Building Information Modelling

Scottish Futures Trust

BIM Case studies

Client Historic environment Scotland (HES)

Value £24 Million

Type Retrofit

Sector Historic / Conservation

THE PALACE EDINBURGH CASTLE

Relevant project stages

01	02	03	04	05	06	07
Brief	Concept	Definition	Design	Build and Commission	Handover & Close out	Operation In Use

ENABLING OPERTATIONAL BENEFITS

The Project

Historic Environment Scotland (HES) is a non-departmental public body (NDPB) that cares for and manages 345 Properties in Care (PICs), including some of Scotland's most iconic buildings, sites and monuments. HES is a partner in the Scottish 10 Project consisting of the digital documentation of all of Scotland's World Heritage Sites and a selected group of World Heritage Sites overseas.

In readiness for the Scottish Governments BIM requirement the HES delivered a BIM pilot BIM project to trial the adoption of Level 2 BIM standards and processes, where appropriate. The HES BIM Project aims to establish a comprehensive information resource to support the operational management of the Palace Block, a complex and highly significant building within Edinburgh Castle, a Scheduled Ancient Monument and central component of the Old and New Towns of Edinburgh World Heritage Site.

This involved the production of a comprehensive asset information model (AIM) of the historic Palace Block at Edinburgh Castle on the basis of laser scan point cloud data, legacy information and on-site surveys. The project, which is being delivered entirely with HES internal resources, is currently in progress and in line with the Scottish Government's BIM programme.

Key Benefits

Raising the profile of BIM with Historic Environment Scotland (HES)

Facilitated development of organisational BIM capacity and highlighted its potential benefits

Provided a platform for HES to engage with external stakeholders and to take a lead role in investigating the use of BIM for the management of historic buildings.

The Palace, which has been in royal use since the 14th century, was the residence of Mary Queen of Scots in the 16th century and the birthplace of James VI in 1566. It has housed the Honours of Scotland since the 17th century and is now a major tourist attraction. HES and its Predecessor organisations have been responsible for the care, maintenance and operation of the Castle complex, including the Palace, since 1906.

The HES BIM Project is a subsidiary work stream within the overall Properties in Care Asset Management System (PICAMS) Project. PICAMS is a digital asset management system bringing together different existing information management system and dataset.

Other related work streams within PICAMS include the SIGMA pilot project - a collaborative initiative with the British Geological Survey to develop a GIS-based on-site digital condition monitoring and reporting tool for PIC and the Rae project, a Scottish Government ministerial commitment to digitally document all 345 PICs.

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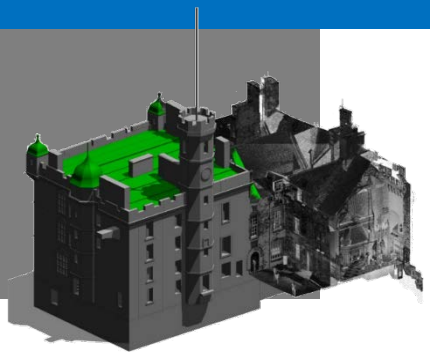
Project Scope

- As-existing Asset Information Model (AIM) of the Palace Block in line with the agreed Asset Information Requirements (AIR).
- Common Data Environment (CDE) strategy with appropriate data structures, templates and standards.
- Information outputs as required to meet the identified uses of the AIM
- Analytical post-project evaluation to inform a full business case for the adoption of IM at organisational level.



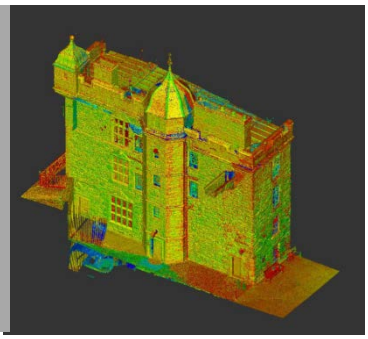


Image (R) Laser scanned image of Edinburgh Castle Main Palace. Stage 2 data capture - capturing baseline as-existing information for the Palace AIM. The full laser scan survey of the Palace Block took place over a 4 week period. A total of approximately 500 scans were produced too minimise occlusion and ensure that adequate coverage was achieved,

A future aspiration of the HES BIM Project is to develop an as-completed AIM of the Engine Shed, a capital project sponsored by HES to redevelop and extend a formerly derelict industrial building in Stirling to provide accommodation for Conservation Directorate's Science and Outreach Teams. The project, which has a construction cost of £5m, is currently being delivered with the involvement of an external supply chain. It is due to be handed over to HES in early 2017, and it is planned to commence developing the Engine Shed AIM thereafter, potentially tying in with the Soft Landings element of the capital project.

Key Challenges

The HES BIM project has faced, and indeed continues to face, a number of challenges. These relate principally to organisational BIM uptake and engagement, although there are several technical and industry-related issues that are equally relevant.

Organisational

- Securing senior management Buy-in for BIM
- Minimum resources in terms of funding and staffing
- Coordinating wide skills disparities in the team, particularly regarding maintaining agreed processes and quality standards

Industry

Lack of bench mark data to inform HES BIM Project

Technical

- Palace block consists largely of complex geometries and non-standardised components
- Not always possible to capture full asset attribute information on the historic components. Part of the exercise to manage end-users' expectations

It is essential to engage with senior managers who already have an interest in BIM with a view to raising the profile of the project within the organisation. Therefore a BIM champion at a sufficiently senior level to advocate the use of BIM and highlight its benefits is a key role. Allied to this, a significant portion of project activity should be focused on stakeholder engagement and education.

In order to capture meaningful asset information requirements that would add value to the AIM, it is crucial to closely involve end-users at all stages of the project. It is recommended that a collaborative methodology is adopted.

Training in BIM tools and processes is a chief priority, as this facilitates the efficient production of high quality outputs that in turn would serve to highlight the benefits of BIM to sceptics within the organisation. Instead of undertaking generic training in the use of BIM tools, it is advisable to assess specific skills gaps in relation to meeting the project objectives in order to procure targeted training.

AIR

The importance of effective information management and of adhering to standard processes and working methods cannot be underestimated, particularly when handling complex interlinked datasets. Take the time to prepare a comprehensive AIR document detailing the planned uses of the AIM and the applicable parameters that will serve as a baseline document that can be referred back to.

Be clear scope AIM. The approach used on HES BIM Project involves 'mining' baseline geometric information (such as point cloud data) to extract minimum level of geometric definition to meet agreed information requirements. The AIM is a 3D database containing information to support operational management.

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The Scottish Futures Trust (SFT) is an independent company established by the Scottish Government with a responsibility for delivering value for money across public sector infrastructure investment

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