

# **BIM for Housing Associations**

Asset management in the 21st century

**Part one: the business case for BIM**

# **Part 1:**

# **The business case for**

# **BIM**

## **BIM for Housing Associations**

## **Asset Management in the 21<sup>st</sup> Century**

June 2021

# Contents

<b>Foreword .....</b>	<b>3</b>
<b>Executive summary .....</b>	<b>4</b>
How to use the documents .....	4
What's next? .....	5
<b>The business case for BIM .....</b>	<b>6</b>
External context .....	6
Systemic challenges .....	7
What is information management using BIM? .....	8
BIM for asset management – (AIM) operational phase .....	9
BIM4HAS' toolkit .....	10
ISO 19650 and the UK BIM Framework.....	11
Other relevant data standards .....	11
BIM for development.....	12
Implementing BIM .....	13
The cost of ignoring BIM .....	16
<b>Conclusion .....</b>	<b>17</b>
<b>Glossary .....</b>	<b>18</b>
<b>Contributors.....</b>	<b>20</b>
Funding supporters .....	20
Contributors.....	20
<b>Disclaimer.....</b>	<b>22</b>

## Foreword

You will probably have seen the BIM (Building Information Modelling) acronym frequently used since the tragic fire at Grenfell Tower in 2017, because of the building information issues the tragedy exposed.

This led Dame Judith Hackitt to recommend, among other things, that a new regulatory system for building safety include a requirement for a ‘golden thread’ of information about a building. The golden thread of building safety information is now officially defined and highlights the need for a better process for producing, managing, using and updating information throughout the entire lifetime of a building.

BIM is a good way for housing associations to meet this requirement. We believe it is the best way to manage information and has benefits for housing associations that go far beyond the critical task of ensuring residents’ safety.

BIM4Housing Associations (BIM4HAs) was formed in 2018 to accelerate BIM uptake in the housing association sector. Safety was the primary motivation, but we also wanted to support increased efficiency and help empower informed decisions.

Our objective was to demystify BIM and make it more accessible. We wanted to provide peers with tools and guidance on how to use BIM in our sector.

We are delighted to present this toolkit for anyone to use. It is the output of a large collaborative effort, mostly of donated time from housing associations and leading architectural, engineering and specialist consultancies, as well as employer’s agents and main contractors.

This document sets out the business case and outlines the initial steps to enable an executive team to decide whether to provide the high-level endorsement essential to begin BIM integration. If you’re interested in understanding more about the advantages of BIM and want to move your organisation forward in adopting it, we sincerely hope this set of documents is useful.



## Executive summary

In the context of the Grenfell Tower tragedy, the Hackitt Review and the Building Safety Bill, there is strong impetus to manage the creation, handover and retention of vital building and fire safety information, as a minimum.

BIM (Building Information Modelling) is the managed scoping, production, checking and delivery of digital asset information. BIM can therefore help housing associations meet and maintain Building Safety Cases (an expected requirement for higher-risk buildings in the new regulatory regime). An accurate and reliable information model will bring other benefits including easing procurement and handover, assisting asset management and reducing cost and waste.

However, whilst housing associations are well placed to benefit from integrating BIM processes into their development and asset management strategies, few hold sufficient information about their projects, and even fewer in digital form.

At BIM4HA, we have developed a toolkit of resources compliant with the latest standards, which together, with this report will provide a guide to start implementing digital processes.

## How to use the documents

The toolkit and its supporting documents are free to download and use. Please make sure you read the guidance and the disclaimers to make the best use of the toolkit.

The diagram below identifies which documents are more relevant by function:

	Executive	Asset Management	Building Safety	Development	Contractors and Consultants
<b>Who should read:</b>					
<b>Part 1: The Business Case for BIM (this document)</b>					
The Business Case for BIM					
<b>Part 2: Toolkit and Guidance</b>					
Guidance Document					
What is in the box and how to use					
Equivalency Table of Definitions					
<b>Toolkit Items</b>					
Scopes of Services (SoS)					
Organisation Information Requirements (OIR)					
Asset Information Requirements (AIRs)					
COBie Spreadsheet of Asset Information					
Exchange Information Requirements (EIRs)					
Master Information Delivery Plan (MIDP) Example					
Diagram: Hierarchy of Information Requirements					
Diagram: BIM Implementation					
Asset Spatial Hierarchy Example					
Essay: BIM for Existing Buildings					

## What's next?

BIM4HAs has set up a forum to support best practice and provide opportunities for feedback and questions from users of the toolkit. We will also be using the online community to share updates and additional resources, provide feedback on the benefits from those who are using the toolkit and develop other initiatives. The forum is hosted on Microsoft Teams and is open to anyone in the sector involved or interested in collaborating on BIM implementation.

To download the toolkit and join the BIM4HAs' forum please visit [housing.org.uk/BIM4HAs](https://housing.org.uk/BIM4HAs).

If you have any questions about the toolkit or would like further information, please do not hesitate to email us at [BIM4HAs@ukbimalliance.org](mailto:BIM4HAs@ukbimalliance.org)

# The business case for BIM

## External context

The 'Building a Safer Future Independent Review of Building Regulations and Fire Safety: Final Report' detailed unanimous concerns on the ineffective creation, handing over and ongoing management of vital building and fire safety information.<sup>1</sup> In a sample of 44 investigations<sup>2</sup> into external wall materials within the residential sector since the Grenfell Tower fire, not a single organisation held complete or accurate 'as-built' plans, documentation or data.

As a result, the Industry Safety Steering Group,<sup>3</sup> chaired by Dame Judith Hackitt, has consistently maintained the value and importance of developing and managing a golden thread of building safety information<sup>4</sup>. The Ministry of Housing, Communities and Local Government (MHCLG) are consulting with registered housing providers on defining and bringing the golden thread into operation to inform the Building Safety Bill that will bring in new requirements for higher-risk buildings.

"There needs to be a golden thread for high-rise residential and complex buildings so that the original design intent, and any subsequent changes or refurbishment, are recorded and properly reviewed."

Dame Judith Hackitt  
December 2017

### Safety case:

A structured and compelling argument with relevant and comprehensive supporting evidence<sup>4</sup>.

The government intends to publish standards setting out what digital requirements the golden thread of information will have to meet. Whether or not it stipulates that duty holders must use BIM, we are confident that integrating BIM into development and asset management activities is the most efficient means of confidently evidencing the golden thread for safety and compliance purposes.

<sup>1</sup> Building a Safer Future Independent Review of Building Regulations and Fire Safety: Final Report  
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/668831/Independent\\_Review\\_of\\_Building\\_Regulations\\_and\\_Fire\\_Safety\\_web\\_accessible.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/668831/Independent_Review_of_Building_Regulations_and_Fire_Safety_web_accessible.pdf)

<sup>2</sup> PRP Architects Development Consultancy

<sup>3</sup> Building a Safer Future: Independent Review of Building Regulations and Fire Safety, Chapter 8 'Golden Thread of Building Information'.

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/707785/Building\\_a\\_Safer\\_Future\\_-\\_web.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/707785/Building_a_Safer_Future_-_web.pdf)

<sup>3</sup> Industry Safety Steering Group Terms of Reference

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/982823/ISSG\\_terms\\_of\\_reference.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/982823/ISSG_terms_of_reference.pdf)

<sup>4</sup> T Kelly (2008) Are Safety Cases Working? Safety Critical Systems Club Newsletter 17 (2), 31-33

<https://www-users.cs.york.ac.uk/~tpk/2008scscarticlekelly.pdf>

There are also significant additional benefits from taking BIM forward into your business. The Centre for Digital Built Britain summarises these as including<sup>5</sup>:

- Efficiency through the lifecycle of a building (or group of buildings).
- Increased productivity, which accelerates delivery.
- Eliminating risks and assisting health and safety planning.
- Improved prediction and reduction of the whole lifecycle costs.
- Better data management reducing waste.
- Value through smarter decision-making.
- Better stakeholder engagement.

## Systemic challenges

Alongside the requirements that will soon be enacted by the Building Safety Bill, housing associations face several systemic issues which impair information management and negatively impact building maintenance costs and management time.

For example, it took several months after the Grenfell Tower fire for our sector to establish that there were 168 Aluminium Composite Material (ACM) clad buildings. Typical data-based systems describe external walls with a word or two: 'cladding', 'metal' and nothing on the type of insulation. The lack of sufficient data prompted urgent reviews of other building information, such as plans, documents or product literature for these relatively new buildings. These reviews often found that information was incomplete or inaccurate. In many cases only site inspections could determine if ACM cladding was present or not.

Large amounts of time and money are absorbed searching for essential building information across our sector. Searching for a recalled component or other detailed information suffers from:

- The standard of information from providers is poor.
- Information is not organised or stored consistently.
- Processes for exchanging information vary.

Were you aware that VK457 Concealed Pendant Sprinklers also sold in the UK were recalled<sup>6</sup>?

Generally, they react to fire, but tend to also activate for no reason and flood homes.

Have any of these or other recalls?

Know where to start looking?

---

<sup>5</sup> Centre for Digital Built Britain. Key Benefits of BIM <https://www.cdbb.cam.ac.uk/BIM/key-benefits-bim>

<sup>6</sup> <https://www.vk457sprinklersettlement.com/Home/SubmitClaim>

The root cause of inefficiency lies not with the limitations of the typical databases that we all use, or the state of information received by main contractors building new homes. Our service providers deliver on the information standards that we set. It is our responsibility as clients to articulate our project and asset information requirements correctly and to check then accept what is transferred to us.

But it would be wrong to say that housing associations are at fault. This is because building information management is a complex subject. The issues are systemic. There are no easy solutions like ‘off the shelf’ software or Operations and Maintenance data standards to insert into construction contracts.

## **What is information management using BIM?**

BIM is a process for managing all types of project and asset information digitally. It is a means of producing, managing, using and updating information throughout the entire lifecycle of a building.

The term ‘BIM’ is often associated with powerful 3D design software but, in fact, BIM is more focused on how clients, consultants, designers and contractors work together to deliver the information needed for the ongoing management of an asset.

BIM’s evolution as an important methodology for development and asset management started some time before the Grenfell Tower fire. The coalition government published its Construction Strategy in 2011, which included setting out a BIM mandate setting minimum BIM requirements on centrally-procured public projects<sup>7</sup>. This was soon followed by a Publicly Available Standard (PAS) 1192 for implementing BIM in 2013-14<sup>8</sup>. Early projects demonstrated significant value from purpose-driven, structured, verified and validated information created by managed exchanges in a collaborative and secure environment.<sup>9</sup> This knowledge and experience is consolidated into the ISO 19650 international suite of standards, which were first released in 2018 and 2020<sup>10</sup>, providing robust, mature and definitive BIM guidance.

---

<sup>7</sup> <https://www.gov.uk/government/publications/government-construction-strategy>

<sup>8</sup> PAS 1192-5: 2015 Specification for security-minded building information modelling, digital built environments and smart asset management. [https://www.designingbuildings.co.uk/wiki/PAS\\_1192-5:2015](https://www.designingbuildings.co.uk/wiki/PAS_1192-5:2015)

<sup>9</sup> See, for example, PWC’s BIM Level 2 Benefits Measurement Methodology (March 2018) available here:

[https://www.cdbb.cam.ac.uk/files/3\\_pwc\\_benefits\\_measurement\\_methodology.pdf](https://www.cdbb.cam.ac.uk/files/3_pwc_benefits_measurement_methodology.pdf)

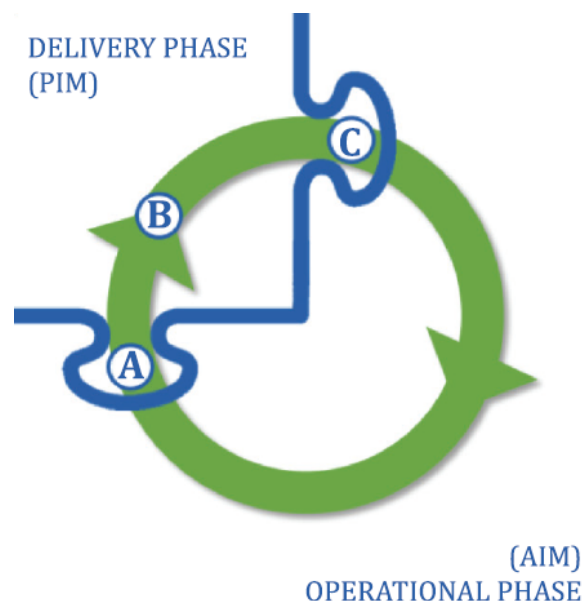
<sup>10</sup> BS EN ISO 19650-1:2018 Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 1: Concepts and principles Part 2: Delivery phase of the assets Part 3: Operational phase of the assets.

The new ISO and guidance from the UK BIM Framework Website <https://www.ukbimframework.org/standards-guidance/> and <https://ukbimframework.org/resources>

This guidance is applicable to housing associations' activities including:

- Development.
- Asset management.
- Building safety.

Part 1 of ISO 19650 on Concepts and Principles sets out the lifecycle of a BIM project into asset information management in a deceptively simple diagram. This illustrates the importance of continuous improvement and places greater emphasis on managing buildings after they are built.



Key:

- A. Brief by housing association to a project team's PIM.
- B. Design intent model becomes the virtual construction model.
- C. The delivery phase uses the model and defines handover information.

**PIM: Project Information Model** relevant for constructing new buildings

**AIM: Asset Information Model** reflecting the maintenance and management portion of a building's lifecycle.

Diagram 1: Source: BS EN ISO 19650-1:2018

## BIM for asset management – (AIM) operational phase

BIM processes are just as applicable to existing assets as to new builds. Part 3 of the ISO 19650 series is dedicated to the asset management phase and is highly relevant to housing associations for improving the capture, transfer and storage of information and data. The UK BIM Framework (the standards and guidance supporting BIM) contains guidance specific to ISO 19650-3.

The rationale for change is clear: if we had held even partial data on our external walls, ACM remediation could have been faster and less costly. Looking ahead, having the right level of accurate information and data will allow us to respond quickly and effectively to a product recall. Crucially, through the provision of a golden thread<sup>11</sup> of building information, develop evidence-based Building Safety Cases, which will be a requirement for higher-risk buildings in the new regulatory system.

<sup>11</sup> Golden Thread Definition and Principles, Building Regulations Advisory Committee (BRAC) Golden Thread Working Group  
<https://www.cibse.org/news-and-policy/policy/golden-thread-definition-and-principles>



Creating and storing information and data using externally recognised structures and processes provides benefits beyond compliance. Interoperable data can be used with any system and at all stages of a building's lifecycle. This creates efficiencies because information exchanges become easier to repeat, audit and automate. This is particularly significant because of the large number of organisations (including supply chain) and their respective data systems that are involved in the management of assets.

The golden thread is both the information that allows a building operator or manager to understand a building and the steps needed to keep both the building and people in and around it (including emergency responders) safe, now and in the future.

Building Regulations Advisory Committee  
Golden Thread Working Group May 2021

BS EN ISO 19650-3:2020 'Operational Phase of Assets' recommends that asset owners should predefine 'trigger events' for deploying BIM to update records proportionately and sets out a process that housing associations can adopt and then adapt for their organisation.

Initial Building Safety Cases are used as trigger events for enhancing and restructuring data, documents and plans. Capital works on existing assets, including change of use and cyclical building fabric renewals are other examples of trigger events for updating asset information models. Updating records within organisations should be a constant and dynamic process so repairs, for example, are accurately recorded, ultimately providing a single version of the truth.

There are short-term costs but long-term benefits of adopting established digital processes and data standards. For example, if data was structured for interoperability, updating building records would be more efficient, accurate and scalable across systems.

## **BIM4HAs' toolkit**

The existing standards are useful but not ready for deployment, because they are still generic for use across different sectors. This presents a challenge for any client in any sector new to BIM. The BIM4HAs project was launched to help overcome this challenge in the housing association sector and we have produced a series of resources, tailored for housing associations, to enable you to deploy BIM within the design and build context.

The project work began with asset managers from member housing associations compiling their asset information requirements. Leading consultants, architects, engineers, main contractors and BIM information managers translated these into a standard set of documents aligned to the very latest standards and according to best practice. Experts from the UK BIM Alliance supported this by systematically conducting peer reviews of each asset.

The toolkit is now available and is free for anyone to use. It includes:

1. Scopes of services
  - a. A matrix of tasks to define your strategy and then to deliver a development project.
  - b. Written for insertion into appointments and contracts.
2. Asset Information Requirements (AIRs)



- a. Define what is needed for safety, compliance, asset management and repairs.
  - b. Includes an example Construction Operations Building Information Exchange (COBie) sheet for building and component data.
- 3. Exchange Information Requirements (EIRs)
  - a. Sets out the 'how'.
  - b. Includes an example Master Information Delivery Plan (MIDP) which sets out who will be providing what, at what stage and at what Level of Information Need.
- 4. Organisation Information Requirements (OIRs)
  - a. Describe the information required by an organisation for asset management systems and other organisational functions.
- 5. Guidance
  - a. Outlines how to use the items in the toolkit.
  - b. BIM for Existing Buildings – a report by asset managers on digitising existing asset information.

## ISO 19650 and the UK BIM Framework

The body of work described above would not be scalable if it were not produced according to BS EN ISO 19650 and the guidance supplied through the UK BIM Framework.

Although the ISO 19650 series authoritatively defines BIM concepts and sets out robust processes, the framework it provides is generic and applicable to any type of contract across the construction and property sectors. This is part of its strength: it is recognised and scalable.

But these provisions are not intended simply to be inserted into contracts. They require substantial client input to define what information requirements are, how the data is to be exchanged and where it should go and be used. Much of that initial work has been completed by BIM4HAs to accelerate housing associations' progress, but the toolkit must still be adapted to suit your organisation's specific needs.

## Other relevant data standards

Since 2018, an expert-led collaborative effort of over 140 housing associations was delivered by HACT UK Housing Data Standard and powered by OSCRE<sup>12</sup>. It effectively defined Organisation Information Requirements for almost any housing association, known as the HACT Data Standard<sup>13</sup>. This body of work expanded when a new Development Handover Data Standard was delivered in late 2020. This standard already includes the BIM4HAs' Asset Information Requirements as 'Asset Inventory'.

They are, like this toolkit, available free of charge. We suggest you also consider adopting these standards that dovetail with the toolkit. They will help accelerate BIM implementation and integration within your organisation. Like the BIM4HAs' toolkit, the HACT standards are acknowledged by the Industry Safety Steering Group, Building Regulations Advisory

<sup>12</sup> OSCRE <https://www.oscre.org/About-Us>

<sup>13</sup> <https://www.hact.org.uk/DataStandard>

Committee and MHCLG's Golden Thread initiative, mitigating any perceived misalignment with eventual regulatory regime.

## **BIM for development**

The toolkit is more evolved to instruct BIM in the capital/development phase and help to design and construct buildings more efficiently. During a project, if the client defines their asset and project information requirements comprehensively, BIM can drive the production of complete and accurate asset management data and documentation to benefit the occupation phase. The toolkit has an articulated set of baseline requirements which reduces costs for those using it.

There are nonetheless costs associated with enabling BIM within a housing association adopting this approach, both at a programme level and instructing it at a project level, but these are quickly balanced against the savings and benefits.

One early BIM adopter confirmed a project with fully integrated BIM cost less than 0.5% of the build cost of a 180-unit scheme. The tools and technology are well established in the supply chain. BIM4HAs' participants agree that service providers are ready and waiting for client leadership.

A recent Chartered Institute of Builders Golden Thread report<sup>14</sup> on a sector survey confirms this readiness and revealed culture to be the foremost obstacle. The potential for housing associations to instigate positive change is significant and these benefits demonstrate why housing associations should at least consider implementing BIM:

- **Designs** – the design phase is underpinned with a robust set of information requirements to ensure that housing associations are specific about information deliverables from the start. Housing associations can better monitor and assure quality, helping increase efficiency within a design team. The result is better value for money from a well-coordinated and more complete design.
- **Construction** – risks are reduced. Better design information from a BIM-enabled client and consultant team makes cost, programme, performance and risk estimation more accurate. Variations during construction are reduced. Even without a BIM design, data standards can still be introduced before construction begins in order to create good handover information.
- **Handover** – information is structured according to recognised standards. This 'machine readable' information allows automated validation and upload into any native systems.
- **Quality** – buildings with fewer issues are delivered. Accurate, complete and trusted data is well-structured, so it is easier to update and maintain the golden thread of building information for the life of the asset.

---

<sup>14</sup> <https://www.ciob.org/media-centre/news/ciob-and-i3pt-launch-golden-thread-report>

## Implementing BIM

We shouldn't underestimate the challenge of defining the level of building information needed, then going on to instruct and maintain it. We encourage housing associations to make it a strategic concern, given the benefits it could bring over the longer-term. Executive sponsorship and leadership across asset management, building safety, development and IT is needed, all with a sustained effort. Only collaboration will maximise the gains and minimise overall effort.

ISO 19650 standards recommend starting any BIM project with clearly defined Organisational Information Requirements (OIRs). These are at the top of the hierarchy of information. Diagram 2 shows where we have adapted the guidance for the housing association sector. BIM4HAs' members and Buildings Client Group<sup>15</sup> agree starting pilot projects with these in hand would be 'correct' and certainly ideal.

But this may not be a realistic expectation and it is not a prerequisite to starting a pilot. Diagram 3 on page 16 shows one way forward. It is an implementation plan for a housing association's development programme, aligned with the RIBA work stages, but stages 0 and 1 describe strategic steps for diagnosing information needs and enabling a consistent BIM approach for your projects. Inserting BIM enablers from the toolkit can be done at RIBA work stage 2 or 3. Note the steps at 0 and 1 in Diagram 3 reflect ISO BS 19650 guidance cited above.

Getting BIM off the ground or into projects will not happen for free. This is new and features more work. First external expertise to support your strategy will probably be needed. Those who have already adopted BIM would recommend not looking for single source solutions software systems or expecting BIM benefits without committing to change. Technology and expertise are important, they are the only tools to support people managing building information more efficiently and effectively.

New external skills from BIM information managers will be recommended for your deployment but our supply chain of designers and contractors today are able to deliver in varying degrees. To support procurement, we offer clear robust schedules of services. These are aligned to RIBA work stages, reflected in Diagram 3. This is also a very good resource to analyse BIM workflows in detail.

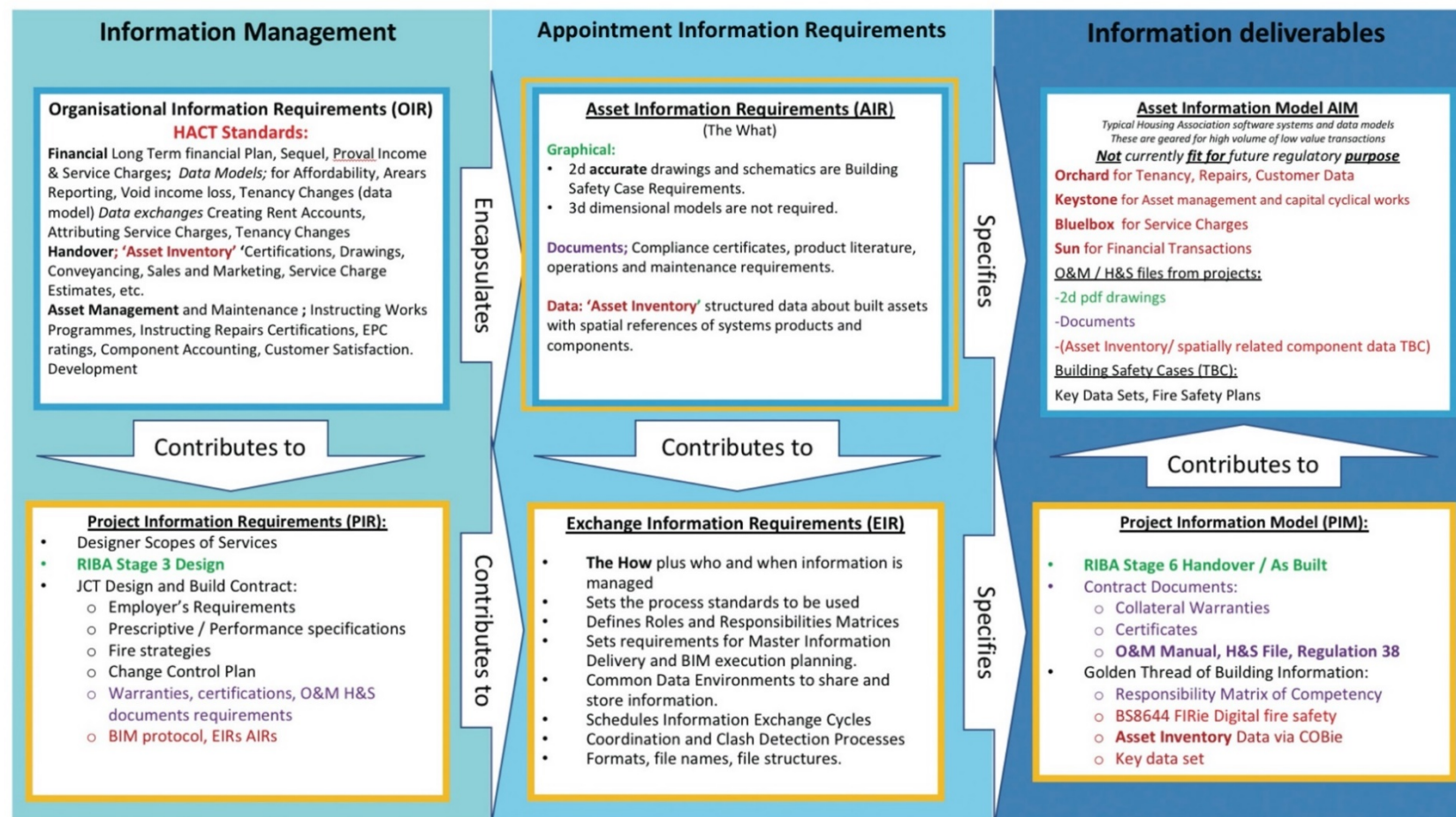
---

<sup>15</sup> <https://www.cdbs.cam.ac.uk/AboutCDBB/WorkingGroups/buildings-client-group>

Diagram 2: Hierarchy of Information Requirements. Information categories are colour coded.

# Hierarchy of Information Requirements

Adapted for Housing Association Use



Key: Blue Boxes – Typical HA Existing and Corporate Information. Orange Boxes Development Project Information. Green Graphical Items, Purple Documents, Red Data.

Registered office: Lion Court, 25 Proctor St, Holborn, London WC1V 6NY  
 020 7067 1126 | housing.org.uk | National Housing Federation Limited,  
 trading as National Housing Federation. A company with limited liability.  
 Registered in England No. 302132



Diagram 3: BIM implementation plan

# BIM Implementation

Aligned with the RIBA Plan of Work 2020



Aligned with the RIBA Plan of Work 2020

RIBA  
Plan of Work  
2020

Strategy			Project		Review		
0 Define the organisation's BIM Strategy	1 Prepare BIM Briefing	2 Procure BIM Design services	3 Coordinate BIM design	4 Procure Contractor and Technical BIM	5 Deliver BIM Construction	6 Verify BIM handover	7 Finalise BIM
0.1 Nominate Executive sponsor(s) and empower an accountable lead	1.1 Define and execute an internal BIM implementation plan	2.1 Define BIM objectives for the project	3.1 Monitor design team's BIM Performance	4.1 Issue BIM project specific BIM contract documents, EIRs, AIRs, BIM information Protocol, BIM specific JCT Contract Amendments	5.1 Verify preconstruction Building Safety and Golden Thread Information	6.1 Validate Final Handover Digital Information (General, Building Safety and Golden Thread Information etc.)	7.1 Update to the Project Information from 12 months Defects Rectification Period (DRP), Post Project Reviews and evaluations
0.2 Clarify the BIM process, outline its benefits, costs and organisation wide impacts	1.2 Obtain BIM information management expertise	2.2 Adapt designer scopes of services and construction contracts	3.2 Verify compliance of: a. BEP b. DRM c. MIDP d. CDE	4.2 Assess contractor BIM capability and capacity responses, pre appointment BIM Execution Plans (BEP).	5.2 Receive and validate Data Drop Three	6.2 Archive 3d model	7.2 Review BIM performance and integrate lessons learned into standard documentation and processes
0.3 Analyse existing building information management for gaps against standards, best practices and emerging compliance requirements	1.3 Define roles and responsibilities and	2.3 Issue BIM project specific BIM enabling docs (EIRs, AIRs)	3.3 Use BIM to manage design team performance	4.3 Validate Contractors proposed: BEP (DRP), MIDP			
0.4 Decide strategies scope and focus, new buildings, existing buildings, size and scale, etc.	1.4 Employ BIM expertise/ Information Manager	2.4 Assess designer BIM capability and capacity responses, pre appointment BIM Execution Plans (BEP)	3.4 Verify Golden Thread of Building Safety Information				
	1.5 Produce standard set of BIM enabling documents (EIRs, AIRs, etc.) for organisational wide use	2.5 Appoint team, Coordinate BEPs	3.5 Audit Clash Detection to measure BIM benefits				
	1.6 Decide Common Data Environment (CDE) approach	2.6 Establish a CDE					
0.5 Formally Adopt BS 19650, BS 8644, HACT Development Handover standards, etc.	1.7 Commit to improving internal information management, handover	2.7 Validate design team's proposed: Coordinated BEP, Design Responsibility Matrix (DRP), Master Information Deliver Plan (MIDP)	3.6 Receive and validate Data Drop one	4.4 Receive and validate Data Drop Two	5.2 Receive and validate Data Drop Three	6.3 Receive and validate Data Drop Four	7.3 Update internal Asset Information Model (AIM) from Project Information.
	1.8 Update EIRs AIRs etc. by applying lessons learned from 7.4		3.7 Initiate 'Property Creation' of Project in internal Asset Information Model (AIM) from Project Info	4.5 Update internal Asset Information Model (AIM) from Project Information	5.3 Update internal Asset Information Model (AIM) from Project Information	6.4 Update internal Asset Information Model (AIM) from Project Information.	7.4 Review internal information processes and update as appropriate.

Association

April 2021 | Version 1.0 | Part of the BIM for Housing Associations Toolkit

Key: Development Team:  Asset Information Management:  Project Team:

Registered office: Lion Court, 25 Proctor St, Holborn, London WC1V 6NY  
020 7067 1126 | housing.org.uk | National Housing Federation Limited,  
trading as National Housing Federation. A company with limited liability.  
Registered in England No. 302132

## The cost of ignoring BIM

One of the BIM4HAs' working groups was dedicated to finding and sharing case studies to demonstrate the benefits of adopting BIM. There was little housing association specific evidence, but a robust body of work from Price Waterhouse Coopers on financial BIM benefits across the property lifecycle<sup>16</sup> is relevant to our sector and the current challenges we face.

For most of us, these include the financial and management resources needed for implementing the requirement for a golden thread of building safety information for higher-risk buildings, which will be legislated for under the Building Safety Bill. In parallel, there are aims in the Social Housing White Paper around being safe in the home and knowing how landlords are performing. We are also facing higher design and construction quality requirements to achieve zero carbon goals.

One relevant example relates to information requirements for higher-risk buildings. MHCLG estimated that it will cost £6,600 - £10,400 for a Building Safety Manager (BSM) managing 7-11 buildings<sup>17</sup> to maintain a building safety case per building per year. Professional fees for structural and fire consultants are estimated to range from £2,300 to £8,100 per building. Higher-risk buildings would be exposed to £8,900 to £18,500 but giving BSM's robust and efficient BIM supported systems for maintaining the golden thread to evidence safety cases should lower consultant fees, as their research and investigation time is reduced. Even achieving the median cost per building of £13,700 supports the business case for BIM.

"These costs will fall on our industry, particularly impacting social landlords and by consequence their residents. But we can reduce the impact to both social landlords and residents if we digitise and standardise the Golden Thread to collect and manage the Building Safety Cases. By having a standardised digital golden thread, this will bring efficiencies, from analysis of economic assessments published by MHCLG this will reduce the costs of 20% or more. With the resulting controlled approach to managing building safety information, it will also reduce the risk in complying with legislation."

Johnny Furlong, Head of BIM, L&Q

---

<sup>16</sup> <https://www.cdbb.cam.ac.uk/news/2018JuneBIMBenefits>

<sup>17</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/877521/A\\_reformed\\_building\\_safety\\_regulatory\\_system\\_-\\_economic\\_assessment\\_of\\_benefits\\_and\\_costs\\_to\\_the\\_gvt\\_response\\_to\\_the\\_Building\\_a\\_Safer\\_Future\\_consultation.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/877521/A_reformed_building_safety_regulatory_system_-_economic_assessment_of_benefits_and_costs_to_the_gvt_response_to_the_Building_a_Safer_Future_consultation.pdf)

## Conclusion

The BIM4HAS' toolkit would not have been possible without vital expert contributions. We estimate the time from experts from leading architectural, engineering and specialist consultancies, as well as employer's agents, easily exceeded £75,000 of value donated by those firms. Those individuals agree this work was also reliant on the hard work donated from participating housing associations. This is instructive for anyone seeking to implement BIM: collaboration is key to unlock benefits. Housing associations that have adopted BIM are providing feedback on the benefits of their BIM implementation plans, which are summarised below.

### **In asset management:**

1. Clear asset information requirements provide useable information from projects.
2. Reduced costs searching for information.
3. Increased accuracy of information.
4. Increased speed of remedial works.
5. Efficiencies in auditing, processing and reusing data.
6. Scalable systems.

### **In development:**

1. Digital evidence to demonstrate anticipated gateway requirements and compliance with the golden thread in higher-risk buildings.
2. Improved design outcomes and better quality in buildings.
3. Reduced construction risk and costs.
4. Improved validation of handover information.
5. Clear asset information requirements deliver information useable for safety and asset management from projects.

While we await the final version of the Building Safety Bill, it is unlikely specific BIM standards will be within it and it is unclear how BIM will feature as part of secondary legislation. In any case, we are confident that utilising BIM processes will fulfil the requirement for the golden thread and would be referenced in official best practice guidance in the future.

Regulatory compliance can be a key driver for change in the housing association sector. It certainly is a motivator for early BIM adopters. It will help us meet the spirit of these new laws and the letter of the eventual regulations. BIM's potential and scope is not limited to safety because of the wider benefits it offers throughout the building lifecycle for any housing association.

In this report, we have aimed to give you compelling evidence of the benefits of BIM. We hope that together with these free and proven resources, this report helps you use BIM to benefit your housing association.

You will not be alone if you embark on this journey either. The BIM4HAS' community is growing and invites any housing association – large or small, advanced or just starting – to join and collaborate to accelerate the uptake of BIM in our sector.



## Glossary

Abbreviation or acronym	Term
Actor	Person, organisation or organisational unit involved in a construction process.
Appointed party	Provider of information.
Appointing party	Receiver of information.
Appointment	Agreed instruction for the provision of information.
Asset	Item, thing or entity that has potential or actual value to an organisation.
Asset Information Model	Information model relating to the operational phase.
Asset information requirements	Information requirements in relation to the operation of an asset.
BIM execution plan	The BIM Execution Plan (BEP) is a necessary part for the development of a BIM project. It defines and ensures the actors who will intervene in a project, from the design and construction phase to the operation.
Building information modelling	Use of a shared digital representation of a built asset to facilitate design, construction and operation processes to form a reliable basis for decisions.
Capability	Measure of ability to perform and function.
Capacity	Resources available to perform and function.
Client	Actor responsible for initiating a project and approving the brief.
Common Data Environment	Agreed source of information for any given project or asset, for collecting, managing, and disseminating each information container through a managed process.
Delivery phase	Part of the lifecycle, during which an asset is designed, constructed and commissioned.
Delivery team	Lead appointed party and their appointed parties.
Digital Built Britain	Digital Built Britain is a partnership between the Department of Business, Energy & Industrial Strategy (BEIS) and Innovate UK to create a digital economy for infrastructure, buildings, and services.
Exchange information requirements	Information requirements in relation to an appointment.
Federation	Creation of a composite information model from separate information containers.
Information	Reinterpretable representation of data in a formalised manner suitable for communication, interpretation or processing.
Information container	Named persistent set of information retrievable from within a file, system or application storage hierarchy.
Information Delivery Plan	Lists information deliverables and sets out when project information is to be prepared, by whom, and using what protocols and procedures for each stage of the project.
Information exchange	Act of satisfying an information requirement or part thereof.
Information model	Set of structured and unstructured information containers.
Information requirement	Specification for what, when, how and for whom information is to be produced.
Abbreviation or acronym	Term

Key decision point	Point in time during the lifecycle when a decision crucial to the direction or viability of the asset is made.
Level of Information Need	Framework which defines the extent and granularity of information.
Lifecycle	Life of the asset.
Master information delivery plan	The Master Information Delivery Plan (MIDP), is a primary plan which is used to manage the delivery of information during the project lifecycle.
Operational phase	Part of the lifecycle, during which an asset is used, operated and maintained.
Organisational information requirements	Information requirements in relation to organisational objectives.
Project information	Information produced for, or utilised in, a particular project.
Project information model	Information model relating to the delivery phase.
Project information requirements	Information requirements in relation to the delivery of an asset.
Status code	Meta-data describing the suitability of the content of an information container.
Task information delivery plan	The Task Information Delivery Plan (TIDP) is a federated list of information deliverables by each task, including format, date and responsibilities.
Task team	Individuals assembled to perform a specific task
Trigger event	Planned or unplanned event that changes an asset or its status during its lifecycle, which results in information exchange.
UK BIM Alliance	The UK BIM Alliance aims to ensure BIM becomes business as usual whilst at the same time, transforming and future proofing the way the industry works.
UK BIM Framework	The UK BIM Framework sets out the approach for implementing BIM in the UK using the framework for managing information provided by the ISO 19650 series.

## Contributors

The BIM4HAs' toolkit would not have been possible without vital expert contributions. We estimate the time from experts from leading architectural, engineering and specialist consultancies, as well as employer's agents, easily exceeded £75,000 donated by those firms. Those individuals agree this work was also reliant on the hard work given freely from participating housing associations. This is instructive for anyone seeking to implement BIM: collaboration is key to unlock benefits.

We would like to thank all those who contributed to this report, including the following:

### Funding supporters

A2 Dominion  
Notting Hill Genesis  
Optivo  
Peabody  
Southern Housing Group  
Sovereign Housing

### Contributors

A2Dominion  
Airey Miller  
  
Altair Ltd  
Athenophilia Ltd  
Bond Bryan Architects  
  
BPTW  
  
BSI  
Building Better  
Buro Happold  
  
Calfordseaden Ilp  
Catalyst Housing  
Disruptive Innovators Network  
Great Places  
  
Hexagon  
Hill Group UK  
Homes for Lambeth  
Just Practising Ltd

Gary Bellinger  
Monika Kajtar  
Mark Pratten  
Shaun Kelly (Vice Chair)  
Henry Fenby-Taylor  
Emma Hooper  
Rob Jackson  
Kirsty Villiers  
Mark Waite  
Dan Rossiter  
Helen Greig  
Shaun Farrell  
May Winfield  
Varun Soni (Vice Chair)  
Robin Palmer  
Jenny Danson  
Emma Richman  
Martin Blakeley  
Adam Shepherd  
Tom Cannon  
Lloyd Connors (Vice Chair)  
Su Butcher (Project Manager)

L&Q Group  
London Borough of Hammersmith and Fulham

Max Fordham

Metropolitan Thames Valley Housing

MLM Group  
National Housing Federation

Network Homes  
Notting Hill Housing Group

One Housing  
Optivo

Origin Housing  
Other contributors

Patrick Wilson Architects Ltd  
Peabody  
Salix Homes

Savills  
Silver DCC

Southern Housing Group

Sovereign

The IET  
UK BIM Alliance

University of Salford  
Wandle  
Watford Community Housing

Johnny Furlong  
Kurtis Lee  
Rehan Khan  
Kathryn Donald  
John Gunstone  
Bill Watts  
Paul Marsh  
Niall O'Rourke  
Glenn Richardson  
Douglas Silverstone  
Tom Grantham  
Trina Chakravarti  
Claudia Esseen-Jayes  
Victoria Moffett  
Amy Walker  
Michael Kitching  
Rupesh Bhatt  
Kylie Bickford  
David Poat  
Nik Wedlake  
Jesse Meek  
Justin Chamberlin  
Glen Layzell  
Sanjiv Sangha  
Dritan Uka  
Ali Inman  
Amy Simmons  
Tommy Collins  
Patrick Wilson  
Catriona McCulloch  
Hannah Griffiths  
Paul Mooney  
Steve Martin  
Darren Nolan  
Dominic Soheil  
Sam Davidson  
Jack Ostrofsky (Chair)  
Peter Bailey  
Simon Carter  
Katie Lowe  
Mike Victory Rowe  
Rick Hartwig  
Pam Bhandal  
Sarah Davidson  
Christine Gausden  
Olajide Akintelure  
Kelly Privitera

## Disclaimer

The details in this report, guidance and attached template documents are for general information purposes only.

Nothing in these documents constitutes legal advice or gives rise to a solicitor/client relationship. Specialist legal advice should be taken in relation to specific circumstances.

Permission to reproduce extracts from ISO publications is granted by BSI Standards Limited (BSI) on behalf of ISO. No other use of this material is permitted. British Standards can be obtained in PDF or hard copy formats from the [BSI online shop](#).

© Copyright 2021 BIM for Housing Associations

# About BIM for Housing Associations

## Project participants

### Funded by

A2 Dominion  
Notting Hill Genesis  
Optivo

Peabody  
Southern Housing Group  
Sovereign Housing

### Contributions from

A2Dominion  
Airey Miller  
Altair Ltd  
Athenophilia Ltd  
Bond Bryan Architects  
BPTW  
BSI  
Building Better  
Buro Happold  
Calfordseaden Ilp  
Catalyst Housing  
Disruptive Innovators Network  
Great Places  
Hexagon  
Hill Group UK  
Homes for Lambeth  
Just Practising Ltd  
L&Q Group  
London Borough of Hammersmith and Fulham  
Max Fordham  
Metropolitan Thames Valley Housing

MLM Group  
National Housing Federation  
Network Homes  
Notting Hill Housing Group  
One Housing  
Optivo  
Origin Housing  
Patrick Wilson Architects Ltd  
Peabody  
Salix Homes  
Savills  
Southern Housing Group  
Sovereign  
The Guinness Partnership  
The IET  
UK BIM Alliance  
University of Nottingham  
University of Salford  
Wandle  
Watford Community Housing

## How to participate

Visit [housing.org.uk/BIM4HAs](https://housing.org.uk/BIM4HAs) to:

- Download the business case, guidance and toolkit.
- Join the BIM4HAs MS Teams Forum.

### In partnership with

National Housing Federation  
The UK BIM Alliance



SOVEREIGN

