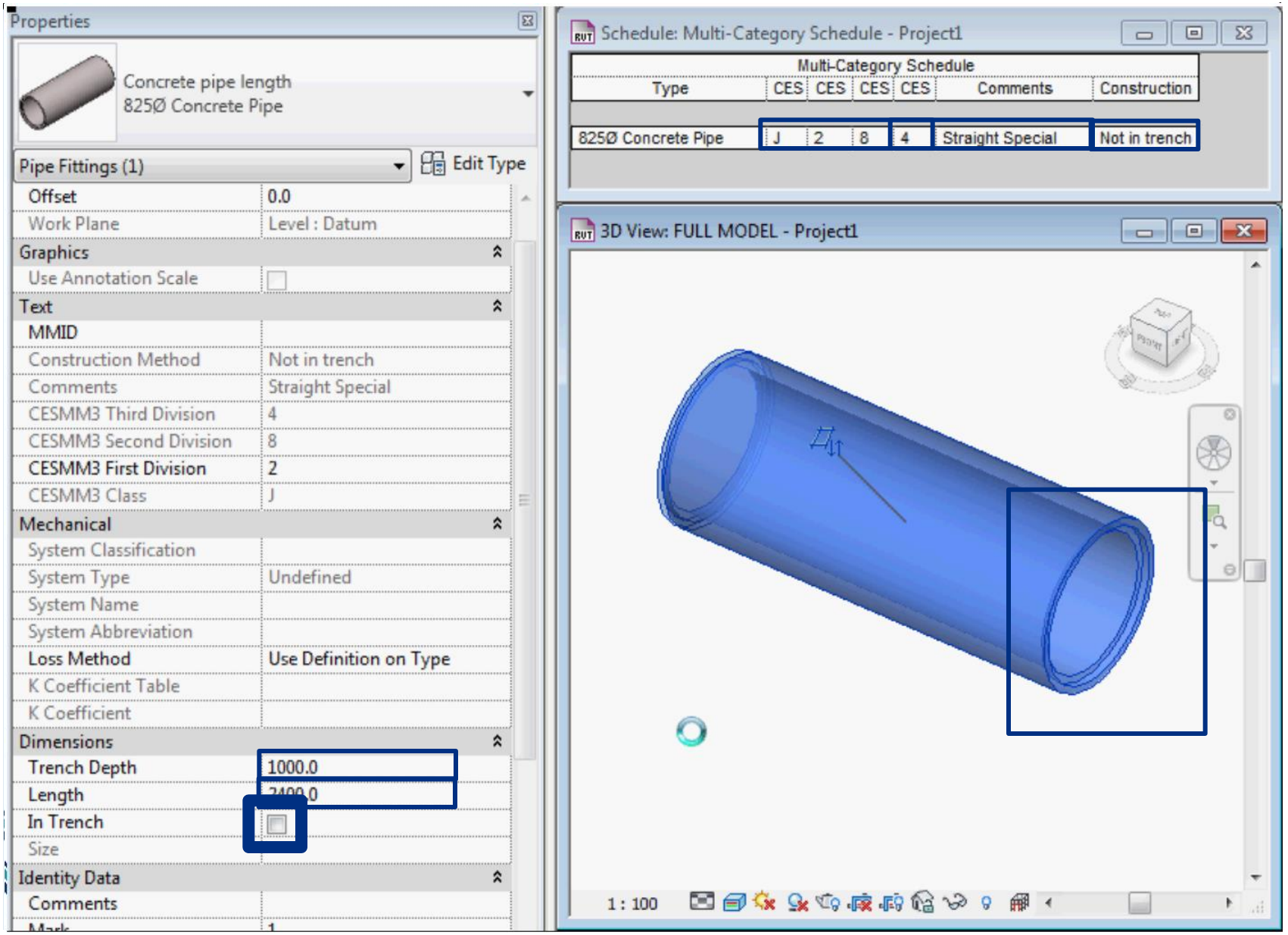
Deliverables

- 2D Drawings
- 3D Models
- 4D (Program Information)
- 5D (Cost Information)
- Rendered Images
- Animated Walkthroughs

Reusable Content




Modify
Beam
Wall
Column
Floor
Truss
Brace
Beam System
Isolated
Wall
Slab
Railing
Ramp
Stairs
Component
Model Text
Model Line
Model Group
By Face
Shaft
Wall
Vertical
Dormer
Level
Grid
Rebar
Area
Path
Cover
Set
Show
Ref Plane
Viewer
Select
Structure
Foundation
Circulation
Model
Opening
Datum
Reinforcement
Work Plane
Modify Schedule/Quantities
Properties
Schedule
Schedule: Multi-Category Schedule
Edit Type
Identity Data
View Name
Multi-Category Schedule
Dependency
Independent
Default View Template
None
Phasing
Phase Filter
Show All
Phase
New Construction
Other
Fields
Filter
Sorting/Grouping
Formatting
Appearance
Edit...
Properties help
Apply
Schedule: Multi-Category Schedule - Project3
Multi-Category Schedule
Type
CES
CES
CES
CESM
Comments
Construction
675Ø Concrete Pipe
1
2
4
1
Standard length
Not in trench
Project3 - Project Browser
Structural Plans (0.000 Datum)
Datum
3D Views
Analytical Model
FULL MODEL
Drafting Views (Detail)
01 Title Sheet
Legends
Schedules/Quantities
Drawing Sheet List
Multi-Category Schedule
Sheets (all)
Families
Annotation Symbols
Boundary Conditions
Ceilings
Curtain Panels
Curtain Systems
Curtain Wall Mullions
Detail Items
Doors
Duct Systems
Floors
Pattern
Pipe Fittings
1 : 100
Ready
Main Model


Properties
Concrete pipe length
825Ø Concrete Pipe
Pipe Fittings (1)
Edit Type
Offset 0.0
Work Plane Level : Datum
Graphics
Use Annotation Scale
Text
MMID
Construction Method Not in trench
Comments Straight Special
CESMM3 Third Division 4
CESMM3 Second Division 8
CESMM3 First Division 2
CESMM3 Class J
Mechanical
System Classification
System Type Undefined
System Name
System Abbreviation
Loss Method Use Definition on Type
K Coefficient Table
K Coefficient
Dimensions
Trench Depth 1000.0
Length
In Trench
Size
Identity Data
Comments
Schedule: Multi-Category Schedule - Project1
Multi-Category Schedule
Type CES CES CES CES Comments Construction
825Ø Concrete Pipe J 2 8 4 Straight Special Not in trench
3D View: FULL MODEL - Project1
1 : 100

Challenges and Benefits

Challenges

Manufacturers Products

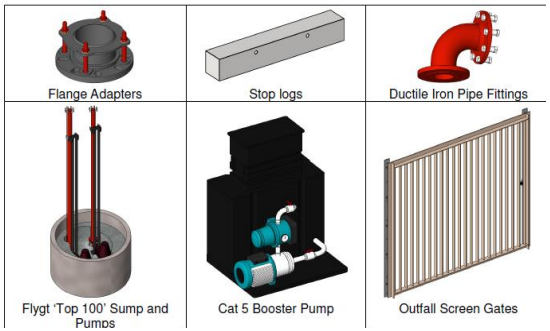
-limited Availability

Interoperability

Quality of Library Data

-who checks ?

Staff Culture



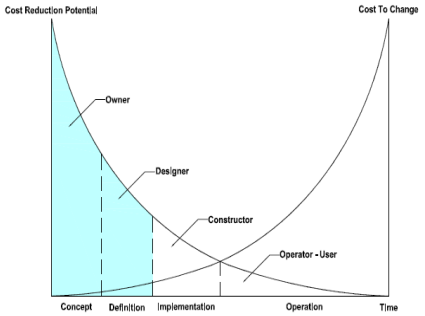
Benefits

Library items for re-use

-future savings 'locked in'

H&S Reviews

Effective communication around stakeholders



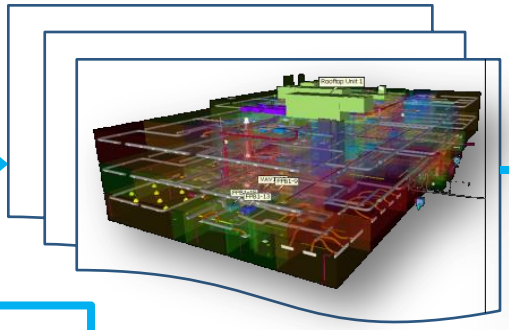
Future BIM ?

Future asset management

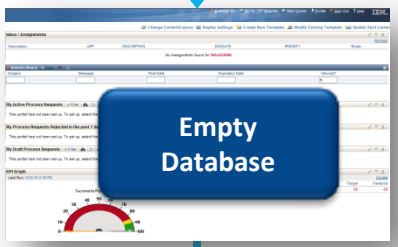
As-Built Client Model

As-Maintained Client Model

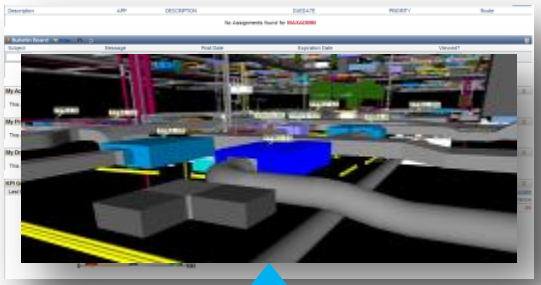
Publish key Data for O&M



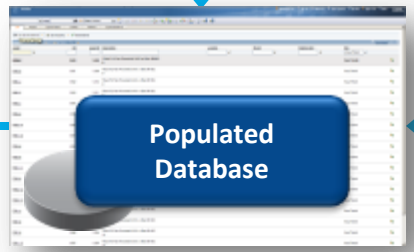
visualisation



Empty Database

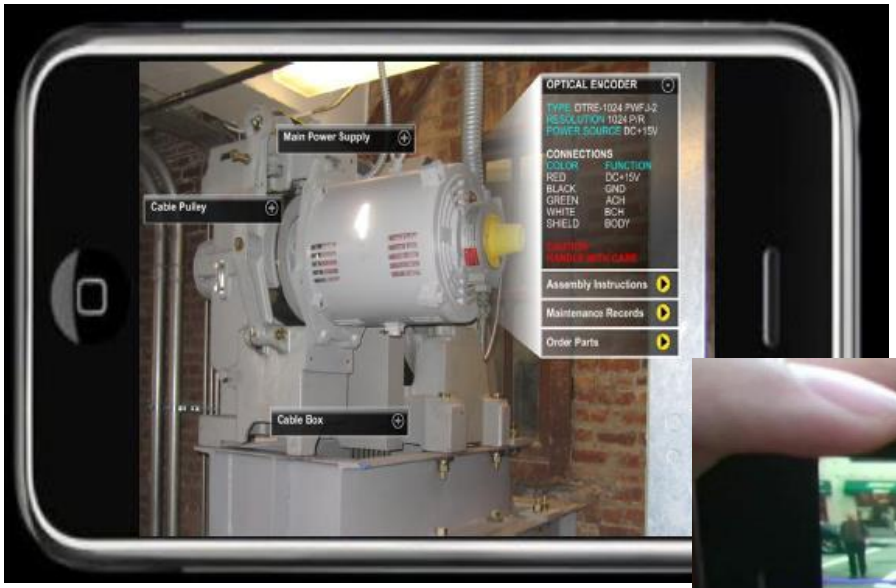


Links between geometry and data

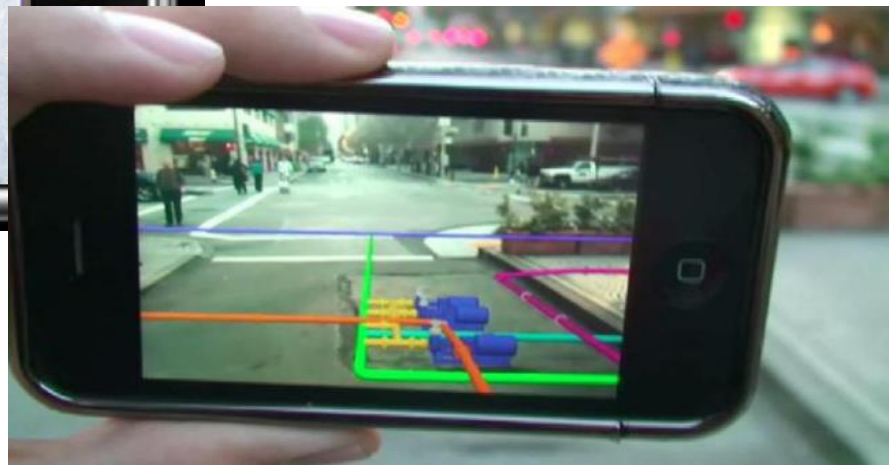


Populated Database

Changes updated in Client Model



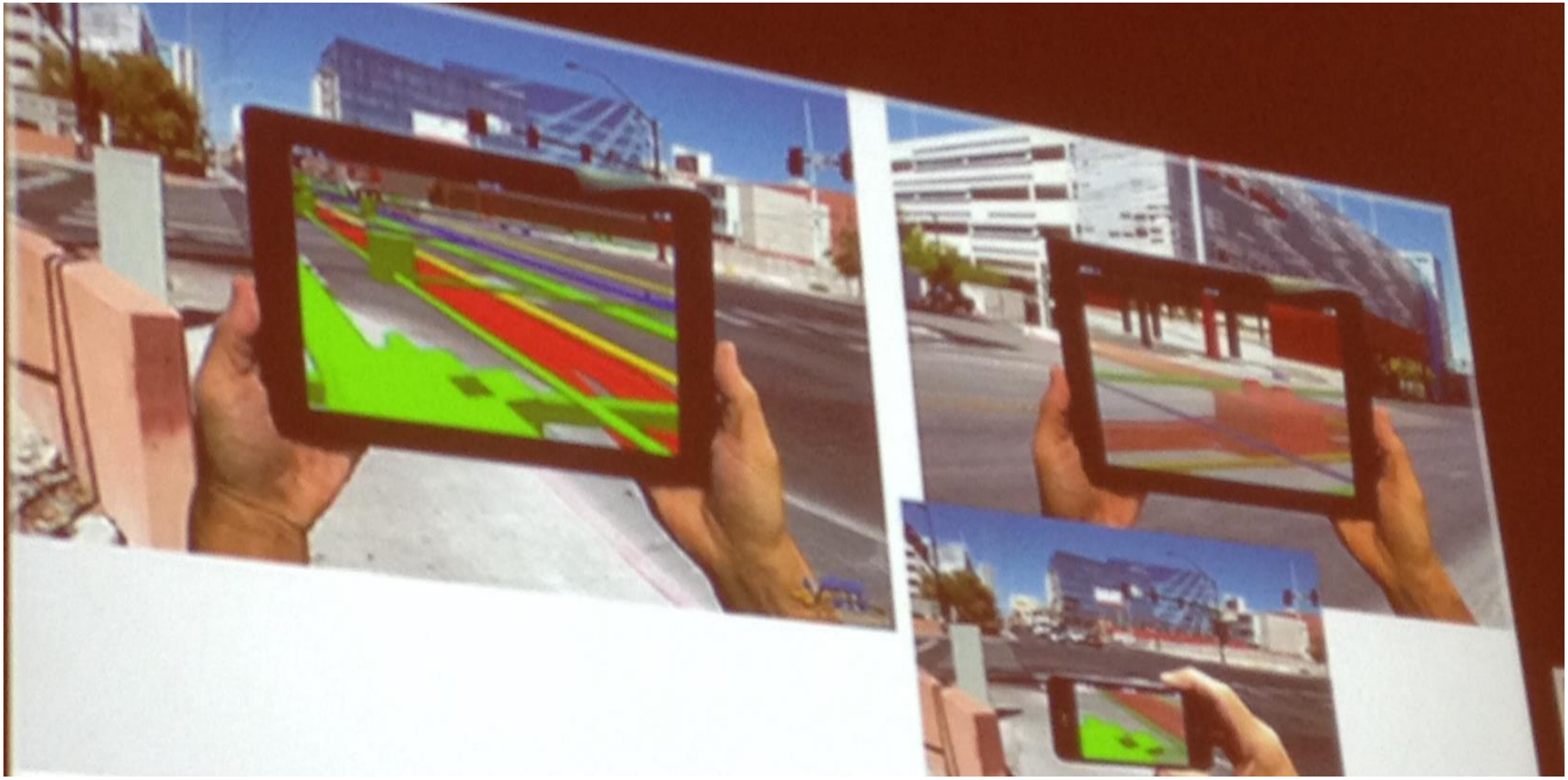
Use of RFID smart tags



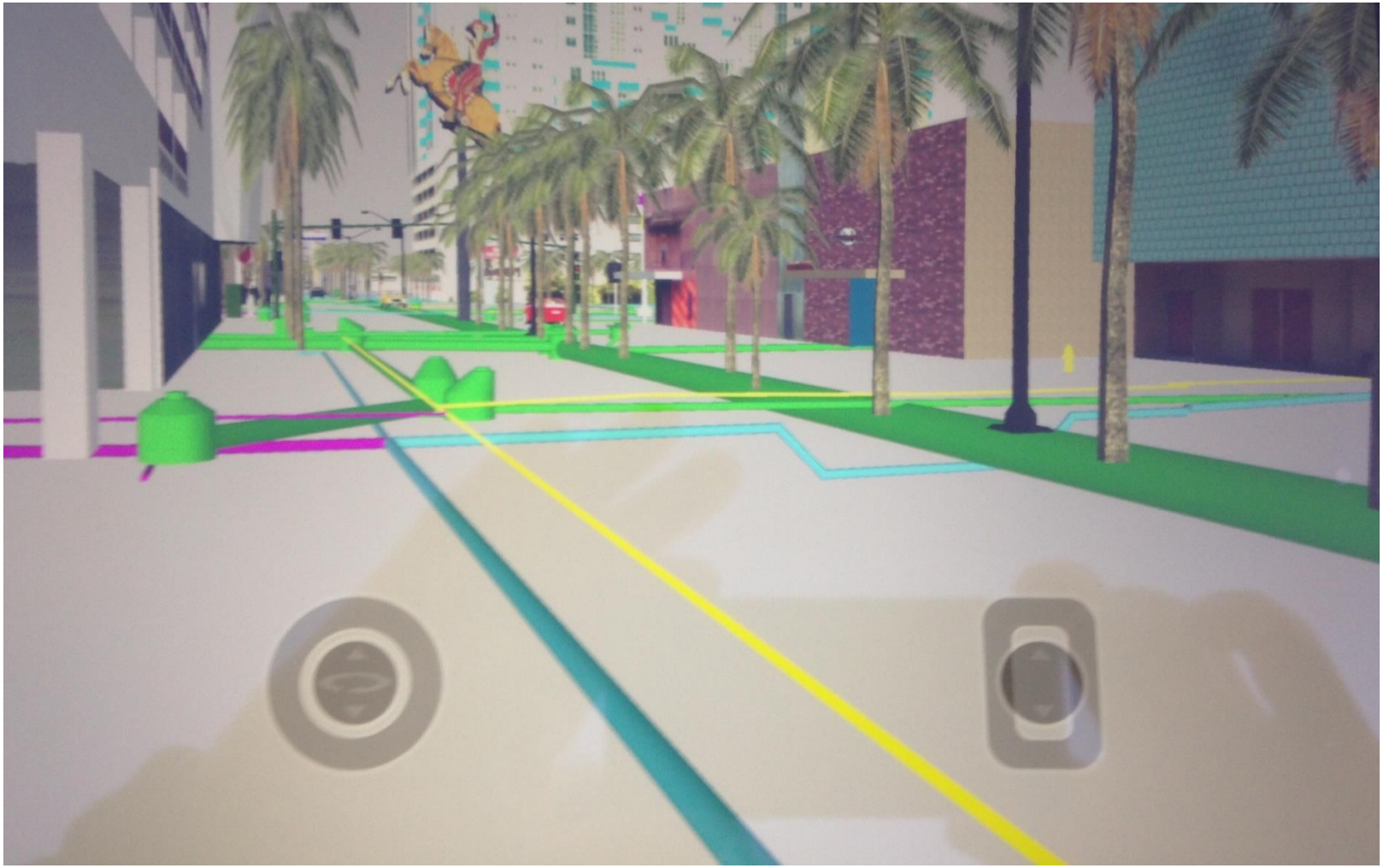
Visualising invisible assets

Source: Autodesk

Digital City

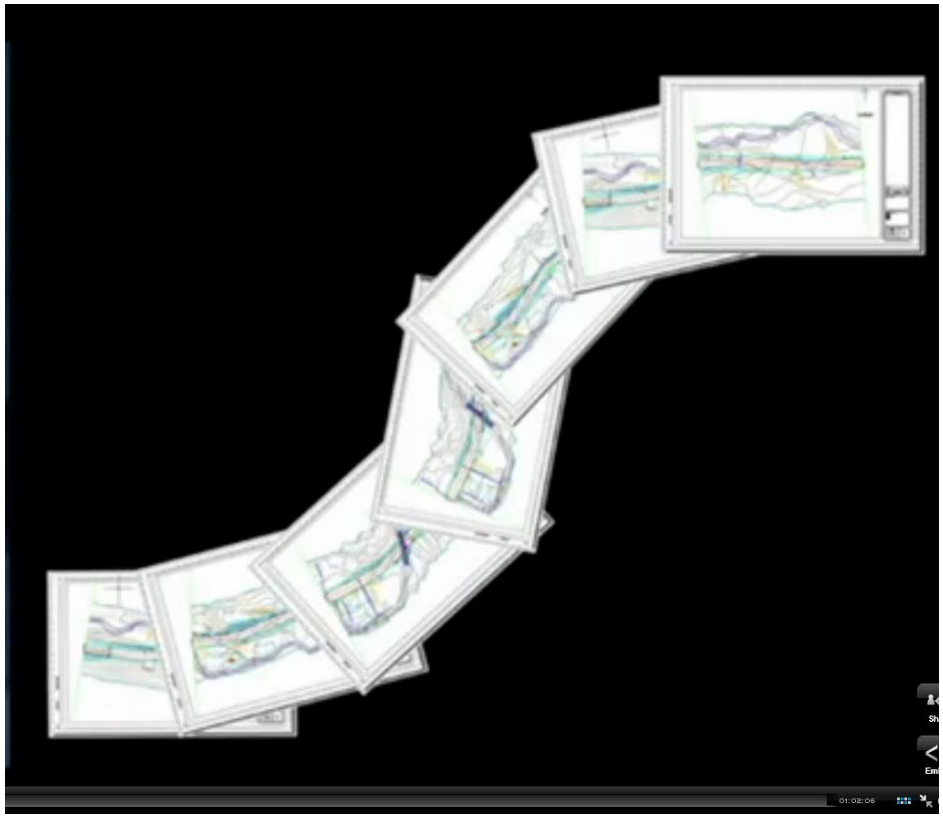


Digital City



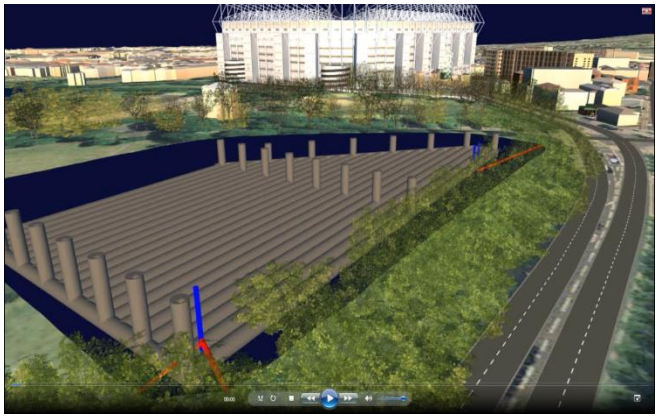
Advancing technology

- Faster, more powerful computers



Advancing technology

- Faster more powerful computers……better software



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