Historic England

Historic England "BIM for Heritage" Guidance

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COTAC BIM for Heritage Conference
London 8 December 2017

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Historic England

- We are the public body that looks after England's historic environment
- We champion and protect historic places, helping people understand, value and care for them
- Based in York I run a team of three surveyors that undertake heritage based surveys using laser scanning, photogrammetry, digital imaging and GNSS technologies
- We also advise upon, procure, research, provide training and publish guidance on geospatial imaging methods and techniques suitable for heritage

https://historicengland.org.uk

https://historicengland.org.uk/research/methods/terrestrial-remote-sensing/specialist-survey-techniques/

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- Up until 1st April 2015 I worked for English Heritage, who were the English Governments principal adviser on all aspects of the historic environment
- English Heritage are now an independent charity that looks after the National Heritage Collection of more than 400 historic properties
- Through these monuments EH brings the story of England to life for over 10 million people each year

ENGLISH HERITAGE

http://www.english-heritage.org.uk/

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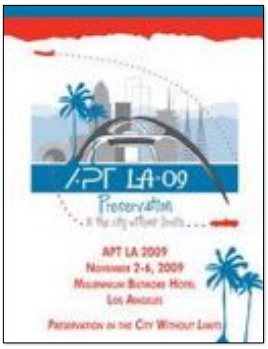
Our BIM journey

- I first heard about BIM whilst attending the Association for Preservation Technology (APT) 2009 conference in USA
- The event included a special session on:

  "*Capturing the Past for Future Use: Integrating Documentation with Repair, Design and Construction Practice in Historic Buildings*"
- Included a variety of historic building related presentations that referred to BIM - a new term that I hadn't heard before!



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BIM Special Interest Group (BIMSIG)

- In January 2013 I established English Heritage's BIM Special Interest Group (BIMSIG)
- Chaired by me this comprised representatives from a variety of teams across the organisation:
  - Estates
  - Heritage Protection & Planning
  - Archaeology & Architecture
  - Remote Sensing
  - Conservation & Science Coordination
  - Archive
- Linked to the National Heritage Science & English Heritage Science Strategies - ***important development for EH & HE***

https://historicengland.org.uk/research/agenda/thematic-strategies/heritage-science/

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BIM Special Interest Group (BIMSIG)

BIMSIG aimed to:

- *Assess the relevance and potential adoption of BIM across English Heritage's own estate of more than 400 historic properties*

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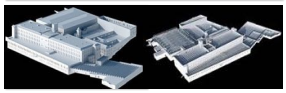
- *Assess the impact of BIM on English Heritage and Historic England's external advice*
  - *Brierfield Mill, nr. Nelson, Lancashire*
  - *19th century mill building - Grade 2 listed*
  - *Adaptive reuse and regeneration*
  - *Measured building surveys undertaken using 3D laser scanning*
  - *BIM model generated to aid conservation planning, presentation & long-term management of regenerated site*

Laser scanning undertaken by Digital Surveys, 2013
Images courtesy of Digital Surveys and Pendle Borough Council



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BIM Special Interest Group (BIMSIG) Research

BIMSIG aimed to:

- *Assess the relevance and potential adoption of BIM across English Heritage's own estate of more than 400 historic properties*
- *Assess the impact of BIM on English Heritage & Historic England's external advice*
- *Facilitate the development of research within heritage and heritage science contexts*

The application of Building Information Modelling (BIM) within a heritage science context

"The overall finding of this project is that BIM within a heritage context is likely to be more complex than for New-Build as it nearly always involves measurement to establish any kind of model, the coordination of different types of legacy information and the organisation of often unique objects"
Carl Brookes, Tiziana Meciani, Dan Niziolek

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University of Reading

Heritage BIM: New ways of digital data management for the historic built environment

"The aim of the project is to investigate how a widely-used IT system for the centralised storage and dissemination of information about a building (Building Information Modelling) can be applied to existing, and specifically historic, built environments"
Joanna Hull, Completion in April 2020

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SEAHA
EPSRC CENTRE FOR DOCTORAL TRAINING IN SCIENCE AND ENGINEERING IN ARTS HERITAGE AND ARCHAEOLOGY
UCL

Building Information Models from monitoring and simulation data in heritage buildings

"Aims to develop a new Building Information Modelling (BIM) paradigm that supports the management and future-proofing of the built heritage. Research will focus on exploring the integration of types of information that are relevant for heritage science, and which are not part of current BIM practice"
Danae Pocobelli, Completion in October 2019

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BIM Special Interest Group (BIMSIG) Guidance development

BIMSIG aimed to:

- *Assess the relevance and potential adoption of BIM across English Heritage's own estate of more than 400 historic properties*
- *Assess the impact of BIM on English Heritage & Historic England's external advice*
- *Facilitate the development of research within heritage & heritage science contexts*
- *Contribute to the development of technical guidance by EH and HE*

https://historicengland.org.uk/advice/technical-advice/

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BIM for Heritage
Developing a Historic Building Information Model

https://historicengland.org.uk/images-books/publications/bim-for-heritage/

Offers guidance on BIM for building owners, end-users, heritage and construction professionals and the potential advantages a BIM approach now offers across heritage projects.

Since release on 20 July 2017 the publication has had 1,554 (public) downloads - the most downloaded piece of guidance in our suite

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Developing a Historic Building Information Model

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Developing a Historic Building Information Model

1. What BIM is and isn't

BIM is:

"*A collaborative process for the production and management of structured electronic information and illustrating, in digital terms, all the elements that compose a building*"

(Historic England 2017)

BIM isn't:

- A specific software package or a type of 3D digital model
- Simply a newer version of 3D CAD or a 3D visualisation tool
- New technology

Its origins are in object-based parametric (*rule-based*) modelling applications for mechanical systems design in 1980's

BIM has been in use for the last 20 years in the architectural, engineering and construction (AEC) industry

Now widely applied in the UK and internationally, mainly in the new-build sector (building and infrastructure)

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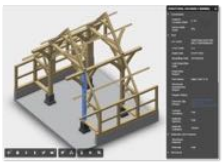
2. How BIM works

BIM (specifically Historic BIM) consists of:

- Geometry (2D and 3D) – typically generated from data captured by laser scanning, photogrammetry (ground-based or mounted on a drone), lidar, closer range scanning, mobile mapping or a combination of methods



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2. How BIM works

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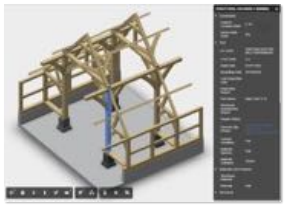
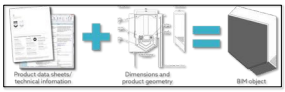
- Non-geometric information – refers to physical building characteristics such as materials, appearance & condition
- Linked documents and data - includes archival data, product specifications, operation and maintenance (O&M) manuals, reports, condition surveys, audio and video recordings documenting visitor experience, inspection logs or other digital file types





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2. How BIM works

- A 'BIM-ready' 3D model formed as an assembly of native BIM components which represents the geometry of the existing fabric
- Often the result of Scan-to-BIM - the process of creating, manipulating and placing BIM components by directly referencing the underlying point cloud
- Scan-to-BIM workflows depend on BIM software ability to import point clouds
- Modelling tolerance refers to how accurately a model fits against the as-existing survey, usually a point cloud
- Level of detail (LOD) is used to describe how much geometric detail is included in the derived BIM components

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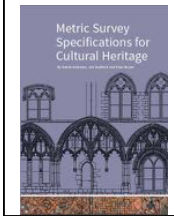
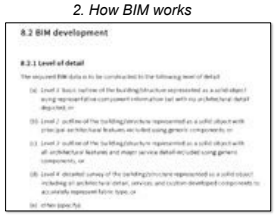
2. How BIM works

- Level of detail (LOD) is used to describe how much geometric detail is included in the derived BIM components
- Historic England Metric Survey Specifications for Cultural Heritage



https://historicengland.org.uk/images-books/publications/metric-survey-specifications-cultural-heritage/



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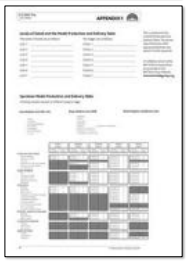
2. How BIM works

- Level of detail (LOD) is used to describe how much geometric detail is included in the derived BIM components
- Historic England Metric Survey Specifications for Cultural Heritage
- Construction Industry Council (CIC) BIM Protocol - *an important document that provides the legal framework which will facilitate and promote the use of BIM*

http://cic.org.uk/publications/



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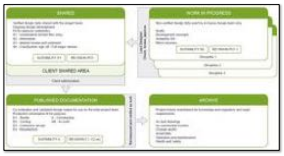
3. Managing BIM Data

- BIM and collaborative working processes offer considerable benefits for construction and asset management, with similar potential for heritage sector
- Successful implementation, especially in large or complex projects, based on:
  - A robust IT infrastructure – *software for producing, managing, exchanging, using and archiving information*
  - Well-thought-out workflows governed by standards and protocols - *there are currently no BIM standards specifically developed for the heritage sector*
  - A sustainable strategy for long-term data management



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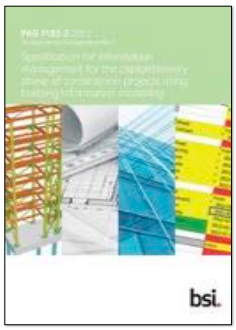
4. Commissioning BIM

- Asking for 'BIM' or 'full BIM' on a project is simply not enough without further defining what that requirement involves
- Knowing what you want - clear vision of what you're using BIM for is the first and fundamental step when commissioning it
- Within standard BIM approach client requirements take the form of the EIR (Employers Information Requirement)
- For Historic BIM the BEP (BIM Execution Plan) outlines selected survey acquisition approach and use of existing legacy data
- BIM specifications can help clients define their requirements for the procurement of BIM-ready datasets



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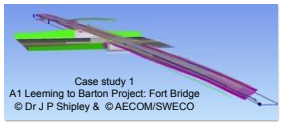
5. Helping you decide

- Are you required to procure/deliver a project using BIM?

Currently the UK government mandate for BIM Level 2 adoption applies to all centrally procured public projects regardless of value

Civil Engineering Surveyor November 2017



Case study 1
A1 Leeming to Barton Project: Fort Bridge
© Dr J P Shipley & © AECOM/SWECO

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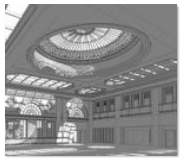
- How could you benefit from adopting BIM on a heritage project?

BIM can be a valuable tool for historic asset management and offers a robust information management framework that can be highly beneficial for heritage research and analysis



Case study 2
Edinburgh Waverley Railway Station
© AHR

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- Who will be responsible for maintaining the Asset Information Model (AIM)?

Imperative it is maintained, checked and updated to reflect changes in physical asset

Case study 3 Woodseat Hall, Staffordshire
© Bridgeway Consulting Limited

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5. Helping you decide

- Do you always need a 3D geometric model?

3D enables better understanding of spaces and components that constitute an historic building

2D is appropriate for linking documents and data within small or less complex sites

Case study 4 The Oriental Club, London
© Bury Associates Limited

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- Can you do this yourself?

Delivering a project using BIM tools and processes, especially involving complex or significant historic assets, can be a daunting prospect

Case study 5 Former Post-office in Dundee
© Greenhatch Group Ltd

Case study 6 Victorian School Building
© Greenhatch Group Ltd

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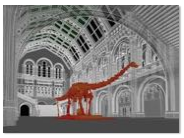
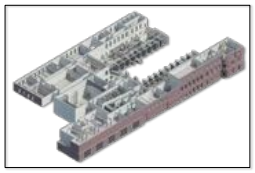
In heritage sector adoption of BIM and collaborative working requires organisations and individuals to embrace change and accept traditional roles and practices may need to be adapted to successfully deliver BIM projects



Case study 7 Hintze Hall entrance Natural History Museum
© Mollenhauer Group Ltd



Case study 8 Imperial War Museum Lambeth Road, London
© Stanburys Ltd

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https://historicengland.org.uk/images-books/publications/bim-for-heritage/

1,554 downloads to Dec 2017

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