Welcome to the NHSScotland ISO 19650 Navigator

The 'UK BIM Framework' together with the UK annex sets out the approach for implementing BIM in the UK using the framework for managing information provided by the ISO 19650 series. ISO 19650 still holds the same principles of what was 'BIM level 2' however there are notable changes to terminology and approach which Boards need to be aware of. Health Facilities Scotland (HFS) and NHSScotland supports the adoption of the latest standards and recommend that projects are encouraged to adopt the ISO 19650 series in a proportionate manner.

This guide explains what the UK BIM Framework is, why it was created and what you need to do.

Enter

NHSScotland
ISO 19650 Interactive Navigator

NHS National Services Scotland

NHS Scotland Assure
Quality in the healthcare environment

I am new to ISO 19650 and the UK BIM Framework

Are you new to ISO 19650 and the UK BIM Framework and want to learn more about what they are and why we need them? Have a look at our frequently ask questions and get up to speed with the key terms and acronyms you will need to know.

Start Here

I am ready to get started and explore my ISO 19650 activities

If you are ready to jump straight in, explore the ISO 19650 navigator and view your appointing party activities by stage.

Start Here

An introduction to ISO 19650

Q Why the Transition to International Standards?

A The UK Level 2 suite of documents (sometimes referred to as the UK 1192 Series) has been favourably received not only in the UK but also further afield by international asset owners and clients that began to adopt the management processes defined within. This meant that many international organisations deemed it unfair to be asked to work in accordance with UK standards, leading to pressure for the UK 1192 series to be made into an international standard.

However, the move to an international standardisation has always been an end goal. The Report for the Government Construction Client Group BIM Strategy Paper published in 2011 highlighted the opportunity for developing an international BIM policy and for the UK to take a leading role in shaping this.

Q Does Brexit have any impact?

A The UK triggered a new work item within ISO via BSI, the UK's national Standards body and then through the 'Vienna Agreement' at European level within the European Committee for Standardization (CEN) (Kemp, 2019). Despite the UK no longer being represented in EU political institutions and future EU trading agreements under negotiation, BSI still retains membership of international standards organisations

Q When were the ISO Standards published?

A In 2018, the first standards within the ISO 19650 series were published. These are based upon the UK 1192 series with the aim to help teams from around the world to minimize wasteful activities and increases predictability around cost and time, through a common approach. This has many positives and opportunities for the UK construction industry that are familiar with and aligned their business processes to the UK 1192 series.

'BS EN' in front of the standard signifies that the ISO standard is a British adoption of EN standards with some changes.

Q Who is supporting the UK move to these standards?

A To help the UK transition from BIM level 2 to the new ISO standards, the UK BIM Framework was launched in October 2019 a collaboration between BSI, CDBB and the UK BIM Alliance (UKBIMA) to collectively 'develop and champion one single guidance in a clear and concise manner to support industry understanding of BIM standards and their implementation.'

The UK BIM Framework (Figure 2) sets out the approach for implementing BIM in the UK using the framework for managing information provided by the ISO 19650 series. It includes:
• the published standards called upon to implement BIM in the UK
• the UK BIM Guidance Framework
• useful links to other resources

An introduction to ISO 19650

Q **What are the published standards called upon to implement BIM in the UK?**

A The ISO 19650 standards are an evolution of the Information management using BIM as set out in BS 1192:2007+A2:2016 and PAS 1192 parts 2 and 3 and address the development of a consistent approach to managing information through the whole life cycle of buildings and infrastructure, a vital first step in the progression of the built environment sector to digital transformation. The table on the right and image below shows the standards called upon within the UK BIM Framework.

BS EN ISO 19650 is fundamentally an internationalisation of the UK's BIM L2 approach and contains all the same principles and high-level requirements with specific UK content contained in our National Annex.

Therefore BS EN ISO 19650-2 should be used in conjunction with the UK National Annex. For example ISO 19650-2 requires that information is classified using a classification systems in accordance with ISO 12006-2. Within the UK National Annex, Uniclass 2015 (the UK implementation of ISO 12006-2) is required.

While ISO 19650-2 requires that each information container has a unique ID, the UK National Annex states how this should be defined.

Title	Description
BS EN ISO 19650 1:2019	Organization and digitization of information about buildings and civil engineering works, including building information modelling — Information management using building information modelling: Concepts and principles
BS EN ISO 19650 2:2019	Organization and digitization of information about buildings and civil engineering works, including building information modelling — Information management using building information modelling: Delivery phase of the assets
National Annexe to BS EN ISO 19650 2:2018	Clarification of UK specific implementation of this the BS EN ISO 19650-2 standard
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 — Part 5: Security-minded approach to information management
PAS 1192 3:2014	Specification for information management for the operational phase of assets using building information modelling
PAS 1192 6:2014	Specification for collaborative sharing and use of structured Health and Safety information using BIM
BS 1192 4:2014	Collaborative production of information. Fulfilling employer's information exchange requirements using COBie (Construction Operations Building information exchange). Code of practice
BS 8536 1:2015	Briefing for design and construction. Code of practice for facilities management (Buildings infrastructure)
BS 8536 2:2015	Briefing for design and construction. Code of practice for asset management (Linear and geographical infrastructure)

BS EN ISO 19650-1:2018

BS EN ISO 19650-5:2020

PAS 1192-6:2018

BS 8536 Parts 1 & 2

Information Management (CapEx)

Information Management (OpEx)

Data Exchanges

Principles & concepts

CapEx

Security Minded Digital Working

OpEx

Health & Safety

Better briefing

BS EN ISO 19650-2:2018

National Annex

BS EN ISO 19650-3:2020

BS 1192-4:2014

Q   Are there still BIM Levels?

A   Replacing 'BIM Level 2' and labelling of BIM Maturity, the 'UK BIM Framework' together with the UK annex sets out the approach for implementing BIM in the UK using the framework for managing information provided by the ISO 19650 series. The ISO 19650 series represents 'maturity stages' to cater for the broader spectrum of information management, with the stage 2 maturity being identified as 'BIM according to the ISO 19650 series', a mix of manual and automated information management processes used to generate a federated information model.

Q   What does 'BIM according to the ISO 19650 series' actually mean?

A   The UK BIM Framework, has moved away from BIM levels. 'BIM according to the ISO 19650 series' covers what was referred to as BIM Level 2 but also covers aspects of what was referred to as BIM Level 1 and BIM Level 3 (using the 1192 terminology). It is important to note that there is no legal definition of 'BIM according to ISO 19650 series'. This means that within appointment documents, you should set out (as far as possible) what your Board expects and requires from the information management processes set out in the ISO 19650 series. Equally, you should make sure that you get agreement and clarification from your supply chain (Lead appointed party/PSCP and appointed parties) as to what 'BIM in accordance with the ISO 19650 series' means to them.

Q   Why the need for a National Annex?

A   Working within a committee to find an international consensus can be challenging. Not just in terms of approach but also in what things are called. It is inevitable that countries may have ways of working specific to that region and therefore many of the UK terms have been changed for an international audience. To resolve this, regional specific requirements are contained within a National Annex.

While ISO 19650 defines the requirements, the National Annex defines standards that have to be used within a particular region. Although it could be argued that the introduction of a Country specific National Annex is a failure of the standard to agree on a common way of working, it does facilitate all countries to participate.

Q   When should NHSScotland use the UK BIM framework and ISO 19650 series?

A   While there is no legal requirement for clients to shift to the ISO, using the latest standards is always best practice. The European standards body, CEN will adopt the ISO 19650 series, meaning that they will become the preferred method of procuring publicly funded projects across Europe.

To assist NHSScotland Boards make the transition from BIM Level 2 to ISO 19650, HFS are currently producing a suite of ISO 19650 compliant templates and documents.

Q **Are the Level 2 standards still relevant?**

A ISO 19650 Parts One and Two define the collaborative processes for the effective management of information throughout the delivery and operational phase of assets when building information modelling (BIM) is being used. In 2019, the UK published the first UK implementation of these together with a UK focused transition guide. (A 'BS EN' in front of the title signifies that it is the British adoption of a European (EN) standard.) While ISO 19650-2 defines the requirements, such as classification systems, regional requirements such as the use of Uniclass 2015 in the UK are defined within a National Annex.

In 2020, ISO 19650 part 5 was published covering security, with the UKs implementation of this being published in July 2020, followed by BS EN ISO 19650 part 3 covering the operational phase of assets.

The publication of these standards has led to the withdrawal of BS 1192 (Principles), PAS 1192 part 2 (capital/delivery phase) and PAS 1192 part 3 (Operational phase) and PAS 1192 part 5 (Security) which will no longer be supported or revised. This is because you cannot have two competing standards. They will still be available for the near future to act as a reference point, however, they will lose their status as a standard.

Currently ISO 19650-4 is in development, while at the time of writing, there has been no agreement to develop equivalent standards for BS 8536 (parts 1 and 2) or PAS 1192-6:2014 which sit outside of ISO 19650 but are part of the UK BIM Framework.

ISO 19650 Series

BS EN ISO 19650-1:2018	BS EN ISO 19650-2:2018	BS EN ISO 19650-6:2020	BS EN ISO 19650-3:2020

Superseded by *Superseded by* *Superseded by* *Superseded by*

BS 1192:2007	PAS 1192-2:2013	PAS 1192-5:2015	PAS 1192-3:2014

UK 1192 Series

Q   What is ISO?

A   ISO or the International Organization for Standardization is an independent, non-governmental international organisation. It aims to deliver international standards that support innovation and provide solutions to global challenges. In essence it is about facilitating free and fair global trade.

It is made up of 163 national standards bodies, including the UK standards body, BSI (British Standards Institute). A new work item within ISO was triggered by BSI through the Vienna Agreement at European level within the European Committee for Standardization (CEN). The Vienna Agreement aims to prevent duplication of effort and reduce the time when preparing standards by various parties working together.

Q   What is CEN?

A   The European Committee for Standardization (CEN) brings together the national standard bodies of 34 European countries. It has an agreement for the technical co-operation with ISO. This means that CEN and ISO jointly plan the development of new standards, and where an ISO meets European legislation and market requirements, the ISO standard will be adopted, replacing any corresponding CEN standard. The reason being, you cannot have two competing standards.

Q   What is BSI?

A   The British Standards Institution (BSI) is the national standards body of the United Kingdom. BSI produces technical standards on a wide range of products and services and also supplies certification and standards-related services to businesses.

Acronyms

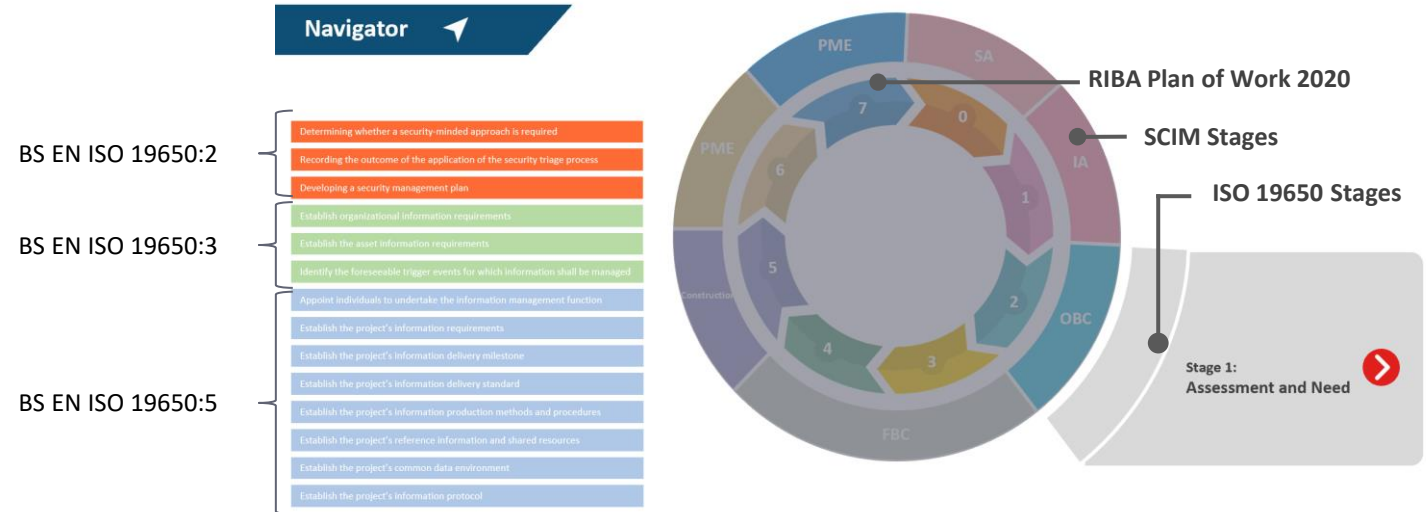|						
AIM Asset Information Model	**BIM** Building Information Modelling	**BS** British Standard	**BSI** British Standard Institute	**CDBB** Centre for Digital Built Britain	**CEN** The European Committee for Standardization	**EIR** Exchange Information Requirements
FBC Final Business Case	**UKBIMA** UK BIM Alliance	**IA** Information Manager	**AIR** Asset Information Requirements	**O&M** Operation and Maintenance Manual	**OBC** Outline Business Case	**ISO** International Organization for Standardization
PIM Project Information Model	**NA** National Annex	**OIR** Organisational Information Requirements	**PAS** Publicially Available Specification	**PoW** Plan of Work	**PIR** Project Information Requirements	**SMP** Standards, Methods and Procedures Soft Landings

Getting Started

Two new terms are within the ISO 19650 series replacing the term 'Employer'. Firstly, 'appointing party' which means the provider of information, goods or services, such as a consultant and secondly 'appointed party' which means the receiver of information, goods and services.

The ISO 19650 Navigator wheel covers nine stages. The illustration below shows where as the appointing party you should place your focus.

Stage	Level
Stage 1 Assessment and Need	High
Stage 2 Invitation to tender	High
Stage 3 Tender response	Low
Stage 4 Appointment	Medium
Stage 5 Mobilzation	Low
Stage 6 Collaborative production of information	Low
Stage 7 Information model delivery	Medium
Stage 8 Project close out	High
Stage 9 In Use	High

Using the navigator wheel, work your way around the various relevant stages.

BS EN ISO 19650:2
- Determining whether a security-minded approach is required
- Recording the outcome of the application of the security triage process
- Developing a security management plan

BS EN ISO 19650:3
- Establish organizational information requirements
- Establish the asset information requirements
- Identify the foreseeable trigger events for which information shall be managed

BS EN ISO 19650:5
- Appoint individuals to undertake the information management function
- Establish the project's information requirements
- Establish the project's information delivery milestone
- Establish the project's information delivery standard
- Establish the project's information production methods and procedures
- Establish the project's reference information and shared resources
- Establish the project's common data environment
- Establish the project's information protocol

RIBA Plan of Work 2020
SCIM Stages
ISO 19650 Stages
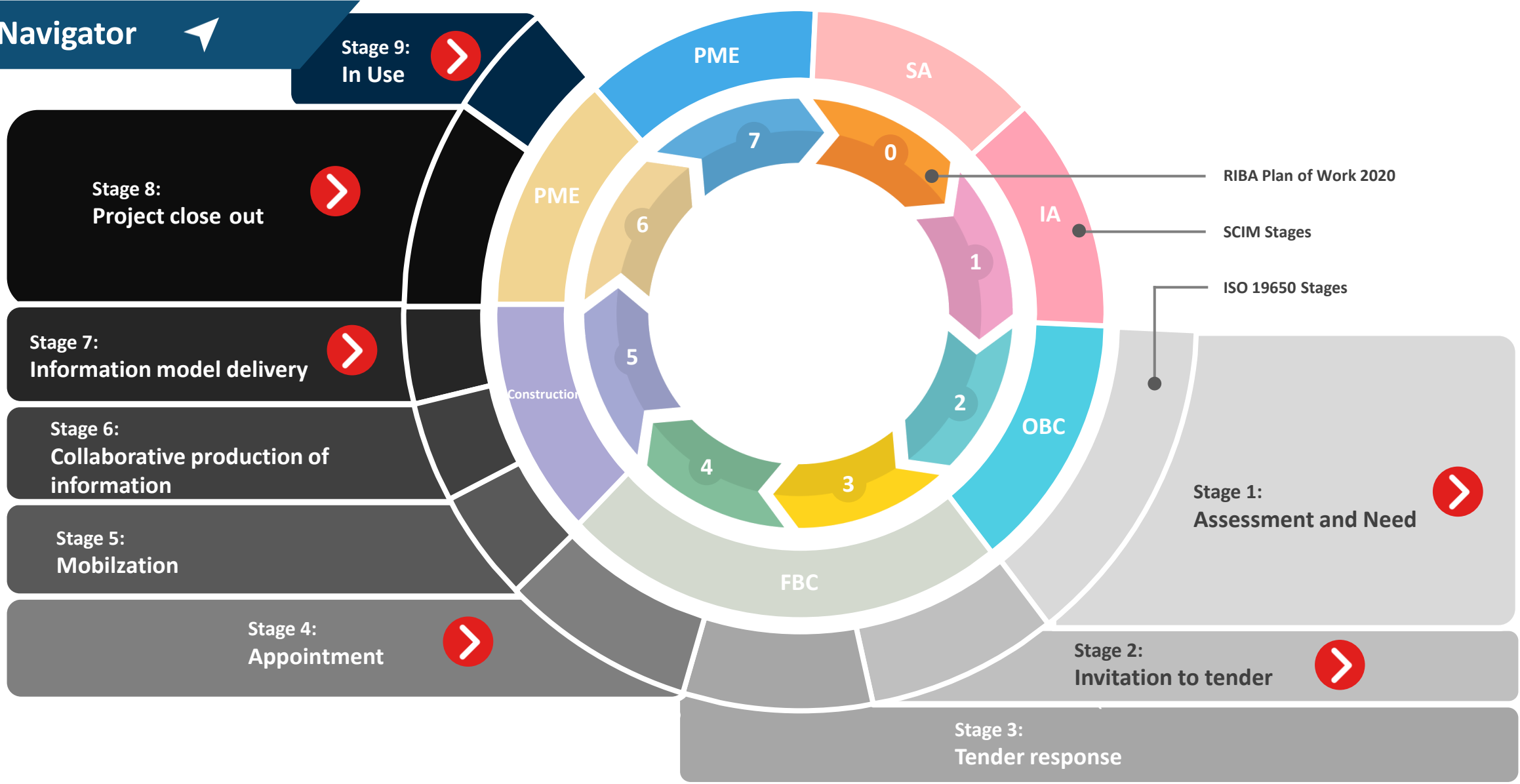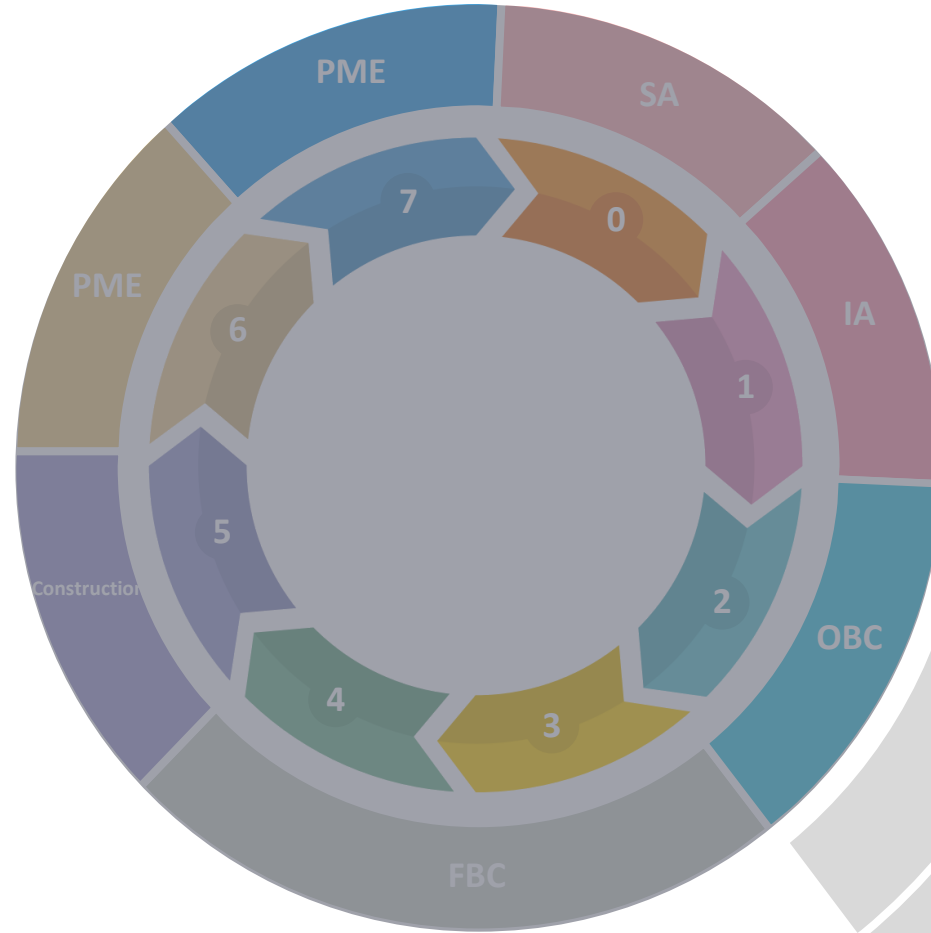Stage 1: Assessment and Need

Relevant clauses are displayed. The colour determines the standard from which they relate to.

What do I need to do? The activity, Standards and clause that it relates, a plain language description and key tasks are displayed within each stage.

Activity	Clause	Description / Narrative	Key Task(s)
Review and continue maintenance of the AIM	ISO 19650-3 5.8.2	The appointing party shall review whether the AIM continues to fulfil the requirements of 5.1.11 and is being maintained according to 5.1.12. If either of these is not met, then the appointing party shall implement appropriate mitigating measures.	Ongoing monitoring, updating and maintenance of the AIM.

Determining whether a security minded approach is required

Recording the outcome of the application of the security triage process

Developing a security management plan

Establish organizational information requirements

Establish the asset information requirements

Identify the foreseeable trigger events for which information shall be managed

Appoint individuals to undertake the information management function

Establish the project s information requirements

Establish the project s information delivery milestone

Establish the project s information delivery standard

Establish the project s information production methods and procedures

Establish the project's reference information and shared resources

Establish the project s common data environment

Establish the project s information protocol

Stage 1:
Assessment and Need

Activities

Activity	Clause	Description / Narrative	Key Task(s)
Determining whether a security-minded approach is required	ISO 19650-5 Clause 4.7	The organization(s) shall apply the security triage process to determine whether a security-minded approach is required in relation to the project.	Use the NHSScotland security guidance and triage process to determine whether a security minded approach is required
Recording the outcome of the application of the security triage process	ISO 19650-5 Clause 4.8	The organization(s) shall record the outcome (ST1, ST2, ST3 or ST4) of the application of the security triage process for each initiative, project, asset, product or service to which it is applied, including where there is no identified need for a security-minded approach beyond protection of sensitive commercial and personal information.	Record the outcome of the application of the security triage process.
Developing a security management plan	ISO 19650 Clause 5-7	Develop, maintain and implement a security management plan which enables the agreed mitigation measures set out in the security strategy to be implemented in a consistent and holistic manner.	Develop a security management plan which sets out related security polices, guidance and security information requirements.

Activity	Clause	Description / Narrative	Key Task(s)
Establish organizational information requirements	ISO 19650-3 Clause 5.1.2	The appointing party shall identify any existing organizational information requirements (OIR) or establish, document and maintain its OIR to meet the needs of its organizational functions and its asset management system.	A Board should at a strategic level develop an organizational information requirements (OIR) aligned with their asset management policy, strategy and asset management systems The following activities may assist in the definition of a Board's OIR: • optimizing the asset management strategy and optimizing/prioritizing its asset management plan(s); • assessing the financial benefits of planned improvement activities; • modelling the asset to support operational decision making; • determining the operational and financial impact of asset unavailability or failure; • making life cycle cost comparisons of alternative capital investments; • identifying expiry of warranty periods; • determining the end of an asset's economic life, e.g. when the asset related expenditure exceeds the associated income. These OIRs will inform the projects AIR and PIR. Continued…

NHSScotland
ISO 19650 Interactive Navigator

NHS National Services Scotland

NHS Scotland Assure
Quality in the healthcare environment

1 2 4 7 8 9

15

Activity	Clause	Description / Narrative	Key Task(s)
Establish the asset information requirements	ISO 19650-3 Clause 5.1.4	The appointing party shall establish the asset information requirements (AIR) necessary to enable it to meet its OIR. The AIR shall include requirements from all relevant interested parties, including departments within the appointing party and interested third party organizations such as local authorities or regulators	Define and capture the project AIRs based upon the AIRs. This will include data for the Asset Management systems such as EAMS and CAFM.
Identify the foreseeable trigger events for which information shall be managed	ISO 19650-3	The appointing party shall identify and record foreseeable trigger events, representing those events during the operational phase when new or updated information concerning an asset will be generated or required.	Identify and record the foreseeable trigger events for which information shall be managed. Examples of trigger events include: • Performance evaluation of an asset, including failure trends from similar components used elsewhere and experience-based learning and feedback from asset performance; • inspection of an asset; • maintenance work on an asset, whether planned or reactive; • minor works on an asset, such as minor repairs, component replacements or minor upgrades.

Activities

Activity	Clause	Description / Narrative	Key Task(s)
Appoint individuals to undertake the information management function	ISO 19650-2 Clause 5.1.1	Clause 5.1.1 specifically covers the appointing party's (client's) project wide assignment of the information management function, with clause 5.3.1 covering the appointment level equivalent across lead appointed party (tier 1) delivery teams. Every clause (activity) from ISO 19650-2 will therefore need to be assigned across the project team appropriately with individuals nominated to fulfil activities and tasks as the project progresses. For an appointing party, it is critical that the information management function is clearly assigned prior to engaging any lead appointed parties such as the project manager, cost consultant or design consultant. The appointing party is responsible for identifying and engaging one or more individuals (from within their organization or from a third party) to undertake the information management function in respect of the project. The scope of the information management function to be undertaken by the individual(s) is also determined by the appointing party. Collectively this scope covers all of the appointing party's activities as described in ISO 19650-2. It is important that whoever undertakes the information management function has the appropriate knowledge and skills required. A lead appointed party could in theory, carry out some or all of the information management function. It is suggested that an individual (or individuals) carrying out the information management function on behalf of the appointing party should not be carrying out the lead appointed party's own information management function. The Information Management Assignment Matrix in ISO 19650-2 Annex A offers a template for clarifying which activities will be undertaken by the individual(s) engaged to undertake the information management function. Note: Where there is limited knowledge and capability internally, it may be preferable to appoint a third party in an advisory role to support the information management function. Ownership should however remain with individuals within the appointing party's organization who understand the business operating model and desired outcomes.	The very first step should be to understand the context, purpose and scope of the information management function for the project, and then assign the various responsibilities and accountabilities for the required activities appropriately. This includes: • Consider the scope of the information management function • Determine how the scope will be resourced • Complete the information management assignment matrix to appropriately allocate appointing party responsibilities and activities • Where the information management function is to be delivered by a third party or a lead appointed party, ensure that the scope of their appointment suitably reflects the activities and responsibilities assigned to them

Activity	Clause	Description / Narrative	Key Task(s)
Establish the project's information requirements	ISO 19650-2 Clause 5.1.2	Project information requirements (PIR) are defined by the appointing party. They identify the information needed to satisfy strategic objectives at key decision points during a design and construction project. They inform the exchange information requirements (EIR), which are appointment, not project based. It is important that PIR are appropriately defined since they are fundamental to the robustness of the EIR and the delivery of the information needed. Note that the PIR are not expressed in tender or appointment content. During the project the appointing party needs to understand: a. The purposes for which information is required. For example to support the organization or the asset to function or to enable the design and construction project to progress to the next stage b. The information which will be required for those purposes c. The way that the information is identified might depend on the knowledge of the appointing party and the nature of the decisions that are to be made. The appointing party may know precisely what information is required but equally they might not. For example, if a key decision to progress to the next stage is related to whether construction can be completed by a specific date, the PIR might identify that construction programme information is required for Board review. Alternatively, if the decision to progress to the next stage is related to a broader area, say: the safe construction and operation of the asset, then the PIR might identify that information is needed to demonstrate that the design is safe to construct and operate. Continued…	

Activities

Activity	Clause	Description / Narrative	Key Task(s)
Establish the project's information requirements. Continued…	ISO 19650-2 5.1.2	Clause 5.1.2 lists seven points of consideration for establishing project information requirements: 1. The project scope. Basic information about the project. 2. The intended purpose for which the information will be used by the appointing party. - The reasons why information is required by the appointing party during the project. A list of possible purposes is set out in ISO 19650-1 clause 5.1. 3. The project plan of work. - How the project will be broken down into stages or intervals. 4. The intended procurement route. - How appointments/contracts will be structured, the relationships between parties and the rules that govern a project. 5. The number of key decision points throughout the project. - The points during a project where the appointing party requires information to make informed decisions. 6. The decisions that the appointing party needs to make at each key decision point. - Decisions that an appointing party may be required to make during a project to achieved the desired outcomes, ensure project progression and/or to feed back into wider organization strategies. 7. The questions to which the appointing party needs answers, to make informed decisions. - These questions provide a check to ensure that decisions can be made using the information provided. If the appointing party concludes that some of these points are not relevant or do not aid beneficial communication of the PIR then there is no requirement to do anything beyond 'consider' and document that no further action is needed.	

Activity	Clause	Description / Narrative	Key Task(s)
Establish the project's information delivery milestone	ISO 19650-2 5.1.3	Information delivery milestones are defined to determine when information models will be exchanged from the delivery team to the appointing party and/or between delivery teams. Clause 5.1.3 identifies four key considerations for determining information delivery milestones. They require the appointing party to think about the information needed for their own purposes plus information delivery obligations they might have themselves. The latter is particularly relevant where a programme of works is being delivered, where a project might consist of separate enabling works and construction contracts or where a traditional procurement approach is adopted. Information delivery milestones should be programmed such that they support key decision points and project progression. However, given the point at which milestones are determined they are unlikely to be date specific. It may be appropriate to position the milestones within or at the end of project stages.	This is a project as opposed appointment standard and you should establish: • Applicable standards, specifications and guidance • Formats and details of exchanges between software solutions • How information should be structured and classified • Nomenclature for the project such as file naming, revisions and status • Method of assignment for level of information need • Use of information during the operation phase of the asset

NHSScotland
ISO 19650 Interactive Navigator

NHS National Services Scotland

NHS Scotland Assure
Quality in the healthcare environment

1 2 4 7 8 9

20

Activities

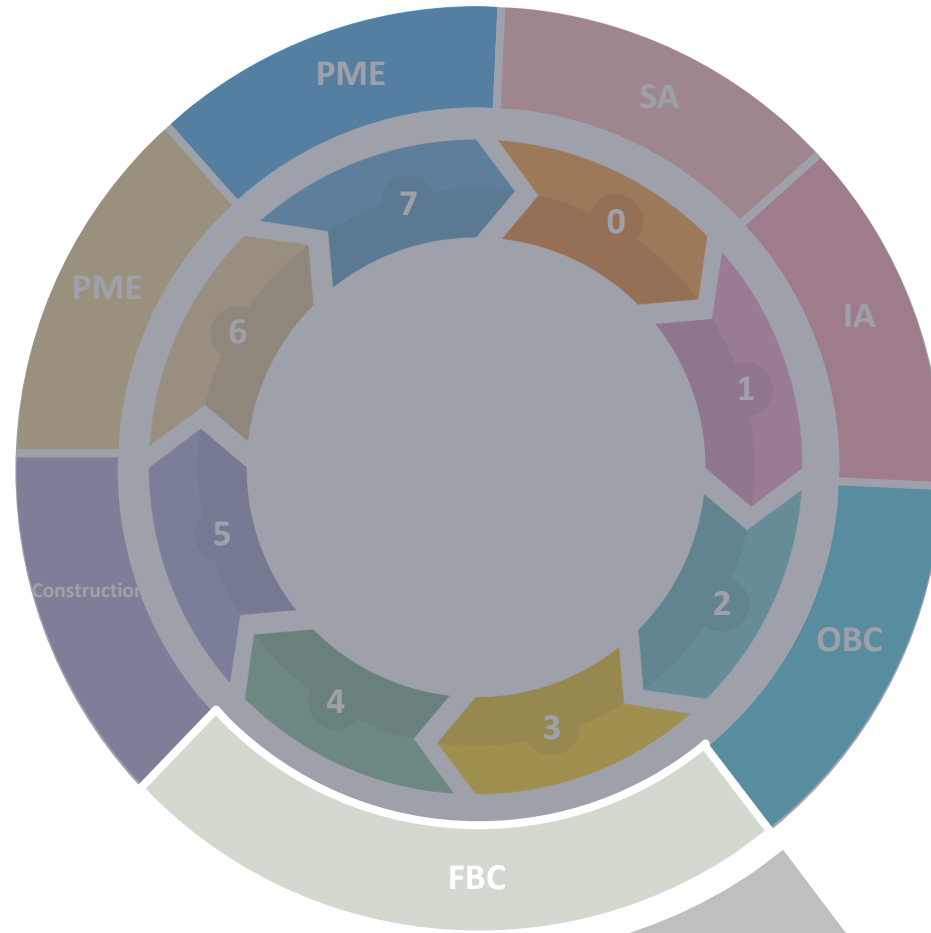| Activity	Clause	Description / Narrative	Key Task(s)
Establish the project's information delivery standard	ISO 19650-2 5.1.4	When establishing the information standard, the appointing party considers: **_Exchange of Information:_** What standardized elements for exchanging information have been established for the project. For example, the information standard may establish project-specific codes to support the national annex information container naming convention and the permitted values for metadata fields. It may also specify the naming and numbering systems for elements such as: Components, Types, Systems, Storeys, and Spaces. **_Structuring and classification of Information:_** What work breakdown structures and classification system(s) have been established for the project. For example, the information standard may establish a work breakdown structure based on a classification system (such as Uniclass 2015), a schedule of packages, or other criteria. **_Method of specifying level of information need:_** What method of describing the level of information need has been established for the project. For example, the information standard may establish that the NBS level of definition convention shall be used. In which case it will likely either cross-reference to an external source or include the textual description and an associated code for each level of detail and level of information. **_Use of information during the operational phase:_** What standardized elements for operational use have been established for the project. For example, the information standard may establish additional information that should be incorporated such as the use of NRM3 codes in addition to Uniclass 2015 classification. It should be noted that as the information standard is project-specific, some of the established information standards may not be applicable depending on the nature of the appointment. For example, additional handover information may be included within the information standard which are not relevant for an appointment to produce a concept design. Remember that the information standard is set out at a project rather than appointment level. Its amalgamation with the information production methods and procedures may prove beneficial as both are project-specific and often used in tandem (unlike the exchange information requirements, which is an appointment specific resource).	This is a project as opposed appointment standard and you should establish: • Applicable standards, specifications and guidance • Formats and details of exchanges between software solutions • How information should be structured and classified • Nomenclature for the project such as file naming, revisions and status • Method of assignment for level of information need • Use of information during the operation phase of the asset

NHSScotland
ISO 19650 Interactive Navigator

NHS National Services Scotland

NHS Scotland Assure
Quality in the healthcare environment

1 2 4 7 8 9

← ↗ → 21

Activity	Clause	Description / Narrative	Key Task(s)
Establish the project's information production methods and procedures	ISO 19650-2 5.1.5	When establishing the information production methods and procedures, the appointing party considers: **Capture of existing asset information: How existing information will be captured.** For example, the information production methods and procedures may establish what properties need to be captured about existing asset information, the permitted values, or measurement units. It may also specify which information container(s) this information is captured within. **Generation, review or approval of new information: How information is produced, reviewed or approved.** For example, the information production methods and procedures may establish that information should be produced within a specified software application. It may also specify how to review information by providing a procedure or a specific workflow to be followed. **Security or distribution of information: How to implement specific security requirements or how to share information.** For example, the information production methods and procedures may establish that additional meta-data relating to a security rating should be applied to all information containers. It may also specify the common data environment (CDE) solution to be used for the distribution of information. **Delivery of information to the appointing party: How information is provided to the appointing party.** For example, the information production methods and procedures may establish what procedure to follow when delivering information such as whether additional checks are required or if an additional CDE solution is to be used. It should be noted that as the information production methods and procedures are project-specific, some of the established production methods and procedures may not apply to all appointed parties. For example, additional handover procedures may be included within the information production methods and procedures which are not relevant for an appointment to produce a concept design. Remember that the information production methods and procedures are set out at project rather than appointment level. Its amalgamation with the standard may prove beneficial as both are project-specific and often used in tandem (unlike the exchange information requirements, which is an appointment specific resource).	Established specific information production methods and procedures including: • the capture of existing asset information; • the generation, review or approval of new information; • the security or distribution of information; and • the delivery of information

NHSScotland
ISO 19650 Interactive Navigator

NHS National Services Scotland

NHS Scotland Assure
Quality in the healthcare environment

1 2 4 7 8 9

22

Activity	Clause	Description / Narrative	Key Task(s)
Establish the project's reference information and shared resources	ISO 19650-2 5.1.6	The appointing party considers existing reference information and shared resources to support tender of all appointed parties. Reference information could be relevant to the overall project, such as Ordnance Survey mapping or information relating to adjacent assets and/or utilities owned by other organizations. Reference information could also be selected information from the existing asset information model, such as low-temperature hot water and chilled water schematics or layouts to be used in an office refurbishment project. In addition, reference information may include the information delivered during a preceding appointment, usually by a different delivery team. For example, performance specifications prepared by the appointing party's design team for tendering a design and build contract. It is possible for a prospective lead appointed party to receive reference information that it produced itself in a previous appointment, for example a masterplan produced by multi-disciplinary practice X would be reference information for the subsequent design development package that the same practice is bidding for along with a number of other practices. Not providing reference information means that prospective lead appointed parties are likely to either include costs to generate it themselves, or include a risk allowance in their pricing, or both. Alternatively, in ignorance, they may proceed on the basis of incomplete reference information which may ultimately impact the quality of their deliverable, through no fault of their own. These are the kinds of unnecessary costs and pitfalls that information management according to the ISO 19650 series is intended to avoid. Shared resources can take many forms, such as document templates, 3D object libraries or custom line styles clause 5.1.6 provides examples. To provide a practical illustration the client might provide a template for the BIM execution plan, to be used by all prospective lead appointed parties, to make sure that this part of each tender submission is structured in the same way and can be consistently evaluated. Finally, an important consideration for both reference information and shared information is the use of open data standards.	Compilate all relevant existing information, shared resources and library of objects that will be required to support a tender and procurement process.

Activity	Clause	Description / Narrative	Key Task(s)
Establish the project's common data environment	ISO 19650-2 5.1.7	Before any information can be exchanged between the appointing party and their delivery team(s), a set of workflows and exchange solutions must be agreed and implemented that form the common data environment (CDE). A workflow may for example, include the approval process and timescales, a solution may be a file management system. The appointing party is accountable for ensuring this CDE is implemented, configured and supported throughout the project. They may delegate this to a third party but it should be in place to enable tender information to be shared (and therefore before issuing tender information to any prospective lead appointed party). It is therefore not practical to delegate this activity to a prospective lead appointed party at this stage. It is however, acceptable to transition hosting, managing and supporting of the CDE to a lead appointed party after appointment but "transitioning" is the operative word as it must be functional before transitioning. When implementing the CDE, it must enable: • Each information container to have a unique ID, based upon an agreed and documented convention comprised of fields separated by a delimiter For example: ensuring the chosen CDE solution is configured in line with the UK National Annex clauses NA.2 and NA.3 contained in ISO 19650-2 • Each field to be assigned a value from an agreed and documented codification standard For example: the CDE solution helps users find information quickly like model files by searching for the Type M3 or CR (refer to National Annex clause NA.3.6 contained in ISO 19650-2) • Each information container to have the following attributes assigned; 1) status 2) revision 3) classification Note: the CDE solution allows additional data to be tagged to information containers beyond the information container unique ID to assist the project team in their understanding of what is the latest information and how it can be used Continued…	• Determine whether you have the in-house capability to deliver a CDE solution or whether it has to be delivered by a third party such as a PSCP. • Configure the CDE to implement the project's information standard and information methods and procedures

Activities

Activity	Clause	Description / Narrative	Key Task(s)
Establish the project's common data environment. Continued…	ISO 19650-2 5.1.7	• The ability for information containers to transition between states and the recording of the name of user and date when information container revisions transition between each state Note: the CDE workflow can keep a detailed audit trail of each information container's content, status and revision activity. This can also provide clarity about what and when sign off is required before a transition can take place. • Controlled access at an information container level For example: the CDE solution and workflow can allow configuration that restricts access to information containers that have not reached a sufficient level of maturity or are too sensitive for specific organizations or individuals to have access to them	• Determine whether you have the in-house capability to deliver a CDE solution or whether it has to be delivered by a third party such as a PSCP. • Configure the CDE to implement the project's information standard and information methods and procedures

Activities

Activity	Clause	Description / Narrative	Key Task(s)
Establish the project's information protocol	ISO 19650-2 5.1.8	Each appointment must contain an information protocol, i.e. all lead appointed party's appointments and all appointed parties' appointments. The lead appointed party's appointment will contain the project's information protocol, and this will be included in the appointed party's appointment documents with any appropriate differences to reflect each appointment.	Compile your information protocol for each appointment using the NHSScotland BIM Protocol as a baseline.

Establish the appointing party s exchange information requirements

Assemble reference information and shared resources

Establish tender response requirements and evaluation criteria

Compile invitation to tender information
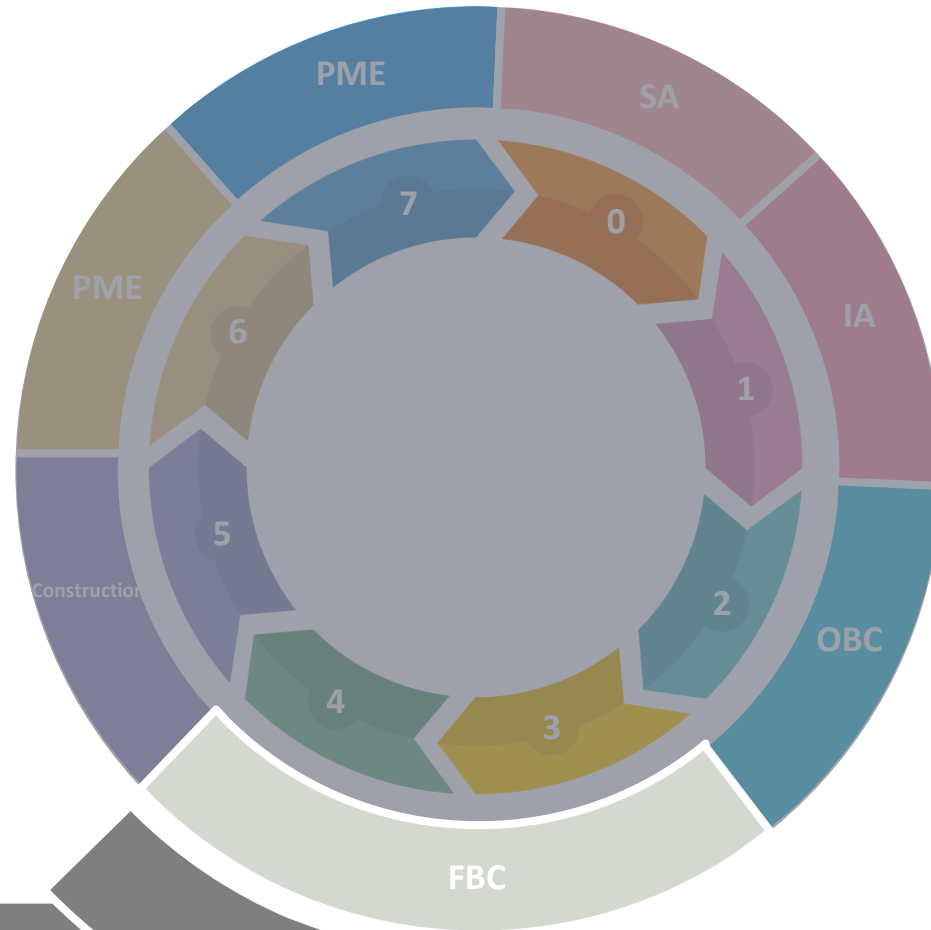
Working with appointed parties

PME

SA

IA

OBC

FBC

Construction

7

0

6

1

5

2

4

3

Stage 2:
Invitation to tender

Activities

Activity	Clause	Description / Narrative	Key Task(s)
Establish the appointing party's exchange information requirements	ISO 19650-2 5.2.1	Comprehensive and properly managed exchange information requirements (EIR) are fundamental to successful information management. They provide the framework for each and every delivery team active within a project. Each EIR is a specification detailing the information required by the appointing party for all information exchanges with a lead appointed party. There are several activities in clause 5.2.1 which the appointing party needs to work through to ensure each EIR is fully defined. Each EIR is derived from the project information requirements (PIR) (which includes the organizational information requirements) and the asset information requirements (AIR). Once the PIR and the AIR are identified, they are broken-down to a more granular level as EIR relative to the lead appointed party's scope of works, and each information requirement is associated with a level of information need. This enables the appropriate facets of information to be defined. In addition, the EIR establishes information exchange dates relative to delivery milestones to ensure information is delivered at the right time. Each EIR is appointment specific and included within invitation to tender documentation. An EIR is read in conjunction with the project's information standard and information production methods and procedures (see ISO 19650-1 clause 5.5). For example: as part of the PIR (see insight clause 5.1.2) one of the purposes for information is to support the ongoing progression of the project. Within the EIR the appointing party identifies that the information required is a construction programme report which summarizes where the programme is ahead/ behind schedule in PDF format. For example: from the AIR the appointing party requires asset information for maintenance purposes which will feed into their facilities management system. For this they specify in the EIR the exact information required against the relevant asset(s) which enables it to be imported into their system. During project delivery each EIR provides the mechanism for reviewing and accepting information models for the duration of the associated lead appointed party appointment.	Compile your EIR for each appointment required for your project e.g. project management, designer team or a main contractor. This should be based upon the NHSScotland EIR template.

Activity	Clause	Description / Narrative	Key Task(s)
Assemble reference information and shared resources	ISO 19650-2 5.2.2	Reference information and shared resources should be provided in appropriate information containers via the project's common data environment (CDE). During the tender process, access to these information containers by prospective lead appointed parties has to be managed by the appointing party. This is to ensure that prospective lead appointed parties do not have inappropriate access to any other information being shared by existing delivery teams on the project. The information containers in the CDE should have status codes (to identify the permitted use of the information), revision codes and classification codes to help prospective lead appointed parties use them correctly.	• Upload reference information and shared resources to the CDE in accordance with the project's information standard and production methods and procedures and give prospective lead appointed parties appropriate access and permissions to that content • Revoke CDE access for prospective lead appointed parties who are not successful in their tender response

Activities

Activity	Clause	Description / Narrative	Key Task(s)
Establish tender response requirements and evaluation criteria	ISO 19650-2 5.2.3	The appointing party determines the minimum requirements that the prospective lead appointed party is to meet and communicate in their tender response. At the same time, the appointing party establishes how they will evaluate the effectiveness with which these minimum requirements are addressed within tender responses received.	• Establish minimum requirements to be addressed within the prospective lead appointed party's tender response
		This provides the prospective lead appointed party with a degree of direction about what they should detail in their tender response and enables consistent and fair evaluation of tenders received.	• Identify how the tender response will be evaluated
		Key considerations are likely to be:	
		• The required content of the (pre-appointment) BIM execution plan. For example: does the BIM execution plan sufficiently detail the delivery team's proposed federation strategy, is it feasible and practical?	
		• The competency, capability and capacity of the prospective lead appointed party to deliver the information requirements. For example: does the prospective lead appointed party have suitable skills to manage and deliver the information requirements and crucially are the people with those skills available for the duration of the appointment?	
		• How the project delivery team will be mobilized, thinking about getting resources and technology ready to go. The appointing party will want to establish that the lead appointed party has a mobilization plan in place to get the delivery team up and running so that information can be produced in a co-ordinated and collaborative manner in support of the delivery team's programme. The appointing party will also want to establish that delivery will not begin until the plan has been fully enacted.	
		• The prospective lead appointed party's consideration of information delivery risk. This is communicated via a risk register, compiled by the prospective lead appointed party in respect of the delivery team.	
		Minimum requirements might take the form of questions to be addressed in the tender response. For example: please explain how you will manage and mitigate risk associated with information delivery?	
		Ensure use of appointment specific questions that are relevant to the appointment within the context of the project, and the scope of works to be undertaken by the delivery team. Evaluation criteria should be measurable.	

NHSScotland
ISO 19650 Interactive Navigator

NHS National Services Scotland

NHS Scotland Assure
Quality in the healthcare environment

1 2 4 7 8 9

30

Activities

Activity	Clause	Description / Narrative	Key Task(s)
Compile invitation to tender information	ISO 19650-2 5.2.4	The tender contents for information management should be combined with other tender information being issued to the same prospective lead appointed party, such as technical specifications for the works and the requirements for completing technical proposals.	Compile within your tender documents: • the appointing party's exchange information requirements; • the relevant reference information and shared resources (within the project's common data environment); • the tender response requirements and evaluation criteria (if applicable); • the project information delivery milestones; • the project's information standard; • the project's information production methods

NHSScotland
ISO 19650 Interactive Navigator

NHS National Services Scotland

NHS Scotland Assure
Quality in the healthcare environment

1　2　4　7　8　9

31

Activities

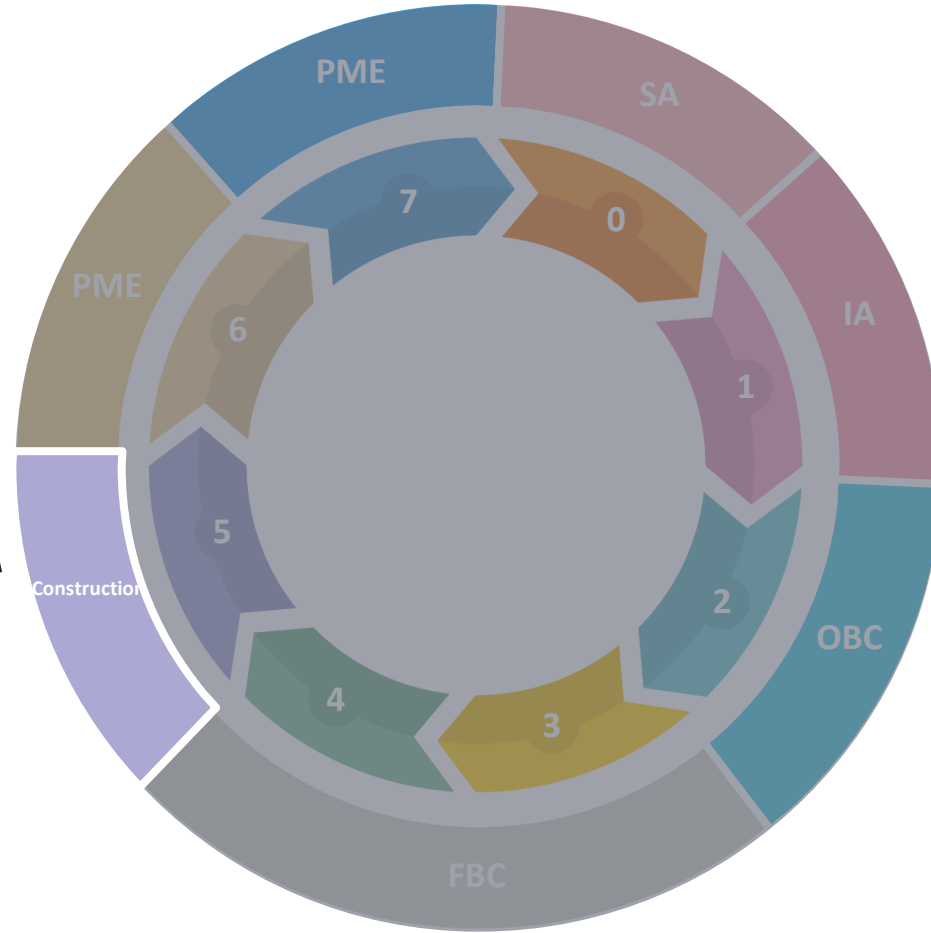| Activity	Clause	Description / Narrative	Key Task(s)
Working with appointed parties	ISO 19650-5 9.1	The organization(s) shall, as part of the appointed party selection process, assess all tender documentation to establish how it is intended that the security requirements set out in the security management plan would be met. The organization(s) shall assess the security understanding, capability, competence and experience of the organizations for an appointment, as well as any security training, coaching and support requirements.	Ensure that assessment of the tender documentation includes a security review against requirements.

NHSScotland
ISO 19650 Interactive Navigator

NHS National Services Scotland

NHS Scotland Assure
Quality in the healthcare environment

1 2 4 7 8 9

32

Complete lead appointing party s appointment documents

Working with appointed parties   Post appointment award

PME

SA

PME

IA

Construction

OBC

FBC

0
1
2
3
4
5
6
7

Stage 4:
Appointment

NHSScotland
ISO 19650 Interactive Navigator

NHS
National
Services
Scotland

NHS Scotland Assure
Quality in the healthcare environment

1   2   4   7   8   9

33

Activity	Clause	Description / Narrative	Key Task(s)
Complete lead appointing party's appointment documents	ISO 19650-2 5.4.6	It is important that each of the five resources listed are included within the lead appointed party's appointment documents. The appointing party may find it helpful to clarify to its legal representatives preparing the appointment that some of the resource content may changing/evolve throughout the appointment so this can be incorporated correctly within the appointment documents.	The following should be included within the appointment documents: • the appointing party's exchange information requirements; • the project's information standard (including any agreed additions or amendments); • the project's information protocol (including any agreed additions or amendments); • the delivery team's BIM Execution plan; and • the delivery team's Master Information Delivery Plan (MIDP).

Activity	Clause	Description / Narrative	Key Task(s)
Working with appointed parties - Post appointment award	ISO 19650-5 9.3	9.3.1 The organization(s) shall monitor and enforce all security-related provisions in the appointment documentation relating to its appointed parties in order that they adopt an acceptable security-minded approach to the fulfilment of their appointment-related obligations. 9.3.2 The organization(s) shall work with its delivery team to assist in the understanding of the security requirements and to address any outstanding security issues.	Monitor compliance with the project's security requirements

Review and accept the information model
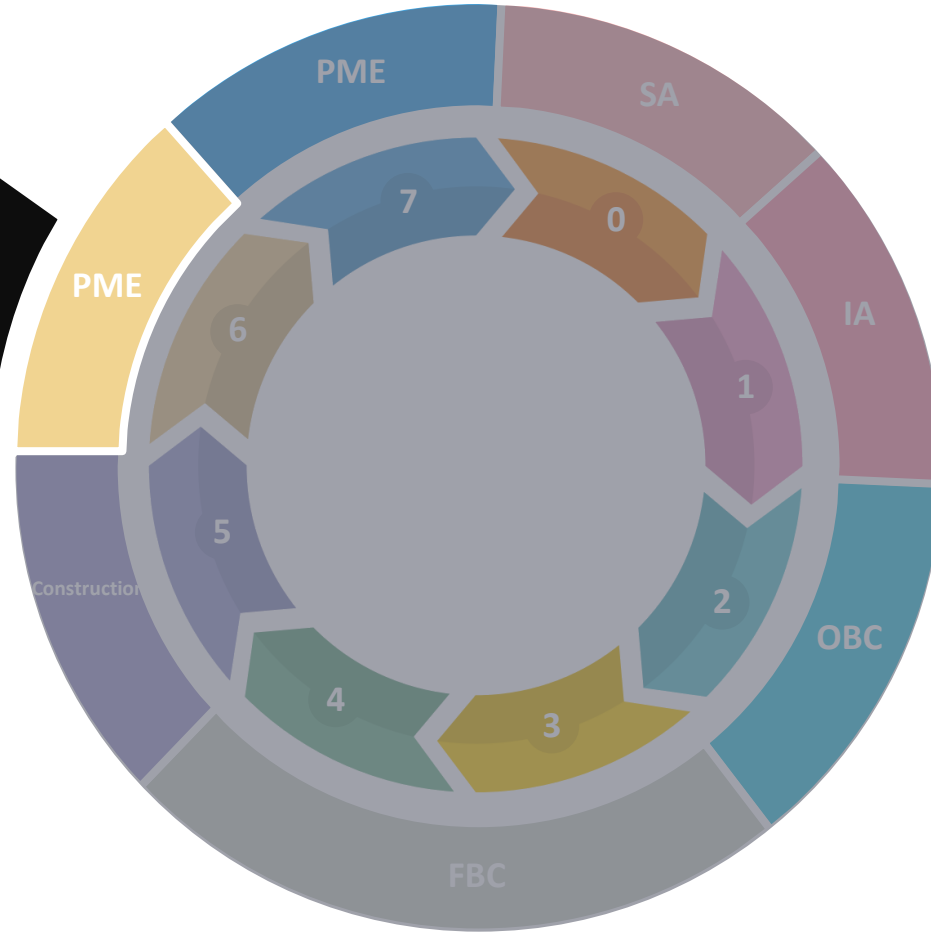
Stage 7:
Information model delivery

Activity	Clause	Description / Narrative	Key Task(s)
Review and accept the information model	ISO 19650-2 5.7.4	This clause is the fourth and final step in the process of delivering the information model as an information exchange to the appointing party and having it accepted as Published information. The appointing party reviews the information submitted by an appointed party. In doing this, the appointing party is concerned to check that the information has been delivered according to the project's information production methods and procedures (such as, abiding by the security procedures). • The appointing party should, where relevant, be checking the contents of the information container against: • its exchange information requirements (EIR) including any acceptance criteria specified in the EIR • the dates recorded in the master information delivery plan (MIDP), and against • the degree of information required defined through the level of information need. If the review is successful the information model will be accepted by the appointing party and will transition to the Published state - the appointed party(ies) will publish the information container(s) with an A status code – see ISO 19650-2 clause NA 4.2. If the review is unsuccessful, the information model will be rejected and one, some or all of the information containers will need to be revised. Although ISO 19650-2 says that "... the appointing party shall ... instruct the lead appointed party to amend the information and resubmit for appointing party's acceptance", it is understood that the amendment to any information container is actually carried out by the relevant appointed party, under the direction of the lead appointed party. Partial acceptance of the information model should be avoided. This is to prevent potential disputes arising within the delivery team or other delivery teams. For example, if information model delivery is not complete, its output as reference information for another delivery team will be unreliable. The published information will then be available as reference information for other delivery teams. This may then trigger a new appointment process.	• Review the project's information production methods and procedures, the EIR, the MIDP and level of information need for each information requirement • Review each information container in accordance with these resources • If the review is successful, accept the information model • If the review is unsuccessful, reject the information model and instruct the lead appointed party accordingly

Stage 8:
Project close out

Archive the project information model

Compile lessons learnt for future projects

Working with appointed parties   End of appointment

Aggregate an accepted information model into the AIM

Establish processes to maintain the AIM
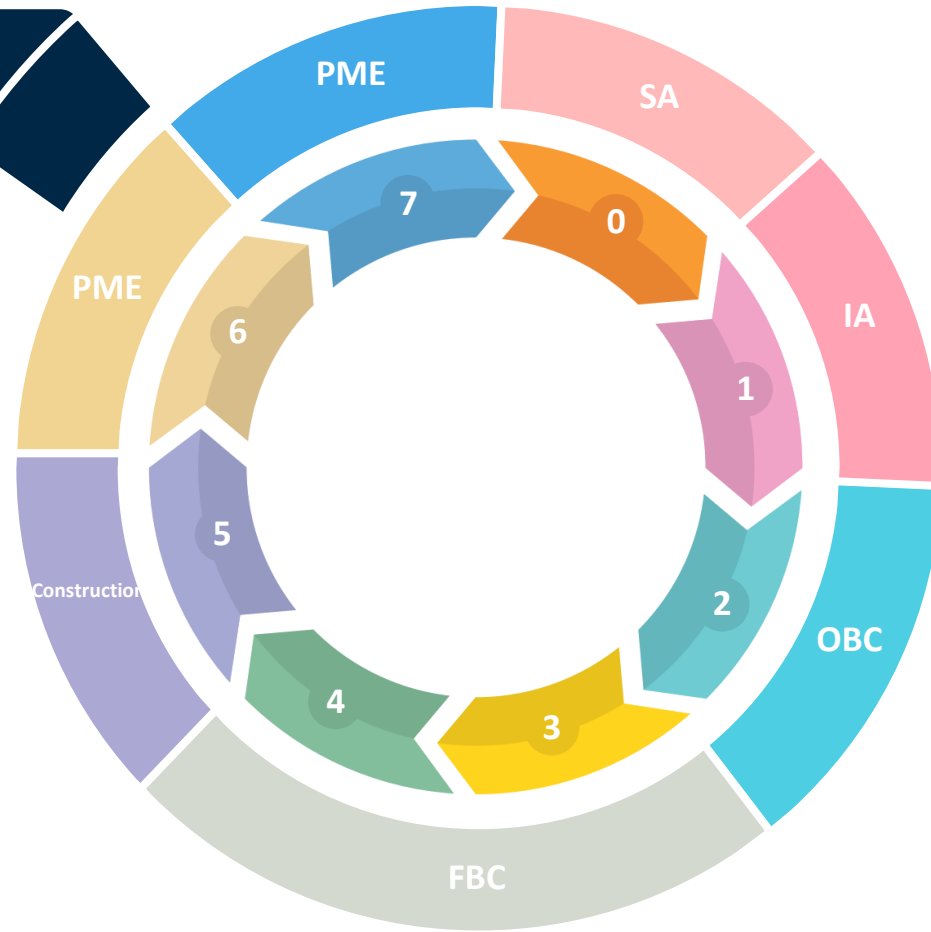
Activities

Activity	Clause	Description / Narrative	Key Task(s)
Archive the project information model	ISO 19650-2 5.8.1	Although individual information containers are added to the common data environment archive during information production, this particular requirement relates to archiving the whole project information model as part of project close-out. This is to ensure that there is a definitive final version of the project information model available in case it needs to be referred to by the appointing party after the project has been completed.	Ensure that a final as-built project information model has been received and archived.

Activity	Clause	Description / Narrative	Key Task(s)
Compile lessons learnt for future projects	ISO 19650-2 5.8.2	The opportunity to capture, store and disseminate lessons learned from one project to the next (and from one appointment to the next), supports continuous improvement of the briefing, delivery and operational outcomes of future projects. Although this is noted as a project close-out activity, capture of lessons learned might also improve processes within the duration of an appointment. It is paramount that sufficient time and resources are allowed to identify, record and understand the implications of these lessons. A robust process will ensure information collected is appropriately structured and in a consistent format to enable analysis, storage and onward utilization. Capture of lessons learned is also an activity referenced in the BS 8536 series (which remains within the UK BIM Framework), as part of soft landings. Soft landings provide a structured methodology whereby lessons can be captured. The key objective of capturing lessons learned is to support future projects from briefing through to the operational stages. Therefore, consideration should be made to engage with stakeholders across the project life cycle to best inform the lessons and in doing so future projects. Through a soft landings approach, the implementation of suitably developed Post Project Evaluations (PPE) and Post Occupancy Evaluations (POE) provide the platform upon which project lessons can be captured from a variety of project stakeholders (Design Team, FM Teams, Contractor, user etc). It is equally important that the obligations to actively participate within the lessons learned process are clearly embedded within stakeholders appointments. The project stakeholders should be engaged and encouraged to contribute to the lessons learned, considering what was done well, what could have been done better and areas for further consideration. Both quantitative and qualitative information may be collected and suitable provisions for the analysis and dissemination of this information should also be considered within the organization. Continued…	Capture lessons learned within the NHSScotland soft landings process.

Activity	Clause	Description / Narrative	Key Task(s)
Compile lessons learnt for future projects. Continued	ISO 19650-2 5.8.2	It is equally important that the obligations to actively participate within the lessons learned process are clearly embedded within stakeholders appointments. The project stakeholders should be engaged and encouraged to contribute to the lessons learned, considering what was done well, what could have been done better and areas for further consideration. Both quantitative and qualitative information may be collected and suitable provisions for the analysis and dissemination of this information should also be considered within the organization. Typical assessment criteria that may be considered within a lessons learned exercise include:- • Assess if the project/investment delivered the required outcomes. • Assess any pre-determined performance metrics. • Did the project delivery meet required budget and programme? • Did the procurement process satisfy all parties? • Did the information management process deliver its required outcomes? • What is the asset users' feedback? • What are the final commercial costs for the project for benchmark purposes? • Does the operational asset perform as designed? • What were the social benefits/values delivered by the project? • What was the carbon impact of the investment? The list is not exhaustive but provides examples criteria to be considered. Defining the criteria at the outset for the project will best support the delivery team meet these project outcomes.	Capture lessons learned within the NHSScotland soft landings process.

Activity	Clause	Description / Narrative	Key Task(s)
Working with appointed parties – End of appointment	ISO 19650-5 9.4	The organization(s) shall implement appropriate and proportionate measures for checking the compliance of any delivery team with any requirements for the delivery, secure storage, disposal or destruction of sensitive information.	Check that the delivery team has met requirements for secure storage, disposal or destruction of sensitive information.

Activity	Clause	Description / Narrative	Key Task(s)
Aggregate an accepted information model into the AIM	ISO 19650-3 5.8.1	The appointing party shall be responsible for the process to incorporate an accepted information model into its AIM and reconcile that information with the existing contents of the AIM, irrespective of its source. This shall include a process to incorporate the accepted information model into its existing enterprise systems, where appropriate.	Ensure the as-built information models are now fully within your Board's AIM CDE
Establish processes to maintain the AIM	ISO 19650-3 5.1.12	The appointing party shall establish or follow existing suitable processes to maintain the AIM for as long as is appropriate. These shall include processes to: • allocate tasks for the production, maintenance, retention, transmission, access to, assurance and archiving of information; • transfer AIM maintenance requirements and/or ownership of the AIM when there is a change of asset owner or appointing party; • establish the content, meaning, format and medium for representation, retention, transmission and retrieval of information; • establish version control, check integrity and verify information against AIR and update the AIM as appropriate; • improve information quality to support organizational objectives; • archive or dispose of obsolete, unreliable or unwanted information; • archive the AIM, in part or in whole, at decommissioning/end of life; • ensure the AIM complies with requirements for security as described in ISO 19650-5; • store information in such a way that it is safe, readily retrievable and use preventative maintenance to protect it from physical and technological deterioration or obsolescence; and • maintain the agreed level of alignment between the contents of the AIM and the state of the physical asset.	Establish processes to maintain the AIM throughout the operational stage.

**NHSScotland
ISO 19650 Interactive Navigator**

NHS National Services Scotland

NHS Scotland Assure — Quality in the healthcare environment

1 2 4 7 8 9

← ↗ →

43

Review and continue maintenance of the AIM

Activity	Clause	Description / Narrative	Key Task(s)
Review and continue maintenance of the AIM	ISO 19650-3 5.8.2	The appointing party shall review whether the AIM continues to fulfil the requirements of 5.1.11 and is being maintained according to 5.1.12. If either of these is not met, then the appointing party shall implement appropriate mitigating measures.	Ongoing monitoring, updating and maintenance of the AIM.

RIBA PoW Overview

UK BIM Framework

Contact Us

Please share comments on the ISO 19650 Navigator:
NSS.DEandAMTeam@nhs.scot

@NHSNSS

@nhshfs

NHSNSS Website

NHS Scotland Assure Website

About Health Facilities Scotland (HFS)

Health Facilities Scotland is a division of National Services Scotland and provides operational guidance to NHSScotland bodies on a range of healthcare facilities topics. We deliver and co ordinate effective advice and support in relation to national facilities, decontamination and equipping and technical matters which support and improve health and well being services.

We work closely with the Scottish Government and NHSScotland Health Boards to establish professional and technical standards and best practices.

About NHS Scotland Assure

NHS Scotland Assure exists to improve how we manage risk in the healthcare built environment across Scotland. Managing risk in the right way gives those involved in maintaining NHS buildings, facilities and equipment confidence and reassurance.

As a new service, Assure aims to be recognised across the world as a national centre for reducing risks in the healthcare built environment. The service will ensure safety, fitness for purpose, cost effectiveness and capability to deliver sustainable services.