BIM for the Historic Environment

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FISH HEIRNET 9th of June 2017

Why Building Information Modelling (BIM)?

1994 1998 2002 2011

‘Waste has been estimated to be as much as 30% of construction cost’

Why BIM?

- ✓ Reduce project risks; time, cost, quality, and safety
- ✓ Reduce project waste; material and efforts
- ✓ Increase certainty of outcomes
- ✓ Improve communications
- ✓ Increase visibility of the design and delivery processes

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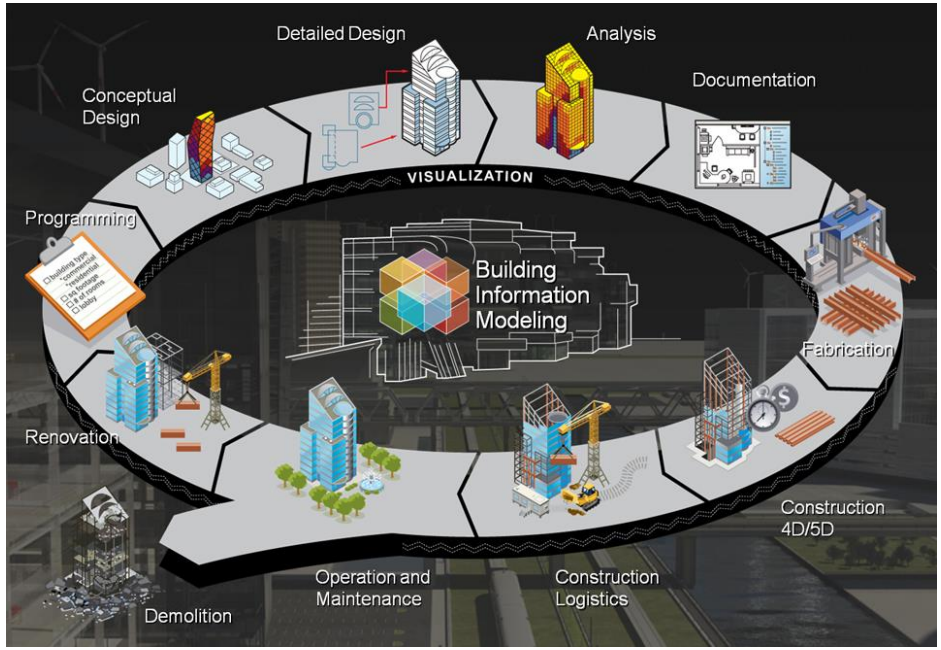
Start with the end in mind!

What is BIM?

BIM is…

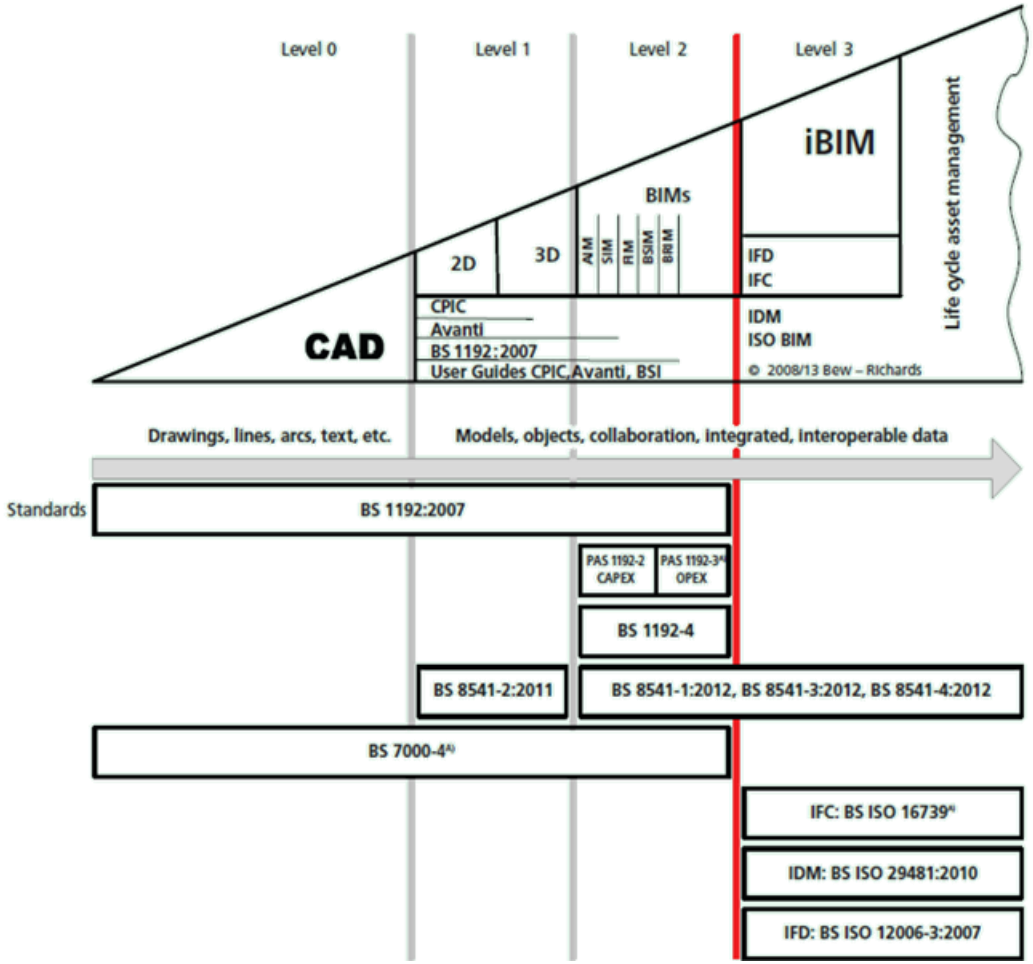
a ‘collaborative way of working, underpinned by the digital technologies which unlock more efficient methods of designing, creating and maintaining our assets. BIM embeds key product and asset data and a 3 dimensional computer model that can be used for effective management of information throughout a project lifecycle – from earliest concept through to operation’.

Source: HM Government – Building Information Modelling - Industrial strategy : government and industry in partnership (2012)



Source: Autodesk

BIM Maturity Levels



Source: PAS1192-2, 2012

LEVEL DEFINITIONS

0- Unmanaged CAD probably 2D, With paper as the most likely data exchange mechanism

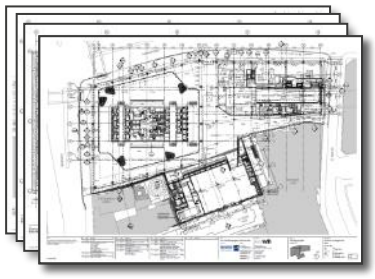
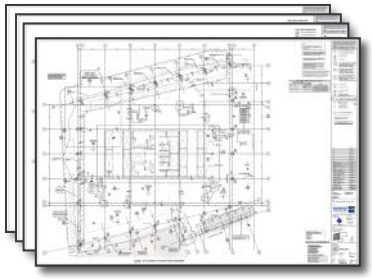
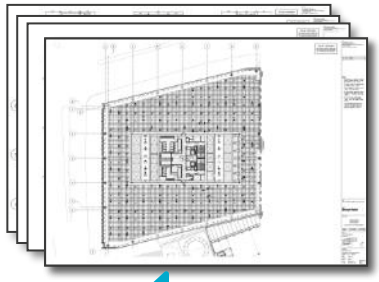
1- Managed CAD in 2 or 3D format with a collaboration tool providing a common data environment, Commercial data managed by standalone cost packages with no integration

2- Managed 3D environment held in separate discipline's with attached data. Commercial data managed by an CDE. The approach may utilise 4D Programme data and 5D cost elements

3- Fully open process and data integration enabled by IFC or similar. Managed by a collaborative model server. Could be regarded as iBIM (integrated BIM) potentially employing concurrent engineering processes

Traditional Approach

Architecture + Structure + MEP

Vector based design & documentation

Coordination at document level

Difficult to understand the building

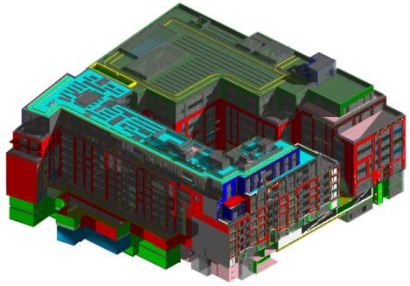
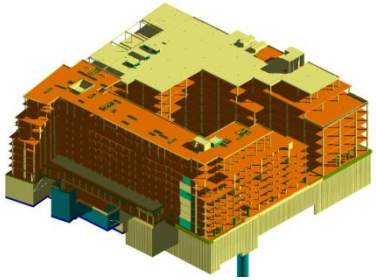
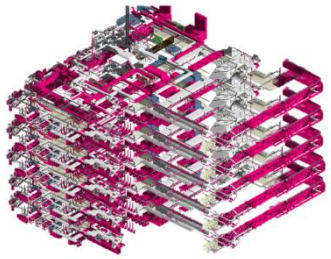
Difficult/laborious to find clashes

Difficult/laborious to coordinate internal documentation

Partially resolved design & documentation

BIM Approach

Architecture + Structure + MEP

Object oriented design & documentation

Coordination at model level

Better understanding of the building

Easier to find clashes

Automatic coordination of internal documentation

Enhanced coordination of design & documentation

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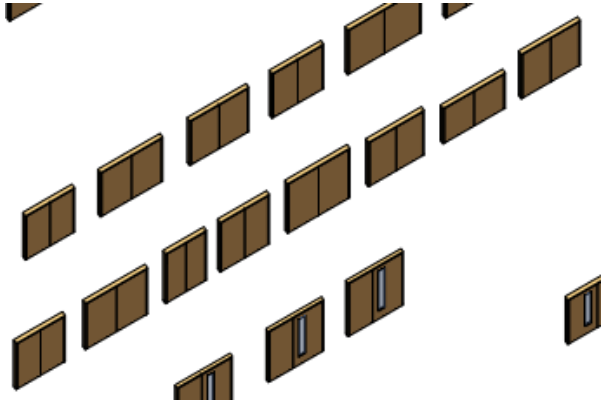
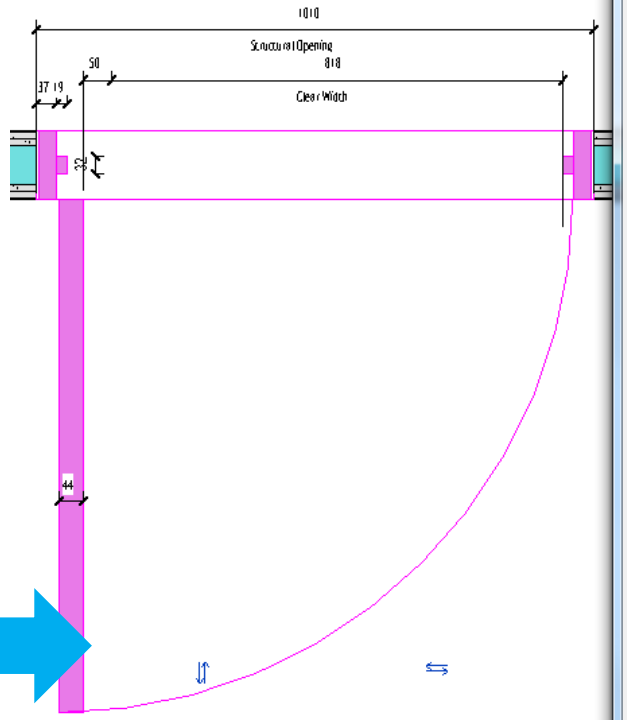
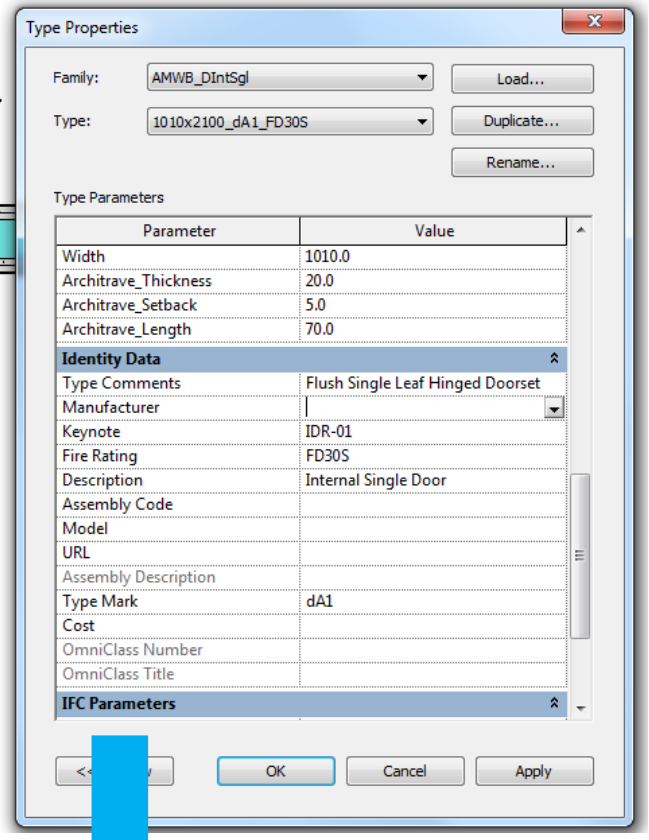
Building Information Modelling







IDR-01 — **Lobby Door: [Type dA] Painted Flush Single Leaf Hinged Doorset**
[Refer to Stage E - Internal Doors Plan & Elevation Drawings]

1. Visual And Functional Description

Visual Description:
Smooth, painted timber doorset, factory primed and painted.
Functional Description:
The doors are to operate as follows:
Hinged single leaf doorset.
Architrave profiles to mask ends and project beyond Face of adjacent skirtings and/or Riser doors and/or MDF Flank/Overhead wall Panelling by 5mm.
Material:
Solid core, Hardwood lipped and MDF/paper faced door leaf: TBC (to be developed for Tender; requirements to follow)
Allgood @nart or equivalent

D2.B2.R4b	HV.2	dA2	810	2240	IDR-01	Flush Single Leaf Hinged Doorset
D2.B2.R4c	HV.2	dA2	810	2240	IDR-01	Flush Single Leaf Hinged Doorset
D2.B2.R4d	HV.2	dA2	810	2240	IDR-01	Flush Single Leaf Hinged Doorset
D2.B2.R6a	Tenant Electrical	dH4	1400	2490	IDR-08	Flush Double Leaf Pivot Doorset
D2.B2.R7a	FA.1	dG6	810	2490	IDR-07	Flush Single Leaf Pivot Doorset
D2.B2.R13a	WPs/VPs/CHW/VRF	dA7	810	2340	IDR-01	Flush Single Leaf Hinged Doorset
D2.B2.R14a	Supply Duct Shaft	dA2	810	2240	IDR-01	Flush Single Leaf Hinged Doorset
D2.B2.R15a	Tenant Electrical	dA7	810	2340	IDR-01	Flush Single Leaf Hinged Doorset
D2.B2.R16a	PH	dA7	810	2340	IDR-01	Flush Single Leaf Hinged Doorset
D2.B2.R17a	Comms.2	dA14	710	2240	IDR-01	Flush Single Leaf Hinged Doorset
D2.B2.R18a	B/W Extract Shaft	dA7	810	2340	IDR-01	Flush Single Leaf Hinged Doorset
D2.B2.R19a	Spr	dH6	1260	2065	IDR-08	Flush Double Leaf Pivot Doorset
D2.B2.R20a	PH	dG6	810	2490	IDR-07	Flush Single Leaf Pivot Doorset

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BIM is process and technology enabling…..

- Digital representation of physical and functional characteristics
- Whole life approach (concept to operation)
- Consistency and standardisation
- Shared knowledge
- Enhanced decision making

Benefits of BIM – Information Management

- Easier access to information
- Improved productivity (reduced errors and omissions, reduced rework)
- Improved reactive response
- Improved certainty of outcomes

*'**Understanding** of any component of heritage is beyond understanding the physical characteristics of existing building, because each individual heritage object is a message from the past, and it remains as living witnesses of the age's tradition'.*

(The Venice Charter, 1964)

Why BIM for the Historic Environment?

- Support activities to the understanding and preservation of the historic built environment
- Support CRM assessments and decision making
- Support conservation, restoration, rehabilitation, repair and maintenance activities
- Assist archaeological/structural analysis
- Support the management of Heritage Information
- Improve communication with the public - Digital representation of historic structures
- Demonstrate safe methods of working, logistics planning and movement
- Capture knowledge

(Perceived benefits)

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BIM4Heritage is a special interest group established within the BIM4Communities to champion Building Information Modelling (BIM) within the Historic Environment. The group is part of the UK BIM Alliance, which is a cross-industry alliance formed to lead BIM Level 2 and the digital formation of the construction and infrastructure sectors.

Organisations involved:

The British Museum

Royal Academy of Arts

Houses of Parliament

National Trust

BIM Building Information Modelling (BIM) Task Group

English Heritage

Historic England

Historic Environment Scotland | Àrainneachd Eachdraidheil Alba

IHBC · Institute · of · Historic · Building · Conservation

ICOMOS

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Alan Baxter Integrated Design

Purcell

Ramboll

Arup

Plowman Craven

COTAC Council on Training in Architectural Conservation

MRDA Architects and Conservation Consultants

MOLA

Page \ Park

Donald Insall Associates Chartered Architects and Historic Building Consultants

Dannatt Johnson Architects

CIOB The Chartered Institute of Building

apm

CIAT

University of Reading

Middlesex University

UEL University of East London

BIM4Heritage

Goals

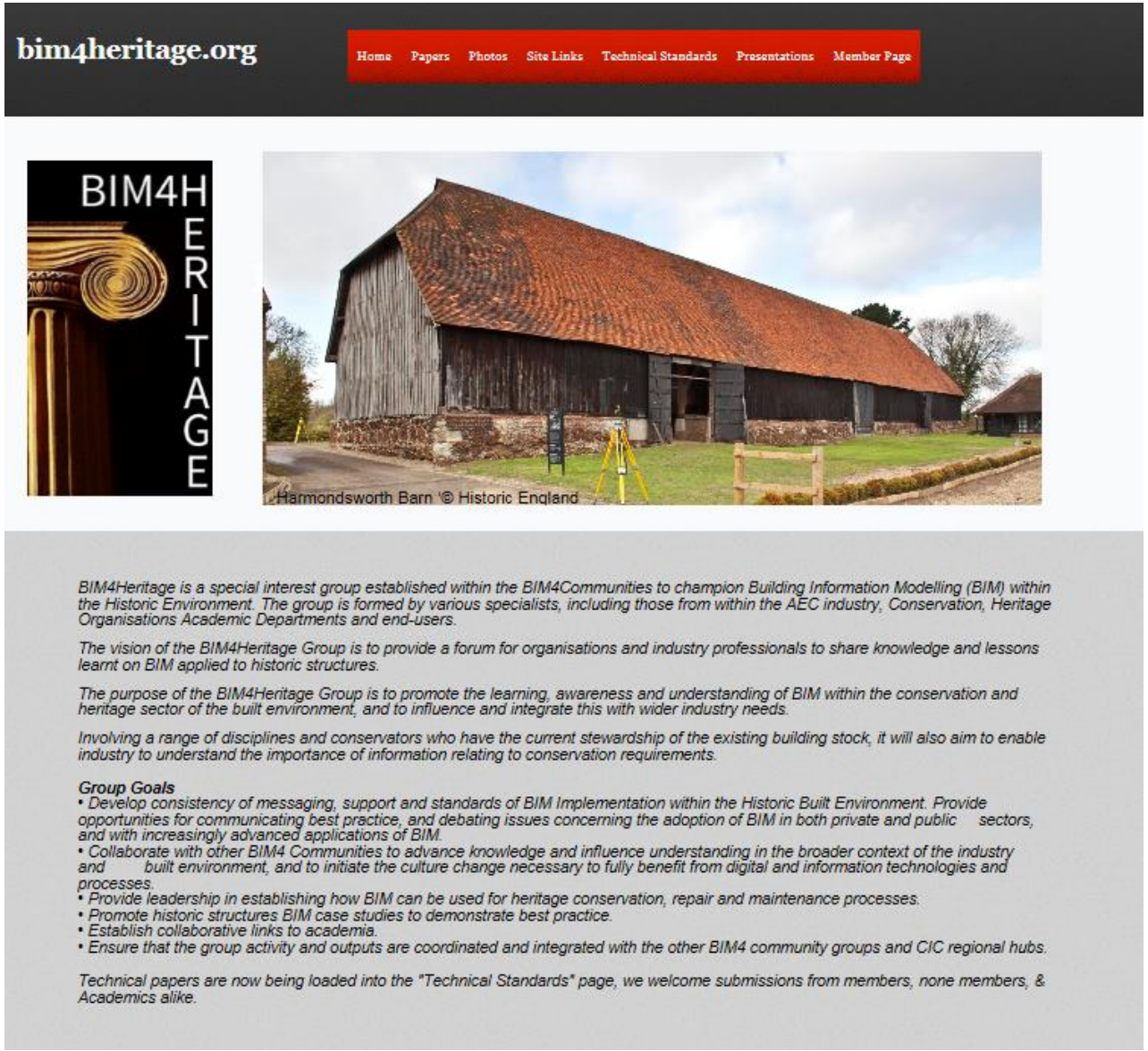
- Provide leadership in establishing how BIM can be used for heritage conservation, repair and maintenance processes.
- Develop consistency of messaging, support and standards of BIM Implementation within the Historic Built Environment.
- Provide opportunities for communicating best practice, and debating issues concerning the adoption of BIM in both private and public sectors, and with increasingly advanced applications of BIM.
- Collaborate with other BIM4 Communities to advance knowledge and influence understanding in the broader context of the industry and built environment, and to initiate the culture change necessary to fully benefit from digital and information technologies and processes.
- Promote historic structures BIM case studies to demonstrate best practice.
- Establish collaborative links to academia.
- Ensure that the group activity and outputs are coordinated and integrated with the other BIM4 community groups and CIC regional hubs.

Projects:

- Development of BIM implementation guidance for asset owners -how BIM can be used for heritage conservation, repair and maintenance processes.
- Define deliverables information requirements for heritage conservation, repair and maintenance processes.
- Define LOD/LOI for heritage metric survey specifications/ model production.
- Development of an LOD/LOI manual for multiple scenarios
- Development of guidance on the combination of point cloud data and BIM geometry for the heritage sector.
- Development and publishing of heritage BIM case studies
- Data collection/sharing standard
- Classifications specific to heritage
- EIR/BEP specific to heritage

Our website:

http://www.bim4heritage.org/



Events:

BIM Regions – BIM for Heritage: Applying BIM to existing Buildings and Places

4th July 2017, The Skills Company, 90 Great Bridgewater Street Manchester

Launch Conference

14th September 2017, Royal Academy of Arts, Burlington House, London

THANK YOU