

# Little book of BIM

**2021 edition**

**bsi.**

Inspiring trust for a more resilient world.

# Welcome to the BSI little book of BIM

In the contemporary built environment, projects are being designed, constructed and operated against a backdrop of powerful and complex pressures. With the right digital transformation strategies and support in place, your organization will have the tools you need to achieve and maintain resilience. Digital transformation, including Building information modelling (BIM), can help you build a sustainable, resilient organization.

This handy guide is your quick reference to some of the key terms which are commonly used in describing BIM and its related processes, as well as your link to the key standards.

This guide can be used by organizations across the supply chain.

The global adoption of BIM continues to accelerate, delivering a sustainable, resilient built environment. Since the publication of the international standard ISO 19650, it is vital you understand the principles of information management.

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## What is BIM?

BIM is a collaborative way of working underpinned by digital technologies. It uses a shared digital representation of an asset to facilitate design, construction and operation processes to form a reliable basis for decisions.

Greater efficiencies can be realized due to significant pre-planning during the design and construction phases, providing comprehensive information at handover stage.



# BIM standards

**PD 19650-0:2019** – Transition guidance to BS EN ISO 19650.

## **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. Concepts and principles

## **BS EN ISO 19650-2:2018**

Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) -Information management using building information modelling. Part 2: Delivery phase of the assets.

## **BS EN ISO 19650-3:2020**

– Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM). Information management using building information modelling. Operational phase of the assets.

## **BS EN ISO 19650-5:2020**

– Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM). Information management using building information modelling. Security-minded approach to information management.

## **BS 1192-4:2014**

– Collaborative production of information. Fulfilling employer's information exchange requirements using COBie. Code of practice.

## **PAS 1192-6:2018**

– Specification for collaborative sharing and use of structured Health and Safety information using BIM.

## **BS 8536-1:2015**

– Briefing for design and construction. Code of practice for facilities management (Buildings infrastructure).

## **BS 8536-2:2016**

– Briefing for design and construction. Code of practice for asset management (Linear and geographical infrastructure).

To discover the BIM standards, visit:

[ukbimframework.org/standards-guidance](http://ukbimframework.org/standards-guidance)

# Library object standards

## **BS 8541-1:2012**

– Library objects for architecture, engineering and construction. Identification and classification. Code of practice

## **BS 8541-2:2011**

– Library objects for architecture, engineering and construction. Recommended 2D symbols of building elements for use in building information modelling

## **BS 8541-3:2012**

– Library objects for architecture, engineering and construction. Shape and measurement. Code of practice

## **BS 8541-4:2012**

– Library objects for architecture, engineering and construction. Attributes for specification and assessment. Code of practice

## **BS 8541-5:2015**

– Library objects for architecture, engineering and construction. Assemblies. Code of practice

## **BS 8541-6:2015**

– Library objects for architecture, engineering and construction. Product and facility declarations. Code of practice

To discover library objects standards, visit:

[\*\*BS 8541 standards\*\*](#)

## **Additional international standards referenced in BSI BIM certification schemes**

### **BS ISO 44001:2017**

– Collaborative business relationship management systems. Requirements and framework.

### **BS EN ISO 9001:2015**

– Quality management systems. Requirements.

### **BS EN ISO 55001:2014**

– Asset management. Management systems. Requirements.

### **BS EN ISO/IEC 27001:2017**

– Information technology. Security techniques. Information security management systems. Requirements.

### **BS ISO 10004:2018**

– Quality management. Customer satisfaction. Guidelines for monitoring and measuring.

# BIM guiding principles

**BIM has formalized principles relating to how assets should be designed, built and operated to best realize an asset's value and potential offered by this new way of working.**

## People, processes and technology

BIM is not just about technology; it's a new way of designing, building and operating assets enabled by the use of technology. Equally, if not more fundamental than technology is the set of processes that should be followed (outlined within the ISO 19650 and BS/PAS 1192 series of standards) as well as the change in working practices at an operations level. This is best exemplified by the need for a collaborative approach across the supply chain.

## Collaborative engagement

One of the key success indicators of a project using BIM is the degree to which the supply chain has worked in collaboration to meet the project/asset needs. This means working openly as well as sharing information and experience with supply chain members in a way that encourages collective problem solving and coordination.

## Start with the end in mind

A key problem that is addressed by using BIM is the issue of rushed decisions being made with insufficient and/or incorrect information. Starting with the end in mind, these decisions are pushed "up-stream" so that they are better informed and do not present themselves unexpectedly. Examples of this include;

completing all principle design work and coordination before the commencement of construction, and ensuring that design decisions are being made across the entire delivery phase with respect to the operational performance and utilization of the asset (BS 8536).

## Digital asset

Having the right information available to the right people at the right time makes all the difference. When delivering a project, or managing an asset using BIM, it is critical that the information requirements of the project are specified clearly to the entire project team. Keeping focus on exactly what information is needed and when, its purpose, its format and how information will be shared, are all key aspects of better information management.

## Holistic approach to security

Once it has been identified what needs to be protected and the threats and consequences associated with this, (to ensure the security of a sensitive asset and sensitive information) a holistic approach should be adopted covering people, process, technological security and physical security.

# Terms and abbreviations

There are many terms which form part of the BIM language. Whilst not exhaustive, here are some of the common ones to look out for.

## **CDE – Common Data Environment**

A workflow to control the single source of information for any given project or asset. Used to manage the collection and dissemination of all relevant approved project/asset information. Used in combination with a digital storage solution, information is shared collaboratively in a logical and accessible way to help all key parties readily gain access to information, use consistent naming conventions, avoid duplication and retain ownership.

## **OIR – Organizational Information Requirements**

This specifies what information is required to achieve an organization's strategic objectives in relation to business operation, asset management, portfolio planning etc. The OIR may be developed from an ISO 55001 asset management system.

## **AIR – Asset Information Requirements**

This defines the information that is required, and the managerial and technical aspects of producing this information, for the operation of an asset.

## **EIR – Exchange Information Requirements**

This specifies the information that is required related to a specific appointment (contract). It includes responsibility, timescales, format and level of information need of the project information; consisting of the relevant information requirements from the OIRs, AIRs and PIRs.

## **PIR – Project Information Requirements**

This specifies the information that is required related to a specific project; consisting of the relevant information requirements from the OIRs and AIRs.

## **Level of Information Need**

This is a methodology to specify the granularity of information to support a given purpose. This should be defined as the minimum granularity to avoid over-production of information leading to waste.

## **Information standard**

This establishes requirements on the exchange of information, the structuring and classification of information, assignment of level of information need and use of information in the operational phase of the asset.

## **Information Production Methods and Procedures**

This establishes the methods and procedures required to be used when generating, reviewing, distributing or delivering information.

## **BEP BIM Execution Plan**

This specifies the delivery plan which will be undertaken by the delivery team as a response to the received tender documentation. It includes, amongst other things, who is responsible for providing information, as well as who will be undertaking which responsibilities within the delivery team.

## **Mobilization Plan**

This details the approach, timescales and responsibilities for the delivery team to be implemented during mobilization. This includes testing information exchanges between task teams and testing the proposed information production methods and procedures.

## **MIDP – Master Information Delivery Plan**

Developed from the BIM Execution plan, this is the primary plan for when information is going to be prepared, by whom and when. Each information deliverable will be aligned to a defined project delivery milestone.

## **TIDP – Task Information Delivery Plan**

This is a plan, developed by each task team, which is incorporated into the Master Information Delivery Plan based on the agreed responsibilities outlined within the BIM Execution Plan.

## **Risk Register**

This details the delivery team's risk associated with the timely delivery of information deliverables in accordance with the EIR. Considered risks include (amongst others), meeting the information delivery milestones and adoption of the project's information standard.

## **PIM – Project Information Model**

This is the aggregation of information developed during the design/construction phase of the project. Information that forms the PIM is created by the project team controlled by the CDE workflow. As the project develops so too will the PIM, which will increase in both size and accuracy; starting as a design intent progressing to a record of construction once complete.

## **COBie – Construction Operation Building Information Exchange**

This is a structured method of exchanging information about maintainable assets. COBie, often delivered as a spreadsheet, has a pre-defined structure that is used to share this information in both a human-readable and machine-interpretable manner.

## **AIM – Asset Information Model**

This is the aggregation of information needed to support the management and operation of the asset (infrastructure or building). The AIM is typically formed or updated using a subset of the PIM at the handover stage of a project. The AIM will continually be updated and developed as information is provided following works that affect the asset.



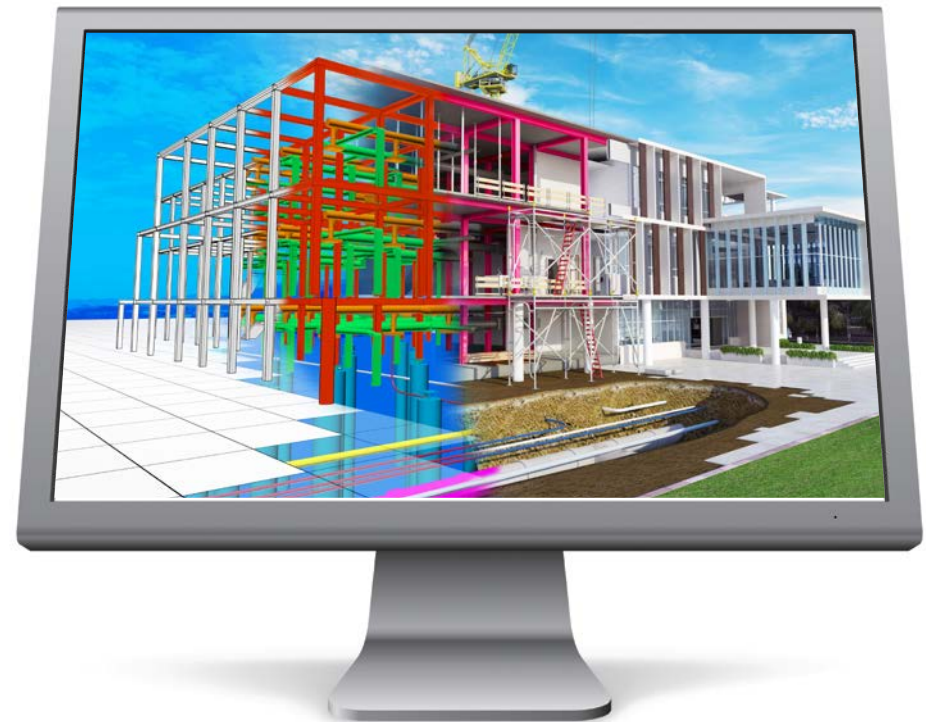
## Global BIM adoption

Governments around the world are accelerating the adoption of BIM, or are starting to introduce different requirements to embed the adoption of BIM, by mandating or setting conditions of contract for public works projects, infrastructure projects or projects defined by scale.

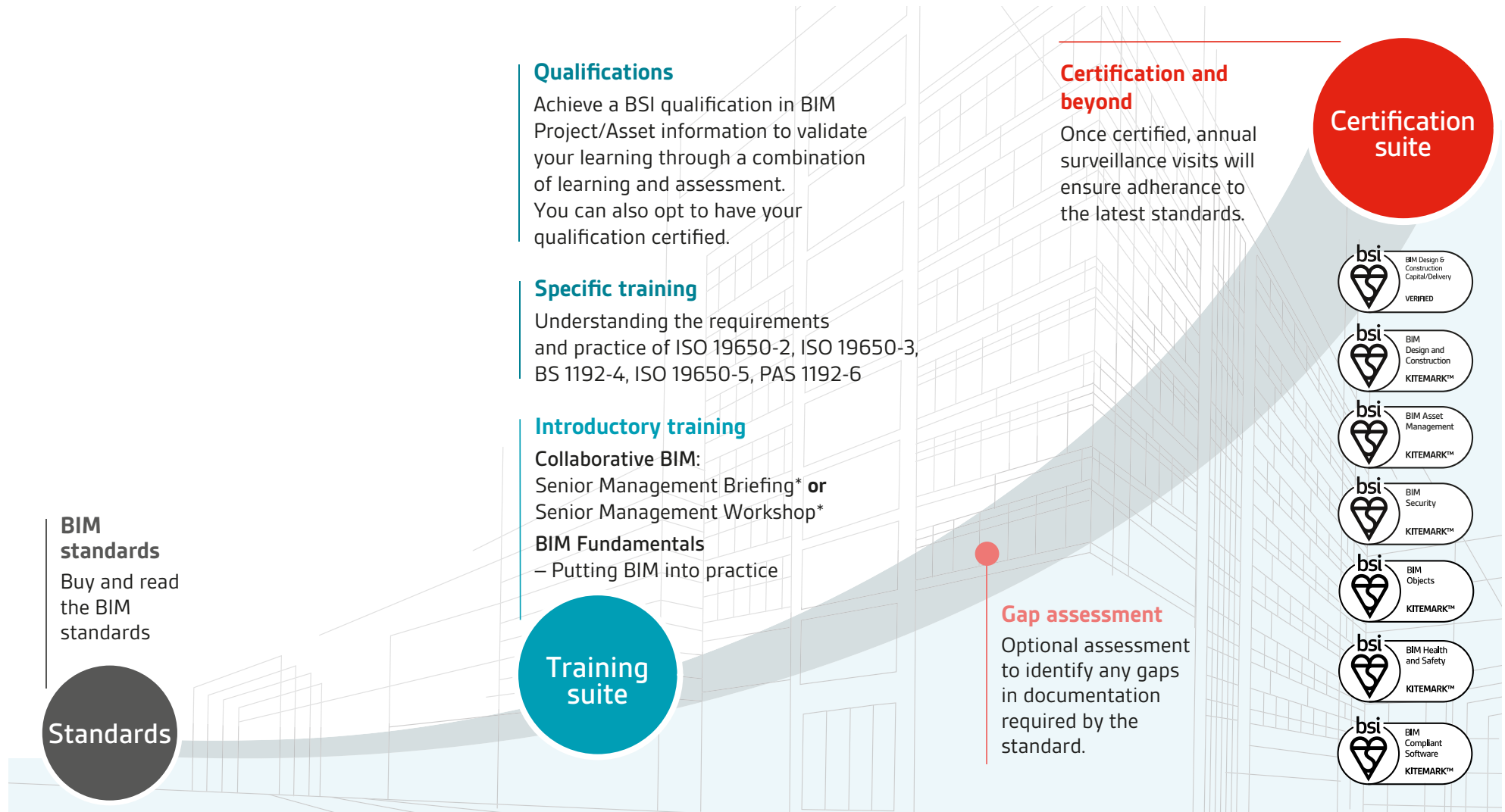
The publication of international BIM standards supports this adoption. These standards define the minimum requirements and give further recommendations on applying best practice.

Use of the internationally recognized BIM standards will help remove barriers to collaborative working and competitive tendering across borders. The international BIM standards offer the potential to act as a passport for organizations that embed them to gain access to international markets.

With the publication of ISO 19650, parts 1, 2, 3 and 5, BIM now has an internationally agreed definition. 'BIM according to ISO 19650' defines the minimum requirements and gives further recommendations to applying best practice to BIM.



# BSI BIM journey



## Standards for your BIM journey

British Standards Online (BSOL), our online standard management tool, gives you access to BIM standards and as well as over 9,000 standards related to the built environment, including construction and civil engineering-specific standards. Our standards are designed to help you establish best practice, build resilience, embrace new technologies and be fit for the future.

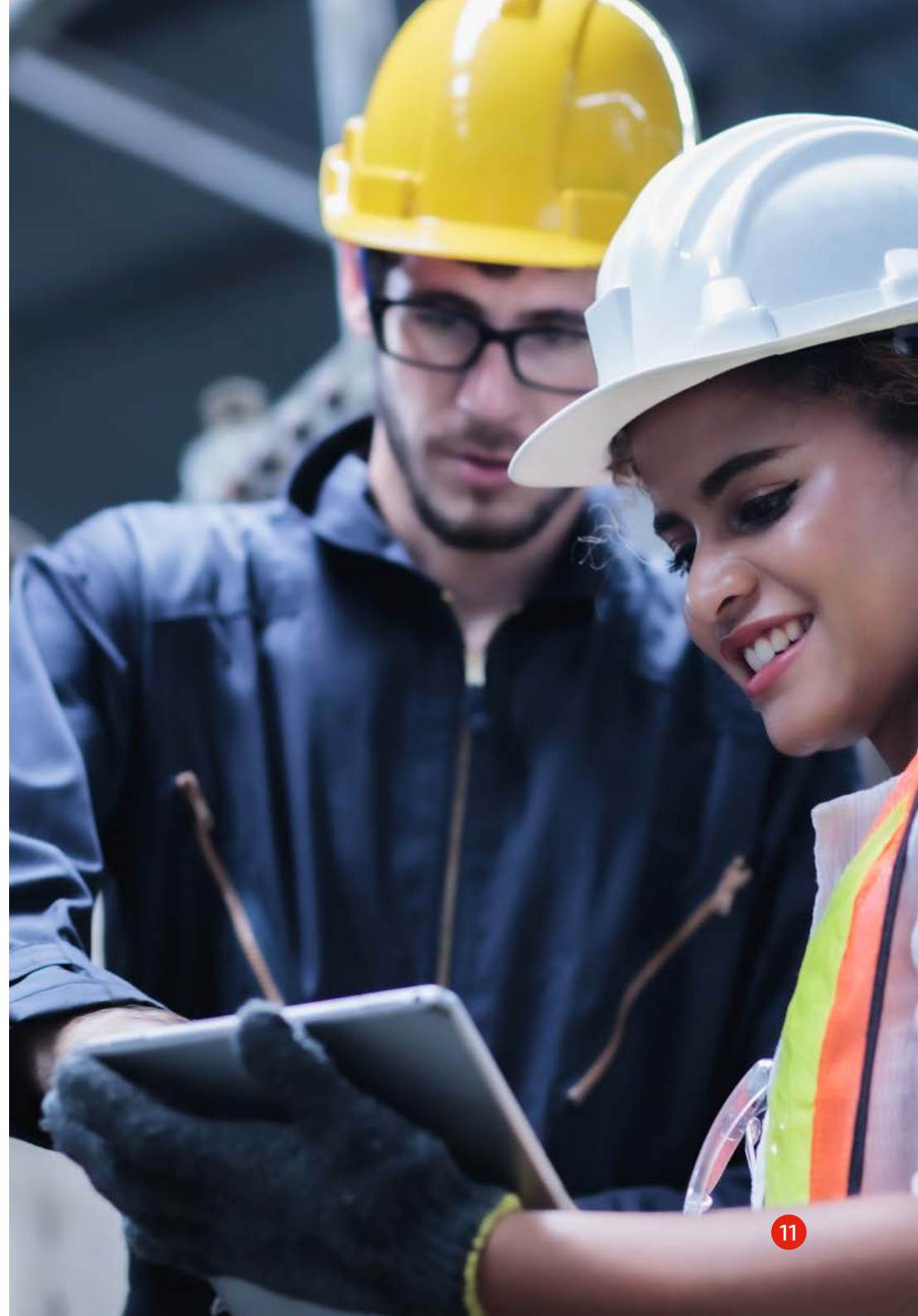
Access the standards you need in one place – BS, EN, ISO, PAS, IEC and ASTM standards. With BSOL, anyone in your organization that needs access to multiple standards can view and download them. Subscribe to pre-built modules or build a personalized standards collection.

### With BSOL you get:

- One access for all your standards
- Reduced risk within your organization
- Instilled trust with your clients

We have been serving clients who design, build, operate, or decommission assets since 1901, helping embed excellence across the globe to improve business performance and resilience.

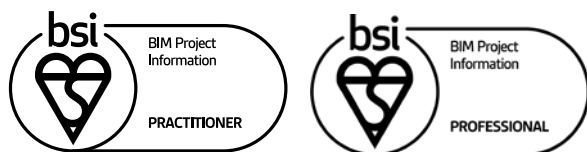
[bsigroup.com/en-GB/built-environment-bsol-uk](https://bsigroup.com/en-GB/built-environment-bsol-uk)



# Your learning journey with BSI

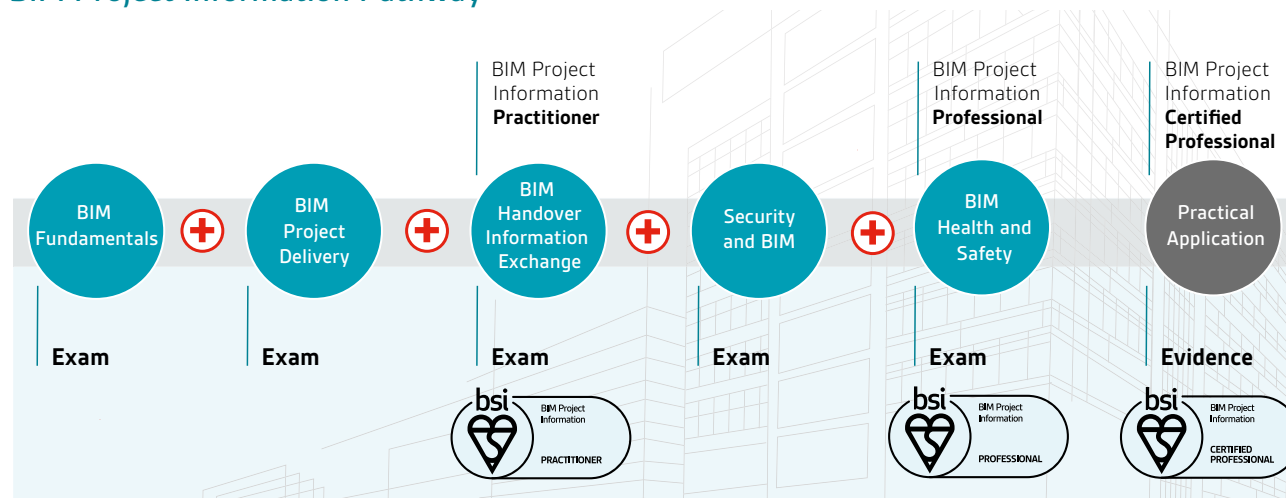
Do you have the right skills within your organization to meet current or future BIM projects? As BIM becomes business as usual, how can you ensure the competency of your teams and consistency on BIM projects?

Our BIM qualifications will give you a BSI Mark of Trust, reassuring your clients, bid-writers and project teams that your skills have been validated. You can achieve Practitioner or Professional status by successfully completing courses and their associated assessment.



Once you've achieved your BSI Professional qualification, and with the relevant three years' experience, you can choose to have your skills certified. The rolling three-year programme will provide evidence that your skills are experience-based and up-to-date.

## BIM Project Information Pathway



## BIM Asset Information Pathway



## General BIM standards training courses

### BIM Fundamentals – putting BIM into practice

This course is designed to raise your awareness and introduce you to the basic principles of BIM.

It will explain how BIM principles help to reduce waste in construction and asset management. We'll provide you with an overview of the standards that define BIM implementation and the fundamental processes of a Common Data Environment (CDE).

This course is ideal if you're adopting BIM practices into your organization or helping your clients or supply chains to adopt it.

It will be particularly useful for construction and asset management professionals including project managers, asset managers, designers, constructors, manufacturers, maintenance contractors, and information managers.

**Duration: two days**

### Collaborative BIM: Senior Management Briefing

This course will help you to understand the benefits of digitization, lean processes and collaborative approaches in the delivery and operation of assets (buildings and infrastructure).

It will provide an introduction to ISO 19650, the international series of standards for building information modelling (BIM). It will also provide an introduction to how clients and supply chains need to work together to manage project and asset information successfully.

Finally, the course will discuss the different types of change that are needed to put collaborative BIM into practice and enable you to start creating your own action plan for your organization's next steps.

Senior managers tasked with understanding and then championing collaborative BIM processes to their project delivery or asset management operations.

We strongly recommend you have experience of management engagement with project and asset portfolio activities.

**Duration: half a day**

### **Collaborative BIM: Senior Management Workshop**

This course will help you understand the benefits of digitization, lean and collaborative approaches in the delivery and use of assets. It will also provide an introduction to ISO 19650, for building information modelling (BIM), and collaborative working.

You'll be able to understand the methods for setting clear purposes and priorities as part of a BIM strategy, and gain an appreciation of UK PAS 1192-3 and BS 8536 for infrastructure and buildings.

This course is ideal if you're a senior manager tasked with introducing BIM to your organization, or if you're involved in BIM processes for project delivery and asset management.

**Duration: one day**

### **Building Information Modelling (BIM): Digital Built Britain, IoT and SmartCities**

Attention is now turning to the nature and implications of BIM and beyond; including social integration, Smart Cities (Communities), Geographical Information Systems (GIS), Internet of Things (IoT) and Smart Contracts.

This course will help you engage with the implications of the wider scope of built environment data and information management. You'll start to understand how you can exploit the opportunities that this might provide.

Please note that this course has been developed with a UK focus but it may still be of interest to you.

This course is ideal for clients, asset owners, designers, construction, commissioning and facility managers who may need to anticipate the latest developments in the creation and management of the built environment.

**Duration: one day**

## Specific BIM standards training courses

### BIM ISO 19650-2: Project Delivery

This course will help you understand the information management processes that are needed for a design and construction project to be delivered using BIM according to ISO 19650-2: Project Delivery Phase.

It follows on from the BIM Fundamentals course, where information management concepts and principles are introduced.

This course is ideal for project clients, designers (architects, structural and civil engineers, services engineers, etc.), main contractors and sub-contractors, manufacturers of complex products and components.

Asset and facilities managers will also find it helpful to find out how operational information is specified and delivered during a construction project.

**Duration: one day**

### BIM ISO 19650-3: Information Management in the Operational Phase

This course will help you understand the asset information management process set out in ISO 19650-3 and how this links with other parts of the ISO 19650 series. It follows on from the BIM Fundamentals course, where the subject of information management using collaborative BIM is introduced.

Asset managers and facility managers working on behalf of an asset owner or operator. Asset contractors or in-house teams delivering maintenance, repairs, minor refurbishment works, condition surveys.

People working on projects (client side or supply side) may find it helpful to understand how operational information gets specified by the asset owner/operator and incorporated into project Exchange Information Requirements.

**Duration: one day**

### **BIM BS 1192-4: Handover Information Exchange**

This course will help you obtain the benefits of COBie as the digital information exchange between design and supply chain, and the client or operator. It will give you an introduction to BS 1192 and collaborative working.

It also highlights the importance of clear Asset Information Requirements and a checkable digital Plan of Work.

This course is ideal if you're involved in communicating the benefits of BIM within your organization.

It is also particularly useful for design and construction managers charged with delivering COBie, typically within a BIM project.

**Duration: one day**

### **BIM 19650-5: Security and BIM**

This course will help you engage with the security implications arising from BIM according to ISO 19650. The course will guide you through the contents of ISO 19650-5 and how security impacts their roles (client, asset owner, designer, contractor, facilities manager, etc.).

This course is ideal for clients, designers, facilities, construction and commissioning managers who may need to implement security policies in relation to the built environment.

**Duration: one day**



### **BIM PAS 1192 Part 6: Health and Safety**

This course will help you understand the benefits of structured health and safety information and its digital information exchange amongst design and supply chain, and the client or operator. The importance of clear Asset Information Requirements (AIR) and a checkable digital Plan of Work will be emphasized.

This course is ideal for clients, designers, facilities, construction and commissioning managers charged with delivering health and safety within a collaborative or BIM project.

**Duration: one day**



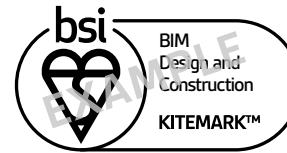
# BSI certification solutions

## BIM Verification for Design and Construction



Based on ISO 19650 (Parts 1 and 2), this has been developed for any organization involved in using BIM. It will help you demonstrate your BIM capability through independent and impartial third-party verification.

## BSI Kitemark™ for Design and Construction

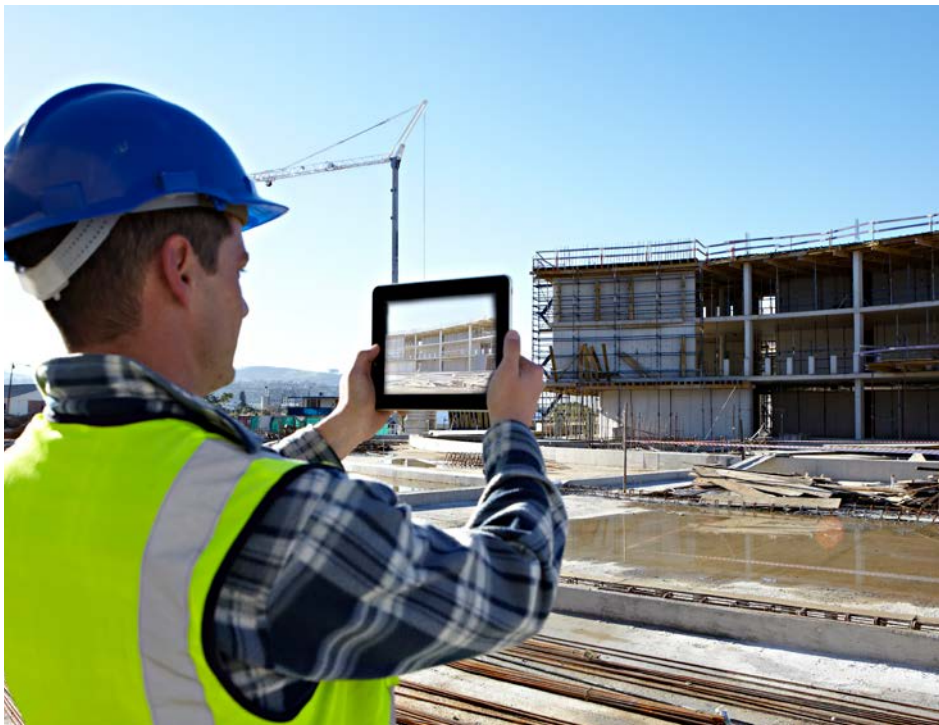


Suitable for any organization within a project team, the BSI Kitemark provides a robust measurement of a company's delivery of BIM projects, certifying businesses for their diligence in design and construction, supply chain management and delivery of customer service excellence. As with other BSI Kitemarks, organizations holding the BSI Kitemark will be routinely assessed, providing clients with complete confidence in their delivery to industry standards.

**“The BSI Kitemark is a respected brand. Applied to our services it will reinforce client confidence and prove greater quality in the delivery of BIM projects.”**

**David Throssell**, Head of Digital Construction, Skanska UK

The BSI Kitemark for Design and Construction builds on BIM Verification for Design and Construction. It involves sampling of past, on-going and completed projects and assessment of customer satisfaction (through ISO 10004 Customer Satisfaction Guidelines for monitoring and measuring). It also uses additional assessment parameters through BS ISO 44001 Collaborative Business Relationships and builds on specific requirements from ISO 9001, Quality Management.



## BSI Kitemark for BIM Asset Management



The BSI Kitemark for BIM Asset Management provides assurance that asset and facilities managers have integrated BIM into their asset management processes

and confirms that asset information is accurate and up-to-date. We assess evidence of controlled documented procedures for all processes against the assessment standard BS EN ISO 19650-3, evidence of implementation of these processes against a managed asset, measurement and monitoring of customer satisfaction, effective management of the supply chain and Quality Management (ISO 9001).

**“We are able to apply consistent standards and processes across the group for managing data and information over the lifecycle of assets. It helps build up the capability of our colleagues which will improve the quality of delivery and make the process efficient. The BSI Kitemark will ultimately improve the way we manage assets for our clients and ultimately for the society.”**

**Navil Shetty,**

Director, Fellow and Technical Chair for Asset Management, Atkins Ltd

## BSI Kitemark for BIM Security

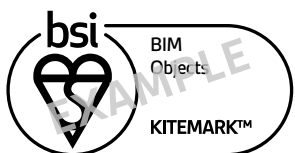


The BSI Kitemark for BIM security builds on the two kitemark certifications for design and construction, and asset management. It focuses on the assessment of how an

organization is embedding security principles in alignment with BS EN ISO 19650-5 Specification for security-minded approach to building information modelling. This assessment will look into how you approach security with respect to physical systems, technological systems, personnel awareness/adoption of security, and organizational security processes.

With security becoming an ever-more important factor for business continuity, ensuring that your organization is adopting an appropriate and proportionate security minded approach is vital. A BSI Kitemark can help you mitigate security risks.

## BSI Kitemark for BIM Objects



The BSI Kitemark for BIM Objects is the benchmark in best practice for the production of digital products used in BIM models. Designed to prove manufacturers

have embedded BIM within their product manufacturing processes, it covers the full range of construction products for structural, architectural and mechanical, electrical and plumbing. The Kitemark certification process ensures that your BIM Objects are a true likeness of your physical products, to give your customers complete confidence during design, construction and asset management. The assessment standard is BS 8541 – Library objects for architecture, engineering and construction:

**Part 1** – Identification and classification

**Part 3** – Shape and measurement

**Part 4** – Attributes for specification and assessment

We've also developed an additional set of requirements for the BSI Kitemark that build on these standards and are based on industry feedback to help ensure your BIM content is of the highest quality.

**“The BSI Kitemark for BIM Objects demonstrates that Legrand has a robust set of processes in place for the production and management of BIM objects which is important as we continue on our digital journey”**

Matt Crunden, Training and BIM Manager, Legrand Electric

## BSI Kitemark for Health and Safety



The application of BIM brings with it greater opportunities to foresee health and safety risks earlier in the delivery and management of projects, as well as greater access to trusted, searchable information.

Based on PAS 1192-6, the specification for collaborative sharing and use of structured Health and Safety information using BIM, the BSI Kitemark for health and safety validates the adoption of processes and outputs according to PAS 1192-6 and can be used as evidence to support the effective management of the international standard ISO 45001, occupational health, safety and wellbeing.

## BSI Kitemark for compliant software

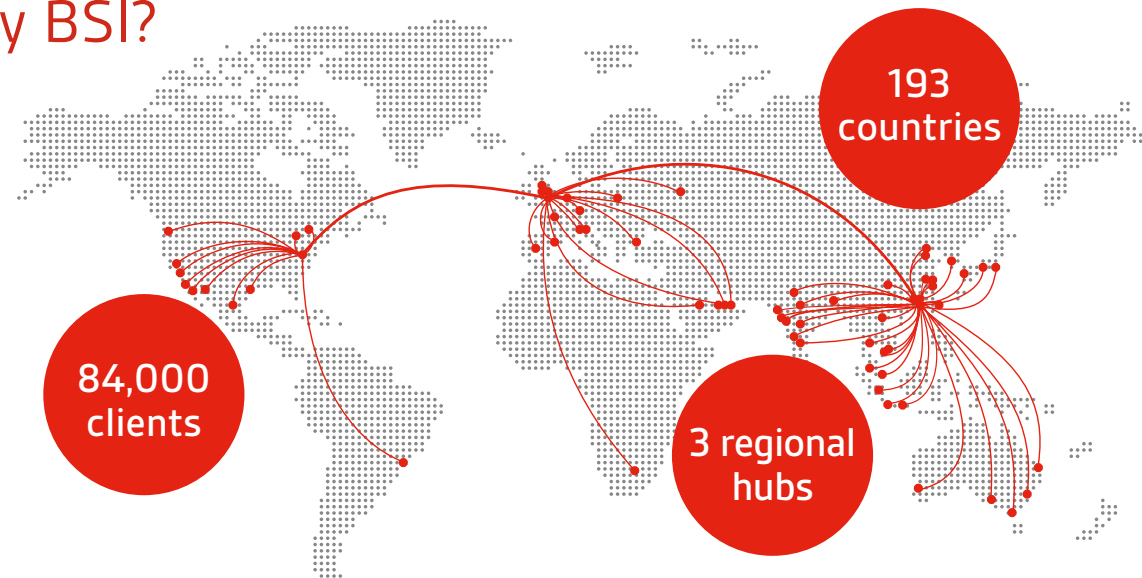


For software companies, the BSI Kitemark for compliant software provides independent validation that your software tools support and align to the ISO 19650

series and additional BIM standards. This will give your customers confidence that your software meets internationally recognized best practice for BIM, and that it will help streamline their working practices.

You will also be required to evidence the security of the software, how you support your software users, resilience software and the underlining Business Management System (BMS).

## Why BSI?



### Making excellence a habit

BSI is the business improvement company that enables organizations to turn standards of best practice into habits of excellence. For over a century we have championed what good looks like and driven best practice in organizations around the world.

Working with 84,000 clients across 193 countries, we are a truly international business with skills and experience across a number of sectors including built environment, food, healthcare, aerospace and automotive.

Through our expertise in Standards Development and provision of Knowledge Solutions, Assurance Services and Regulatory Services, we help individuals, and organizations to realize their potential by embedding resilience in their everyday business for the benefit of wider society.

We help clients to manage risk, improve performance and grow sustainably, which in turn inspires trust in their products, systems and services with their customers.

## BSI BIM enquiries

Find out more

Call: **+91 11 4762 9000**

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