



**COTAC BIM4C
Integrating HBIM
Framework
Report
Bibliography
(Version 1)**



COTAC BIM4C Integrating HBIM Framework Report

Bibliography: Version 1 as at 26 July 2016

This Bibliography Version 1, as at 26 July 2016, offers a preliminary compilation of related references relevant to HBIM considerations. It does not aim to be comprehensive at this time but, in the absence of other relevant compilations, it is offered as an initial attempt to aid the creation of a more all-inclusive collation. It includes references provided by Michael Netter, presented as part of his Kingston University MSc thesis, as at 20 May 2016. Additional suggestions for inclusion in the next version would be welcome.

Ingval Maxwell, Chairman COTAC
July 2016

The 'Council on Training in Architectural Conservation' (COTAC)

Established in 1959 as the '*Conference on Training in Architectural Conservation*' COTAC's founding principle was its recognition of the need for specialists to properly specify and oversee work involved in repairing and conserving historic buildings and churches. At the time, this ground-breaking approach occurred when industry and professional training and education in modernism, concrete and brutalism prevailed, and the knowledge of traditional building technologies was fast disappearing. Over the years COTAC has successfully, persistently and influentially worked to lift standards, develop training qualifications and build networks across the conservation, repair and maintenance (CRM) sector, estimated (in 2014) at 42% of all construction industry activities. This has involved national agencies, professional and standard setting bodies, educational establishments and training interests.

In its new guise, the '*Council on Training in Architectural Conservation*' was re-established as a Charitable Incorporated Organisation in July 2015, where COTAC's 21st century role is no less critical than that of its past. New technologies, including aspirations to low carbon retrofit, demanded energy efficiencies and emerging digital innovations, can too easily obscure the need for a core understanding of traditional materials and how to approach historic structures with a finely honed set of skills. This report aims to address an imbalance in the understanding of these essential areas within the emergence of Building Information Modelling (BIM).

In doing so, COTAC enabled a *BIM4Conservation* (BIM4C) Group in 2015 with the remit of raising awareness and understanding of BIM within the conservation and heritage sector of the built environment, and to link with other BIM4 Communities in advancing knowledge and influencing understanding of conservation needs within the broader context of the BIM industry sector.

This Report, presented in three parts with a bibliography, offers some considerations that might be taken into account as the awareness of the particular needs of BIM4C gain ground. Through that development it is hoped that an appreciation of the differences in approach required by Historic Building Information Modelling will emerge.

Ingval Maxwell OBE DADun RIBA FRIAS CAABC CAA FSAScot
Chairman COTAC
May 2016

Whilst every care has been taken on the preparation of this publication COTAC and the authors specifically excludes any liability for errors, omissions or otherwise arising from its contents. Readers must satisfy themselves as to the described content.

Select Survey Information and Related www Based Bibliography (References accessed 28 December 2015, with one addition on 26 July 2016)

Conservation Links

Historic England Conservation Principles

These *Principles, Policies and Guidance* for the sustainable management of the historic environment have been developed through extensive debate and consultation, both within English Heritage and with colleagues in the historic environment sector and beyond.

<https://historicengland.org.uk/images-books/publications/conservation-principles-sustainable-management-historic-environment/>

COTAC

Arrange in accordance with the 14 ICOMOS Training and Education Guidelines, a broader range of Conservation web-based Bibliographic Links is available on the COTAC Website at:

<http://www.cotac.org.uk/bib.php>

BIM and HBIM Links

BIMTalk

BIMTalk is an online BIM information portal centered on building design, construction, manufacturing and facilities management. In addition to details on the Standards, the site contents provides a Glossary; a list of useful Sites; Case Studies; a Virtual Library; details on BIM Courses and Events: Processes; and Legal Matters. See: <http://bimtalk.co.uk/standards>

The site has been set up by members of the CIBSE BIM Steering Group, a voluntary association of individuals pooling their knowledge of BIM with others to try to fill a gap in general BIM information. It lists the main UK 'standards' that relate to BIM and briefly describes them, offering the following URL links:

http://bimtalk.co.uk/standards#bs_11922007

http://bimtalk.co.uk/standards#pas_1192-22013

http://bimtalk.co.uk/standards#pas_1192-32014

http://bimtalk.co.uk/standards#bs_1192-42014

http://bimtalk.co.uk/standards#draft_iso_dis_16757-1

The Survey Association (TSA)

The Survey Association, known generally as TSA, is the trade body for commercial survey companies in the UK. The association was formed in 1979 to give a focus for private sector

businesses in land and hydrographic survey. It is important to realise, however, that it is not a regulatory body.

The role of TSA is to promote best practice amongst its members, provide a forum for members for discussion, debate and continuing professional development and, to the wider audience such as engineers and architects, provide guidance on new methods and techniques and a list of suitably qualified and experienced companies. The association has over 160 companies in membership as full, associate, supplier, and affiliate or academic members directly involved in the survey business.

<http://www.tsa-uk.org.uk/the-association/about-us/>

TSA's Client Guides

TSA's Client Guides are primarily aimed at other professionals such as engineers, architects, planners and clients in general. They are not intended to go 'in depth' into practical issues but to act as a basic guide on a particular topic and, in particular, on procedures and regulations which may govern how a particular aspect of the survey is carried out.

Guidance Notes are generally aimed at survey companies and clients who require detailed information on a subject. Where procedures are recommended for specific professional tasks, these are intended to embody 'best practice', i.e. procedures which in the opinion of TSA meet a high standard of professional competence.

TSA Basic Land/Building Survey Enquiry Sheet

http://www.tsa-uk.org.uk/guidance_notes/TSA_Client_Guide_-_Survey_Specification_for_Architects.pdf

Client Guide To Topographical Surveys

http://www.tsa-uk.org.uk/guidance_notes/TSA%20Client%20Guide%20-%20Topographical%20Surveys_Issue%202_HR.pdf

Client Guide To Terrestrial Laser Scanning

http://www.tsa-uk.org.uk/guidance_notes/TSA%20Client%20Guide%20-%20Terrestrial%20Laser%20Scanning_Issue%203_HR.pdf

Client Guide To Small Unmanned Aircraft Surveys

http://www.tsa-uk.org.uk/guidance_notes/TSA%20Client%20Guide%20-%20SUA%20Surveys_Issue%203_HR.pdf

Client Guide To Satellite Imagery Surveys

http://www.tsa-uk.org.uk/guidance_notes/TSA%20Client%20Guide%20-%20Satellite%20Imagery%20Surveys_Issue%202_HR.pdf

How To Save Your Constituency From Flooding

http://www.tsa-uk.org.uk/guidance_notes/TSA_Client_Guide_-_MP_Flooding_Guidance.pdf

Client Guide To Mobile Lidar Surveys

http://www.tsa-uk.org.uk/guidance_notes/TSA%20Client%20Guide%20-%20Mobile%20LiDAR%20Surveys%20Issue%203_HR.pdf

Client Guide To Measured Building Surveys

http://www.tsa-uk.org.uk/guidance_notes/TSA%20Client%20Guide%20-%20Measured%20Building%20Surveys%20Issue%203_HR.pdf

Client Guide To Geological Surveying

http://www.tsa-uk.org.uk/guidance_notes/TSA%20Client%20Guide%20-%20Geological%20Surveying%20Issue%201_HR.pdf

Client Guide To Digital Ortho- Photography

http://www.tsa-uk.org.uk/guidance_notes/TSA%20Client%20Guide%20-%20Digital%20Orthophotography_Issue%203_HR.pdf

Client Guide To Tagging Underground Assets

http://www.tsa-uk.org.uk/guidance_notes/TSA%20Client%20Guide%20-%20Asset%20Tagging%20Issue%203_HR.pdf

Client Guide To Aerial Lidar Surveys

http://www.tsa-uk.org.uk/guidance_notes/TSA%20Client%20Guide%20-%20Aerial%20LiDAR%20Surveys%20Issue%203_HR.pdf

Client Guide To Achievable Accuracies From Modern Photogrammetric Systems

http://www.tsa-uk.org.uk/guidance_notes/TSA%20Client%20Guide%20-%20Achievable%20Accuracies%20from%20Modern%20Photogrammetric%20Systems%20Issue%203_HR.pdf

WWW Other Sources

Metric Survey Specifications for Cultural Heritage By David Andrews, Jon Bedford and Paul Bryan. Historic England

This document comprises both a specification and guidance notes. The contents of the right-hand pages constitute the clauses of the specification, while the left-hand pages contain guidance pertinent to those clauses.

<https://content.historicengland.org.uk/images-books/publications/metric-survey-specifications-cultural-heritage/metric-survey-specifications-for-cultural-heritage-3rded.pdf/>

The light fantastic: using airborne lidar in archaeological survey

These guidelines are designed to help those intending to use airborne laser scanning (ALS), also known as lidar, for archaeological survey. The aim is to help archaeologists, researchers and those who manage the historic environment decide first whether using lidar data will actually be beneficial in terms of their research aims and then how it can be used most effectively.

<http://historicengland.org.uk/images-books/publications/light-fantastic/>

Specialist Survey Techniques

Specialist survey techniques, such as photogrammetry and laser scanning, are a fundamental component of any heritage project.

<http://www.historicengland.org.uk/research/approaches/research-methods/terrestrial-remote-sensing/specialist-survey-techniques/>

Airborne Remote Sensing

Historic England uses airborne remote sensing methods to identify, record, illustrate and monitor the condition of a wide variety of heritage assets.

The archaeological use of aerial photography continues to transform our knowledge of archaeological landscapes. Newer techniques such as lidar are revealing even more information. Specialist airborne observers undertake aerial reconnaissance to identify and photograph historic sites, particularly those revealed through cropmarks.

Ground based archaeological air photo interpreters analyse thousands of historic and recent photographs, and 3d data from airborne laser scanning (lidar) to create maps of entire archaeological landscapes.

<http://www.historicengland.org.uk/research/approaches/research-methods/airborne-remote-sensing/>

Terrestrial Remote Sensing

Historic England experts investigate how geophysics and other specialist survey techniques can be used to learn more about heritage assets. Archaeological remains still buried under the ground can be revealed by geophysical techniques such as magnetometry, resistivity and ground penetrating radar. Laser scanning and various forms of photogrammetry are used to accurately record in three dimensions buildings, monuments and artefacts. The 3D data is used to create plans, elevations and visualisations to help management, research and illustration.

<http://www.historicengland.org.uk/research/approaches/research-methods/terrestrial-remote-sensing/>

Measured surveys of land, buildings and utilities 3rd edition RICS professional guidance, global

This guidance note is designed for use by land, engineering and measured building surveyors who are acting in an advisory capacity and by survey knowledgeable clients who specify their own surveys. This 3rd edition supersedes the 2nd edition. One of the primary changes from the 2nd edition is the use of survey accuracy band, which takes into consideration client requirements for scale independent metadata and digital data handling environments. The 3rd edition is effective from 8 December 2014

<http://www.isurv.com/site/scripts/download.aspx?type=downloads&fileID=6367>

Principles For The Recording Of Monuments, Groups Of Buildings And Sites (1996) Ratified by the 11th ICOMOS General Assembly in Sofia, October 1996.

The purpose of this document is therefore to set out the principal reasons, responsibilities, planning measures, contents, management and sharing considerations for the recording of the cultural heritage.

<http://www.icomos.org/charters/archives-e.pdf>

Guide for Practitioners 4 - Measured Survey and Building Recording for Historic Buildings and Structure. Historic Scotland 2003

<http://conservation.historic-scotland.gov.uk/publication-detail.htm?pubid=8564>

And

<http://issuu.com/hspubs/docs/guide-for-practitioners-4---measured-survey-and-bu?e=0>

Understanding Historic Buildings: A Guide to Good Recording Practice. Historic England: May 2016 (Accessed 26 July 2016)

This Historic England guidance sets out the process of investigating and recording historic buildings for the purposes of historical understanding. It aims to assist professional practitioners and curators, managers of heritage assets, academics, students and volunteer recorders in compiling or commissioning records that are accurate and suited to the purposes for which they are intended.

See also the publication Section 8, Page 58: Bibliography

<https://content.historicengland.org.uk/images-books/publications/understanding-historic-buildings/heag099-understanding-historic-buildings.pdf/>

From BIM to HIM (Heritage Information Management)

Hong Kong's Architectural Services Department prepared two Resource Kits for Revitalising Schemes – covering the Lady Hotung Welfare Centre and the Old Dairy Farm Senior Staff Quarters. They were used by the Commissioner for Heritage's Office (CHO), which supports implementation of Hong Kong's policy on heritage conservation.

http://www.autodesk.com/temp/pdf/Architectural_Services_Department_of_HKSAR_Government.pdf

Building Information Modeling and Heritage Documentation: XXIIIrd International CIPA Symposium

Despite the widespread adoption of building information modeling (BIM) for the design and lifecycle management of new buildings, very little research has been undertaken to explore the value of BIM in the management of heritage buildings and cultural landscapes. To that end, the construction of BIMs that incorporate both quantitative assets (intelligent objects, performance data) and qualitative assets (historic photographs, oral histories, music) are investigated. The models also lever the capabilities of BIM software to provide a navigable timeline that chronicles tangible and intangible changes in the past and projections into the future. The paper discusses three projects that explore an expanded role for BIM in the documentation and conservation of architectural heritage.

https://d2f99xq7vri1nk.cloudfront.net/legacy_app_files/pdf/Fai.pdf

<https://autodeskresearch.com/publications/heritagedoc>

Michael Netter: Kingston University, 2015 MSc Thesis Historic Building Conservation: additions as at 22 May 2016

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Gigliarelli, E., Quattrone, G. (2014), 'Shared Solutions to Tackle Restoration Restrictions and Requirements for Cultural Landscape and the Sustainable Conservation of Cultural Heritage', in Ioannides, M., Magnenat-Thalmann, N., Fink, E., Zarnic, R., Yen, A., Quak, E. (ed.), ***Digital Heritage, Progress in Cultural Heritage: Documentation, Preservation, and Protection; 5th International Conference, EuroMed***, Limassol, Cyprus 3-8 November, pp. 321-331

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