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BIM ?

Conference 2015

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OpenBIM

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Building Information Modelling (BIM)

Howard Gill

Business Development Manager

Graphisoft UK Ltd.

Conference 2015

London & Nottingham

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BIM GRAPHISOFT

BIM GRAPHISOFT TEAM

30 years knowledge of BIM

Team of construction industry professionals

Develop and deliver BIM training throughout UK

Write articles for publications

Support over 650 companies in the UK

Provide BIM content services

Work with educational establishments

Offer solution sales based upon proven abilities

Provide advice, help, consultancy & support on BIM

BIM GRAPHISOFT Articles

BUILDING CPD
ACHIEVING YOUR BIM OBLIGATIONS

IN THE THIRD OF OUR REGULAR SERIES OF CPD MODULES, WE LOOK AT BIM WHICH, FROM 2015, WILL BE COMPULSORY FOR ALL GOVERNMENT PROJECTS. THIS MODULE IS SPONSORED BY BITE DESIGN

CPD CERTIFIED Construction CPD Certification Service

HOW TO USE THIS MODULE

Building's free continuing professional development distance learning programme is open to everyone who wants to develop and improve their professional knowledge and skills. These modules can contribute to your annual programme of CPD activity to help you maintain membership of professional institutions and bodies.

All you have to do is read this module and then answer the multiple choice questions on the final page; complete your personal details and fax the page to **020-7560 4014** or scan it and email to **building.cpd@ubm.com**.

Alternatively, for a quicker, greener way of completing this module, go to **www.building.co.uk/cpd**

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The E.on building in Nottingham, a development by Miller Birch, was designed by Maber Architects using ArchiCAD BIM software

INTRODUCTION

Building information modelling (BIM) is the process of creating a computer model of a building project that can be used to design fully, analyse, build, manage, refurbish and even demolish that building. From 2015, its use will be compulsory on all government projects, as part of a package of cost-saving measures for the public sector estate announced by chief construction adviser, Paul Morrell, in May.

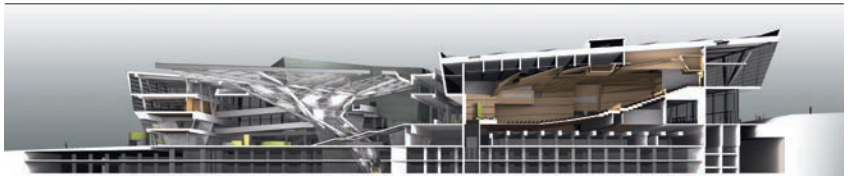
BIM software has intelligence that enables it to understand the many different elements of a building, such as walls, roofs, floors, windows and doors. It also understands the inter-relationship between them. For example, if a wall is moved, other elements associated with it will move too, and if the size of the windows is changed, the openings in all of the walls will adjust appropriately. The model will also include information about the construction and finish of each element and, in some instances, the resources required to construct it. The software stores these elements as parametric objects and allows designers to make global changes to the parameters, such as the size or characteristics, of any element of a building.

The use of 3D software to model buildings during the design phase is common, but most 3D modelling software treats models as collections of dumb surfaces or solids. BIM software differs because it can differentiate between these elements and store a great deal of information about them. This intelligence enables the software to undertake many complex analyses quickly and easily.

CPD MODULE 4 CPD CERTIFIED Construction CPD Certification Service

BUILDING INFORMATION MODELLING

This CPD explores the use of Building Information Modelling which has the potential to dramatically change the process of design and construction. It is the fourth in our regular series of CPD modules for 2011 and is sponsored by Bite



BIM was used on the Darmstadtium project in Germany, designed by FS-Architekten and Chalabi Architects & Partners.

Building Information Modelling (BIM) is the process of creating a computer model of a building project which can be used to fully design, analyse, build, manage, refurbish and finally demolish that building.

BIM software has intelligence, enabling it to understand the many different elements of a building, such as walls, roofs, floors, windows and doors. It also understands the interrelationship between them. For example, if a wall is moved, other elements associated with it will move too, and if the size of the windows is changed, the openings in all of the walls will adjust appropriately. The model will also include information about the construction and finish of each element and, in some instances, the resources required to construct it. The software stores these elements as parametric objects and allows designers to make global changes to the parameters, such as the size or characteristics, of any element of a building.

The use of 3D software to model buildings during the design phase is common, but most 3D modelling software treats models as collections of dumb surfaces or solids. BIM software differs because it can differentiate between these different elements and store a great deal of information about them. This intelligence enables the software to undertake many complex analyses quickly and easily.

The key to BIM is not the visual model, but the database of information that sits behind it. This enables different organisations working on the same project but using different software to store and retrieve information in a consistent, shareable format.

There is no one piece of software that will encompass all the functions required throughout the life of a building information model. Various software will contribute to and draw from the model, and so it is crucial that there is a common language that all BIM software can understand. The International Alliance for Interoperability (IAI), now the Building Smart organisation (www.buildingsmart.org.uk), developed the standard language known as IFC (Industry Foundation Classes) which is an evolving international standard (ISO 16739).

These are the two key characteristics of BIM: the software's ability to understand the constituent elements of a building, and its interoperability.

HOW TO USE THIS MODULE

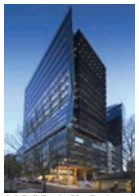
- BD Reviews' continuing professional development distance learning programme can contribute to your annual CPD activity and help you maintain membership of professional institutions and bodies.
- To complete this CPD, read the module, answer the questions and send your submission form via one of the following methods:

Fax 020 7560 4014
Scan and email bdreviews.cpd@ubm.com
Online www.bdonline.co.uk/cpd

Progress of BIM in the UK market

In the UK, most discussions of BIM relate to its use during the design stages, sometimes referred to as "little BIM". Elsewhere, its implementation is more advanced, particularly in Scandinavia, the US, Australia and more recently South Korea. In Sydney, for example, the award-winning Ark, a 21-storey commercial building designed by Rice Daubney Architects using ArchiCAD, was designed, constructed and handed over for facilities management as a building information model.

Several contractors and consultants in the UK market are now beginning to implement a BIM strategy for the design and analysis functions of the process. Some contractors are also looking at estimating functions, and using the BIM model for 4D (time) and 5D (cost) resource allocation during construction phases.

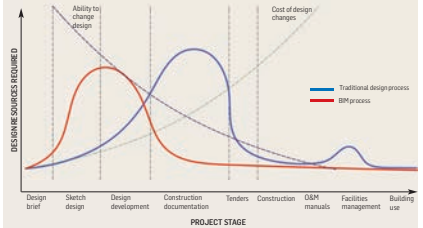


Ark Building by Rice Daubney.

These latter functions are considerably more advanced in the US with Vico software (originally derived from ArchiCAD). Some consultants in the UK are bringing together architectural and structural models and a very few have also integrated MEP models. Currently, structural models are more likely to come from constructional steelwork subcontractors than from design practices. The former have nearly all used software to model and cut the structural members for many years, ensuring their off-site construction is correct before they get to site. Structural models from both Tekla and AceCAD products can be exported as IFC models for importing into architectural BIM software.

Design resources required vs effect achieved

This diagram compares the design resources required using BIM compared to a traditional process



Benefits of using BIM

In a traditional design process 2D drawings are passed between consultants and manually checked. With BIM, intelligent models of the building can not only be passed between consultants but combined into a single model and checked with clash-detection software to ensure coordination. This is not only faster but reduces the chance of human error, as information does not have to be continually recreated.

BIM also aids clearer involved in a project: the client, other consultants, the contractor, subcontractors and operatives. The design model can then be passed to contractors and subcontractors for tendering and project and resource planning. Further information about construction costs and programmes can be gathered and stored, to inform more accurate estimating in future.

The implementation of BIM throughout the construction process presents challenges dramatically reshape the industry. It will undoubtedly be necessary to examine relationships and responsibilities between the various parties involved. Some of these issues were explored in the excellent series of free Directors Briefings held in London in November 2010. The next series will take place in Birmingham in June. http://info.graphisoft.co.uk/directors_bim/

Other benefits include:

- better communication of the design to the client and others at all stages of the process (eg; VBE, Naviswork)
- coordination of construction and specification information, for example with links to national building specifications (eg: ArchiCAD, Revit)
- environmental assessments: better and continuous evaluation of the design in terms of aesthetics, performance and brief fulfilment (offered by products including Solibri, Trelligence, Naviswork)

performance, lighting, fluid dynamics, environmental impact assessments etc (eg; EcoDesigner, IES, Design Builder, Ecotect)

- quicker and easier design revisions, as parametric elements are more flexible and easier to modify at any stage than traditional CAD (eg; ArchiCAD, Revit)
- manageable consistency of standards across a project, as it is easier to maintain consistency with parametric elements (eg; ArchiCAD, Revit)

scheduling of information at all stages (eg; Solibri, ArchiCAD, Revit)

- quantity take offs (eg; Vico, RIB)
- more accurate tendering processes (eg; Vico)
- project planning and resource allocation (eg; Vico, Synchro)
- more accurate construction planning (eg; Vico, Synchro)
- more efficient construction phasing with less wastage (eg; Vico)
- links to facilities management (eg; ArchiFM and other

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Silvertown Quays, London

Urban Strategies Inc. Master Planners,

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BIM is

a process not a product

collaborative 3D modelling

electronic documentation & data

concept design to asset management

for all construction industry members

driven & directed by Government

unlocking new efficient ways of working

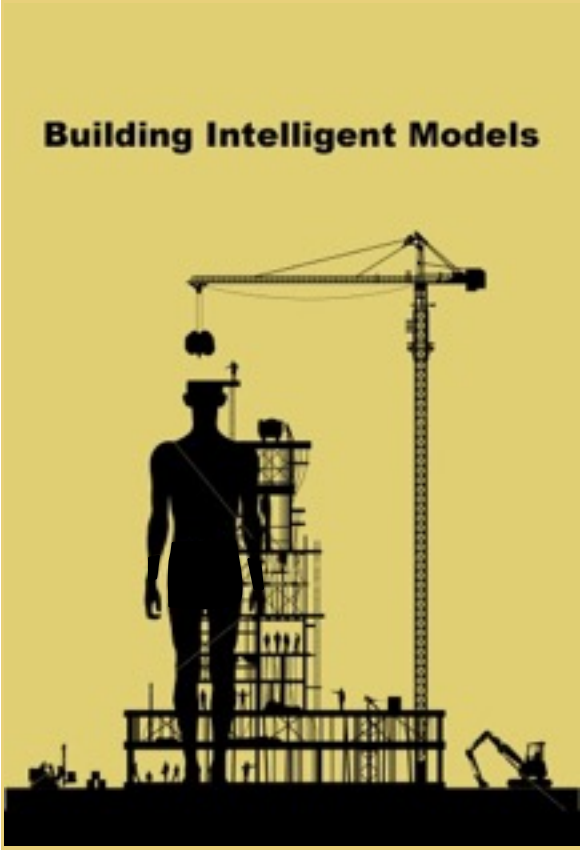
establishing new contractual framework

a game changer and is not going away

BIM : is initially for designers

a better method for design, made possible by new technologies, providing:

- Early cost certainty
- Reduced delivery costs
- Better collaborative working
- Better information co-ordination
- Better/earlier compliance checking
- Better communication of project
- Reduced Risk
- Predictable planning



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BIM : Government Strategy

A report for the Government Construction Client Group

Building Information Modelling (BIM) Working Party Strategy Paper

March 2011

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

The overall aim is to maximise client value by increasing benefits at little or no extra cost.

The government is expecting to be able to reduce capital expenditure on projects by 20%!

BIM : Government Strategy

Cabinet Office - BIM Task Group Report 31st May 2011

All government projects will be required to use collaborative 3D BIM by 2016. (all project and asset information, documentation and data to be electronic)

http://www.bimtaskgroup.org

"This Government's four year strategy for BIM implementation will change the dynamics and behaviours of the construction supply chain, unlocking new, more efficient and collaborative ways of working."

Francis Maude. Minister for the Cabinet Office

Keep it simple; our (BIM) hypothesis is: Government as a client can derive significant improvements in cost, value and carbon performance through the use of open sharable asset information.

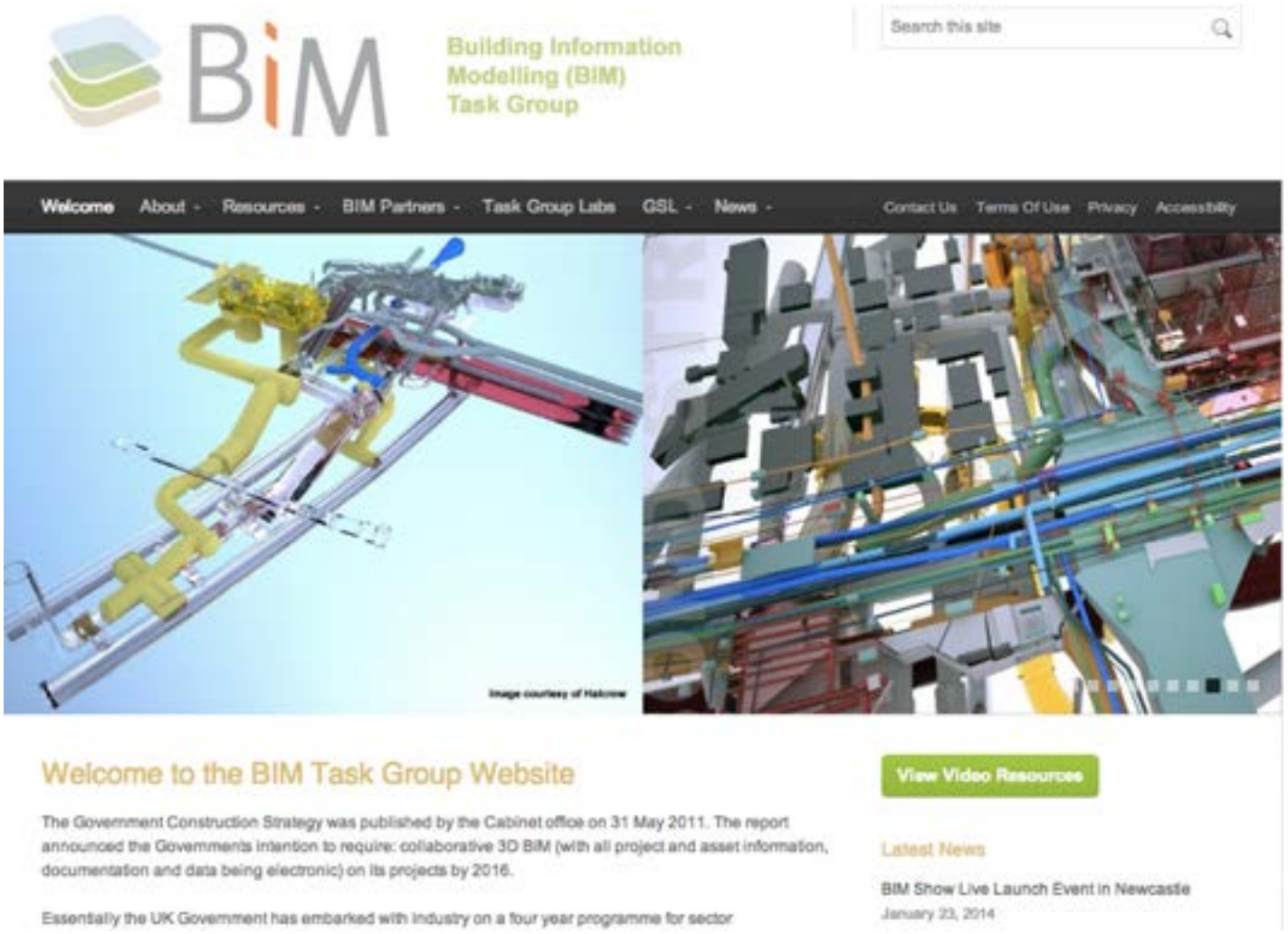
David Philp - Head of BIM Implementation, the Cabinet Office

Paul Morrell: first Chief Construction Advisor

Francis Maude: Minister the Cabinet Office

David Philp - Head of BIM Implementation

BIM : Government Strategy



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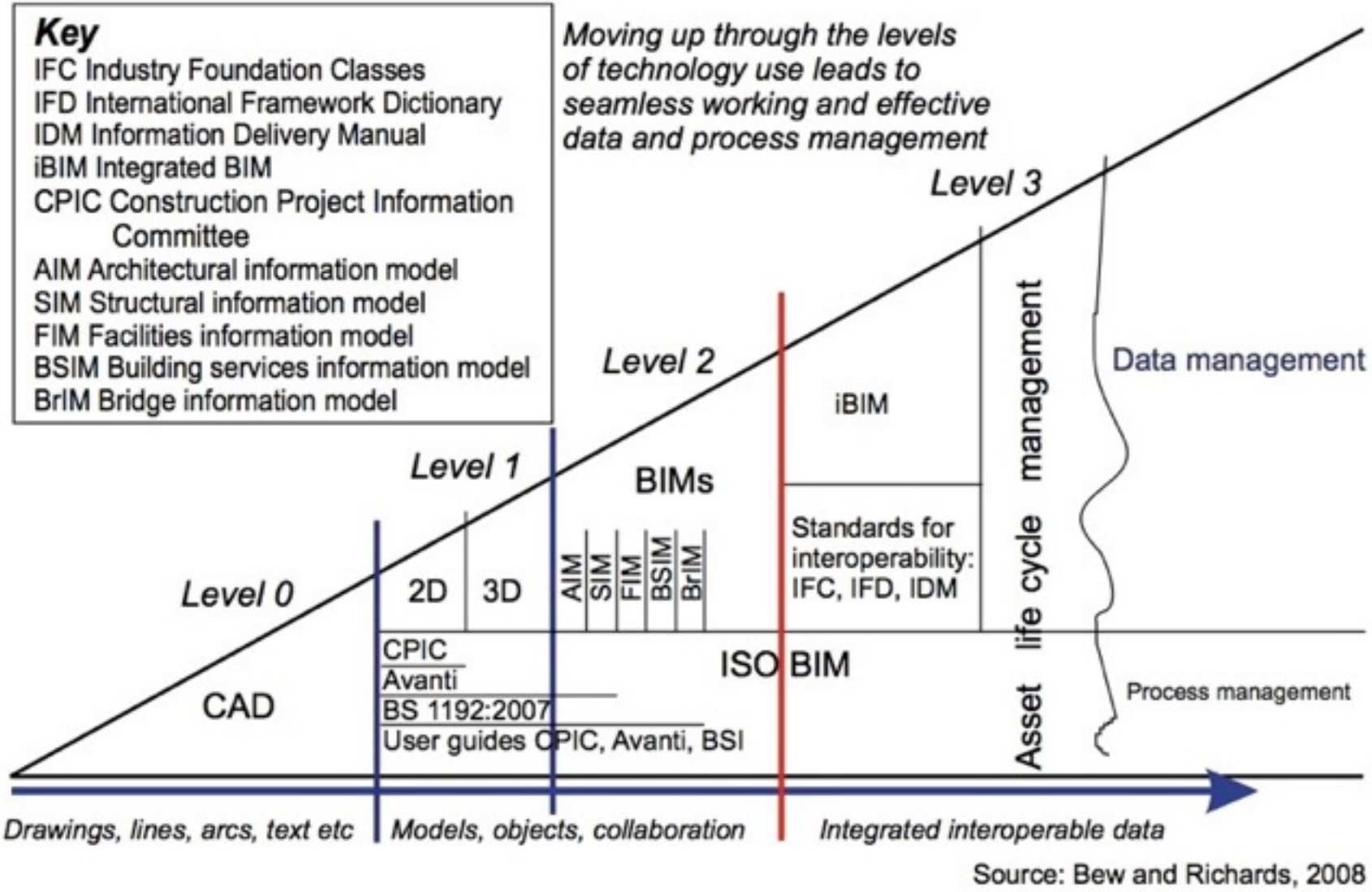
BIM : Where are we going?



Source: Bew and Richards, 2008

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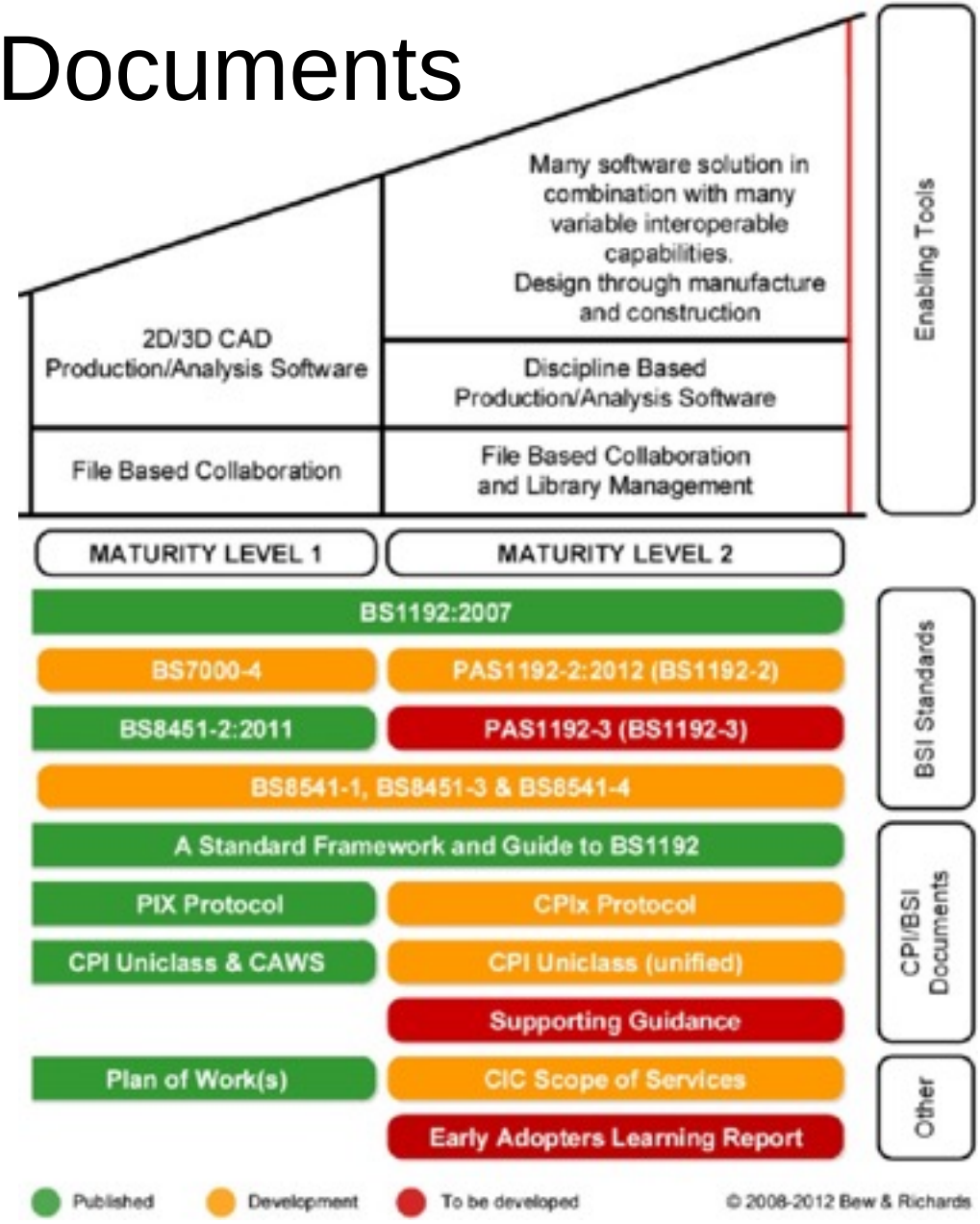
BIM : Government Documents

There are a number of documents to assist with defining standards and definitions for use with BIM

The government's demand is for Maturity Level 2 or BIM Level 2 for projects by 2016

Organisations contributing to the debate: BuildingSmart, BSI, CPIC, CIC, NBS, OpenBIM Network, BRE.



BIM : Digital Britain - Level 3 Strategy

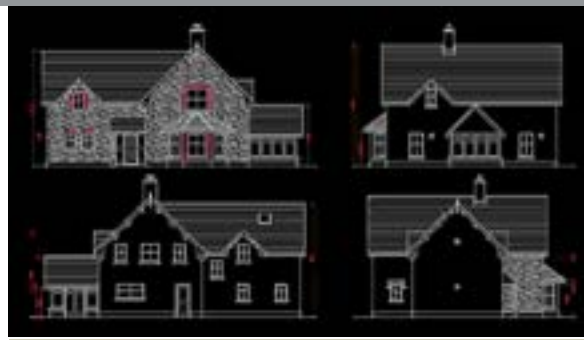
February 2015

BIM is the first truly global digital construction technology and will soon be deployed in every country in the world. It is a 'game changer' and we need to recognise that it is here to stay - but in common with all innovation this presents both risk and opportunity.
Patrick MacLeamy, CEO, HOK Architects

Rapid advances in digital engineering are revolutionising construction. But Building Information Modelling (BIM) is about more than creating models. It is about unlocking knowledge and insight, creating the platform for more efficient and sustainable solutions. At Laing O'Rourke we're taking BIM beyond the traditional geometrical and asset data approach to include time and cost dimensions, offering unparalleled benefits to clients and end-users over the lifetime of buildings and infrastructure.
Ray O'Rourke KBE, Chairman, Laing O'Rourke

Present design methods

2D Design & Production drawings
Plans, sections, elevations & details created independently.
AUTOCAD MICROSTATION VECTORWORKS



3D Design
SKETCHUP 3DSTUDIO RHINO FORMZ CINEMA

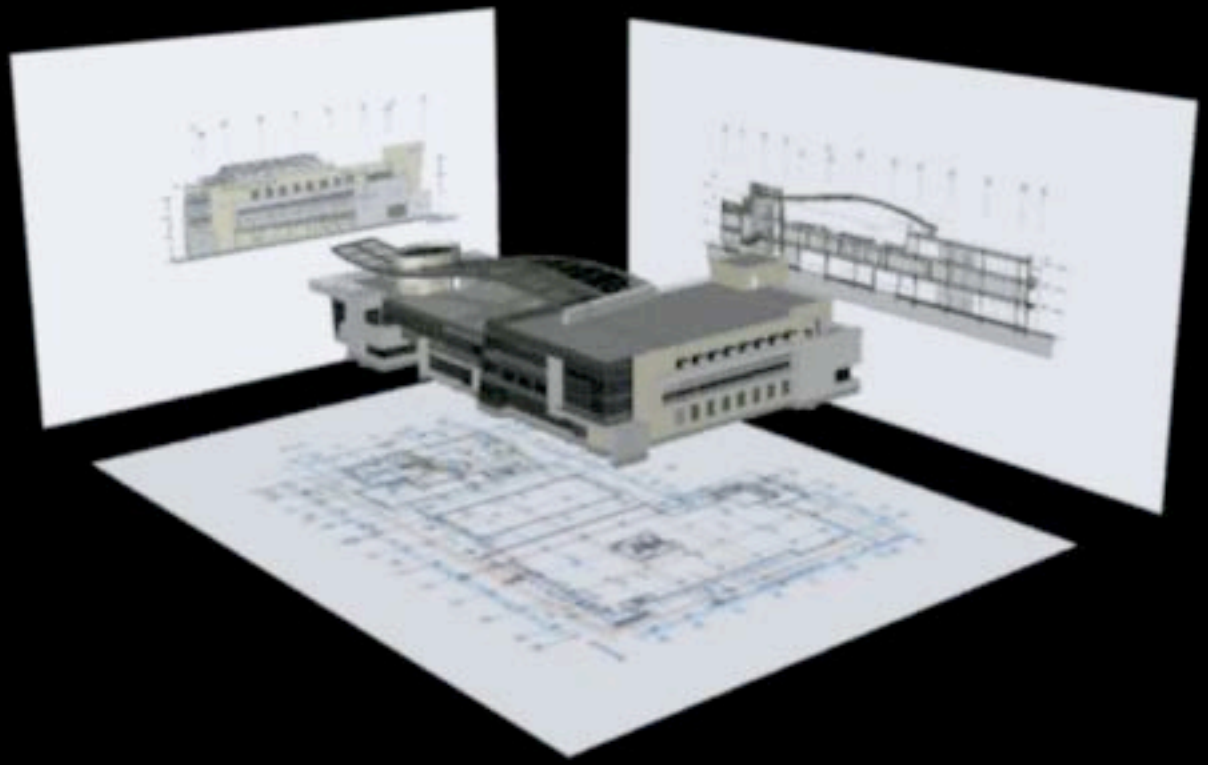
Schedules
EXCEL

Evaluations (by others)
SAP SBEM

Final visuals
PHOTOSHOP CORELDRAW

BIM works differently - always producing coordinated output

changes reflected in every view



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BIM means all the required data from one source

using the following tools and workflow

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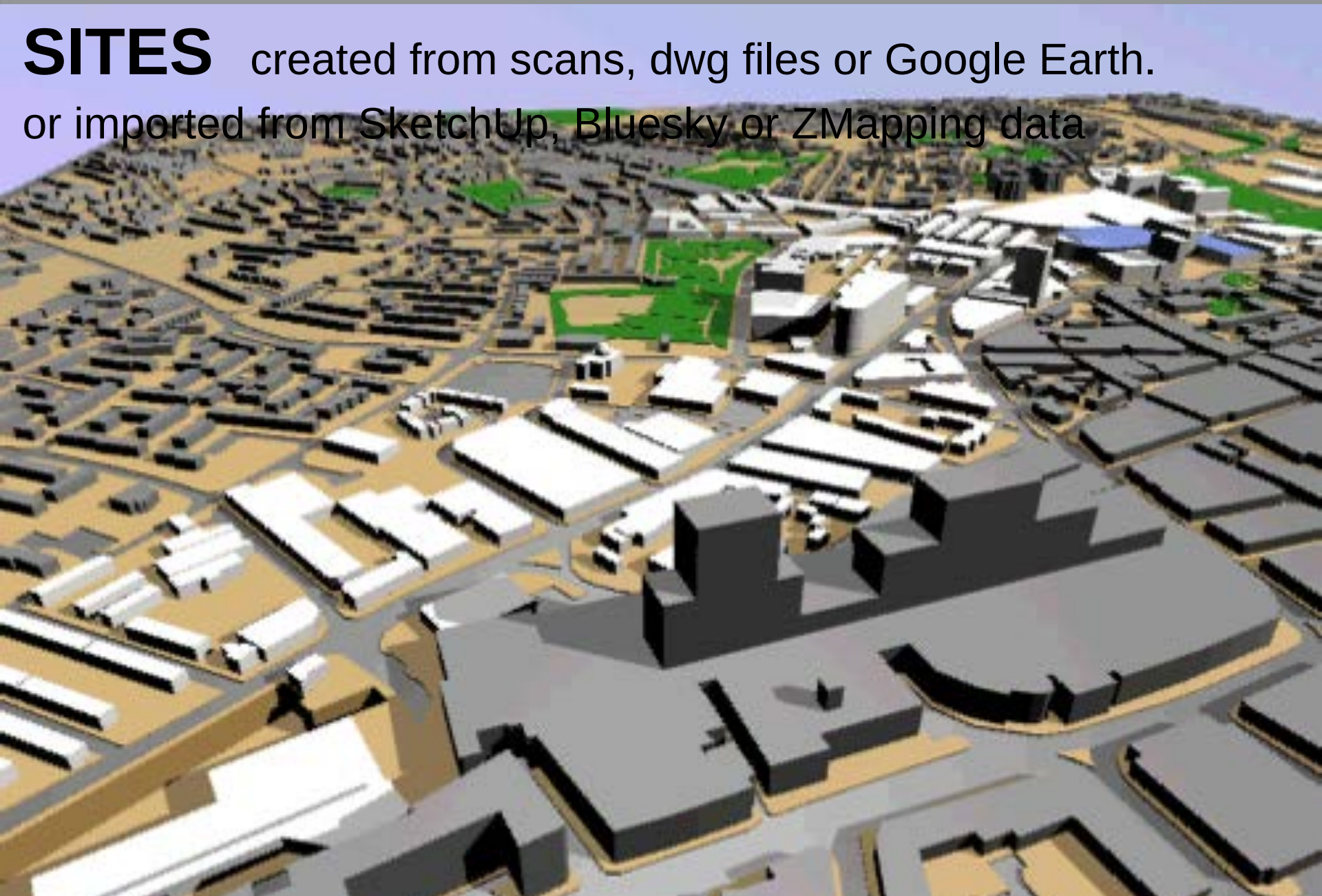
SITES created from scans, dwg files or Google Earth.

or imported from SketchUp, Bluesky or ZMapping data



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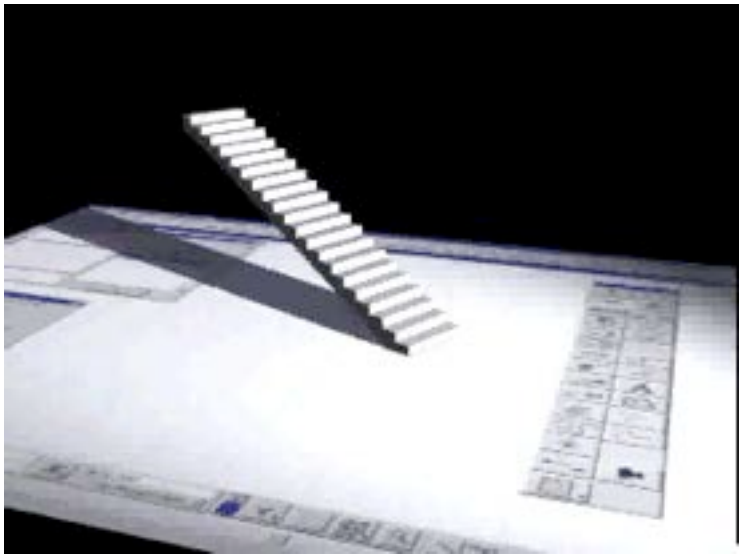
BIM : uses design tools

that look and ‘act’ like construction elements

using parameters for variations...



...and with real objects based upon manufacturer’s parts

BIM : starts with Conceptual Design







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BIM : is used for Massing Studies






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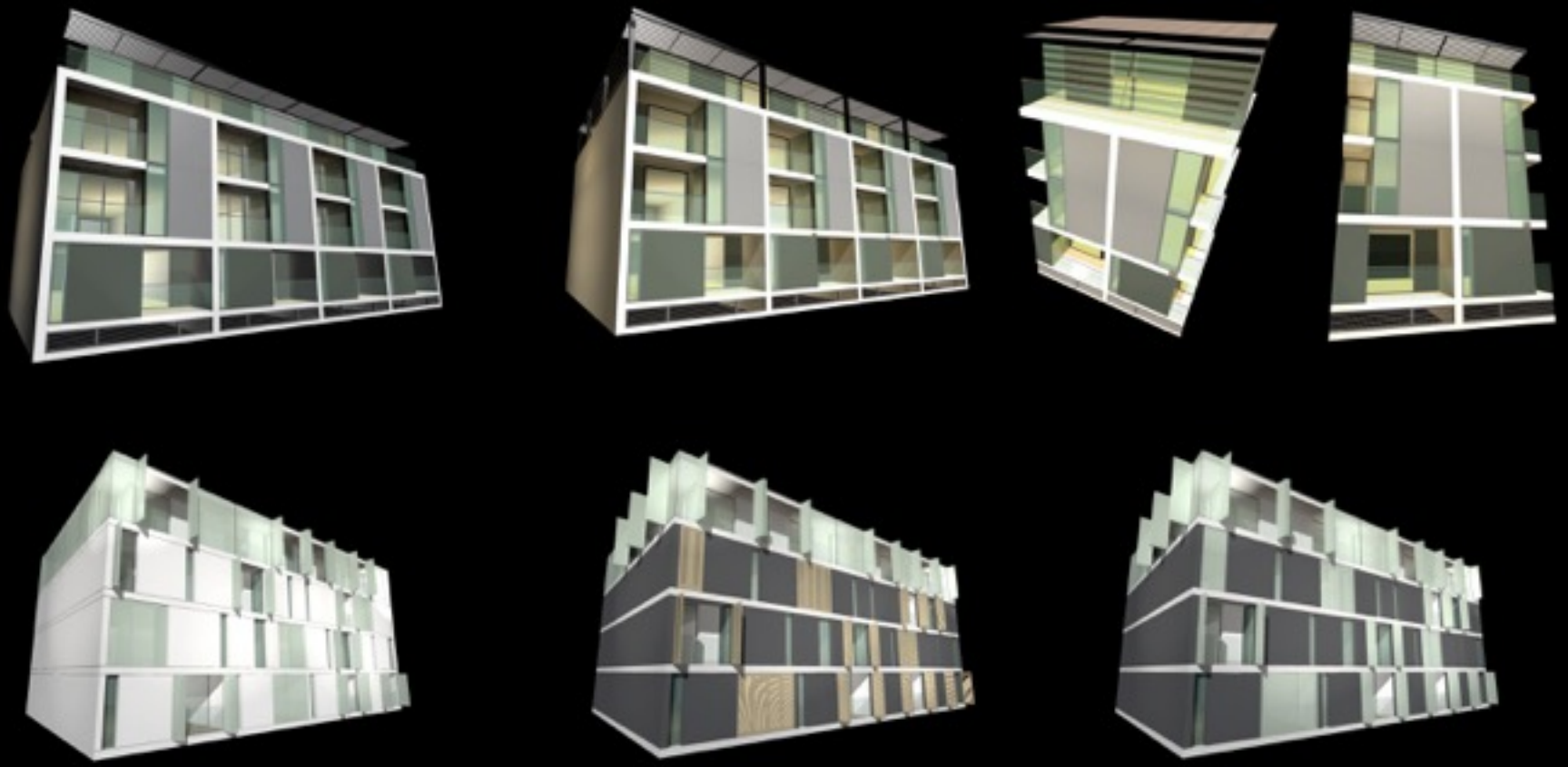
BIM : is used for Facade Studies



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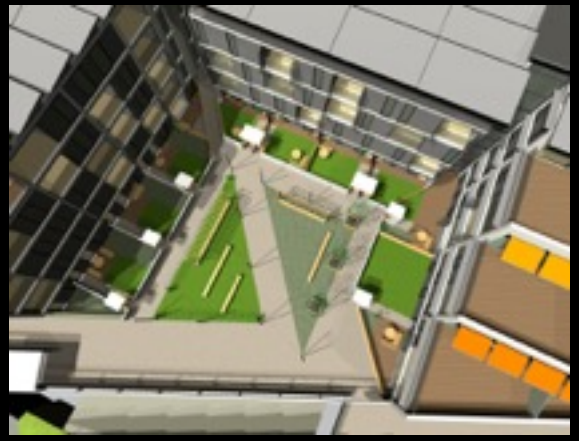
BIM : is used for Design Development





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BIM : is used for Final Designs






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BIM : produces Rendered Elevations

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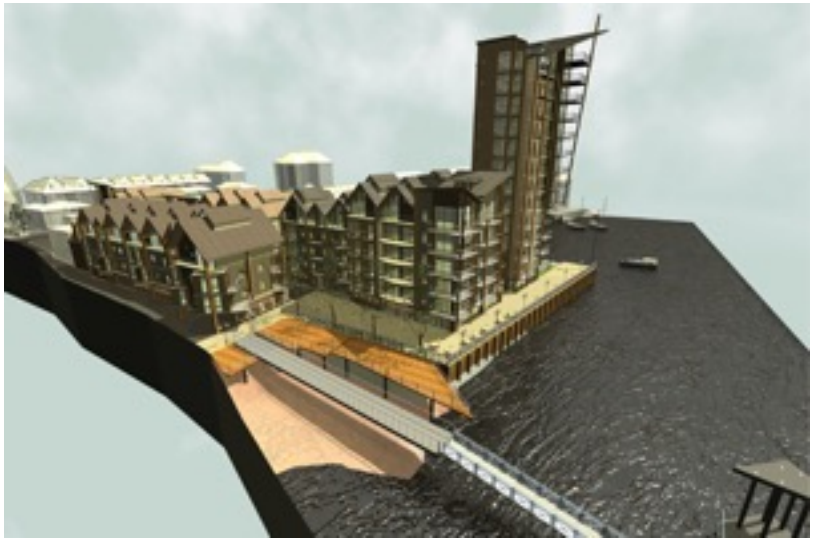
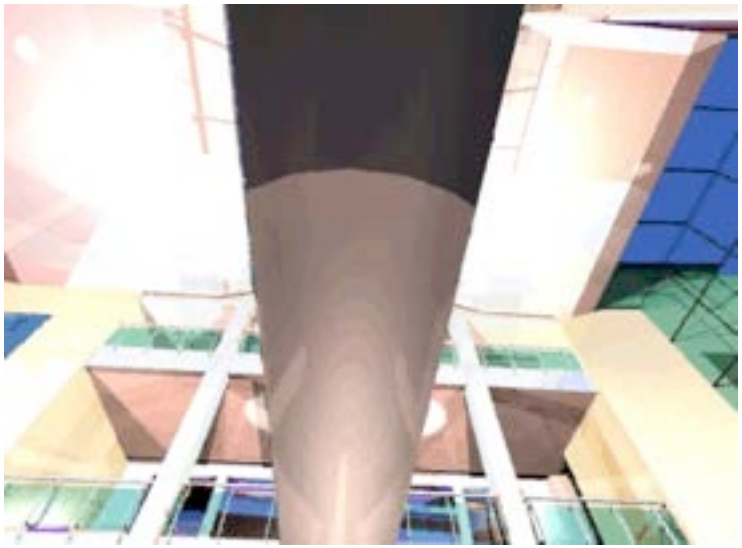
BIM : produces initial Movies

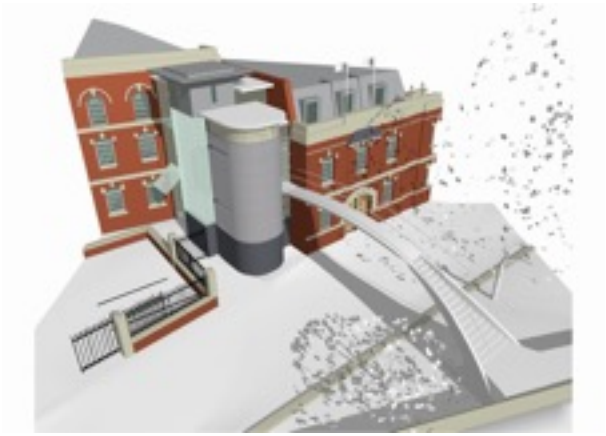
BIM : is used on all project types and sizes



Husband + Carpenter



Nottingham City - Ice Stadium



Crease Strickland Parkins

Constructive Thinking

Indigo Blue

BIM : provides Rendering Styles for varied output

2HD

Caruso St. John

Morgan Carn

Ian Darby Partnership

Bond Bryan Architects

Bite Design

FCBS

HLM Architects

BIM : provides Rendering Styles for varied output

HGP Architects

SHH Architects

Laing O'Rourke

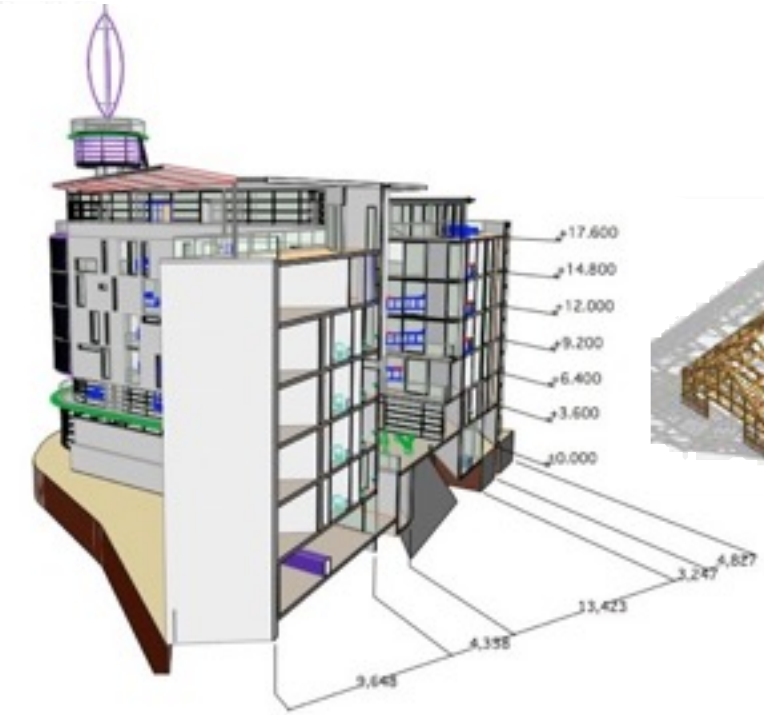
Penoyre & Prasad Architects

LSI Architects

John Robertson Architects

BIM : is used for final presentation movies

BIM : is used for Documentation including dimensioned 3D



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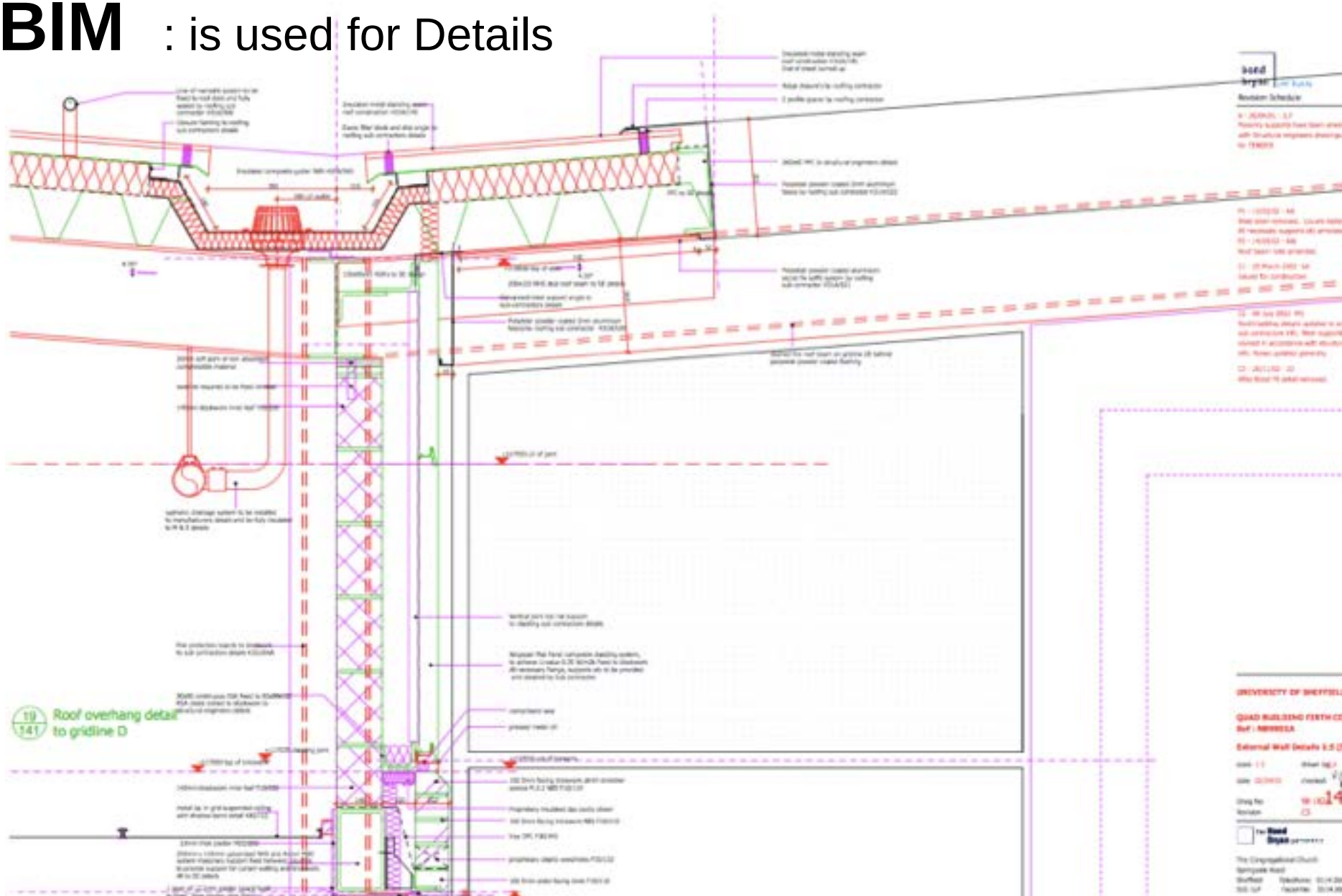
BIM : is used for Details



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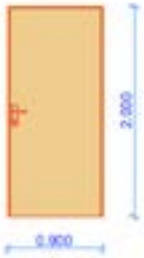
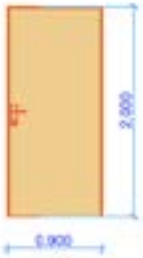
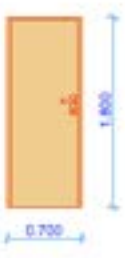
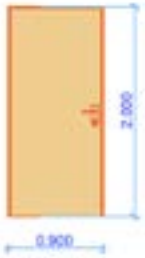
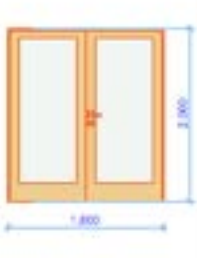
BIM : is used for Schedules

01 Door List

Door Name	D1 13				D2 13
Quantity	2	18	24	26	2
W x H Size	0.900x2.000	0.900x2.000	0.700x1.800	0.900x2.000	1.800x2.000
3D Front View					

Floor (Story)	Zone Category	Area
0 Ground Floor	Circulation	44.90
0 Ground Floor	Office	379.68
0 Ground Floor	Recreation	113.89
0 Ground Floor	Research + Development	102.05
0 Ground Floor	Sales	186.94
0 Ground Floor	Services	27.64
0 Ground Floor	Storage	13.84
		868.93 m2
1 First Floor	Circulation	44.92
1 First Floor	Office	481.58
1 First Floor	Sales	186.94
1 First Floor	Services	27.04
1 First Floor	Storage	13.84
		754.91 m2
2 Second Floor	Circulation	44.92
2 Second Floor	Office	277.61
2 Second Floor	Sales	391.04
2 Second Floor	Services	21.26
2 Second Floor	Storage	20.22
		755.05 m2
3 Third Floor	Circulation	44.46
3 Third Floor	Office	225.91
3 Third Floor	Research + Development	357.43

Room No.	Room Name	Zone Category	Area	Height	Volume	Perimeter
001	Office GF01	Office	138.82	2.700	374.82	31.05
002	Office GF02	Office	138.81	2.700	374.78	31.05
003	Reception + Cafe	Recreation	113.89	9.000	1024.98	4.04
004	Circulation GF1	Circulation	29.15	2.700	78.71	18.90
005	Circulation GF2	Circulation	15.75	2.700	42.53	10.99
006	Toilets M GF	Services	6.10	2.700	28.70	13.91
007	Toilets F GF	Services	6.10	2.700	28.70	14.05
008	Kitchen GF	Services	6.37	2.700	17.21	7.52
009	Store 1	Storage	7.92	2.700	21.40	11.23
010	Research GF01	Research + Development	102.05	2.700	275.53	42.59
010	Store 2	Storage	5.92	2.700	15.98	10.00
012	Sales Team GF	Sales	186.94	2.700	504.73	49.78
013	Sales Team Admin GF	Office	102.05	2.700	275.53	42.59
014	Overseas Admin FF1	Office	138.74	2.700	374.60	31.05
015	Overseas Admin FF2	Office	138.74	2.700	374.60	44.64
016	Overseas Admin FF3	Office	102.05	2.700	275.53	42.58
017	OverseasSales FF1	Sales	186.94	2.700	504.73	49.78
018	OverseasSales Admin FF1	Office	102.05	2.700	275.53	42.59
019	Toilets M FF	Services	6.10	2.700	28.70	13.97
020	Toilets M FF	Services	6.10	2.700	28.70	14.11
021	Circulation FF1	Circulation	29.17	2.700	78.75	18.90
022	Circulation FF2	Circulation				
023	Kitchen FF	Services				
024	Store FF1	Storage				
025	Store FF2	Storage				
026	Gen Office SF1	Office				
027	Gen Office SF2	Office				
028	Sales Office SF1	Sales				
030	Sales Office SF2	Sales				
031	Sales Office SF3	Sales				

Door List

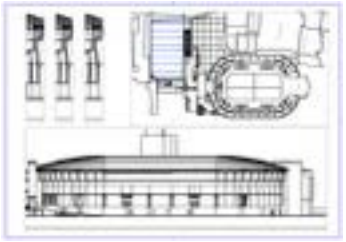
ID	From Room	Type	W x H Size	Acoustic	F.R.	Height	Width
D/0-01		D2 13	1.800x2.000	38 dB/Rw	FS60SC	2.000	1.800
D/0-02		D2 13	1.800x2.000	38 dB/Rw	FS60SC	2.000	1.800
D/0-04		D1 13	0.900x2.000	35 dB/Rw	FS60	2.000	0.900
D/0-05	GBS Zone 0.5	D1 13	0.900x2.000	35 dB/Rw	FS60	2.000	0.900
D/0-06		D1 13	0.900x2.000	35 dB/Rw	FS60	2.000	0.900
D/0-07		D1 13	0.900x2.000	35 dB/Rw	FS60	2.000	0.900
D/0-08		D1 13	0.900x2.000	35 dB/Rw	FS60	2.000	0.900
D/0-09	GBS Zone 0.4	D1 13	0.900x2.000	35 dB/Rw	FS60	2.000	0.900
D/0-10		D1 13	0.900x2.000	35 dB/Rw	FS60	2.000	0.900

"The designer will no longer spend time retyping the data from a 2D CAD model into Microsoft Excel to produce a 200 instance door schedule"

Stephen Hamil, NBS

BIM : provides a new Workflow for Design & Documentation

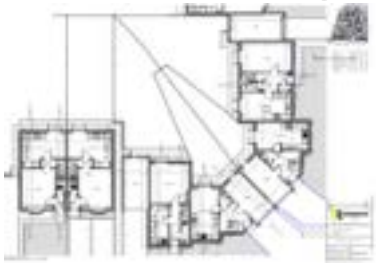



PRINTS
PDF
DWG
IFC
JPEG

Model → Views → Drawings → Output




PLOTS
PMK
DWF
PSD
MODULE
DXF

BIM : 10 Initial Benefits

- uses construction tools
- has consistent functions throughout
- uses workflow from Concept[illegible]pletion
- guarantees coordin[illegible]
- uses param[illegible]jects
- us[illegible]ufacturer's items when required
- highlights errors
- holds data centrally
- is 40% more productive than 2D

A pleasure to use every day !

BIM : some reasons why we are doing this





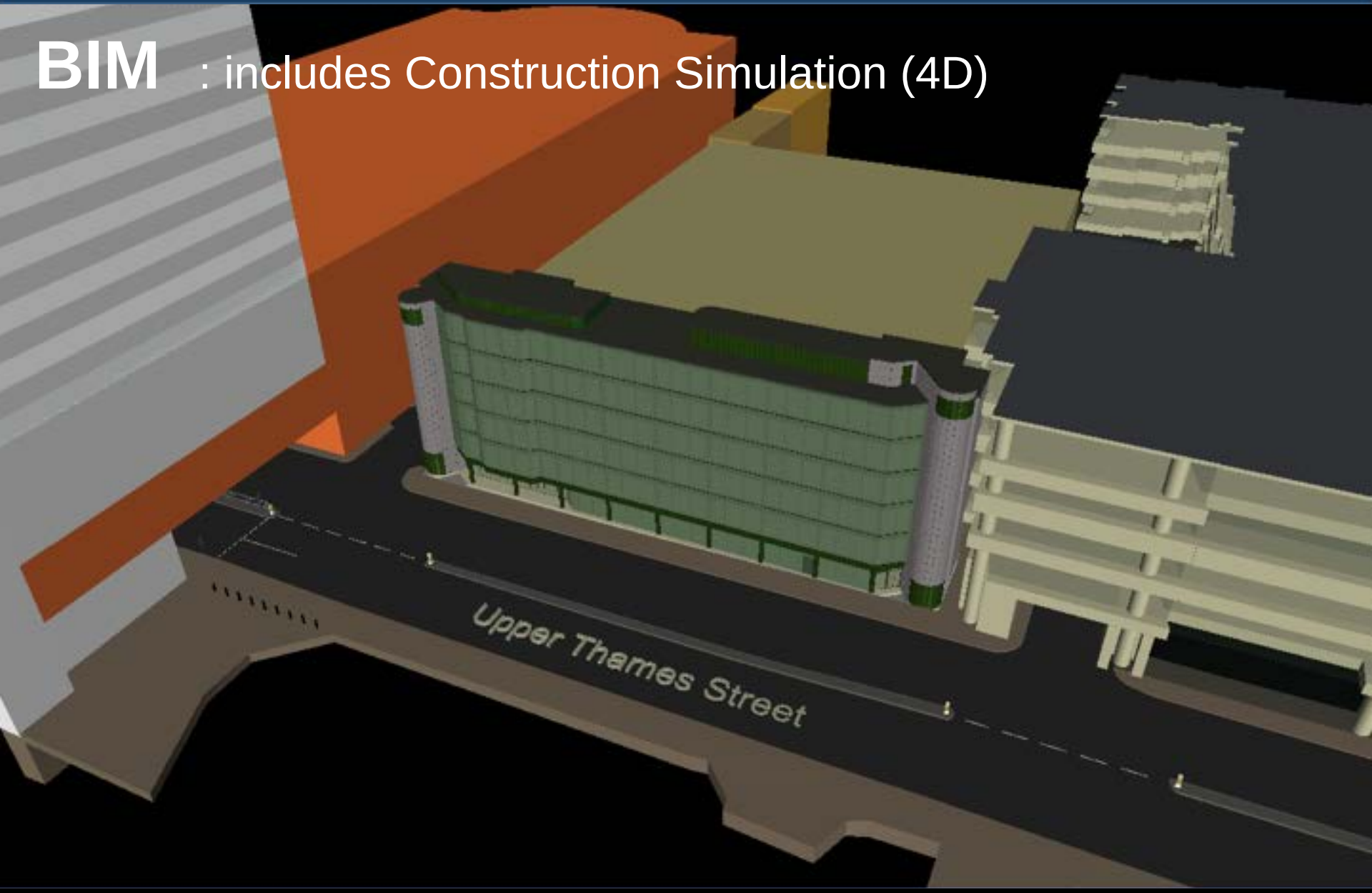



BIM : So is that it ? ……

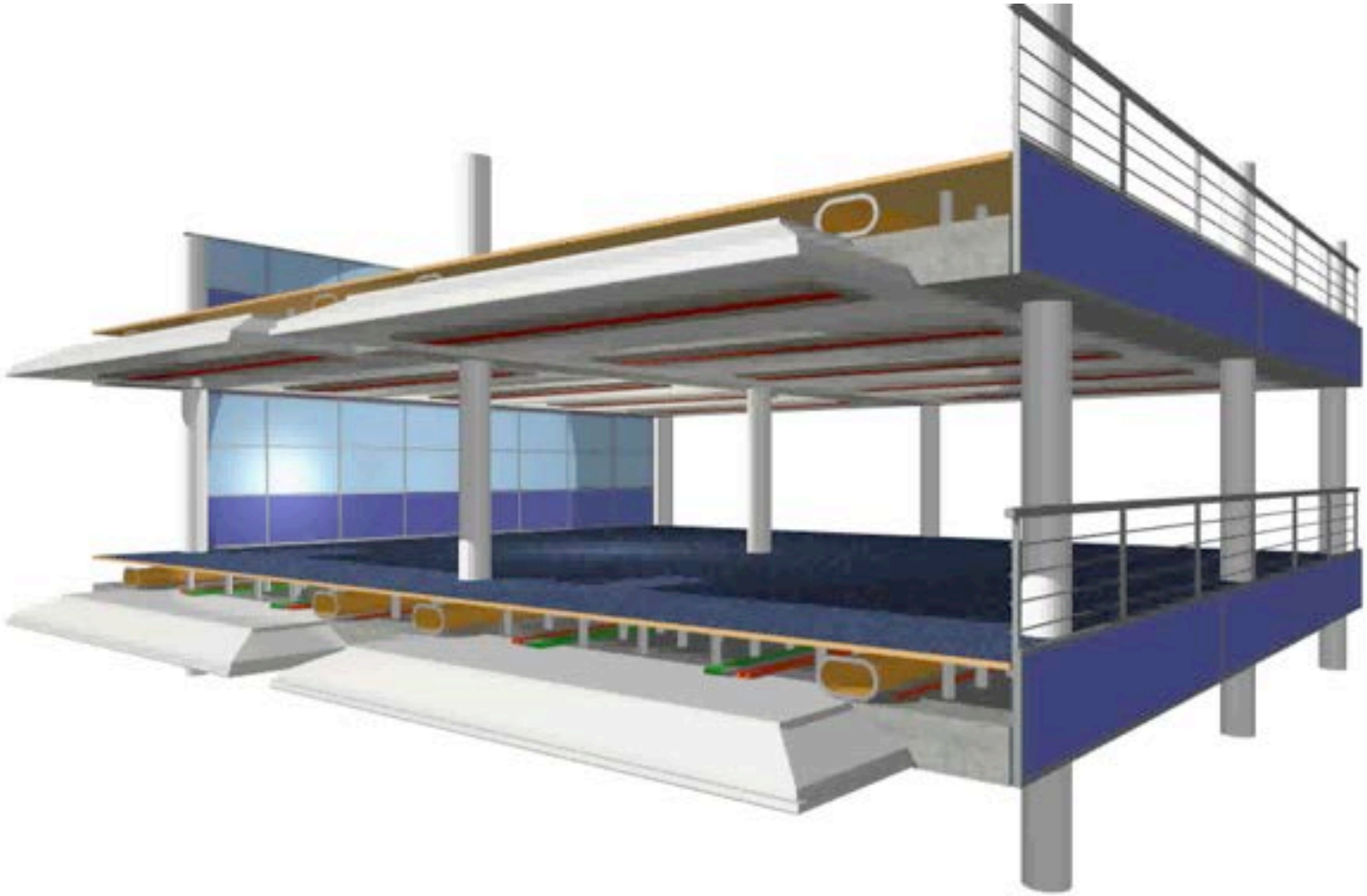
…..it is only the start.

GRAPHISOFT
A NEMETSCHEK COMPANY

BIM : includes Construction Simulation (4D)

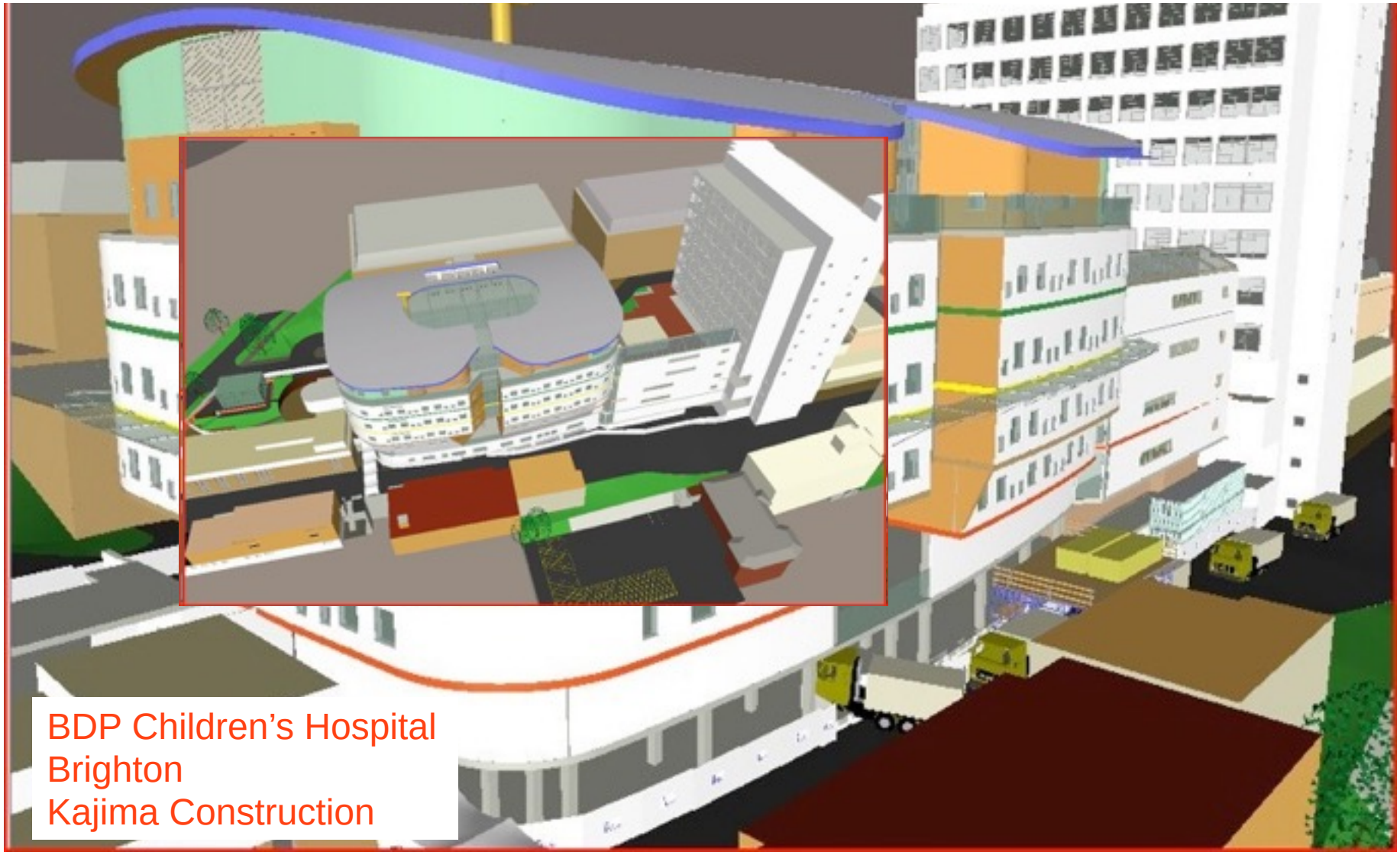


BIM : includes Construction Simulation (4D)



GRAPHISOFT
A NEMETSCHEK COMPANY

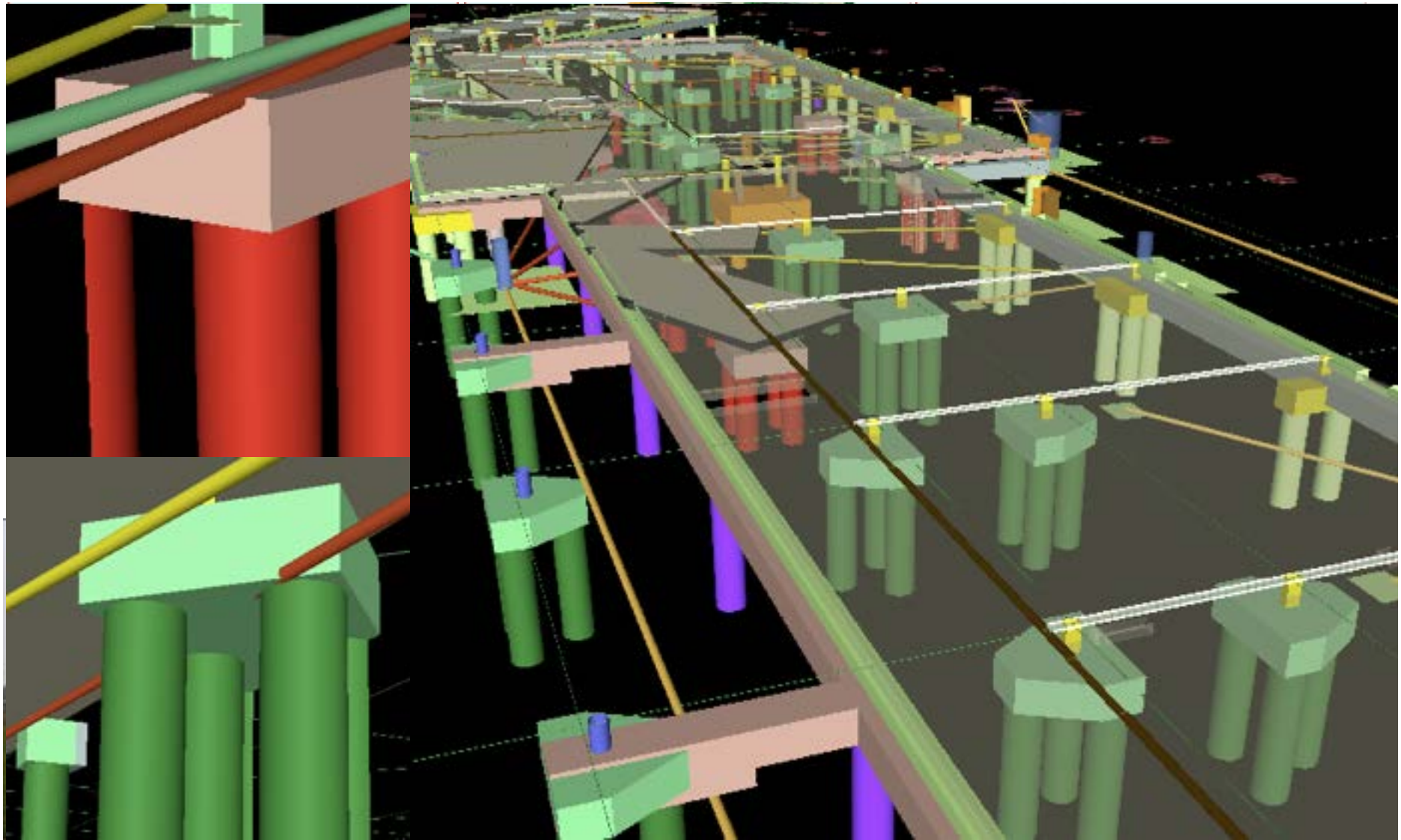
BIM : allows you to review & explain construction (2004)



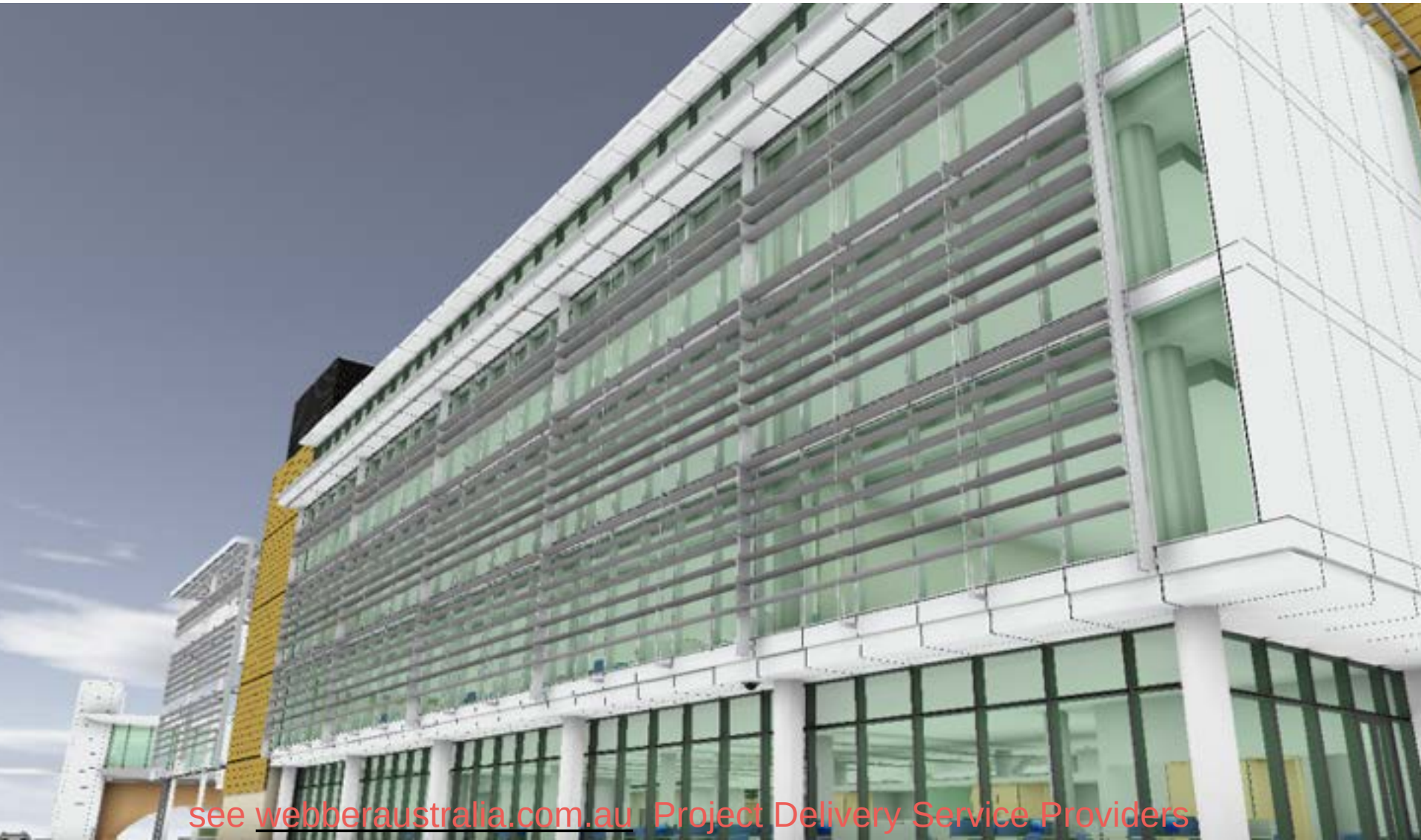
BDP Children's Hospital
Brighton
Kajima Construction

GRAPHISOFT
A NEMETSCHEK COMPANY

BIM : allows you to simulate & prevent clashes (2003)

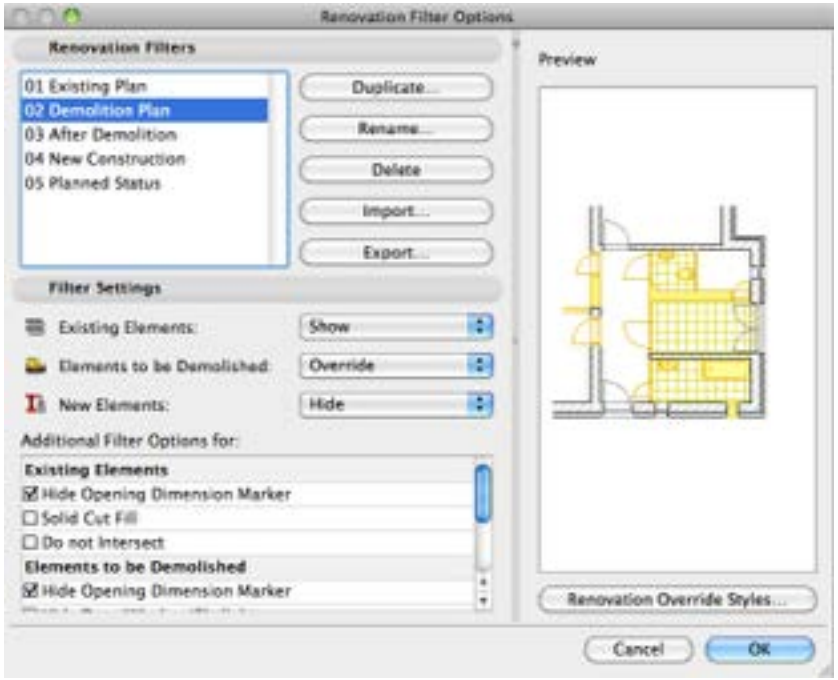


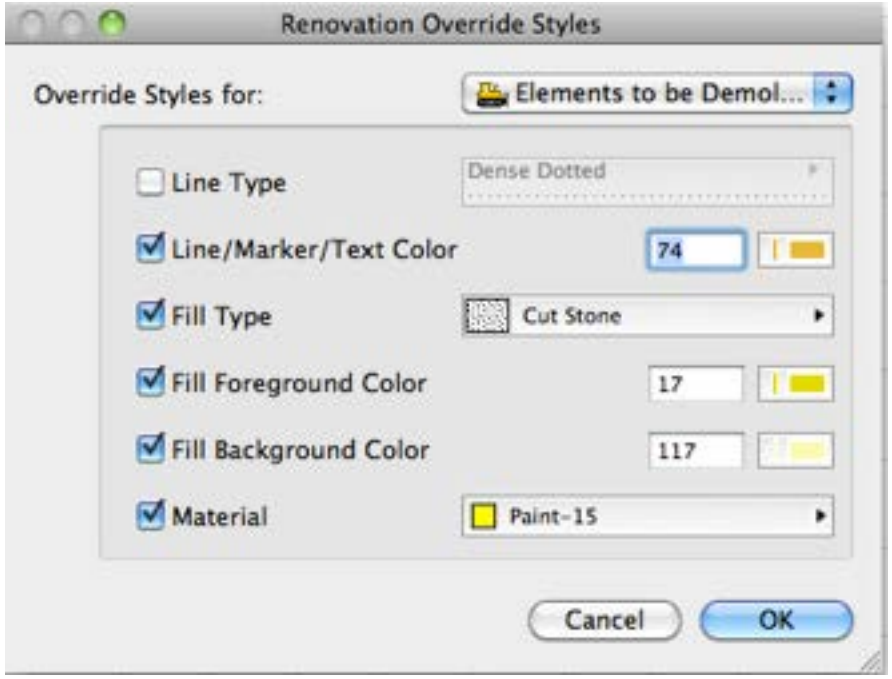
BIM : uses the latest smart tablets & phones with BIMX



see webberaustralia.com.au Project Delivery Service Providers

BIM : includes Renovation Tools





Existing Plan

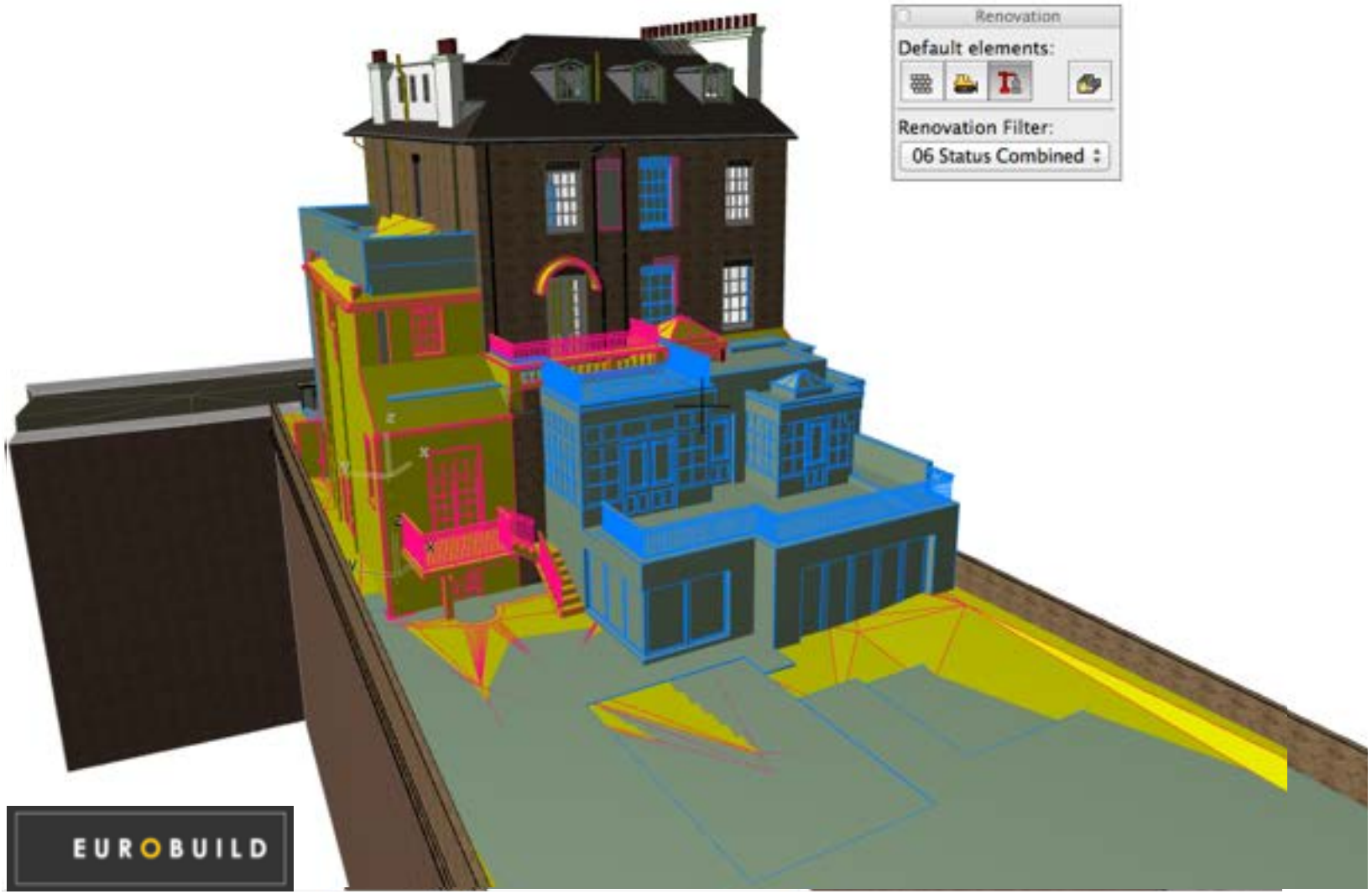
Demolition Plan

After Demolition

New Construction

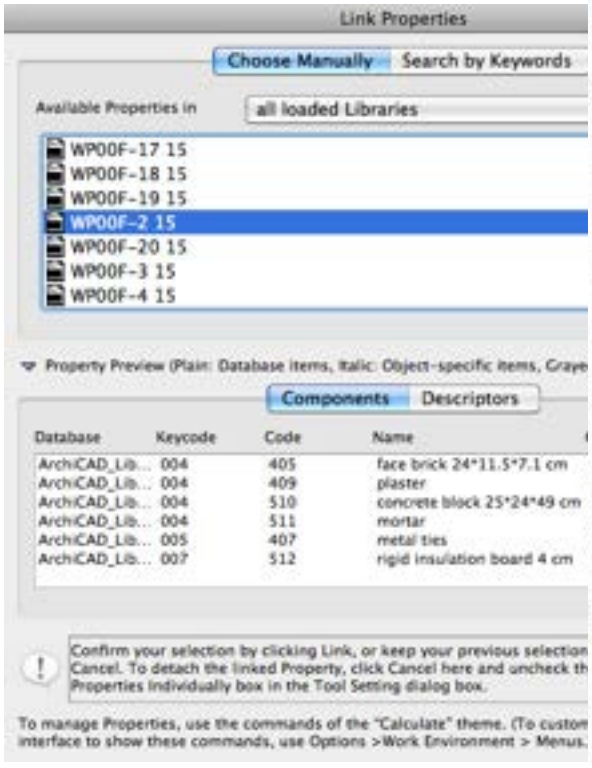
Final Plan

BIM : includes Renovation Tools



GRAPHISOFT
A NEMETSCHEK COMPANY

BIM : includes Quantities and direct links to 5D solutions



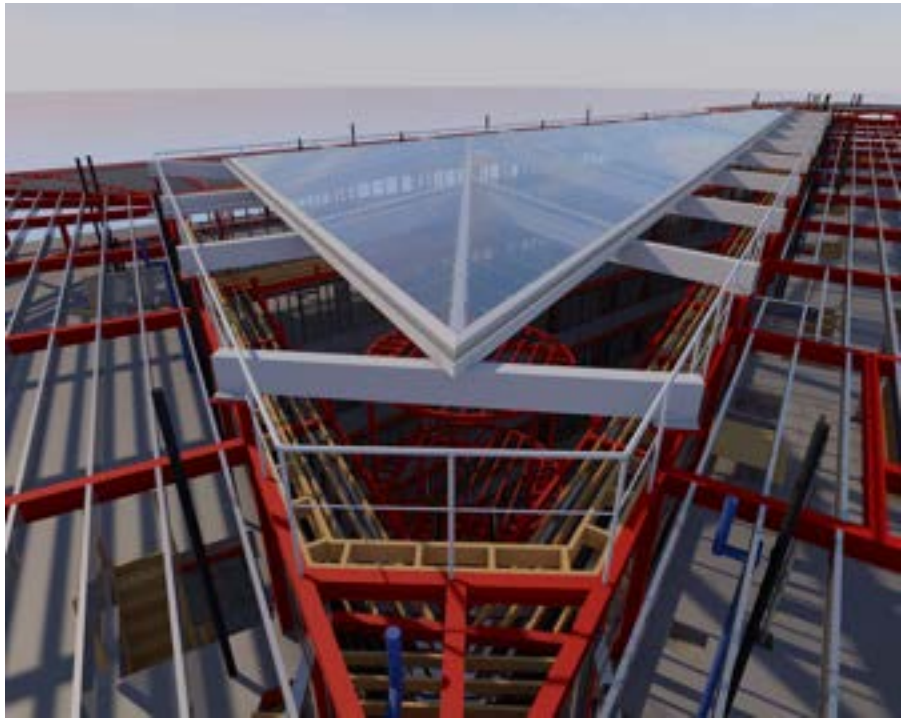
	Component Key Name	Component Code	Component Name	Component Quantity	Component Unit Name	Component
1	Concrete	082	lightweight concrete	2.026	m3	m2
1	Concrete	084	structral concrete	8.102	m3	m2
1	Finishes	2969	10x10 tile	506.384	pieces	m2
4	/	/	/	/	/	/

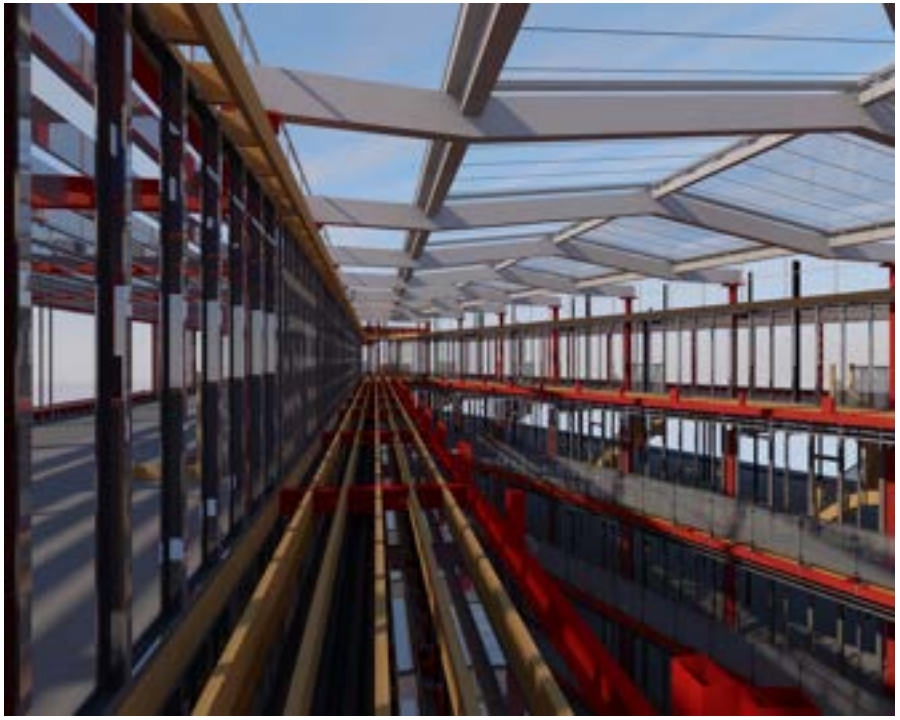
10 mm vertical weathered mortar joints
masonry block with 10 mm joints horizontal and vertical
interior face: 2 coat plaster, 15 mm total

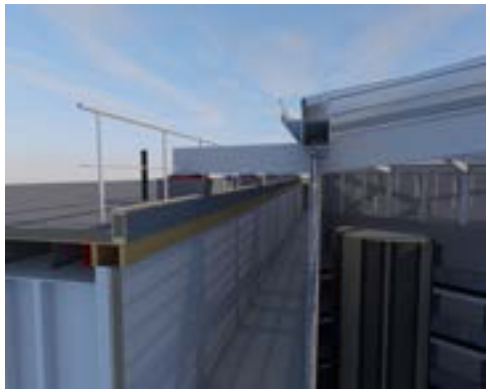
4	Masonry	405	face brick 24*11.5*7.1 cm	4296.548	pieces	m2
4	Masonry	406	masonry block 30*19*14 cm	2980.730	pieces	m2
4	Masonry	408	mortar	6.923	m3	m2
4	Masonry	409	plaster	1.231	m3	m2
4	Metals	407	metal ties	447.557	pieces	m2
1	Termal & moisture protection	103	rigid insulation 3 cm	40.511	m2	m2

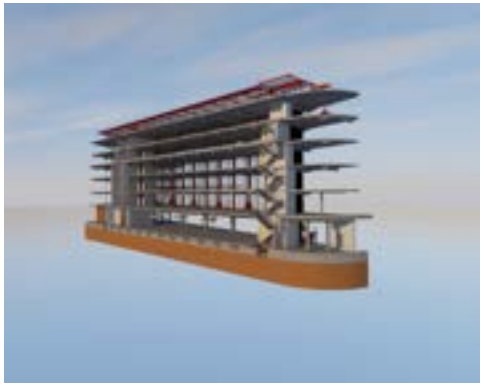
VICO SOFTWARE
Integrating Construction

BIM : creates realistic accurate simulations of all disciplines







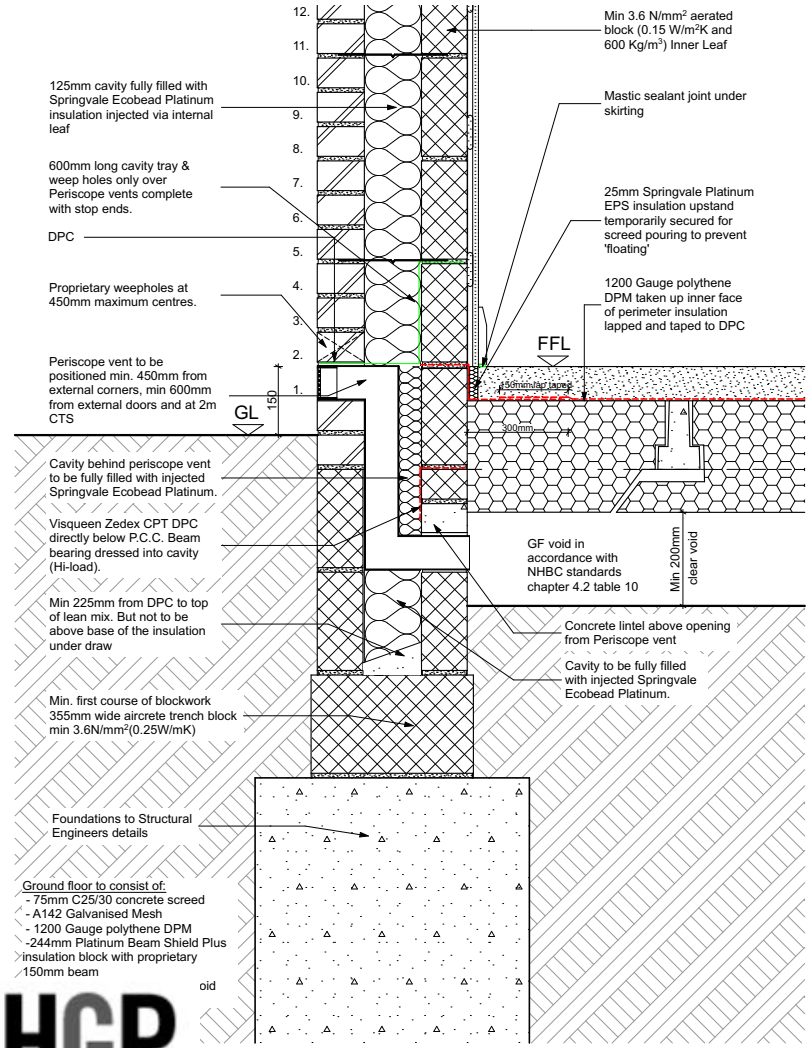


HGP ARCHITECTS

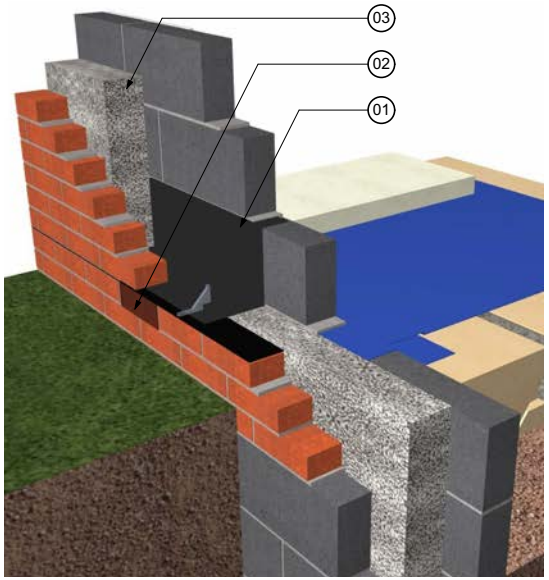
OpenBIM

GRAPHISOFT
A NEMETSCHEK COMPANY

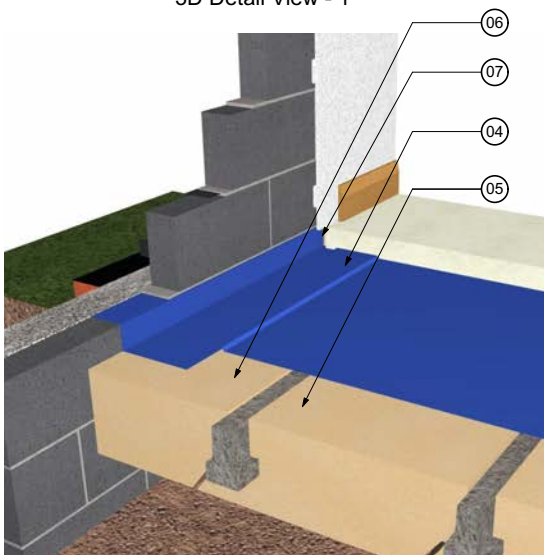
BIM : shows clear intent



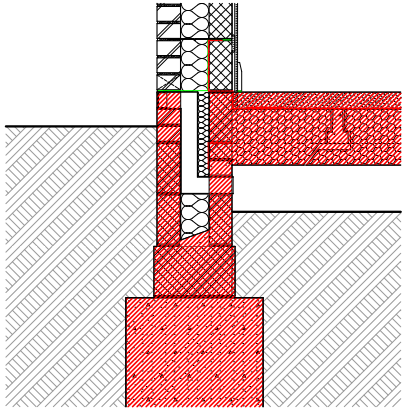
ıshield Ground Floor / External Wall Junction



3D Detail View - 1



3D Detail View - 2



Detail Key

Hatch indicates extent of ground workers package

3D Detail Key

1 - Cavity tray above periscope vent, complete with weep holes.
2 - Rytons or similar approved periscope vent.
3 - 125mm cavity fully filled with injected Springvale Ecobead Platinum insulation.
4 - 1200 gauge polythene DPM with min 150mm lap taped / sealed
5 - Beamshield floor structure with min 200mm vented void below.
6 - Beamshield starter block
7 - 25mm Springvale Platinum EPS insulation upstand

Rev	Description	Date	Initial
C1	Construction Issue	15.07.15	PR

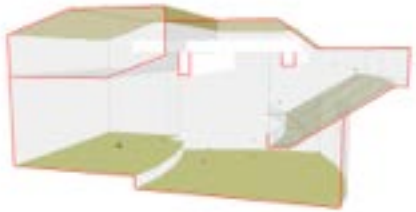
Crest Nicholson Ltd.
Crest House
Pyrcroft Road
Chertsey
Surrey
KT16 9GN

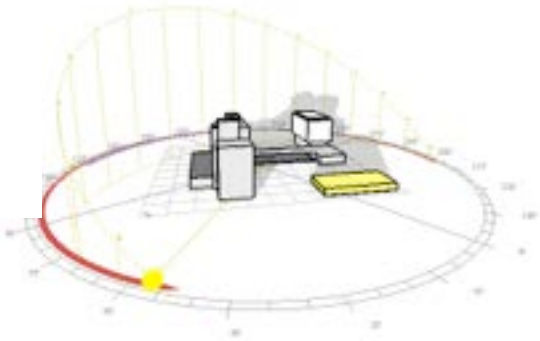
Tel: 01932 580 555
Fax: 08703 363 990
www.crestnicholson.com

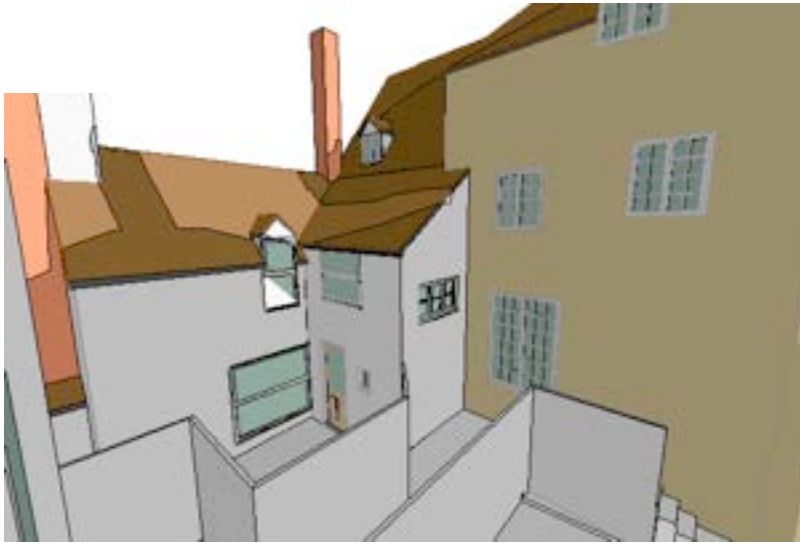
Site/House Type:	Crest Standard Details
Drg Title:	Beamshield Floor / External Wall Without Gas Membrane
Scale:	1:10@ A3 or as noted
Date:	Nov 2014
Drawn:	PR
Checked:	MW
CAD Ref:	14.162
NHBC Approval Ref:	-
Drawing No:	CNSD/2013/010-1
Revision:	C1

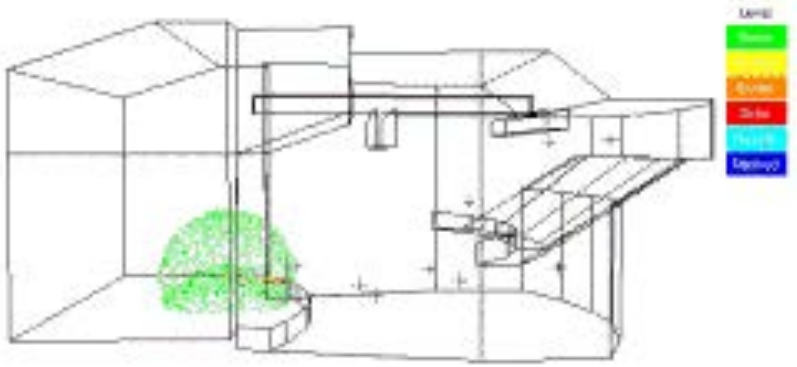
HGP ARCHITECTS

BIM : assists compliance checking









BIM : includes integral Energy Assessment

EcoDesigner - Model Review

Energy Balance Evaluation

Office Development

You can customize this text in the Project Info dialog

Key Values

General project data

Location:	Nottingham	
Activity Type:	Office	
Evaluation Date:	06/10/2011 16:57	

Building geometry data

Treated floor area:	3279.51	m^2
Building shell area:	2839.47	m^2
Ventilated volume:	9624.16	m^3
Glazing ratio:	13	%

Building shell performance data

Air leakage:	1.15	ACH
Outer heat capacity:	64.92	J/m^2K

Heat transfer coefficients	U value	$[W/m^2K]$
Building shell average:	0.99	
Roofs:	0.32 - 5.21	
External walls:	0.33 - 0.59	
Basement walls:	-	
Openings:	2.20 - 3.10	

Specific annual demands

Net heating energy:	50.93	kWh/m^2a
Net cooling energy:	8.40	kWh/m^2a
Energy consumption:	115.29	kWh/m^2a
Primary energy:	223.90	kWh/m^2a
Operation cost:	6.56	GBP/m^2a
CO_2 emission:	23.09	kg/m^2a

Energy Consumption by Sources

Energy				CO_2 emission
Source type	Source name	Quantity	Cost	
		kWh/a	GBP/a	kg/a
Renewable	Environment	27542		0
Fossil	Natural gas	167035	5011	36079
Secondary	Electricity	183510	16515	39638
	Sum:	378088	21527	75717*

Energy quantities

Energy costs

CO_2 emission

* This amount of CO_2 is absorbed in one year by 0.4 hectares (roughly equivalent to 0.7 football fields) of tropical forest.

Energy Balance Evaluation

Office Development

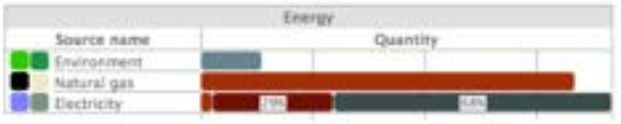
You can customize this text in the Project Info dialog

Energy Consumption by Targets

Target name	Energy Quantity	Energy Cost	Energy Primary	CO_2 Emission
	kWh/a	GBP/a	kWh/a	kg/a
Heating	172366	5490	199731	37231
Cooling	27542	0	0	0
Hot water generation	54066	4866	162200	11678
Ventilation fans	0	0	0	0
Lighting & appliances	124112	11170	372338	26808
Sum:	378088	21527	734271	75717

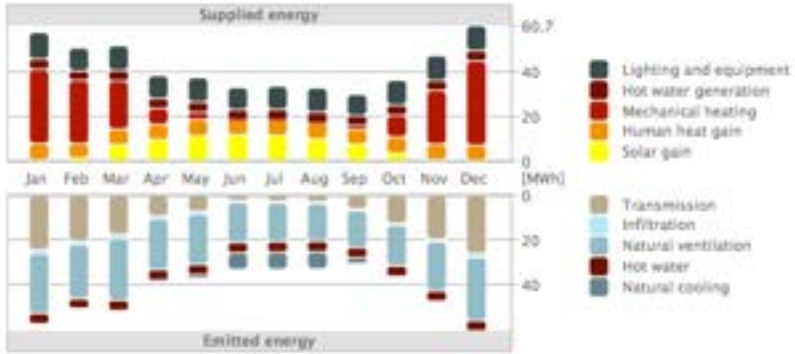
Energy quantities

Energy costs



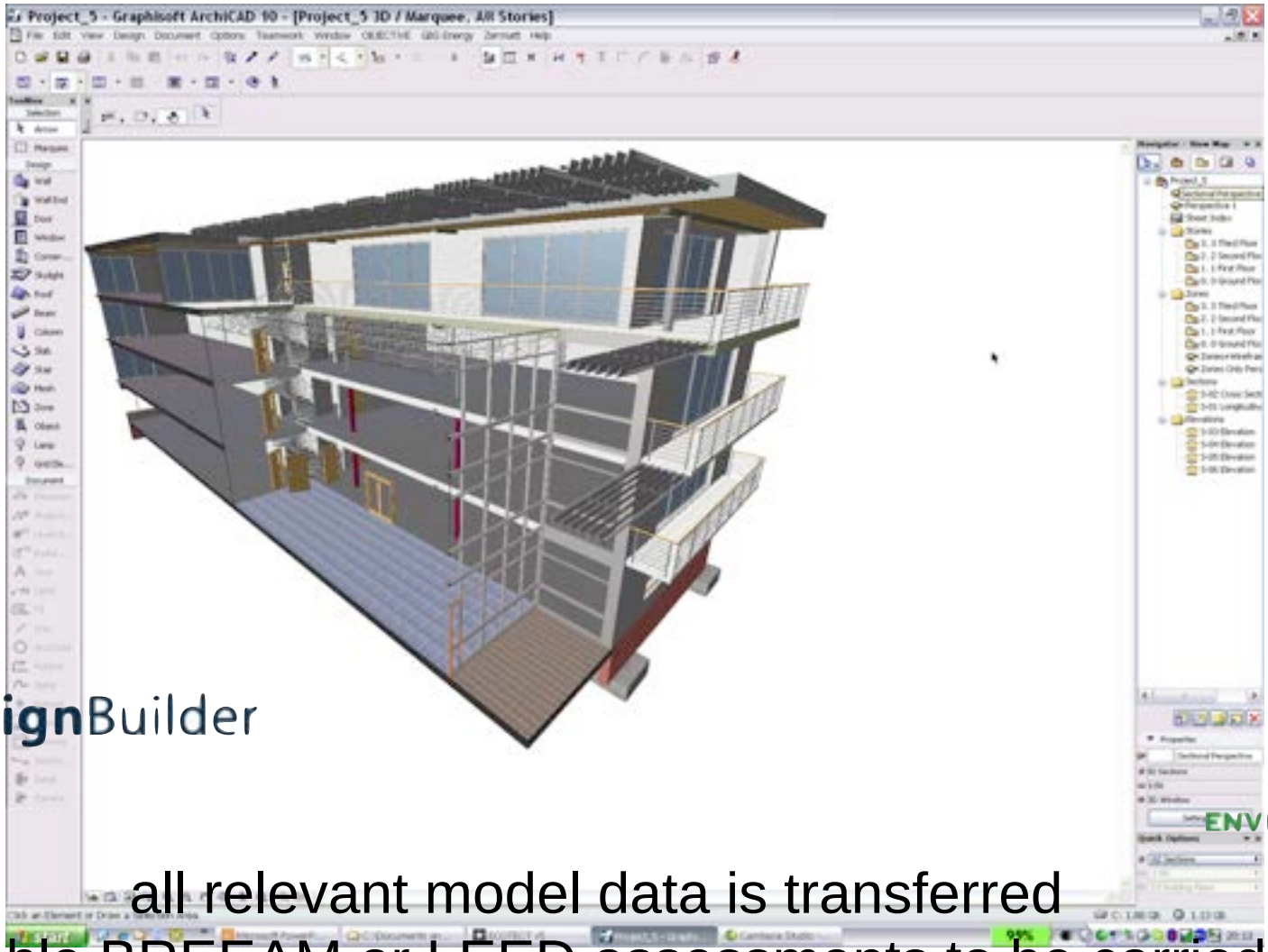
CO_2 emission

Monthly Energy Balance



GRAPHISOFT
A NEMETSCHEK COMPANY

BIM : exports directly to UK energy compliance solutions

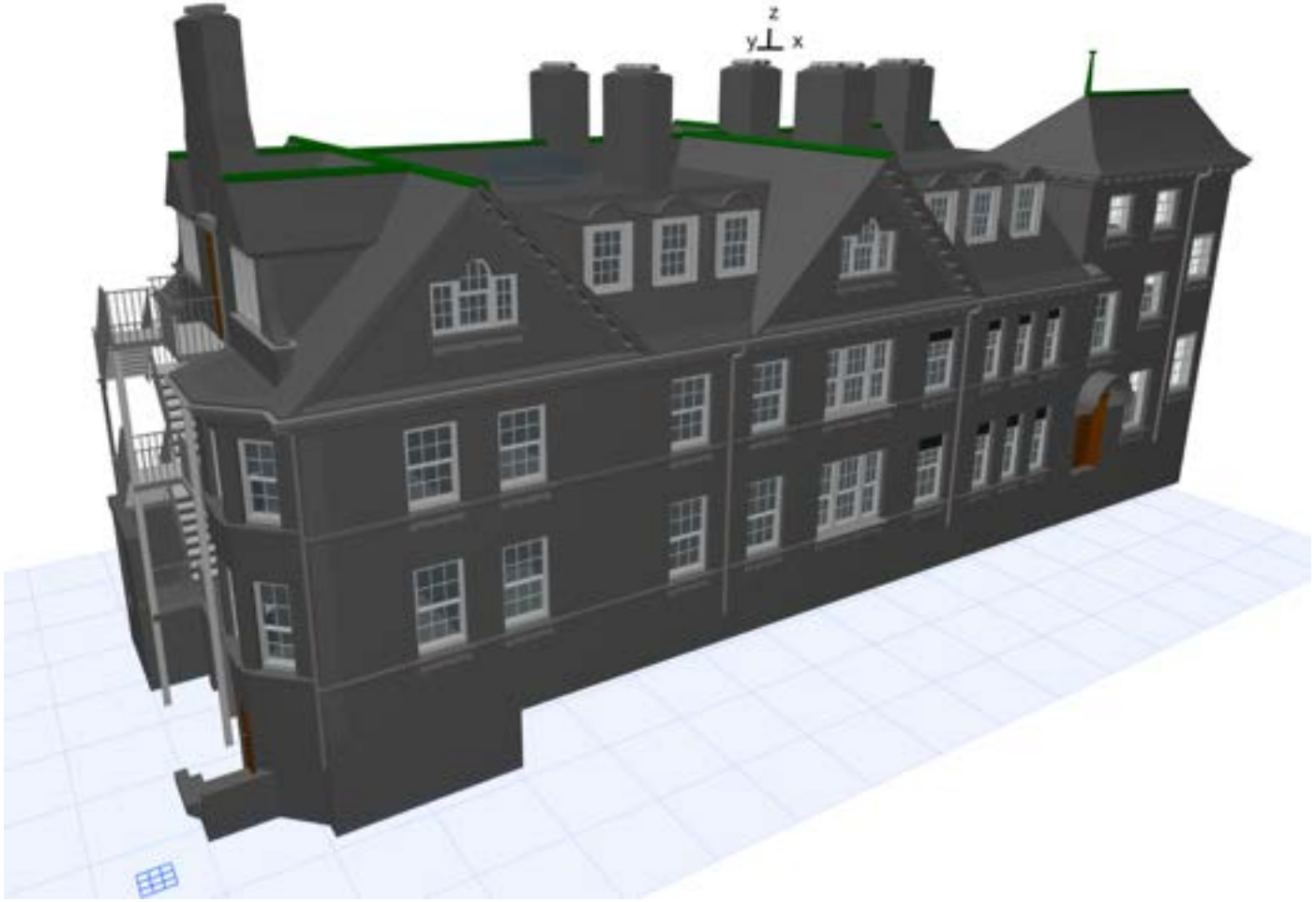


DesignBuilder

ies
INTEGRATED
ENVIRONMENTAL
SOLUTIONS

all relevant model data is transferred
to enable BREEAM or LEED assessments to be carried out

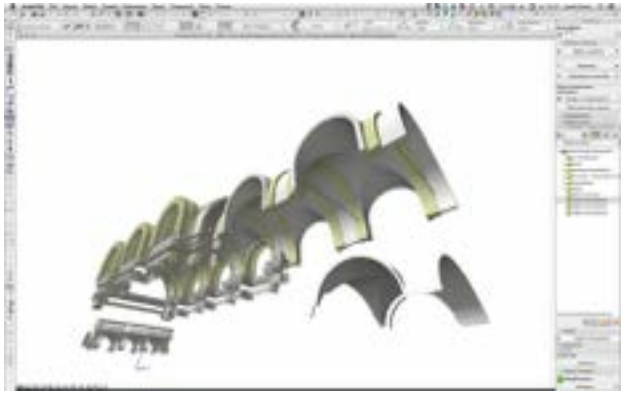
BIM : uses Point Clouds converted to BIM elements



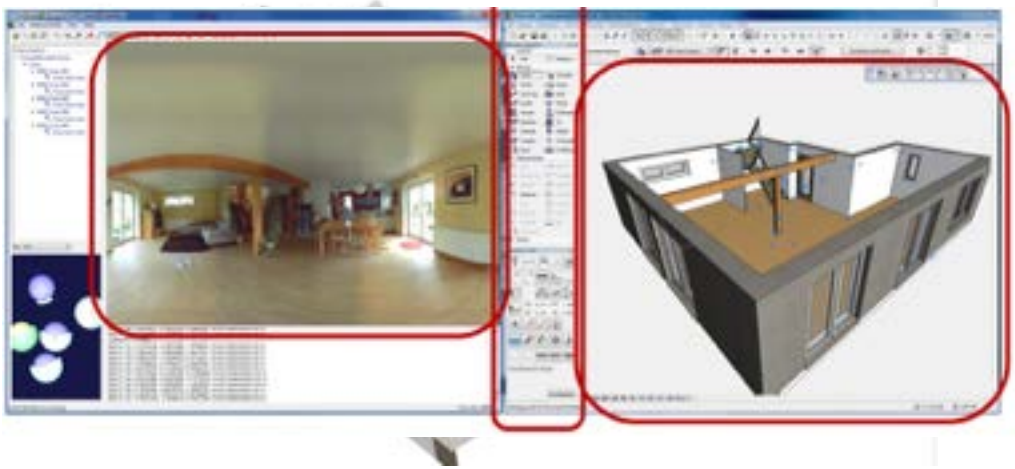
murphy SURVEYS
GLOBAL CONSULTING SURVEYORS

BIM : can use new methods of surveying

Importing Point Clouds and placing BIM elements within the point cloud



Converting Point Clouds to BIM Elements



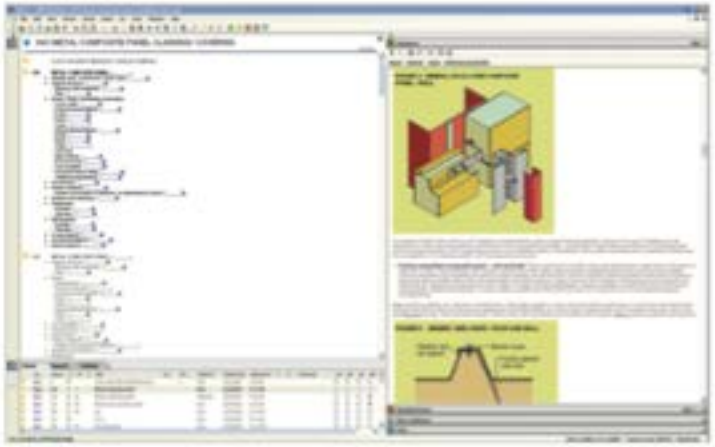
Surveying BIM elements on-site

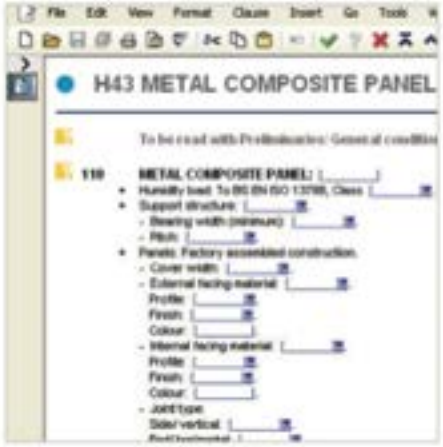
BIM : use new methods to survey directly into BIM on-site

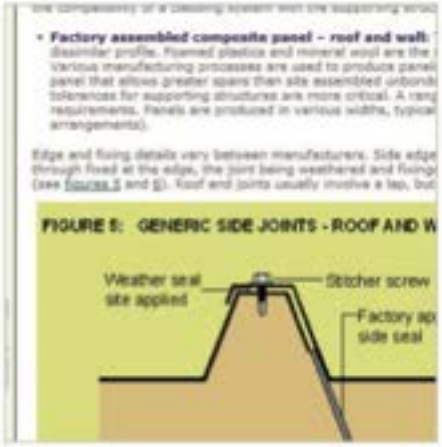
Flexijet & ArchiCAD by BIMPoint

BIM : uses automatically converted Lidar data

BIM : links directly with NBS

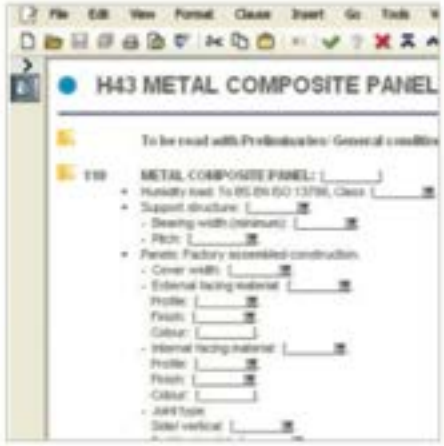


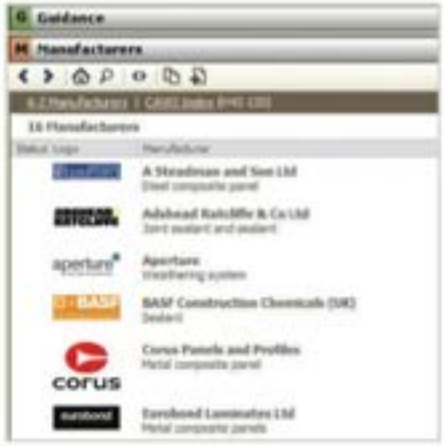




NBS Guidance Notes

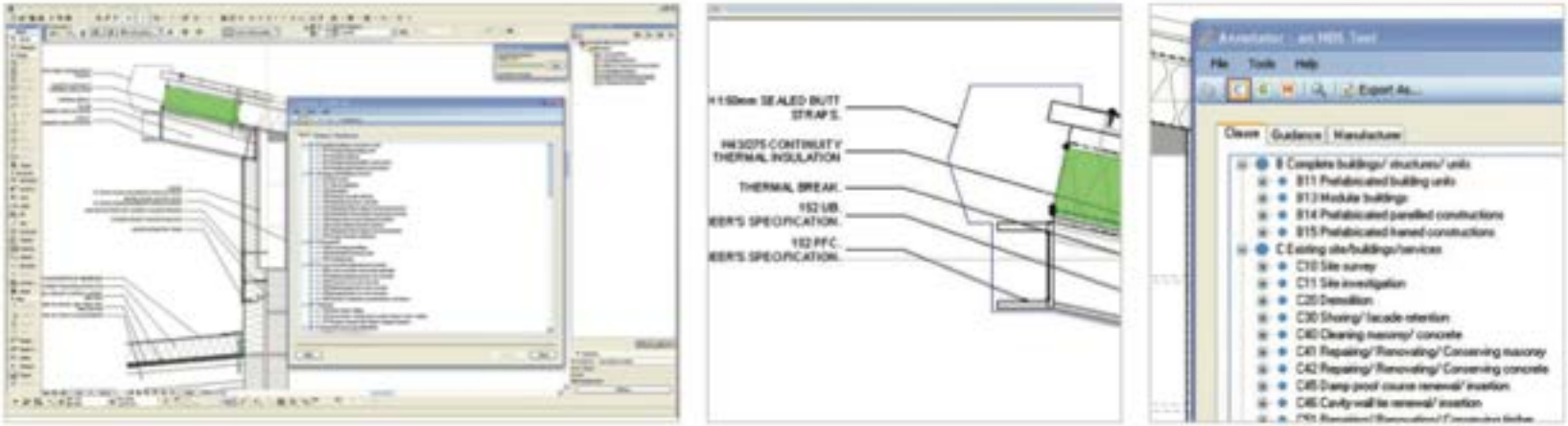
The information contained in the project specification, the clause titles and references, can be read from within BIM and be linked to model views and document sets with a single click. The NBS guidance is also presented in this same context, helping with decision making. Revision facilities will identify what has changed.





NBS Manufacturer Specification Details

BIM : links directly with NBS



Selecting a Clause with NBS Annotator to attach to a design component in ArchiCAD

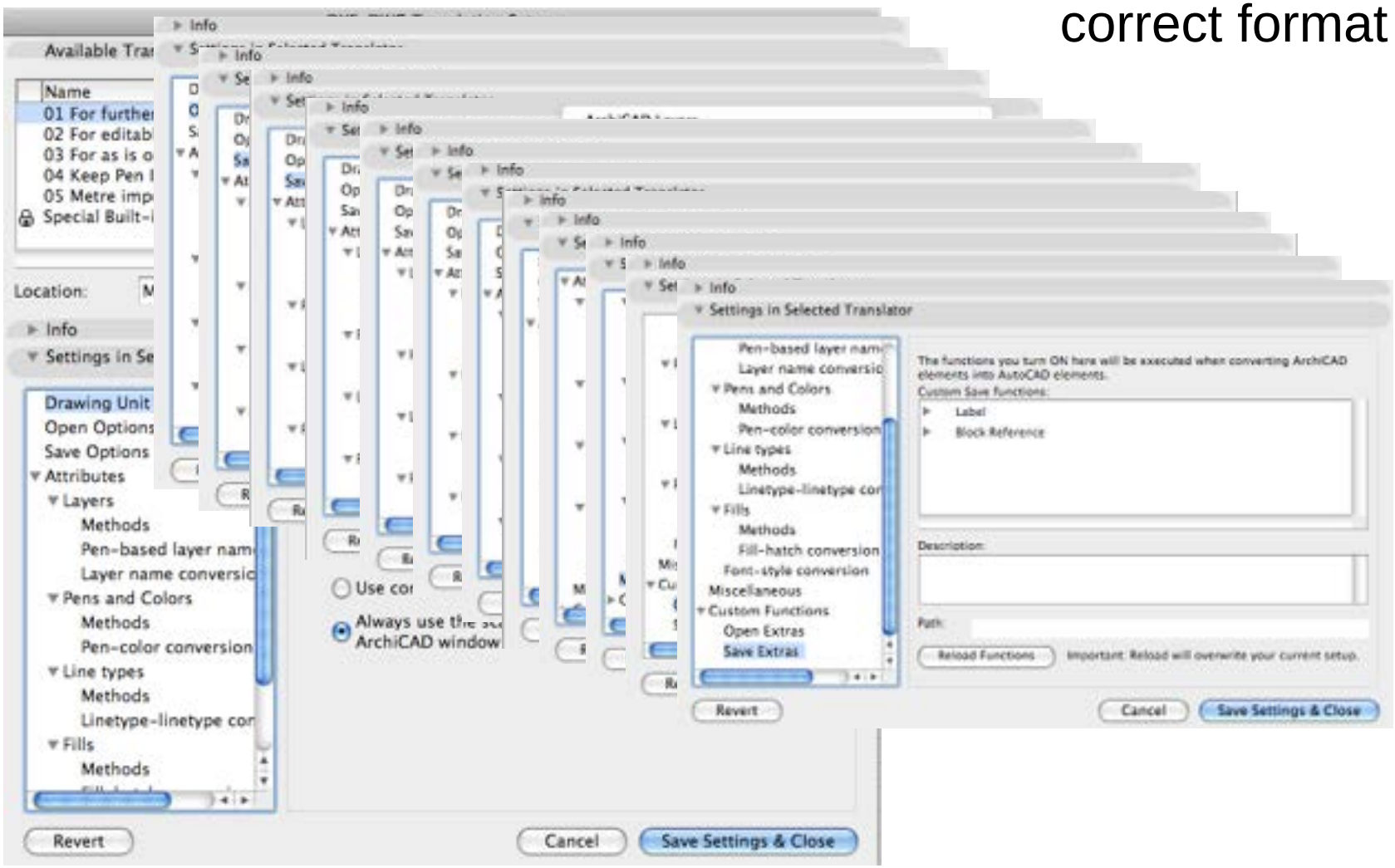
Any element in plan, section, elevation, worksheet, detail or 3D document view, can be selected and linked with an NBS clause. This link is associative, so that if the element is moved or amended the link to this clause is maintained. Powerful update annotation functions ensure coordination of links, clauses and references.

Annotation Report showing status of selected clauses

GRAPHISOFT
A NEMETSCHEK COMPANY

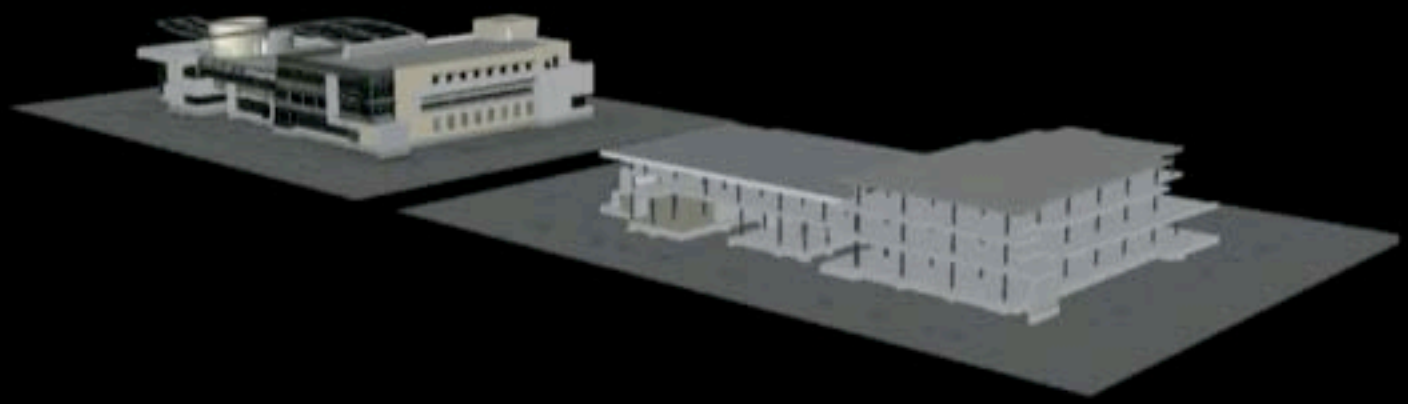
BIM : collaborates easily with legacy DWG data

configurable translator to transfer required data in correct format



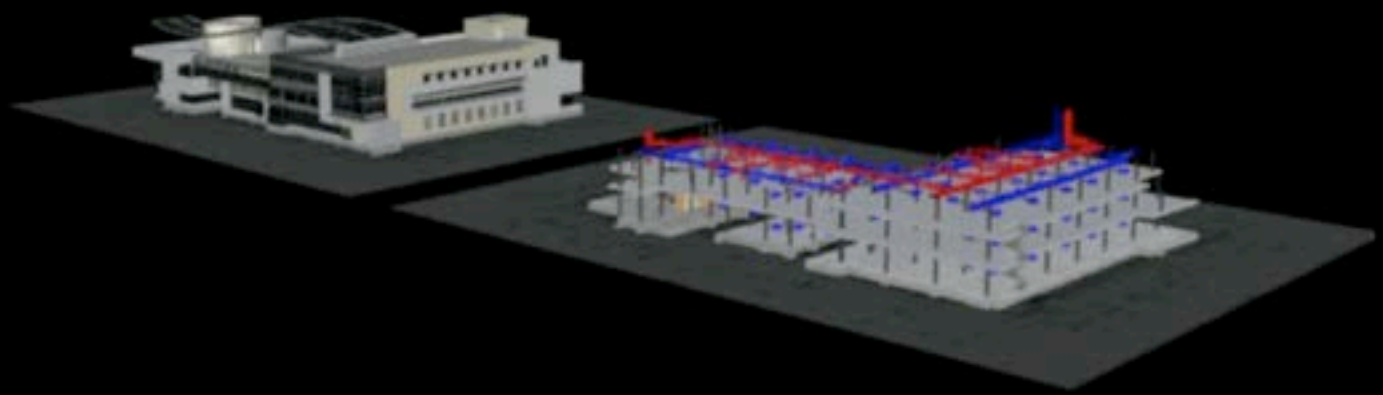
GRAPHISOFT
A NEMETSCHEK COMPANY

BIM : collaborates easily with structural DWG data



GRAPHISOFT
A NEMETSCHEK COMPANY

BIM : collaborates easily with mechanical DWG data



BIM : collaborate intelligently with IFC data

Industry Foundation Classes (IFC) - ISO 16739

Standard file format for moving BIM data between software applications

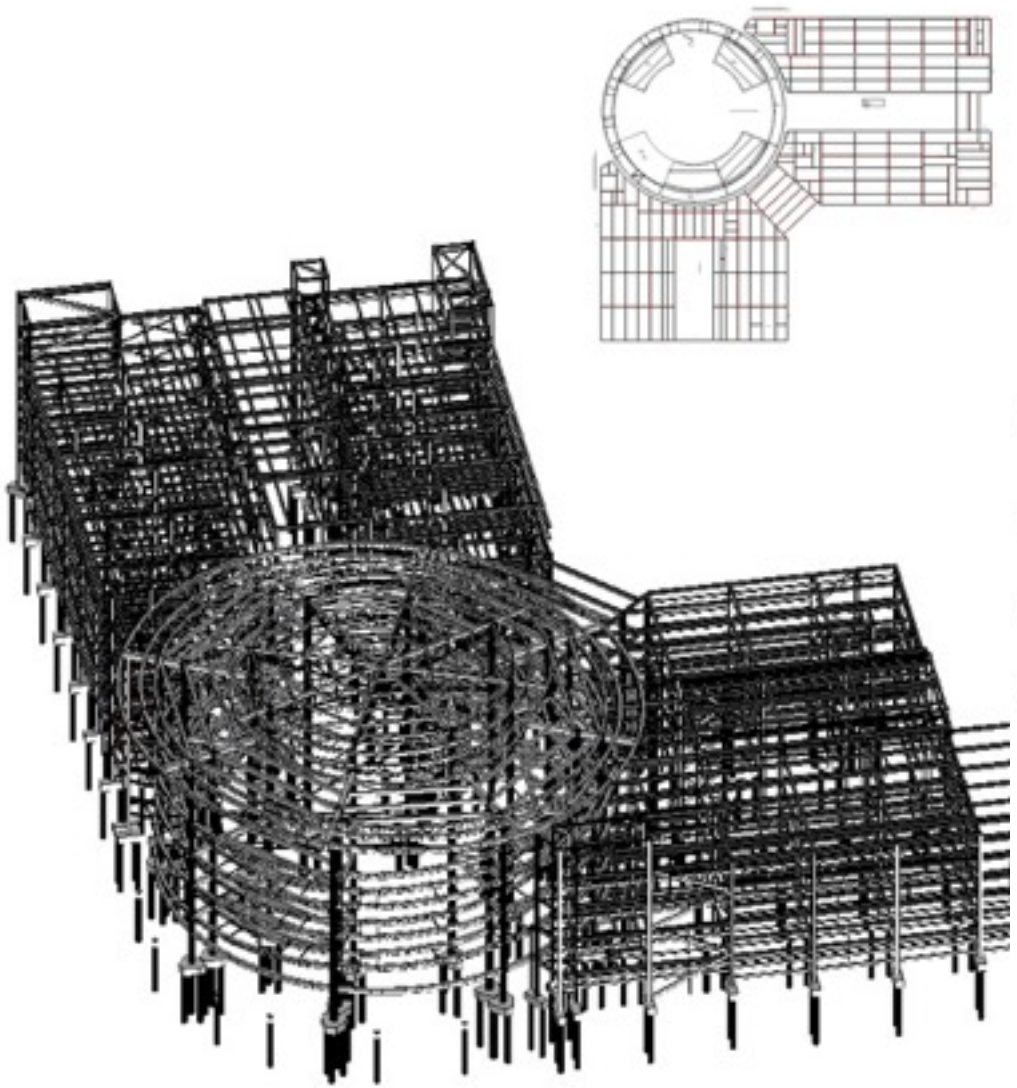
International Framework for Dictionaries (IFD) ISO 12006 (part3)

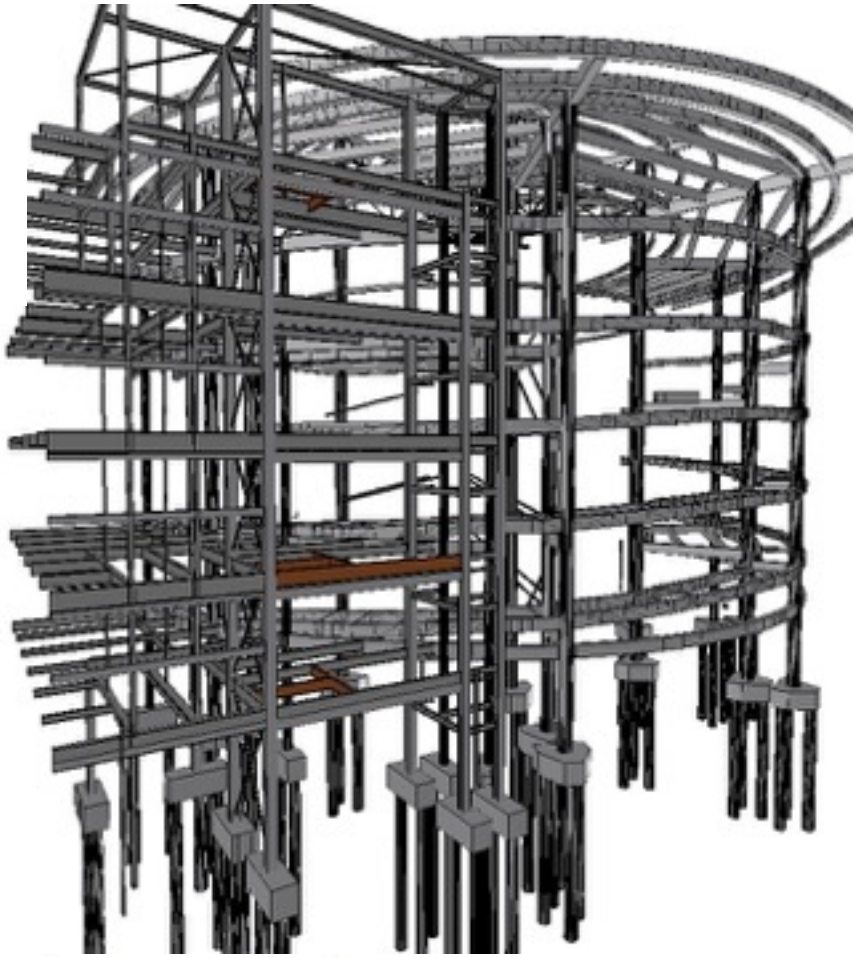
Standard determining how objects are defined when transferred from applications to IFC

Information Delivery Manual (IDM)+Model View Definitions (MVD)

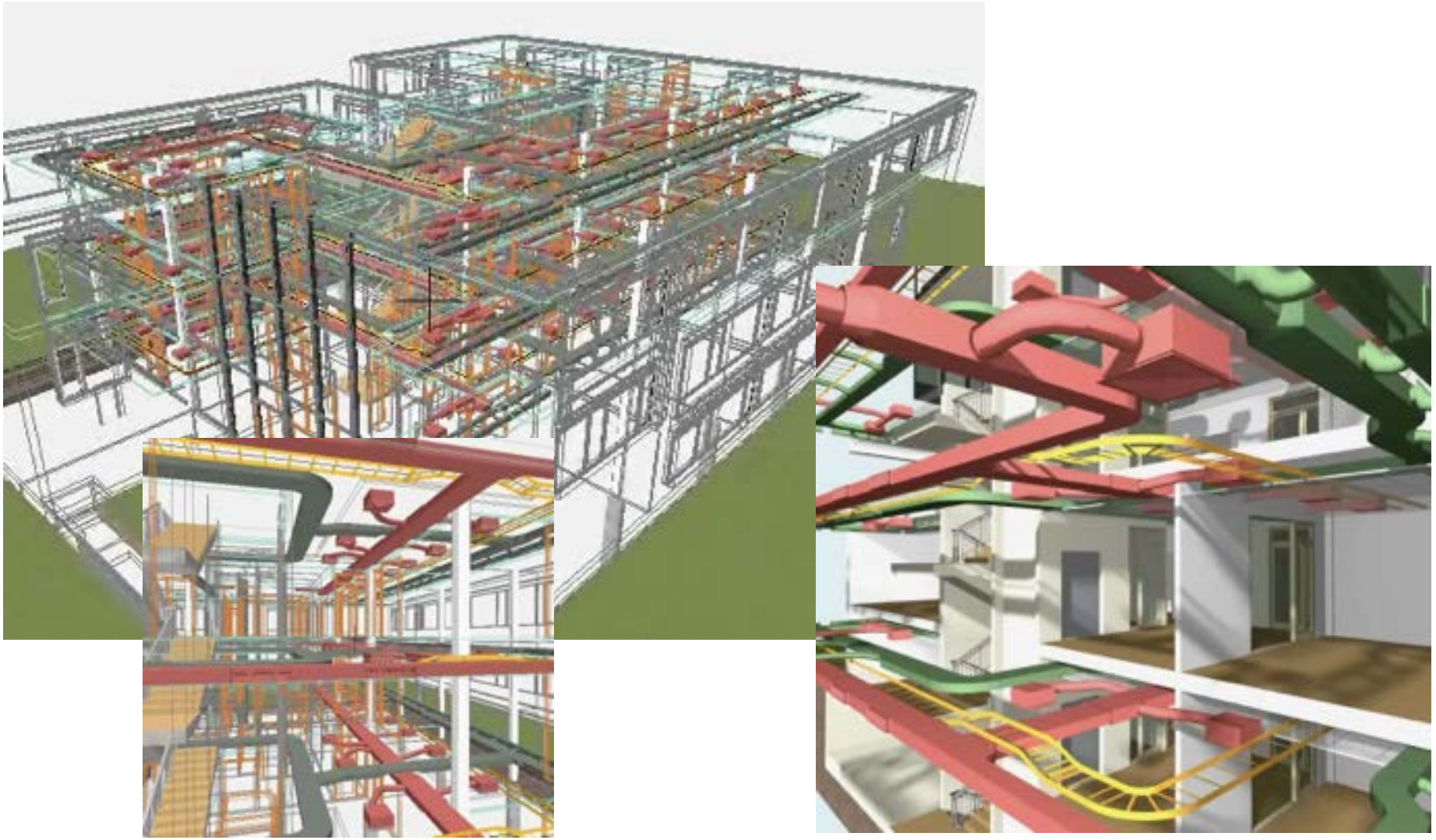
Standards defining what information is transferred by IFC for particular applications

BIM : collaborates intelligently with structural IFC



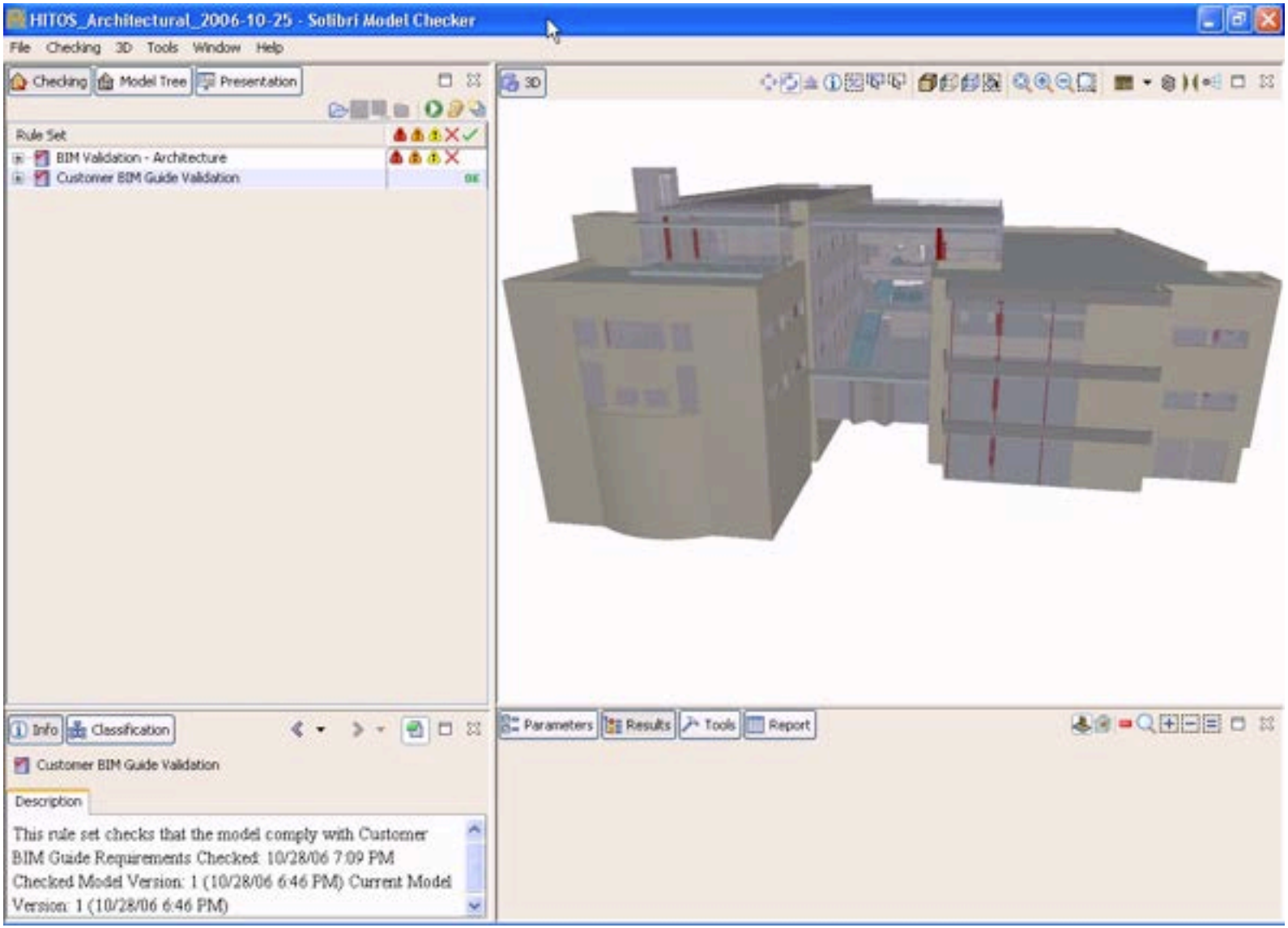


BIM : collaborates intelligently with MEP IFC



GRAPHISOFT
A NEMETSCHEK COMPANY

BIM : allows for validation and rule based checking



BIM : allows project teams to work live on one model file

File Server

speed of sharing and working on models is crucial

software needs to be written for client/server use

WAN - Out of Office working

LAN - Office workstations

BIM : allows you to Teamwork live - in and out of the office

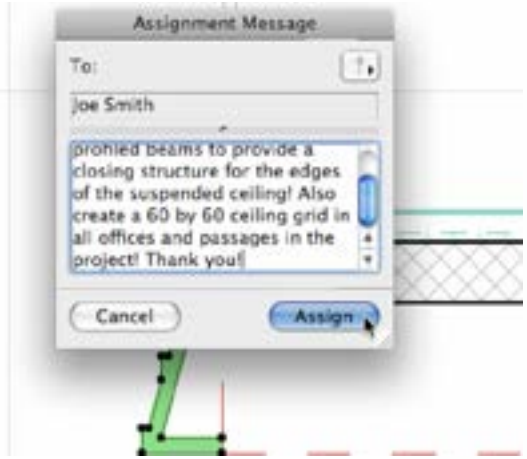
BIM Server

- Only modified data is exchanged with the Server

WAN - Out of Office working

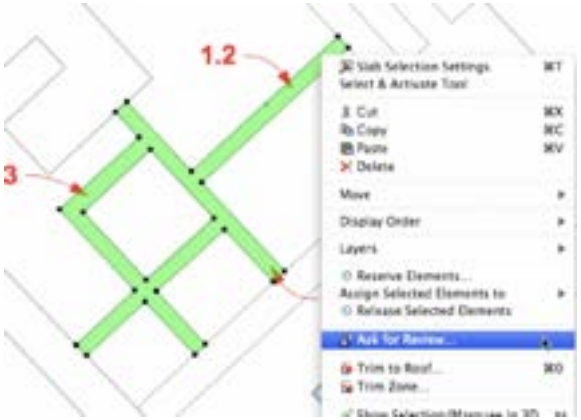
LAN - Office workstations

BIM : allows you to Teamwork live - in and out of the office

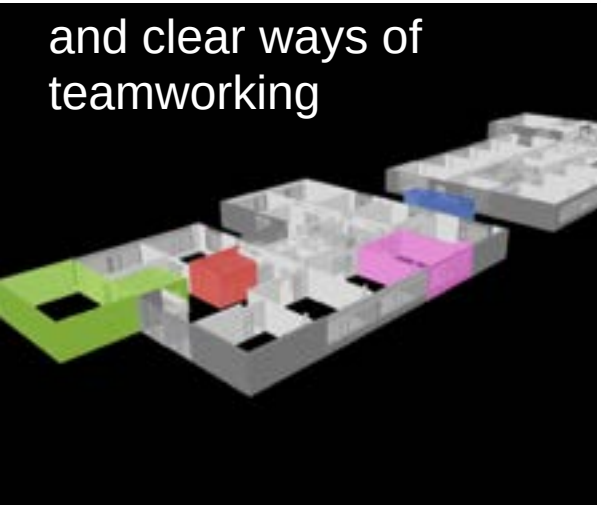


integrated messaging

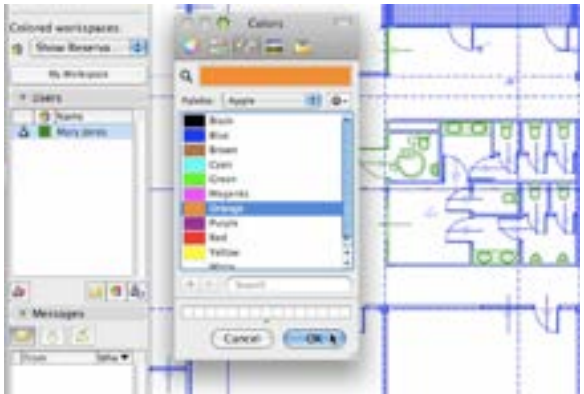
with clear areas of responsibility



and clear ways of teamworking



Working together simultaneously



using the latest technology

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BIM : 10 More Benefits

- Use of construction simulation
- Use of the latest real time technolo
- Sustainability at early desi g
- Used for compli king
- Uses th e based model checking
- exports legacy dwg data
- Uses the latest IFC translations
- Encourages collaboration
- Uses client/server software for teamworking

- Even more of a pleasure to use every day !

BIM : British & International Standards

Information requirements (PAS1192 part2) documents:

Employer's Information Requirements (EIR-tender Docs)

Schedules standards, file formats, data exchange, roles, software, etc.

Supply Chain Information Execution Plan (SCIEP)

Sets out suppliers approach, capabilities, capacity etc.

Project Implementation Plan (PIP)

Part of SCIEP - Sets out each organisation involved's capabilities,

Master Information Delivery Plan (MIDP)

Following award of contract to set out needs for training, delivery of project etc.

BIM Execution Plan (BEP)

BS 1192 ISO 6707-1 ISO 29481-1:2010 ISO 9000:2005 ISO 10303-108 ISO 12006-2 ISO 12006-3 ISO 16739 ISO 15686 ISO 15926 ISO/TR 18529:2000 ISO 22263 ISO/IEC 15288 ISO/IEC 82045 ISO/IEEE 11073-10201:2004 IEC 61508

BIM : EIR Employer's Information Requirements

The Employer's Information Requirements (EIR) form part of the appointment and tender documents on a BIM Project.
The EIR defines which models need to be produced at each project stage – together with the required level of detail and definition. These models are key deliverables in the 'data drops' – contributing to effective decision making at key stages of the project.

Technical	Management	Commercial
• Software Platforms • Data Exchange Format • Co-ordinates • Level of Detail (general) • Level of Detail (components) • Training	• Standards • Stakeholder Roles and Responsibilities • Planning the Work and Data Segregation • Security • Coordination and Clash Detection Process • Collaboration Process • Model review meetings • Health and Safety and Construction Design Management • System Performance Constraints • Compliance Plan • Delivery Strategy for Asset Information	• Timing of data drops • Clients Strategic Purpose • Defined BIM/Project Deliverables • BIM-specific competence assessment

BIM : Standards and Protocols

BIM : Government Soft Landings

To align the interests of procurers, constructors and designers with users and operators and to:

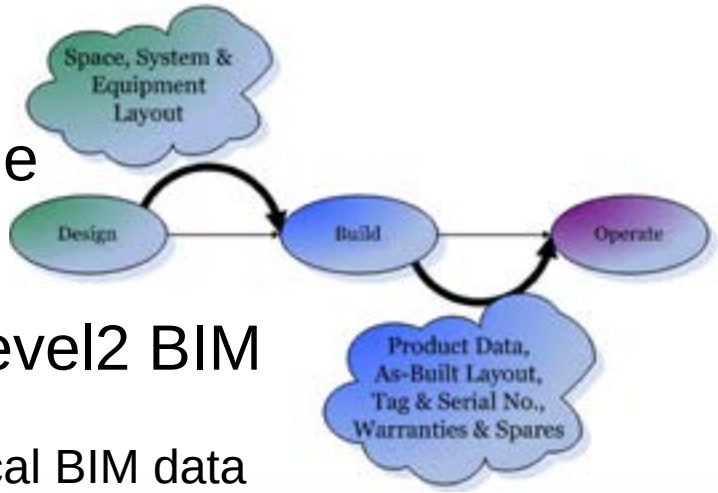
- Improve productivity from asset use
- Reduced their running costs
- Improve certainty in project and operating costs
- Reduce the time needed to reach designed performance
- Capture feedback and knowledge for better portfolio planning

Taking the actions below will achieve this alignment:

- Engage with end users throughout design and delivery process
- Set clear targets and measures for:
  - Functionality & Effectiveness; so that the working environment is conducive to productivity and social well-being.
  - Operational and capital costs; to reduce costs in construction and operation.
  - Environmental Performance; to meet carbon and other sustainability targets.
  - Commission the facility including training in partnership with end users
  - Assess performance for at least three years post completion to establish outcomes and lessons learnt
  - Involve the design team in the early operating phase to tune performance and ensure target outcomes

BIM : provides links to COBie

- Construction Operations Building information exchange
  www.wbdg.org



- COBie data is required for Level2 BIM
  - COBie is a standard for non-graphical BIM data and originated as a set of spreadsheets

- Data recorded as project progresses passed to Client
  - Drop 1: Requirements and Constraints
  - Drop 2: Outline Solution
  - Drop 3: Construction Information
  - Drop 4: Operations and Maintenance Information
  - Drop 5: Post Occupancy Validation Info + Ongoing O&M

BIM : populates Facilities Management (FM) solutions

There is now considerable potential in handing intelligent BIM data to facility managers for quality building operations and maintenance.

Transfer to CAFM

Associate further information with the BIM data.

Create web based Helpdesk facilities for management.

Link to mobile devices for active maintenance

- collaborative ties with the architects and contractors
- collaborative better handoff of more information;
- easier information retrieval;
- a “virtual” building interface;
- automated servicing; and
- real time - even predictive - monitoring of all aspects of today’s structures throughout their life cycles.

BIM : information is available from all professional bodies


PRIVATE CIRCULATION

PAS 1192-2:2012

Building Information Management – Information requirements for the capital delivery phase of construction projects

Third Draft 3.7.2
30 May 2012

COBie Data Drops
Structure, uses & examples

CabinetOffice BIS BIM Ministry of JUSTICE ecs

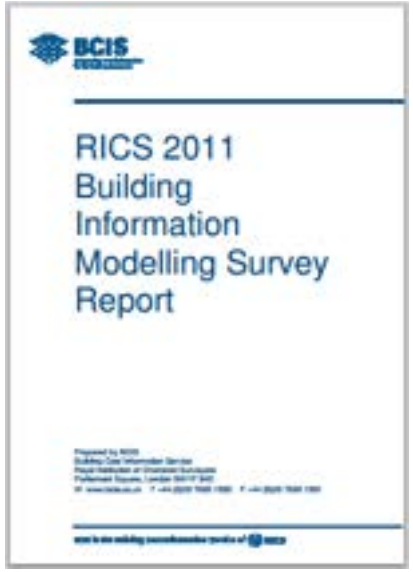

The IFC/COBie Validation Trial: Interim Report October 2012


Adopting BIM for facilities management

Solutions for managing the Sydney Opera House


RIBA

BIM Overlay to the RIBA Outline Plan of Work


BCIS

RICS 2011 Building Information Modelling Survey Report

What should you do now !

BIM : becoming **BIMProficient**

Review

www.graphisoft.com
www.tekla.com
www.buildingsmart.com
www.thenbs.com
www.solibri.com

Start a **BIMTrial**

download software from
www.myarchicad.com
www.bimsight.com
www.solibri.com

Book **BIMTraining**

1 and 2 day courses in BIM
www.graphisoft.com
01895 876 222

..... and move to a **BIMPilot**

BIM : BIMPilot - a unique risk free way to implement BIM

Pilot BIM on live project data

Pilot includes:-

Provision of BIM software licences
Training of users
Creation of project template files
Expert support throughout Pilot Programme period

at the end of the Pilot you may:-

Purchase BIM licences
Purchase BIM licences by deferred payment plan
Continue to rent BIM licences for agreed period
Export files in preferred format and return licences with no further costs.

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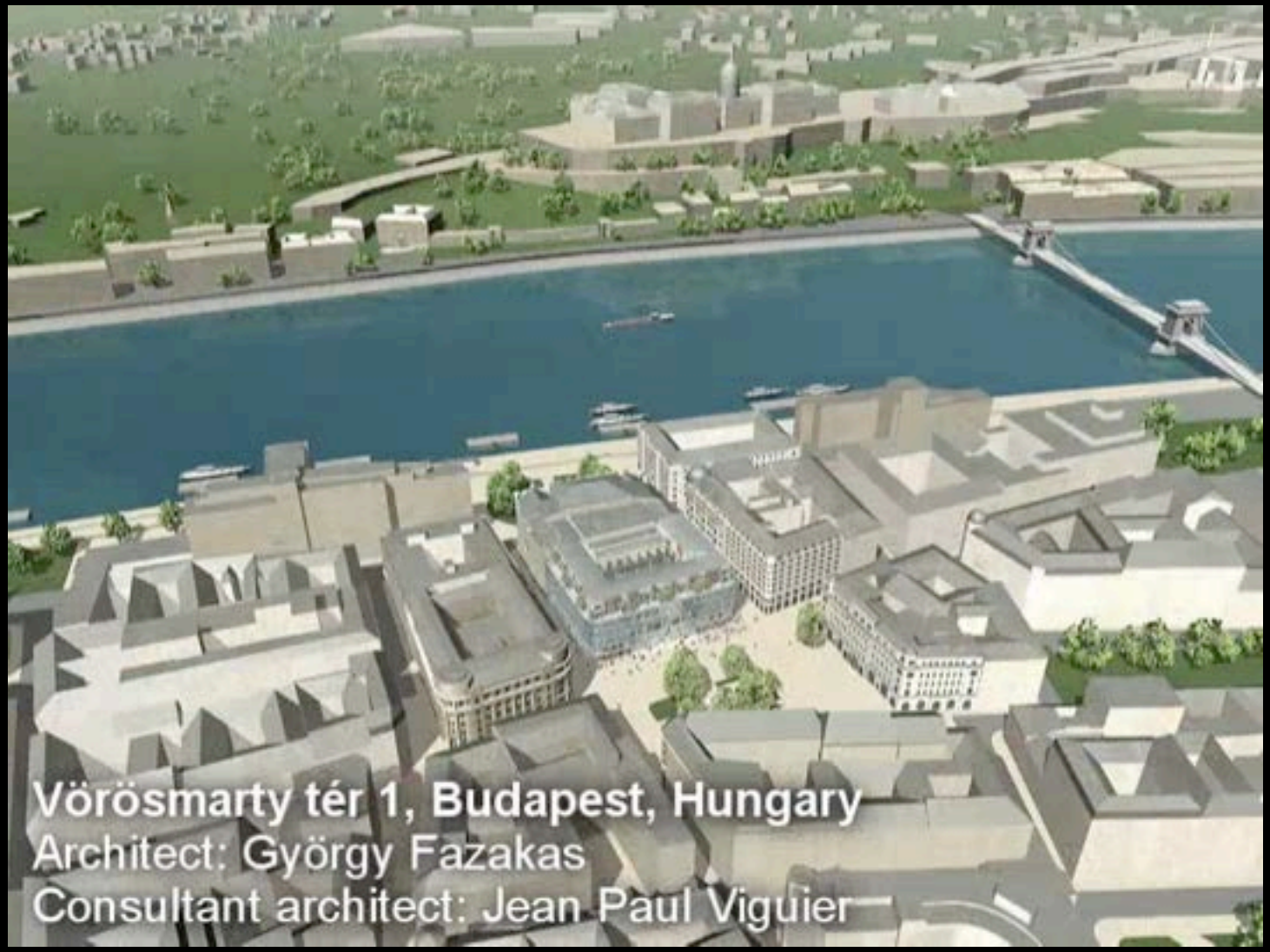
BIM : Questions & Answers



Thank you
for listening

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