

Information management according to BS EN ISO 19650

Guidance Part 2

Parties, teams and processes for the delivery phase of the assets

Edition 6

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If using any information from this report, then its source and date of publication must be acknowledged.

Table of contents

| | |
|---|------------|
| Message from the UK BIM Alliance Chair | 3 |
| Acknowledgments | 4 |
| About BS EN ISO 19650 and building information modelling (BIM) | 5 |
| Abbreviations and acronyms | 6 |
| About this guidance document | 7 |
| 1.0 About ISO 19650 parties and teams | 8 |
| 1.1 Understanding your role and the team context | 8 |
| 1.2 Understanding activities and stages | 13 |
| 1.3 Appointing party | 14 |
| 1.4 Lead appointed party | 18 |
| 1.5 Appointed party/task team | 24 |
| 2.0 ISO 19650-2 clause 5: analysis and activities | 28 |
| 3.0 About the 2021 National Annex | 72 |
| 3.1 Changes in the 2021 National Annex | 73 |
| 3.1.1 Information Container ID Applicability | 73 |
| 3.1.2 Field/String Length | 74 |
| 3.1.3 Project Identifier | 75 |
| 3.1.4 Originator Identifier | 76 |
| 3.1.5 Functional Breakdown Identifier | 77 |
| 3.1.6 Spatial Breakdown Identifier | 78 |
| 3.1.7 Form Identifier | 79 |
| 3.1.8 Discipline Identifier | 81 |
| 3.1.9 Unique Number Identifier | 83 |
| 3.1.10 Status | 84 |
| 3.1.11 Classification | 87 |
| 3.2 Applying the 2021 National Annex | 88 |
| 3.2.1 Application guidance for assessment and need | 88 |
| 3.2.2 Application guidance for the remainder of the delivery phase | 89 |
| 4.0 Information management process summary | 90 |
| 5.0 Summary | 102 |

List of figures

| | |
|---|----|
| Figure 1: ISO 19650 guidance framework | 7 |
| Figure 2: Interfaces between parties and teams | 8 |
| Figure 3: Simple party/appointment relationship | 9 |
| Figure 4: The scenario where there are multiple lead appointed parties and appointed parties (note the parties identified are for illustration only). | 10 |
| Figure 5: Example appointing party and lead appointed party relationships, early design stage (note the parties identified are for illustration only) | 11 |
| Figure 6: The change in the architect's appointment from a pre to post novation scenario (note the parties identified are for illustration only) | 12 |
| Figure 7: Make-up of the delivery team (note the parties identified are for illustration only) | 12 |

List of tables

| | |
|--|----|
| Table 1: Abbreviations and acronyms | 6 |
| Table 2: Activities and stages | 13 |
| Table 3: Information management components of the lead appointed party's appointment | 15 |
| Table 4: Appointing party activity focus | 16 |
| Table 5: Information management components of the lead appointed party's appointment | 19 |
| Table 6: Information management components of the appointed party's appointment | 20 |
| Table 7: Lead appointed party activity focus | 22 |
| Table 8: Information management components of the appointed party's appointment | 25 |
| Table 9: Appointed party/task team activity focus | 27 |

Message from the UK BIM Alliance Chair

Author: Dr Anne Kemp OBE
Chair - UK BIM Alliance



The UK BIM Framework provides the fundamental step towards digital transformation of the UK's built environment industry. The Framework is based on the ISO 19650 series, which first developed out of the UK's former BIM Level 2, but incorporates and anticipates global and future digital perspectives.

The UK BIM Framework embraces and assists in the implementation of the standards for managing information for the whole life of assets of the built environment. The Framework anticipates the potential for integration across portfolios. The Framework provides extensive Guidance which continues to be developed, including the addition of supplementary tools and materials to enable a firm basis for the evolving National Digital Twin Programme.

This Guidance has been developed to help industry to implement the concepts and principles of the ISO 19650 series upon which the UK BIM Framework is based. It has been continually updated to keep track of the publication of the different parts of ISO 19650, and to reflect lessons learnt as further experience is gained in its implementation.

The key parts of ISO 19650 are now all in place, allowing us to realize information management throughout the whole life of built environment assets. It provides for traditional ways of working entailing exchange of information via files, but also caters for shifts towards data exchange. The key is being specific about what information is required and how it is to be delivered. This needs forethought around what should be

the "end in mind" and consideration from an organizational, whole life perspective. This then informs the detailed requirements right down to appointment level.

The work behind developing this Guidance has been considerable. I would like to thank Sarah Davidson and David Churcher for their tireless commitment in continuing to bring this work together - I so enjoy working with you both. Secondly, I would like to thank the many authors who have contributed so generously to the writing of the Guidance - and been so patient in the criticisms and changes that have been required of them. Finally, I would like to thank the many people who have spared time to review and feedback on the Guidance - the Focus Groups in particular, but also those who have contacted us separately. Without this feedback we would not be able to incorporate the wide-ranging experience and testing which is occurring around the industry.

We welcome your continued feedback and shared experiences. You can provide this via guidancefeedback@ukbimframework.org.

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About BS EN ISO 19650 and building information modelling (BIM)

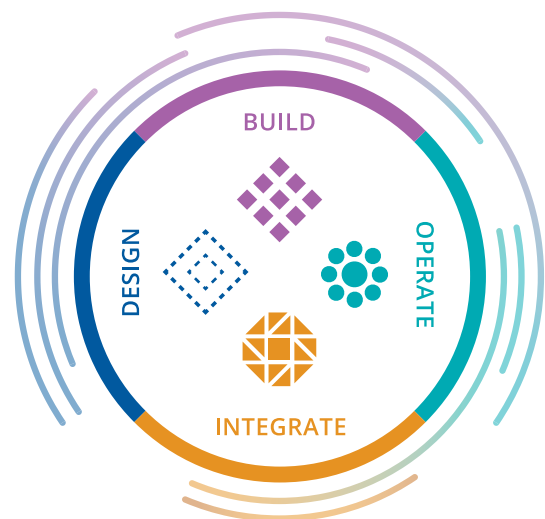
The BS EN ISO 19650 series of standards (herein after referred to as the ISO 19650 series) is an international standard of good practice. It defines information management principles and requirements within a broader context of digital transformation in the disciplines and sectors of the built environment (including construction and asset management industries). Its implementation in the UK is supported by UK National Forewords in ISO 19650 Parts 1 and 2, and a UK National Annex in ISO 19650 Part 2.

The ISO 19650 series replaces some of the existing British Standards and Publicly Available Specifications relating to information management using building information modelling (BIM). It is part of a landscape, or ecosystem, of national and international standards supporting information management processes and technical solutions. It considers all information whether it is a construction programme, a record of a meeting, a geometrical model or a contract administration certificate.

Building information modelling (BIM) plays a key part in the management of information because it provides a methodology that helps us to structure information so that technology can process it.

Structuring information using industry standards helps to improve interoperability. This means that information can be joined-up by both people and technology, which then enables us to extract more valuable knowledge from it. Using the same information structures throughout industry generates consistency, repetition and predictability. This brings real efficiency gains for businesses and provides the data architecture for the connected future.

Standards within the ISO 19650 series are available at www.bsigroup.com. Visit www.ukbimframework.org to see how the ISO 19650 standards plus other standards within the UK BIM Framework map to the design, build, operate and integrate process.



Abbreviations and acronyms

This guidance includes a number of abbreviations and acronyms as set out in Table 1.

Table 1: Abbreviations and acronyms

| Abbreviation or acronym | Term |
|-------------------------|-----------------------------------|
| AIR | Asset information requirements |
| BEP | BIM execution plan |
| BIM | Building information modelling |
| CDE | Common data environment |
| EIR | Exchange information requirements |
| MIDP | Master information delivery plan |
| TIDP | Task information delivery plan |

About this guidance document

The guidance framework supports the UK implementation of the ISO 19650 series. This guidance document (guidance part 2) sits within an overall guidance framework as shown in Figure 1.

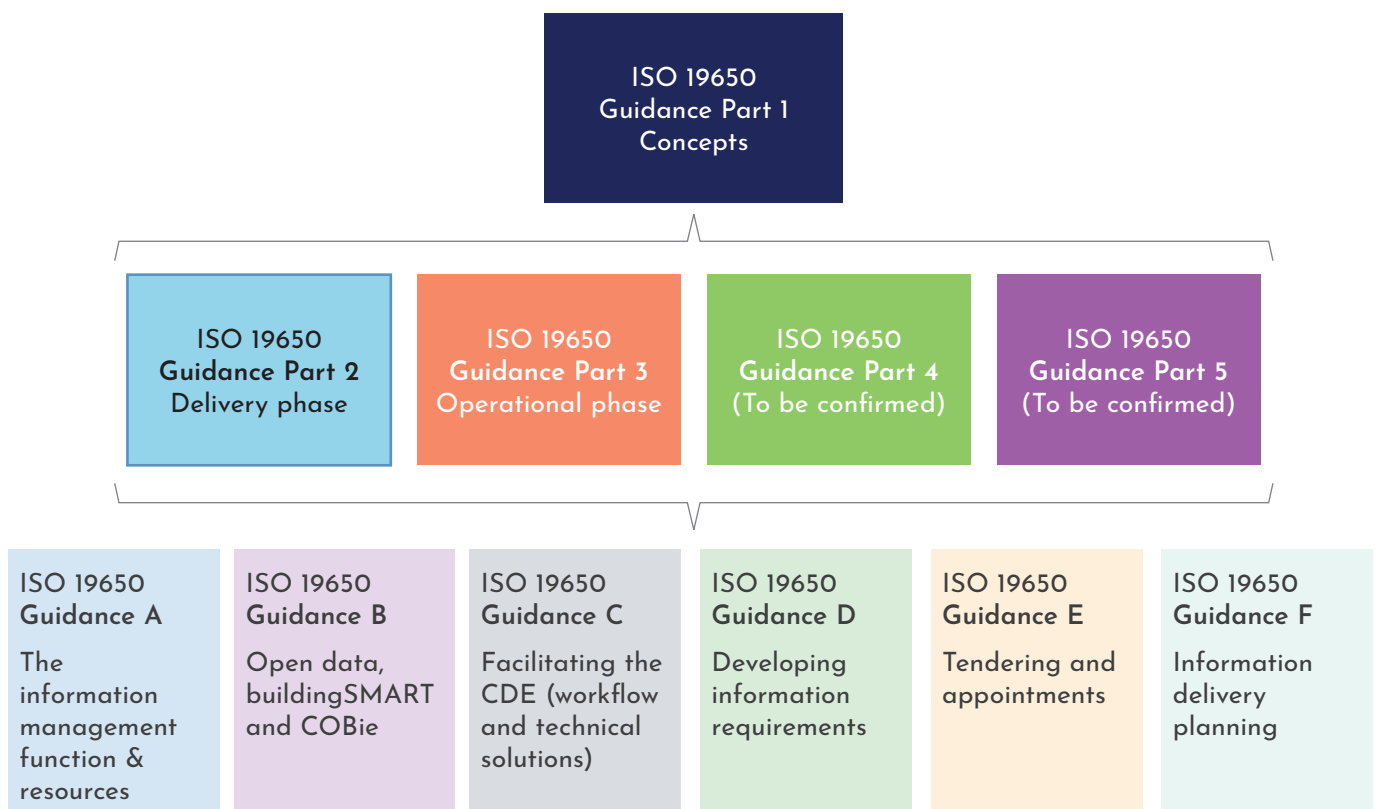


Figure 1: ISO 19650 guidance framework

Guidance part 2 is written to support the implementation of ISO 19650-2 and is relevant to any organization involved in the delivery phase of an asset. It considers the arrangement of parties and teams according to ISO 19650-2 and the activities associated with each sub-clause within ISO 19650-2 clause 5.

It is important that guidance part 2 is read in conjunction with guidance parts A-F where more detail about particular activities and processes is needed. These associated guidance documents are sign-posted throughout this guidance.

As with all guidance supporting the UK BIM Framework, we invite comment and feedback on this guidance part 2 at guidancefeedback@ukbimframework.org.

1.0 About ISO 19650 parties and teams

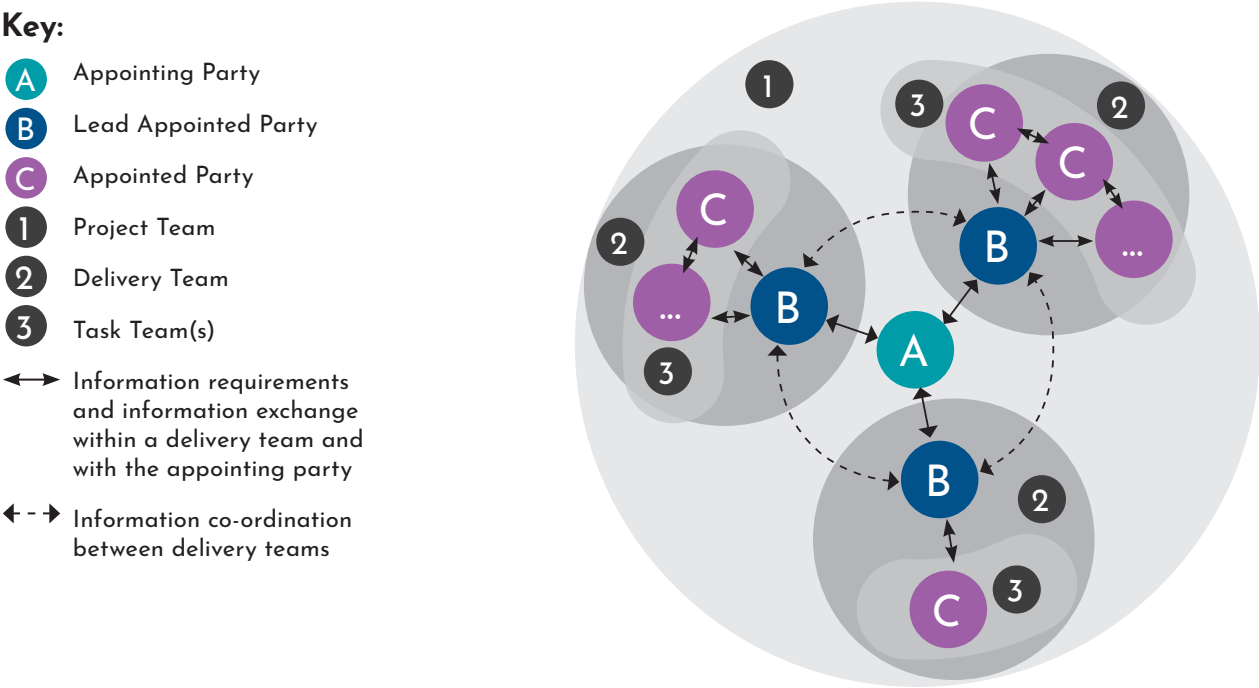
1.1 Understanding your role and the team context

This guidance is written so that you can read it from start to finish or you can navigate through it to understand the activities that are particularly relevant to your role within a project team.

The ISO 19650 series refers to the appointing party, lead appointed party and appointed party and the project team, delivery team and task team.

ISO 19650-2 Figure 2 shows the interface between these parties and teams in terms of information management. A colour coded, simplified version of this image, reproduced with permission from BSI, features in this guidance to provide context to the parties, teams and activities.

Figure 2: Interfaces between parties and teams



Simplified version of ISO 19650-2 Figure 2
Image reproduced with permission from BSI

Sections 1.2, 1.3 and 1.4 of this guidance explain the activities and outputs of the appointing party, a lead appointed party and an appointed party. Section 4 of this guidance shows the flow of activities according to ISO 19650-2 clause 5 and the party/parties engaged in each activity.

It is therefore essential that you understand the ISO 19650-2 role that you are fulfilling so you are clear about your primary and contributing activities and outputs as well as the information management elements of the appointment(s) that you are a party to.

The parties and relationships are as follows (in simple terms):

The **appointing party** is the client or the party managing information on behalf of the client.

A **lead appointed party** is a party appointed by the client.

An **appointed party** is a party appointed by the lead appointed party. The appointed party is the party that **provides the information**. See Figure 3 and the more detailed descriptions of these parties provided in guidance sections 1.2, 1.3 and 1.4.

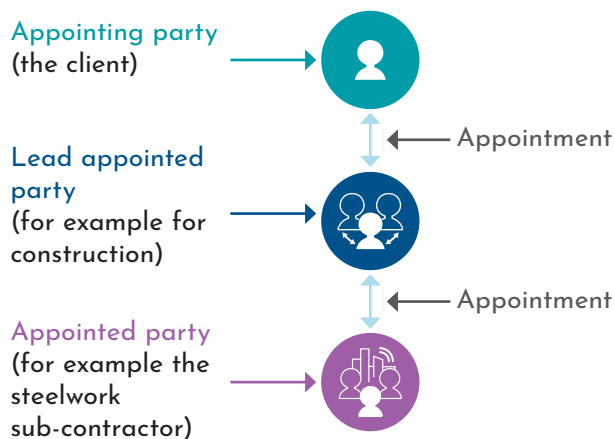
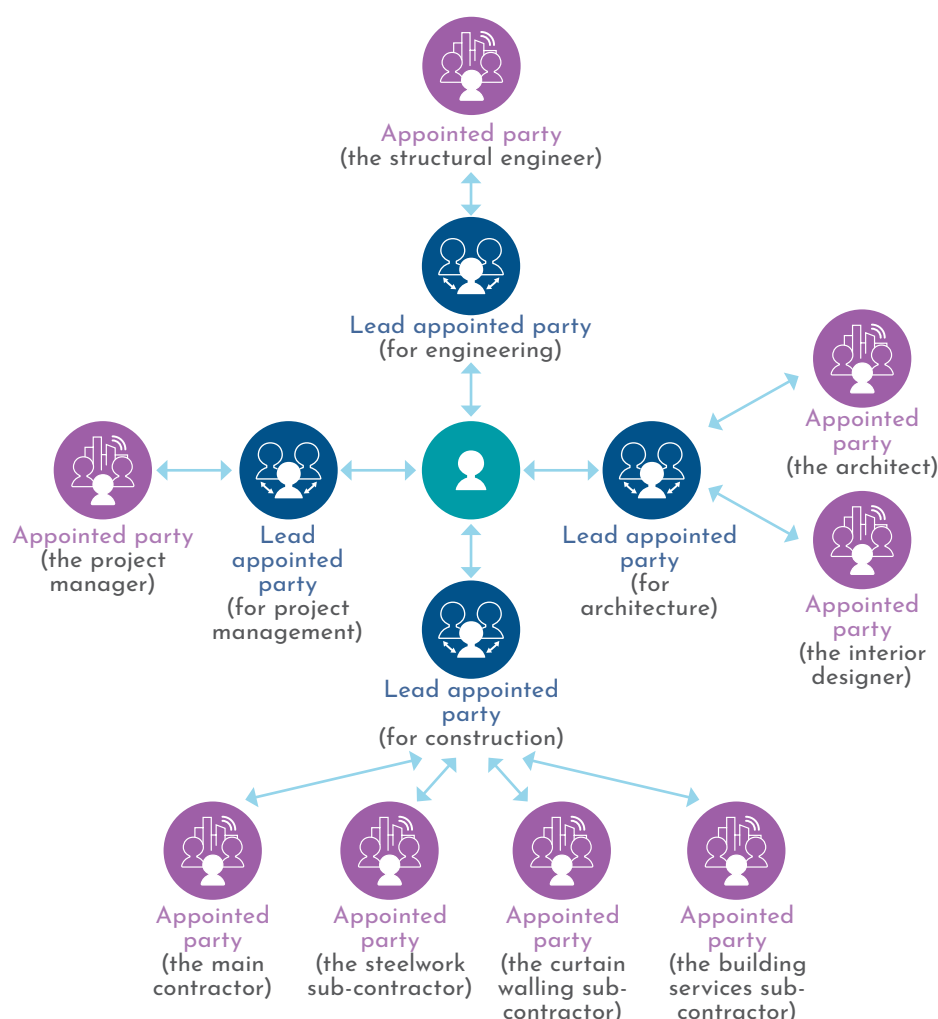


Figure 3: Simple party/appointment relationship

It is important to note that appointments for non-design and design related activities are subject to the same ISO 19650-2 processes.

The appointing party (the client) is likely to have several appointments with lead appointed parties (for example, for architecture, engineering, project management and construction), and a lead appointed party is likely to have several appointments with appointed parties (especially where they are a main contractor) - remember that an appointed party is the party that **provides the information**. See Figure 4.



Key:

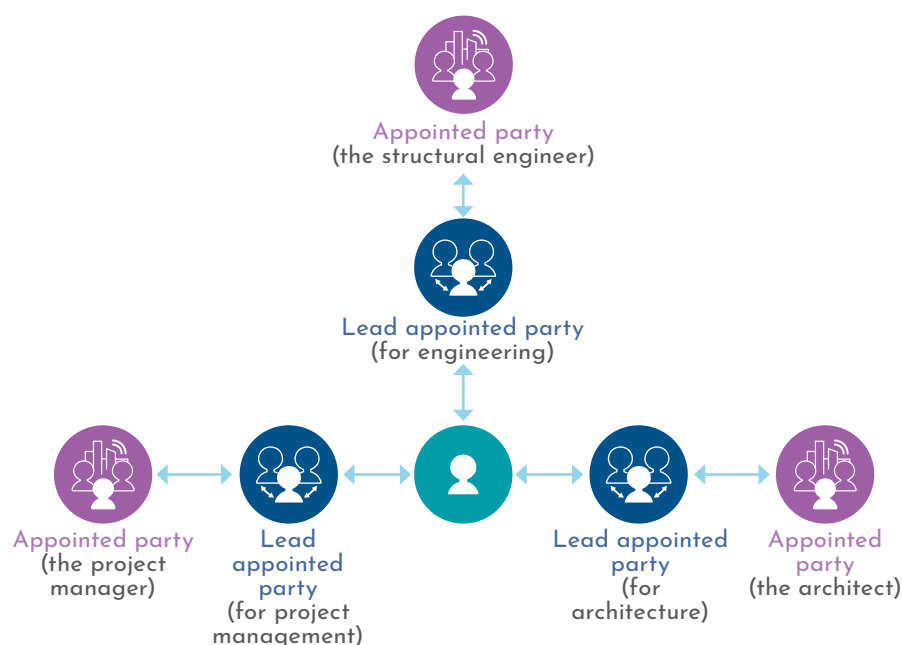
 Appointing Party

 Appointment

Figure 4: The scenario where there are multiple lead appointed parties and appointed parties (note the parties identified are for illustration only).

A project delivered according to a “traditional” structure will have many lead appointed parties, reflecting the direct relationships that are necessary between the client, its consultants, contractor(s) and any specialists.

A project delivered according to a “design and build” structure could have just one lead appointed party (for design and construction). The more common scenario, where there is an element of design carried out prior to the appointment of the design and build contractor will mean that there are multiple lead appointed parties. In this scenario, a lead appointed party may be appointed for architecture for the first part of the project - see Figure 5. However, when the architecture element of the project is novated to the design and build contractor, the architect will become an appointed party to the contractor and the function of the lead appointed party for architecture will cease - see Figure 6.



Key:

 Appointing Party

 Appointment

Figure 5: Example appointing party and lead appointed party relationships, early design stage (note the parties identified are for illustration only)

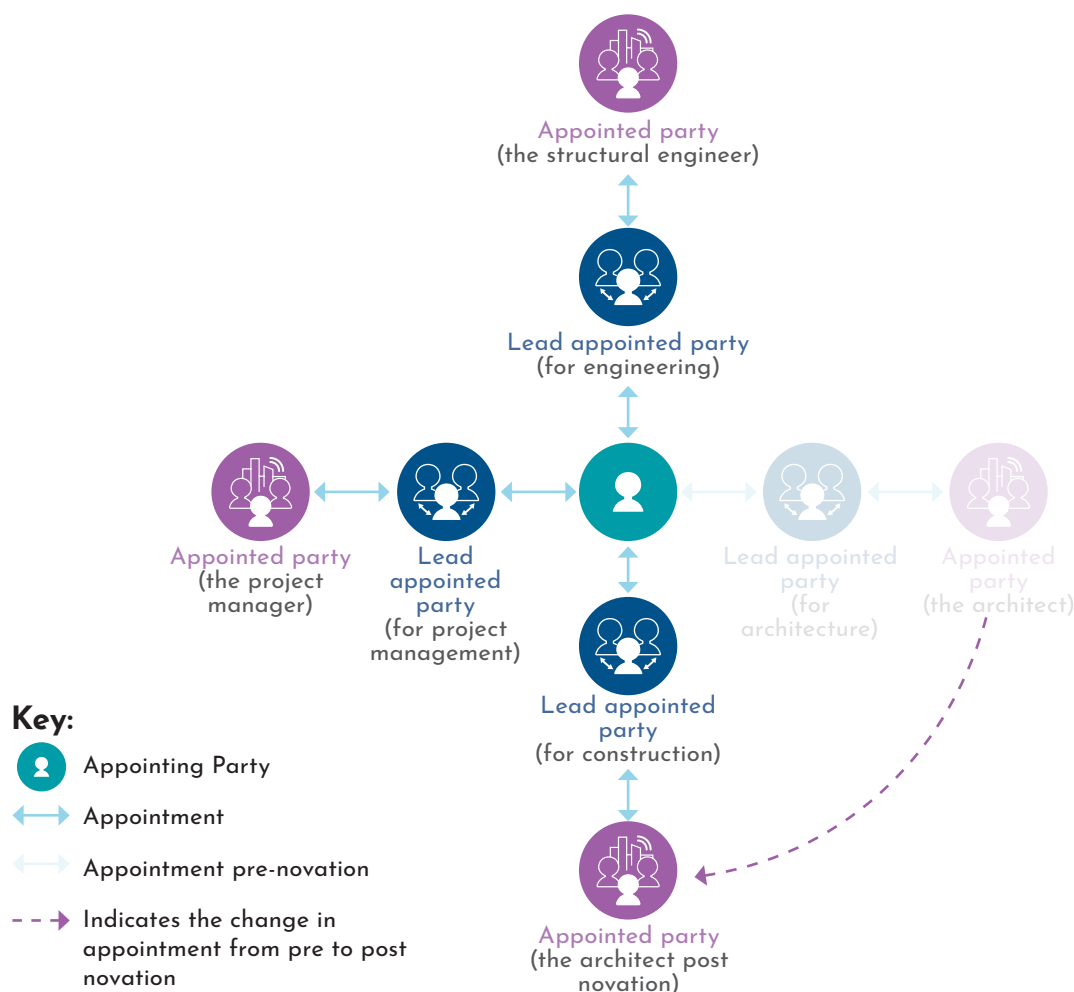


Figure 6: The change in the architect's appointment from a pre to post novation scenario (note the parties identified are for illustration only)

A lead appointed party and their appointed party/parties make up a delivery team as shown in Figure 7.

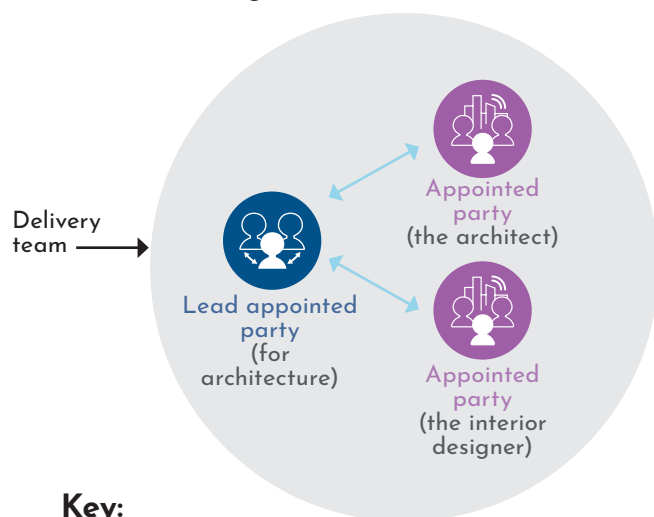


Figure 7: Make-up of the delivery team (note the parties identified are for illustration only)

Where there is a lead appointed party there will be a **delivery team** (even if the delivery team only consists of one lead appointed party organization). Most projects will therefore comprise multiple delivery teams, regardless of the structure of the overall project (traditional, design and build, management and so on).

The project team comprises the appointing party (the client) plus all delivery teams as show in this guidance and ISO 19650-2 Figure 2. It is therefore essential that information is coordinated across delivery teams as well as within delivery teams. This requirement is explored further in ISO 19650 guidance A.

1.2 Understanding activities and stages

The activities that the parties carry out are set out in ISO 19650-2 clause 5 and cover eight stages as follows:

Table 2: Activities and stages

[illegible]

Activities can be categorized as:

- Project level (per project). This means the activity relates to the project as a whole
- Appointment level (per appointment). This means the activity relates to the lead appointed party appointment.

Activities set out in ISO 19650-2 clauses 5.1 and 5.8 relate to a project as a whole. Activities set out in clauses 5.2 to 5.7 are repeated for each piece of work the appointing party (client) tenders (be it for consultants, contractors and/or specialists). The colours represent parties that are active within each stage.

If you want to go directly to the activities relevant to you then:



Go to page 14 for the “Appointing Party” section if you are a client or you are managing information on behalf of a client.



Go to page 18 for the “Lead Appointed Party” section if you are you tendering to be/are responsible for coordinating information between the delivery team and the appointing party (client).

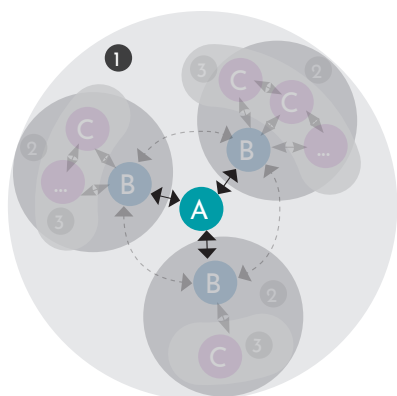


Go to page 24 for the "Appointed Party/Task Team" section if you are tendering for/appointed to a project generally.



If you want to see the flow of activities between all the parties then go to page 90 for the 'Process Summary'.

1.3 Appointing party



If you are a client or are managing information on behalf of a client this means that you are fulfilling the role of the “appointing party” - you are effectively the party “owning” the appointment/project in the context of the ISO 19650 series.

As appointing party you are a member of the Project Team.

Your activities and outputs can be summarized as:

Firstly - to make sure that your information management function is fulfilled by people within your organization or people acting on your behalf or a combination of both.

Then wherever the ISO 19650 series refers to the “appointing party” this means the organization(s) fulfilling the client’s information management function.

Going forward then, in respect of the whole project and before any invitations to tender are issued, your activities as appointing party are to:

- Establish the project’s information requirements, information delivery milestones and information standards
- Identify specific procedures for the production of information including its generation, delivery and secure management
- Identify existing information and/or resources that are relevant to the delivery teams you will be appointing to this project
- Establish the project’s information protocol for incorporation into all project appointments.

You will also need to establish a common data environment (CDE) to support the project and the collaborative production of information. You may wish to appoint a third party to host, manage or support the CDE.

Then for each separate piece of work you are sending out to tender, you need to establish your information requirements. Your outputs in compiling each tender package should consider, and where appropriate include:

- Exchange information requirements (EIR)
- Existing information and resources that are relevant to the tendering opportunity
- Details of how the tender will be evaluated
- Overall project requirements for information delivery, standards and processes
- The project’s information protocol.

It is up to you to determine how these project level and appointment specific resources are assembled into the tender and appointment package for a lead appointed party

In the process of confirming an appointment (of the lead appointed party for example the main contractor) you will both need to agree any changes to the information standards and they should inform you of any risks/ issues which could impact project information delivery milestones. The appointment documents should then include information and information requirements relevant to the appointment.

This is a process/activity that is repeated for each confirmed appointment.

See ISO 19650 guidance C to understand the CDE in detail.

Table 3: Information management components of the lead appointed party's appointment

| Lead appointed party's appointment will document the: | | Prepared by: Appointing party | Prepared by: Lead appointed party |
|---|---|----------------------------------|--------------------------------------|
| Project level | Information standard | ✓ | |
| | Information production methods and procedures | ✓ | |
| | Information protocol | ✓ | |
| Appointment level | Exchange information requirements | ✓ | |
| | BIM execution plan | | ✓ |
| | Master information delivery plan | | ✓ |

Note: preparation of a resource also includes delegation for its preparation.

As appointing party and throughout the project you will review each delivery team's information model against your information requirements and accept or reject as appropriate.

As the project nears close out and the project information model is completed, you will archive the information containers. You will also capture lessons learned with each lead appointed party.

See ISO 19650 guidance A to understand the information management function in detail and the relationship between appointment resources.

See ISO 19650 guidance E to understand information requirements in detail.



Activity focus:

Your level of involvement across ISO 19650-2 clause 5, as an appointing party is as follows:

Table 4: Appointing party activity focus

| | |
|---|--------|
| 5.1 Assessment and need (project) | High |
| 5.2 Invitation to tender (appointment) | High |
| 5.3 Tender response (appointment) | Low |
| 5.4 Appointment | Medium |
| 5.5 Mobilization | Low |
| 5.6 Collaborative production of information | Low |
| 5.7 Information model delivery | Medium |
| 5.8 Project close-out | High |

Relevant clauses to be aware of

For your actions as the appointing party refer to clauses:

- 5.1.1 Appoint individuals to undertake the information management function
- 5.1.2 Establish the project's information requirements
- 5.1.3 Establish the project's information delivery milestone
- 5.1.4 Establish the project's information delivery standard
- 5.1.5 Establish the project's information production methods and procedures
- 5.1.6 Establish the project's reference information and shared resources
- 5.1.7 Establish the project's common data environment
- 5.1.8 Establish the project's information protocol
- 5.2.1 Establish the appointing party's exchange information requirements
- 5.2.2 Assemble reference information and shared resources
- 5.2.3 Establish tender response requirements and evaluation criteria
- 5.2.4 Compile invitation to tender information
- 5.4.6 Complete lead appointed party's appointment documents
- 5.7.4 Review and accept the information model
- 5.8.1 Archive the project information model
- 5.8.2 Compile lessons learnt for future projects

You should also be aware of the following clauses which are relevant because they require you to be informed or to contribute to a process:

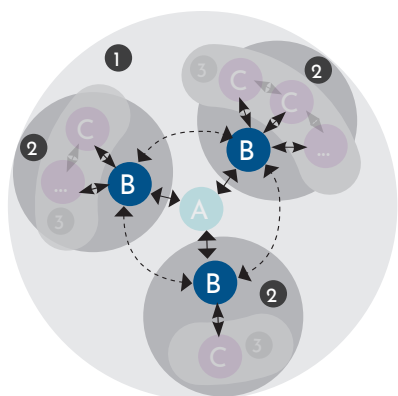
5.4.1 Confirm the delivery team's BIM execution plan

5.4.5 Establish the master information delivery plan

5.5.2 Mobilize information technology



1.4 Lead appointed party



If you are responsible for coordinating information between the delivery team that you are part of and the appointing party (client) this means that you are fulfilling the role of the “lead appointed party” in the context of the ISO 19650 series.

You are a member of both the Project Team and a Delivery Team.

Reference to the lead appointed party

The ISO 19650 series refers to the lead appointed party in two ways:

1. The prospective lead appointed party i.e. a party tendering for the role of lead appointed party
2. Lead appointed party i.e. a party who is confirmed in that role.

Your key activities and outputs as a prospective lead appointed party are:

Firstly - to make sure that your information management function is fulfilled by people within your organization or people acting on your behalf or a combination of both.

Then wherever the ISO 19650 series refers to the “prospective lead appointed party” or “lead appointed party” this means the organization(s) fulfilling your information management function.

Going forward then, in response to the invitation to tender, and in collaboration with the prospective members of your delivery team you:

- Establish the BIM execution plan (BEP)
- Summarize the delivery team’s capability and capacity to manage and produce information
- Establish the delivery team’s mobilization plan, thinking about team-wide approach, responsibilities and required timescales
- Create a risk register to deal with risks associated with timely delivery of information.

The outputs from these activities should form part of your overall tender response.

See ISO 19650 guidance A to understand the information management function in detail.

In order to finalize your appointment as a lead appointed party:

Your completed appointment documents will comprise:

Table 5: Information management components of the lead appointed party's appointment

| Lead appointed party's appointment will document the: | | Prepared by: Appointing party | Prepared by: Lead appointed party |
|---|---|---|---|
| Project level | Information standard | ✓ | |
| | Information production methods and procedures | ✓ | |
| | Information protocol | ✓ | |
| Appointment level | Exchange information requirements | ✓ | |
| | BIM execution plan | | ✓ |
| | Master information delivery plan | | ✓ |

Note: preparation of a resource also includes delegation for its preparation.

Your first activity at this point is to update and confirm the BEP in collaboration with each (to be) appointed party. Any required additions or amendments to the project's information standard, its production methods and procedures, and its information protocol will need to be agreed with the appointing party. The BEP will have contained a high level responsibility matrix and this now needs to be separately refined, developed and sufficiently detailed to identify what information is to be produced, when and by whom (i.e. which task team).

As lead appointed party, you may have your own information requirements in addition to those provided to you by the appointing party. A key activity at this stage is therefore articulating these combined EIR relevant to each prospective appointed party within your delivery team so that each has clear direction about what is required of them.

You are also responsible for compiling the master information delivery plan (MIDP) through the collation of the task information delivery plans (TIDPs) generated by each task team (as a lead appointed party you may also have to undertake task team activities so you may have your own TIDP).

See ISO 19650 guidance A to see the relationships between the appointment resources and ISO 19650 guidance E to see more detail about the BEP.

See ISO 19650 guidance D to see more detail about information requirements



Once you are appointed as lead appointed party

You will need to compile appointment documents for each (to be) appointed party. These should be tailored so that you include the task team EIR and TIDPs that are relevant to the appointment alongside the delivery team's BEP and the agreed project level documents as presented below:

Table 6: Information management components of the appointed party's appointment

| Appointed party's appointment will document the: | | Prepared by: Appointing party | Prepared by: Lead appointed party | Prepared by: Appointed party/task team |
|--|---|----------------------------------|--------------------------------------|---|
| Project level | Information standard | ✓ | | |
| | Information production methods and procedures | ✓ | | |
| | Information protocol | ✓ | | |
| Delivery team level | BIM execution plan | | ✓ | |
| Appointment level | Exchange information requirements | | ✓ | |
| | Task information delivery plan | | | ✓ |

Note: preparation of a resource also includes delegation for its preparation.

You then need to mobilize resources. This means getting people within the delivery team suitably trained with technology and processes in place, tested and up and running. The project's common data environment (CDE) is fundamental to successful information based activities and as lead appointed party you should be made aware of any issues task teams experience with its operation, or with the information/resources accessed through it. Only then is the delivery team in a position to generate, assure, review and authorize information for sharing.

See ISO 19650 guidance C to understand more about the CDE

As lead appointed party, you have the proactive role of managing the progression of the delivery team's information model.

A key activity at the end of each milestone is authorizing each task team's information model to ensure that it meets the project's information standard, the BEP and the EIR assigned to the task team. An information model which is found to be non-compliant (in any aspect) should be rejected with the associated task team(s) being advised to amend their information accordingly.

The delivery team's information model authorized by you is then reviewed by the appointing party. Rejection of an information model will be communicated by the appointing party to you, which you will then need to resolve with the relevant task team. Acceptance of an information model triggers your ability to co-ordinate the information model with other delivery teams' information models.

This process should repeat and continue throughout your appointment.

Another activity of the lead appointed party is to capture lessons learned, in collaboration with the appointing party - ideally throughout your appointment, as opposed to just at the end of it.

**Activity focus:**

Your level of involvement across ISO 19650-2 clause 5, as lead appointed party is as follows:

Table 7: Lead appointed party activity focus

| | |
|---|--------|
| 5.1 Assessment and need (project) | Nil |
| 5.2 Invitation to tender (appointment) | Nil |
| 5.3 Tender response (appointment) | High |
| 5.4 Appointment | High |
| 5.5 Mobilization | High |
| 5.6 Collaborative production of information | High |
| 5.7 Information model delivery | High |
| 5.8 Project close-out | Medium |

For your primary actions as the lead appointed party refer to clauses:

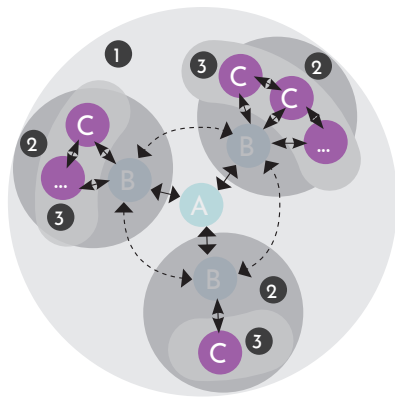
- 5.3.1 Nominate individuals to undertake the information management function
- 5.3.2 Establish the delivery team's (pre-appointment) BIM execution plan
- 5.3.4 Establish the delivery team's capability and capacity
- 5.3.5 Establish the proposed delivery team's mobilization plan
- 5.3.6 Establish the delivery team's risk register
- 5.3.7 Compile the delivery team's tender response
- 5.4.1 Confirm the delivery team's BIM execution plan
- 5.4.2 Establish the delivery team's BIM execution plan
- 5.4.3 Establish the lead appointed party's exchange information requirements
- 5.4.5 Establish the master information delivery plan
- 5.4.7 Complete appointed party's appointment documents
- 5.5.1 Mobilize resources
- 5.5.2 Mobilize information technology
- 5.5.3 Test the project's information production methods and procedures
- 5.6.5 Information model review
- 5.7.2 Review and authorize the information model
- 5.8.2 Compile lessons learnt for future projects

You should also be aware of the following clauses which are relevant because they require you to be informed or to contribute to a process:

- 5.3.3 Assess task team capability and capacity
- 5.6.1 Check the availability of reference information and shared resources
- 5.6.2 Generate information
- 5.7.1 Submit information model for lead appointed party acceptance
- 5.7.3 Submit information model for appointing party acceptance
- 5.7.4 Review and accept information model



1.5 Appointed party/task team



If you are tendering for or appointed to a project generally, this means that you are fulfilling the role of an “appointed party” in the context of the ISO 19650 series. You are a member of both the Project Team and a Delivery Team.

Your organization may include a number of task teams within it.

Reference to appointed party and task team

In ISO 19650-2, most of the requirements below the level of lead appointed party are directed at a task team. There is a lot of flexibility within ISO 19650 regarding the relationship between appointed parties and task teams - in some cases each task team might be a separate appointed party, in other cases an appointed party might include a number of task teams, and in yet more cases a task team might include a number of appointed parties.

To keep things simple in this guidance we are considering the standard to have the same impact on an appointed party and a task team.

Although some ISO 19650 requirements arise before the appointed party/task team is appointed, the standard does not use the term “prospective appointed party”, but we do use this term in the guidance.

Your key activity as a prospective appointed party/task team is to:

Assess your capability and capacity. There are three aspects of capability and capacity to be considered.

1. Capability and capacity to manage information - do you have experience of the standards and do you have enough human resource to do this on this project
2. Capability and capacity to produce information - do you have experience of the methods and procedures and do you have enough human resource to do this on this project
3. Availability of IT - do you have the appropriate hardware, software and support, in sufficient quantities for the project.

In order to finalize your appointment as an appointed party/task team:

You help the lead appointed party to confirm the delivery team's BEP. Any required additions or amendments to the project's information standard, production methods and procedures, and information protocol will need to be agreed with the appointing party. The BEP will have contained a high level responsibility matrix and this now needs to be separately refined, developed and sufficiently detailed to identify what information is to be produced, when and by whom (i.e. which task team).

See ISO 19650 guidance E to understand more about the BEP and ISO 19650 guidance A to see the relationships between the various resources (such as the project's information standard).

The information requirements included in your appointment might be a combination of: those issued to or originating from the lead appointed party.

From your perspective it does not matter which requirements originate with whom, as they all need to be addressed in the TIDP(s) that you establish in collaboration with the appointed parties across the task team(s). These plans are then made available to the lead appointed party for them to compile the MIDP.

ISO 19650 guidance F provides more detail about information delivery planning (responsibility matrices and information delivery plans)

Your completed appointment documents will comprise:

Table 8: Information management components of the appointed party's appointment

| Appointed party's appointment will document the: | | Prepared by: Appointing party | Prepared by: Lead appointed party | Prepared by: Appointed party/task team |
|--|---|----------------------------------|--------------------------------------|---|
| Project level | Information standard | ✓ | | |
| | Information production methods and procedures | ✓ | | |
| | Information protocol | ✓ | | |
| Delivery team level | BIM execution plan | | ✓ | |
| Appointment level | Exchange information requirements | | ✓ | |
| | Task information delivery plan | | | ✓ |

Note: preparation of a resource also includes delegation for its preparation.



Once you are appointed as an appointed party/task team

You work closely with the lead appointed party to mobilize the team resources (personnel and IT) and to participate in training and education where this is necessary to fill knowledge and skills gaps.

You collaboratively generate your information in compliance with the information standard, information production methods and procedures, using the appointing party's reference information and shared resources. To generate appropriate information you will need to understand the project definitions around level of information need, the container breakdown structure and an outline of what information is being produced by other appointed parties/task teams which impacts on your own activities.

You check the information containers that you produce to make sure they are in accordance with the project information production methods and procedures, and against the project information standard. Any non-compliance needs to be addressed by the party who originated the information. Once the procedural aspects of the information container have been checked, you check the contents of the information container to make sure that it meets the information requirements and is in accordance with the level of information need.

You then take part in a delivery team-wide review of the information model. The process of checking your own information and team-wide review can be repeated many times during the production of information leading up to delivery of the information model to the appointing party. At each point of this iterative process, you have to make the agreed changes to your information containers.

When your information model is ready to be delivered, you submit it to the lead appointed party for their review and authorization. If your information is rejected then you make the agreed changes and resubmit.

Once your information has been authorized by the lead appointed party, you submit your information for appointing party review and acceptance. If your information is rejected then this will come back to you via the lead appointed party to be amended and resubmitted.

See ISO 19650 guidance C to understand how information transitions between states in the CDE

Activity focus:

Your level of involvement across ISO 19650-2 clause 5, as an appointed party is as follows:

Table 9: Appointed party/task team activity focus

| | |
|---|--------|
| 5.1 Assessment and need (project) | Nil |
| 5.2 Invitation to tender (appointment) | Nil |
| 5.3 Tender response (appointment) | Medium |
| 5.4 Appointment | Medium |
| 5.5 Mobilization | Medium |
| 5.6 Collaborative production of information | High |
| 5.7 Information model delivery | High |
| 5.8 Project close-out | Nil |

For your primary actions as an appointed party/task team refer to clauses:

- 5.3.3 Assess task team capability and capacity
- 5.4.4 Establish the task information delivery plan
- 5.6.1 Check availability of reference information
- 5.6.2 Generate information
- 5.6.3 Undertake quality assurance check
- 5.6.4 Review information and approve for sharing
- 5.7.1 Submit information model for lead appointed party authorization
- 5.7.3 Submit information model for appointing party acceptance

You should also be aware of the following clauses which are relevant because they require you to be informed or to contribute to a process:

- 5.3.2 Establish the delivery team's (pre-appointment) BIM execution plan
- 5.4.1 Confirm the delivery team's BIM execution plan
- 5.4.2 Establish the delivery team's detailed responsibility matrix
- 5.4.5 Establish the master information delivery plan
- 5.5.1 Mobilize resources
- 5.5.2 Mobilize information technology
- 5.5.3 Test the project's information production methods and procedures
- 5.6.5 Information model review
- 5.7.2 Review and authorize the information model
- 5.7.4 Review and accept the information model

2.0 ISO 19650-2 clause 5: analysis and activities

Note: some of the activities set out ISO 19650-2 clause 5 are explored in detail in the ISO 19650 guidance series (A-F).

This is indicated (as appropriate) against relevant clauses in this guidance section. The resources referred to in ISO 19650-2 clause 5 are also mapped out in ISO 19650 guidance A.

ISO 19650-2 clause 5.1 Assessment and need

Clause: 5.1.1 Appoint individuals to undertake the information management function

See ISO 19650 guidance A to understand more about the information management function

The primary party active within the clause:

Appointing party

Contributing parties to the clause:

n/a

When the activity within the clause should be carried out:

As early as possible

The level of the activity:

Project

Insight:

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

Summary of activities within the clause:

- 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

ISO 19650-2 related clauses

5.1 Information management process - Assessment and need

5.2 Information management process - Invitation to tender

5.3.1 Nominate individuals to undertake the information management function

5.4.1 (e) Confirm the delivery team's BIM execution plan

5.4.5 Establish the master information delivery plan

5.4.6 Complete lead appointed party's appointment documents

5.5.2 Mobilize information technology

5.7.4 Review and accept the information model

5.8 Information management process - Project close-out

Annex A

Clause: 5.1.2 Establish the project's information requirements

See ISO 19650 guidance D to understand more about information requirements

| | | |
|---|--|---|
| The primary party active within the clause: | Insight: 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: <ol style="list-style-type: none"> 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 The information which will be required for those purposes 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. | Appointing party |
| Contributing parties to the clause: | | n/a |
| When the activity within the clause should be carried out: | | Before tendering the first lead appointed party appointment |
| The level of the activity: | | Project |
| Summary of activities within the clause (as appropriate) <ul style="list-style-type: none"> Reflect on ISO 19650-1 clause 5.4 (not clause 5.3 as suggested in clause 5.1.2) Consider the points as set out in ISO 19650-2 clause 5.1.2 Conclude which points are relevant Generate text to reflect content for each relevant consideration | <div data-bbox="448 853 1505 1055" style="background-color: #e6f2ff; padding: 10px; margin: 10px 0;"> 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. </div> Clause 5.1.2 lists seven points of consideration for establishing project information requirements: <ol style="list-style-type: none"> The project scope. <i>Basic information about the project.</i> The intended purpose for which the information will be used by the appointing party <i>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.</i> The project plan of work <i>How the project will be broken down into stages or intervals.</i> The intended procurement route <i>How appointments/contracts will be structured, the relationships between parties and the rules that govern a project.</i> The number of key decision points throughout the project <i>The points during a project where the appointing party requires information to make informed decisions.</i> The decisions that the appointing party needs to make at each key decision point <i>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.</i> The questions to which the appointing party needs answers, to make informed decisions <i>These questions provide a check to ensure that decisions can be made using the information provided.</i> 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. | |

ISO 19650-2 related clauses:

5.1.3 Establish the project's information delivery milestones

5.1.4 Establish the project's information standard

5.1.5 Establish the project's information production methods and procedures

5.2.1 Establish the appointing party's exchange information requirements

Clause: 5.1.3 Establish the project's information delivery milestones

The primary party active within the clause:

Appointing party

Contributing parties to the clause:

n/a

When the activity within the clause should be carried out:

Before tendering the first lead appointed party appointment

The level of the activity:

Project

Insight:

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.

Summary of activities within the clause (as appropriate)

n/a

ISO 19650-2 related clauses

- 5.2.1 Establish the appointing party's exchange information requirements
- 5.2.4 Compile invitation to tender information
- 5.3.6 Establish the delivery team's risk register
- 5.4.2 Establish the delivery team's detailed responsibility matrix
- 5.4.3 Establish the lead appointed party's exchange information requirements
- 5.4.4 Establish the task information delivery plan(s)
- 5.4.5 Establish the master information delivery plan
- 5.5.1 Mobilize resources

Clause: 5.1.4 Establish the project's information standard

The primary party active within the clause:

Appointing party

Contributing parties to the clause:

n/a

When the activity within the clause should be carried out:

Before tendering the first lead appointed party appointment

The level of the activity:

Project

Insight:

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 system 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).

Summary of activities within the clause (as appropriate):

n/a

ISO 19650-2 related clauses:

5.3.2 Establish the appointing party's exchange information requirements

5.2.4 Compile invitation to tender information

5.3.6 Establish the delivery team's risk register

5.4.1 Confirm the delivery team's BIM execution plan

5.4.3 Establish the lead appointed party's exchange information requirements

5.4.6 Complete lead appointed party's appointment documents

5.4.7 Complete appointed party's appointment documents

5.6.2 Generate information

5.6.3 Undertake quality assurance check

Clause: 5.1.5 Establish the project's information production methods and procedures

The primary party active within the clause:

Appointing party

Contributing parties to the clause:

n/a

When the activity within the clause should be carried out:

Before tendering the first lead appointed party appointment

The level of the activity:

Project

Insight:

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 all 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).

Summary of activities within the clause (as appropriate):

n/a

ISO 19650-2 related clauses:

- 5.2.1 Establish the appointing party's exchange information requirements
- 5.2.4 Compile the invitation to tender information
- 5.3.2 Establish the delivery team's (pre-appointment) BIM execution plan
- 5.6.2 Generate information
- 5.6.3 Undertake quality assurance check
- 5.6.4 Review information and approve for sharing
- 5.6.5 Information model review
- 5.7.4 Review and accept the information model
- 5.8.1 Archive the project information model

Clause: 5.1.6 Establish the project's reference information and shared resources

The primary party active within the clause:

Appointing party

Contributing parties to the clause:

n/a

When the activity within the clause should be carried out:

Before tendering the first lead appointed party appointment

The level of the activity:

Project

Insight:

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 and 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.

Summary of activities within the clause (as appropriate):

n/a

ISO 19650-2 related clauses:

5.2.1 (c) Establish the appointing party's exchange information requirements

5.2.2 Assemble reference information and shared resources

5.2.4 Compile invitation to tender information

5.4.3 Establish the lead appointed party's exchange information requirements

5.6.1 Check availability of reference information and shared resources

Clause: 5.1.7 Establish the project's common data environment

See ISO 19650 guidance C to understand more about the common data environment

| | |
|---|---|
| The primary party active within the clause: Appointing party | Insight: 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. |
| Contributing parties to the clause: n/a | 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. |
| When the activity within the clause should be carried out: Before tendering the first lead appointed party appointment | 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. |
| The level of the activity: Project | When implementing the CDE, it must enable: <ul style="list-style-type: none"> • Each information container to have a unique ID, based upon an agreed and documented convention comprised of fields separated by a delimiter |
| Summary of activities within the clause (as appropriate): <ul style="list-style-type: none"> • Appointing party to determine whether they have the in-house capability to deliver a CDE solution or whether it has to be delivered by a third party • Configure the CDE to implement the project's information standard and information methods and procedures | <div data-bbox="464 869 1437 943">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</div> <ul style="list-style-type: none"> • Each field to be assigned a value from an agreed and documented codification standard <div data-bbox="464 1039 1458 1135">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)</div> <ul style="list-style-type: none"> • Each information container to have the following attributes assigned; 1) status 2) revision 3) classification <div data-bbox="488 1234 1497 1330">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</div> <ul style="list-style-type: none"> • 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 <div data-bbox="488 1451 1489 1547">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.</div> <ul style="list-style-type: none"> • Controlled access at an information container level <div data-bbox="464 1601 1481 1697">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</div> |

ISO 19650-2 related clauses:

- 5.1.4 Establish the project's information standard
 - 5.1.5 Establish the project's information production methods and procedures
 - 5.1.8 Establish the project's information protocol
 - 5.2.2 Assemble reference information and shared resources
 - 5.6.1 Check availability of reference information and shared resources
 - 5.6.2 Generate information
 - 5.6.3 Undertake quality assurance check
 - 5.6.4 Review information and approve for sharing
 - 5.7.1 Submit and authorize the information model
 - 5.7.3 Submit information model for appointing party acceptance
 - 5.7.4 Review and accept the information model
 - 5.8.1 Archive the project information model
- National Annex

Clause: 5.1.8 Establish the project's information protocol**An information protocol that is compliant with BS EN ISO 19650 is available via the UK BIM Framework****The primary party active within the clause:**

Appointing party

Insight:

Each appointment must contain an information protocol, i.e. all lead appointed party's appointments and all appointed parties' appointments.

Contributing parties to the clause:

n/a

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.

When the activity within the clause should be carried out:

Before tendering the first lead appointed party appointment

The level of the activity:

Project

Summary of activities within the clause (as appropriate):

n/a

ISO 19650-2 related clauses:

- 5.2.4 Compile invitation to tender information
- 5.3.6 Establish the delivery team's risk register
- 5.4.6 Complete lead appointed party's appointment documents
- 5.4.7 Complete appointed party's appointment documents

ISO 19650-2 clause 5.2 Invitation to tender

Clause: 5.2.1 Establish the appointing party's exchange information requirements

See ISO 19650 guidance D to understand more about information requirements

| | |
|--|--|
| The primary party active within the clause: Appointing party | Insight: 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. |
| Contributing parties to the clause: n/a | Each EIR is a specification detailing the information required by the appointing party for all information exchanges with a lead appointed party. |
| When the activity within the clause should be carried out: Before tendering a lead appointed party appointment | 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). |
| The level of the activity: Appointment | 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). <div style="background-color: #e6f2ff; padding: 10px; margin: 10px 0;"> 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. </div> <div style="background-color: #e6f2ff; padding: 10px; margin: 10px 0;"> 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. </div> During project delivery each EIR provides the mechanism for reviewing and accepting information models for the duration of the associated lead appointed party appointment. |

Summary of activities within the clause (as appropriate):

n/a

ISO 19650-2 related clauses:

- 5.1.2 Establish the project's information requirements
- 5.1.3 Establish the project's information delivery milestones
- 5.1.4 Establish the project's information standard
- 5.1.5 Establish the project's information production methods and procedures
- 5.2.3 Establish tender response requirements and evaluation criteria
- 5.2.4 Compile invitation to tender information
- 5.3.2 Establish the delivery team's (pre-appointment) BIM execution plan
- 5.3.3 Assess task team capability and capacity
- 5.3.6 Establish the delivery team's risk register
- 5.4.3 Establish the lead appointed party's exchange information requirements
- 5.5.1 Mobilize resources
- 5.7.2 Review and authorize the information model
- 5.7.4 Review and accept the information model

Clause: 5.2.2 Assemble reference information and shared resources**The primary party active within the clause:**

Appointing party

Contributing parties to the clause:

n/a

When the activity within the clause should be carried out:

Before tendering each lead appointed party appointment

Insight:

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 make sure 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.

The level of the activity:

Appointment

Summary of activities within the clause (as appropriate)

- 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.

ISO 19650-2 related clauses

5.1.6 Establish the project's reference information and shared resources

5.6.1 Check availability of reference information and shared resources

Clause: 5.2.3 Establish tender response requirements and evaluation criteria

The primary party active within the clause:

Appointing party

Contributing parties to the clause:

n/a

When the activity within the clause should be carried out:

Before tendering each lead appointed party appointment

The level of the activity:

Appointment

Insight:

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 in tender responses received.

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.

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.

Summary of activities within the clause (as appropriate):

- Establish minimum requirements to be addressed within the prospective lead appointed party's tender response
- Identify how the tender response will be evaluated

ISO 19650-2 related clauses:

5.2.3 Compile invitation to tender information

Clause: 5.2.4 Compile invitation to tender information**The primary party active within the clause:**

Appointing party

Contributing parties to the clause:

n/a

When the activity within the clause should be carried out:

Before tendering each lead appointed party appointment

The level of the activity:

Appointment

Insight:

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.

Summary of activities within the clause (as appropriate):

n/a

ISO 19650-2 related clauses:

- 5.2.1 Establish the appointing party's exchange information requirements
- 5.2.2 Assemble reference information and shared resources
- 5.2.3 Establish the tender response requirements and evaluation criteria
- 5.1.3 Establish the project's information delivery milestones
- 5.1.4 Establish the project's information standard
- 5.1.5 Establish the project's information production methods and procedures
- 5.1.8 Establish the project's information protocol
- 5.3.7 Compile the delivery team's tender response

ISO 19650-2 clause 5.3 Tender response

Clause: 5.3.1 Nominate individuals to undertake the information management function

See ISO 19650 guidance A to understand more about the information management function

The primary party active within the clause:

Prospective lead appointed party [please note there is a typographical error in clause 5.3.1 paragraph 3, which should refer to the lead appointed party not the appointing party]

Contributing parties to the clause:

n/a

When the activity within the clause should be carried out:

During tender response

The level of the activity:

Appointment

Insight:

Clause 5.3.1 is the appointment level equivalent of clause 5.1.1 (the project-wide appointment of individuals to undertake the information management function). This part of the information management function describes the activities and tasks undertaken within a delivery team.

The activities making up the information management function vary in complexity and effort. Therefore, it may be appropriate to break down more demanding activities into tasks so more than one individual can be nominated with responsibility for the delivery of the activity. It is important that the individuals nominated have the appropriate knowledge and skills required to undertake the activities assigned.

The aim should be to upskill and self-deliver wherever possible to ensure information management capabilities mature within organizations. However, this clause does allow for a lead appointed party to appoint another organization (an appointed party or a third party) to do this on their behalf.

If the prospective lead appointed party has already been appointed by the appointing party to undertake some or all of its information management function, then the potential conflict of interest has to be avoided, for example by employing different individuals.

Summary of activities within the clause (as appropriate):

n/a

ISO 19650-2 related clauses:

- 5.1.1 Appoint individuals to undertake the information management function (project level)
- 5.3.2 Establish the delivery team's (pre-appointment) BIM execution plan
- 5.3.4 Establish the delivery team's capability and capacity
- 5.3.5 Establish the delivery team's mobilization plan
- 5.3.6 Establish the delivery team's risk register
- 5.3.7 Compile the delivery team's tender response

Clause: 5.3.2 Establish the delivery team's (pre-appointment) BIM execution plan

See ISO 19650 guidance E to understand more about the BIM execution plan

| | |
|--|--|
| The primary party active within the clause: Prospective lead appointed party | Insight: <p>The BIM execution plan is defined in ISO 19650-2 clause 3.1.3.1. The (pre-appointment) BIM execution plan is established by a prospective lead appointed party on behalf of the delivery team and is included in their tender response. The provision of the (pre-appointment) BIM execution plan is a requirement of ISO 19650-2.</p> <p>Clause 5.3.2 identifies seven areas that the prospective lead appointed party should consider in establishing their (pre-appointment) BIM execution plan. However, it is important to understand what the appointing party expects the (pre-appointment) BIM execution plan to contain and to cover this accordingly. Note that the appointing party may have their own BIM execution plan template, which should comply with ISO 19650-2. Assuming this is the case, this template should be made available as part of the invitation to tender documentation.</p> <p>Establishing the (pre-appointment) BIM execution plan should involve collaboration with prospective appointed parties (anticipated members of the delivery team) where known, so that it reflects what the delivery team as a whole will do, not simply what the lead appointed party will do, or would like prospective appointed parties to do.</p> <p>The (pre-appointment) BIM execution plan provides an opportunity for the prospective lead appointed party to identify additions and/or amendments to the project's production methods and procedures and its information standard. This might be needed so that:</p> <ul style="list-style-type: none"> • Information can be effectively generated, reviewed, approved, authorized and exchanged by the different parties involved, and • Distribution and delivery of information is secure and effective |
| Contributing parties to the clause: n/a | |
| When the activity within the clause should be carried out: Any prospective appointed parties that are known at this time | |
| The level of the activity: Appointment | |

Summary of activities within the clause (as appropriate):

- Understand the appointing party's minimum requirements for the (pre-appointment) BIM execution plan and how it will be evaluated
- Establish if the appointing party has a BIM execution plan template that should be populated
- Check the project's production methods and procedures and its information standard. Identify any required additions or amendments
- Consider the contents requirements as set out in ISO 19650-2 clause 5.3.2
- Collaborate with prospective appointed parties so that the contents of the (pre-appointment) BIM execution plan reasonably reflects what the delivery team will do
- Populate the BIM execution plan

ISO 19650-2 related clauses:

- 5.1.6 (b) Establish the project's reference information and shared resources
- 5.2.3 Establish tender response requirements and evaluation criteria
- 5.3.3 Assess task team capability and capacity
- 5.3.7 Compile the delivery team's tender response
- 5.4.1 Confirm the delivery team's BIM execution plan

Clause: 5.3.3 Assess task team capability and capacity**The primary party active within the clause:**

Prospective task team(s)/
appointed parties

Contributing parties to the clause:

n/a

When the activity within the clause should be carried out:

During (or prior to)
preparation of the tender
response

The level of the activity:

Appointment

Insight:

When assessing their capability and capacity, each task team shall consider:

The task team's capability and capacity to manage information

For example: the BIM execution plan's information delivery strategy identifies the use of a specific software package to manage information. Do the members of the task team have experience in managing their information using this software?

The task team's capability and capacity to produce information

For example: the project's information production methods and procedures describe several production methods including space, object type and object component naming conventions. Do the members of the task team have experience in producing their information following these methods?

The availability of IT within the task team

For example: can the hardware, software and IT infrastructure available to the task team meet the information delivery strategy? If not, the task team would need to describe how they intend to meet the information delivery strategy.

It is important to accurately assess task team capability and capacity and to be able to provide evidence if necessary.

In addition, while ISO 19650-2 identifies this as a task team activity, task teams can seek certification as a means of demonstrating capability through an independent third party.

Summary of activities within the clause (as appropriate):

n/a

ISO 19650-2 related clauses:

5.3.4 Establish the delivery team's capability and capacity

Clause: 5.3.4 Establish the delivery team's capability and capacity**The primary party active within the clause:**

Prospective lead appointed party

Contributing parties to the clause:Prospective task teams/
appointed parties**When the activity within the clause should be carried out:**

During preparation of the tender response

The level of the activity:

Appointment

Insight:

There is no Insight for this clause

Summary of activities within the clause (as appropriate):

n/a

ISO 19650-2 related clauses:

5.3.3 Assess task team capability and capacity

5.4.2 Establish the delivery team's detailed responsibility matrix

5.5.1 Mobilize resources

Clause: 5.3.5 Establish the delivery team's mobilization plan**The primary party active within the clause:**

Prospective lead appointed party

Contributing parties to the clause:

Prospective task teams/
appointed parties

When the activity within the clause should be carried out:

During preparation of the tender response

The level of the activity:

Appointment

Insight:

The mobilization plan serves two purposes:

1. It informs the appointing party of the lead appointed party's approach to information management mobilization.
2. It is a tool for the lead appointed party to sufficiently plan out their mobilization phase for information management after appointment.

The mobilization plan may take different forms for example: a schedule, a table or even a Gantt chart.

ISO 19650-2 requires the lead appointed party to consider 11 elements covering testing of information exchange and delivery, common data environments, other software and hardware requirements and training and education. The plan may include:

- Ensuring export file formats are consistent and coherent.
- Testing that the delivery team's common data environment (CDE) solutions perform as expected and that all appointed parties and task teams can access the CDE appropriately.
- Testing that project CDE solutions perform as expected and that all key parties can access it as required. Project CDE solutions should also support all CDE workflows including ensuring acceptance mechanisms work as anticipated
- Testing how information containers may manually or automatically exchange between solutions depending on workflow to reduce review waiting times
- Ensuring site office ICT infrastructure including network lines are in place to allow site staff to access information.
- Producing information management plans or guides to help users operate the CDE solutions
- Educating the delivery team on the project goals and the journey to get there and training the delivery team on the use of any mandatory solutions being provided by the appointing party
- Recruiting of members that play a vital role in the management of information including document/design managers and consultants
- Supporting individuals and organizations that join the delivery team during the appointment

For example - the mobilization plan could describe a series of information management workshops with new appointed parties as part of their project induction

Summary of activities within the clause (as appropriate):

n/a

ISO 19650-2 related clauses:

5.4.1 Confirm the delivery team's BIM execution plan

5.5.1 Mobilize resources

5.5.2 Mobilize information technology

5.5.3 Test the project's information production methods and procedures

Clause: 5.3.6 Establish the delivery team's risk register

| | |
|--|--|
| The primary party active within the clause: Prospective lead appointed party | Insight: ISO 19650-2 sets out the criteria for the prospective lead appointed party to include in their delivery team's risk register. |
| Contributing parties to the clause: Prospective task teams/ appointed parties | For example: the appointing party could specify submission of a sub selection of red risks from the delivery team's risk register. The appointing party may wish to share their current perceived risks that are relevant to delivery as part of the invitation to tender. |
| When the activity within the clause should be carried out: During preparation of the tender response | Note that all parties may have internal risk registers that highlight their own perceived risks. These may have additional risks listed relevant to that party's internal operations and risk management. |
| The level of the activity: Appointment | For example, a lead appointed party may have a corporate risk register that outlines the commercial risks of delivering a common data environment (CDE) and committing to service level agreements. This aspect could be reflected in the delivery team's risk register. |
| | <p>It is suggested that an integrated risk register is generated which includes the information management risks alongside other appointment related risks.</p> <p>Risks to consider including in the delivery team's risk register could, for example, include the following:</p> <p>Assumptions</p> <ol style="list-style-type: none"> 1. Existence, gaps and adequacy of the EIR received, and the steps needed to address these concerns. 2. Impact of roles and responsibilities for information management and how appointing party information requirements are being captured. 3. Information related risks should be integrated into a single risk register. For example, the BEP should not feature a supplementary risk register. <p>Milestones</p> <ol style="list-style-type: none"> 1. Consider whether there is sufficient capability and capacity to meet the delivery milestones. 2. Consider project specific procurement risks. Such as the procurement lead times of telecommunications for project sites. <p>Information Protocol</p> <ol style="list-style-type: none"> 1. Consider whether the rights and responsibilities in the protocol are acceptable from legal and commercial perspectives. 2. Existence, gaps and adequacy of the protocol addressing elements listed in clause 5.1.8. <p>Information Delivery Strategy</p> <ol style="list-style-type: none"> 1. Consider whether an appropriate CDE has been established and its capability to deliver the information delivery strategy 2. That all relevant documentation has been agreed by the delivery team and appointing party and communicated to all task teams as appropriate 3. That the level of information need is defined and agreed for each information exchange requirement 4. Impact of the information model federation strategy and its configuration within the CDE 5. Consider whether the mobilization phase includes all configured production templates is undertaken, tested and confirmed. |

Clause: 5.3.6 Establish the delivery team's risk register**Insight continued:****Methods, Procedures and Information Standards**

1. Consider the proposed methods and procedures against existing organization/ internal procedures.
2. Consider the impact of any deviations from existing processes.
3. Consider whether the proposed methods and procedures are feasible and achievable.
4. Assess whether the appointment / invitation to tender manages change appropriately, including ongoing amendment to appointment information management documentation.
5. Consider whether compliance criteria are measurable.

Mobilization, capability and capacity

1. Assess the impact of communication of the mobilization plan.
2. Ensure consideration for lead times is included in mobilization, for example:
 - a. CDE procurement
 - b. Internet connections / Internet service provision
 - c. System configuration
 - d. Training providers
 - e. CDE testing
3. Assess the impact of a negative outcome from testing information production methods and procedures.

The actual list will depend on the specific requirements of the appointment.

Summary of activities within the clause (as appropriate):

- Identify and assess risks associated with information management and information production
- Decide how to combine information management risks with the other risks being identified

ISO 19650-2 related clauses:

5.3.7 Compile the delivery team's tender response

5.4.5 Establish the master information delivery plan

Clause: 5.3.7 Compile the delivery team's tender response**The primary party active within the clause:**

Prospective lead appointed party

Insight:

There is no Insight for this clause

Contributing parties to the clause:

n/a

When the activity within the clause should be carried out:

During preparation of the tender response

The level of the activity:

Appointment

Summary of activities within the clause (as appropriate):

n/a

ISO 19650-2 related clauses

5.2.4 Compile invitation to tender information

5.3.2 Establish the delivery team's (pre-appointment) BIM execution plan

5.3.4 Establish the delivery team's capability and capacity

5.3.5 Establish the delivery team's mobilization plan

5.3.6 Establish the delivery team's risk register

ISO 19650-2 clause 5.4 Appointment

Clause: 5.4.1 Confirm the delivery team's BIM execution plan

See ISO 19650 guidance E to understand more about the BIM execution plan

The primary party active within the clause:

Lead appointed party

Contributing parties to the clause:

Appointing party and appointed parties

When the activity within the clause should be carried out:

During completion of the appointment

The level of the activity:

Appointment

Insight:

The BIM execution plan should be developed and agreed with each appointed party, both those known to the lead appointed party and those that will be appointed during the delivery team's work. This is to ensure that it reflects their activities, their use of IT and that they can work in accordance with the overall delivery team requirements.

Development of content may also require engagement with the appointing party to agree any necessary additions or amendments to the project's information standard or the project's information production methods and procedures.

Note that the language of this clause is different from clause 5.3.2 (pre-appointment BIM execution plan). Clause 5.3.2 lists items to be 'considered', but clause 5.4.1 lists items that the lead appointed party 'shall' do. Some of the items are 'as required', and this means: check what was in the (pre-appointment) BIM execution plan and update it if the information no longer reflects the current/planned delivery team approach.

It is also important to make sure the BIM execution plan meets the minimum content requirements of the appointing party and fits into their template (clauses 5.1.6 (b) and 5.2.4) if they have one.

A BIM execution plan is likely to evolve over the life of the delivery team as additional parties are appointed. The lead appointed party is responsible for maintaining the delivery team's BIM execution plan so that it continues to represent the team's information management approach. As the BIM execution plan is an appointment (contract) document it will need to be subject to a process of formal change control with changes agreed with the appointing party and the appointed parties.

A key recommendation is that the BIM execution plan is simple and concise so that it can be easily understood, implemented, assured and maintained.

Summary of activities within the clause (as appropriate):

- Reference back to the (pre-appointment) BIM execution plan. Reflect on the content and any feedback from the appointing party generated through the tender evaluation process and change as necessary
- Check the project's information standard
- Collaborate with appointed parties to ensure you collectively agree on the:
 - information delivery strategy
 - responsibility matrix,
 - the information standard, and the
 - proposed information production methods and procedures

At this point you should also confirm IT proposals

- Engage with the appointing party to agree any additions or amendments to the project's information standard or information production methods and procedures
- Update the information delivery strategy and high-level responsibility matrix as required
- Submit to the appointing party for inclusion in the appointment documents

ISO 19650-2 related clauses:

5.1.6(b) Establish the project's reference information and shared resources

5.2.3 Establish tender response requirements and evaluation criteria

5.3.2 Establish the delivery team's (pre-appointment) BIM execution plan

5.3.7 Compile the delivery team's tender response

5.4.6 Complete lead appointed party's appointment documents

5.4.7 Complete appointed party's appointment documents

Clause: 5.4.2 Establish the delivery team's detailed responsibility matrix**See ISO 19650 guidance F to understand more about the responsibility matrices****The primary party active within the clause:**

Lead appointed party

Insight:

Produced from the initial high-level responsibility matrix, a detailed responsibility matrix identifies:

Contributing parties to the clause:

Appointed parties

What information is to be produced;

For example: the detailed responsibility matrix may identify, based on the information container breakdown structure, that information about doors should be provided and quantify how much information is required

When the activity within the clause should be carried out:

During completion of the appointment

When the information is to be exchanged and with whom;

For example: the detailed responsibility matrix may identify which delivery milestone this information is needed by; taking into account any dependencies identified by the delivery team.

The level of the activity:

Appointment

Which task team is responsible for its production.

For example: the detailed responsibility matrix may show that "ABC Architects" is responsible for providing this information.

Whilst preparing the detailed responsibility matrix, it is important to bear in mind that the task information delivery plans and master information delivery plan are governed by the rules set by the matrix, but will be working at an information container level. However, the detailed responsibility matrix must refer back to the exchange information requirements received from the appointing party, to be clear how each requirement is being met.

Summary of activities within the clause (as appropriate):

n/a

ISO 19650-2 related clauses:

5.4.4 Establish the task information delivery plan(s)

5.4.5 Establish the master information delivery plan

Clause: 5.4.3 Establish the lead appointed party's exchange information requirements

See ISO 19650 guidance D to understand more about information requirements

| | |
|---|---|
| The primary party active within the clause: Lead appointed party | Insight: The lead appointed party should define a set of exchange information requirements (EIR) for each appointment it makes just like the appointing party does (see ISO 19650-2, 5.2.1). Each EIR should detail the information required by the lead appointed party from the appointed party. This may include relevant aspects of appointing party's EIR, creating a cascade throughout the supply chain. These are detailed requirements and should be defined around the concept of the level of information need to ensure all facets of information are captured. For example: a tier 1 contractor manages programme and cost; therefore, they may require specific information from certain sub-contractors to enable them to carry out these tasks. |
| Contributing parties to the clause: n/a | |
| When the activity within the clause should be carried out: During completion of the appointment | |
| The level of the activity: Appointment | <p>In addition, the appointing party may require asset information for maintenance purposes which will be delivered by certain sub-contractors.</p> <p>This information is included within the lead appointed party's exchange information requirements and hence the tender information for the relevant sub-contractors.</p> <p>During project delivery the exchange information requirements provide the mechanism for the lead appointed party to authorize information models.</p> |

Summary of activities within the clause (as appropriate):

Clause 5.4.3 provides step by step detail of activities required

ISO 19650-2 related clauses:

- 5.2.1 Establish the appointing party's exchange information requirements
- 5.3.3 Assess task team capability and capacity
- 5.4.1 Confirm the delivery team's BIM execution plan
- 5.4.2 Establish the delivery team's detailed responsibility matrix
- 5.4.4 Establish the task information delivery plan(s)
- 5.4.7 Complete appointed party's appointment documents
- 5.5.1 Mobilize resources
- 5.5.2 Mobilize technology
- 5.6.4 Review information and approve for sharing
- 5.7.2 Review and authorize the information model

Clause: 5.4.4 Establish the task information delivery plan(s)**See ISO 19650 guidance F to understand more about information delivery plans****The primary party active within the clause:**

Appointed party

Contributing parties to the clause:

n/a

When the activity within the clause should be carried out:

During completion of and then throughout the appointment

The level of the activity:

Appointment

Insight:

A Task Information Delivery Plan (TIDP) is a detailed plan for how a particular task team is going to deliver the information it has been asked to provide (models, documents, schedules, calculations, and so on).

There is no prescribed format for the TIDP. It lends itself to being produced as a table, or in a spreadsheet, database or even in an annotated Gantt chart.

A TIDP has certain minimum contents, defined in ISO 19650-2 clause 5.4.4 paragraph 3. These details are provided for each information container that the task team will be delivering. Because of this, a TIDP could be a lengthy resource, with details covering the “what”, and the potential multiple “when’s”, if information containers are to be shared repeatedly during their development.

The purpose of doing this activity from the task team’s perspective is to enable them to clarify what they will and will not deliver as part of their scope and what information will need to be exchanged between them and other task teams to allow timely coordination and progress across the delivery team.

Summary of activities within the clause (as appropriate):

n/a

ISO 19650-2 related clauses:

5.4.2 Establish the delivery team’s detailed responsibility matrix

5.4.5 Establish the master information delivery plan

Clause: 5.4.5 Establish the master information delivery plan**See ISO 19650 guidance F to understand more about information delivery plans****The primary party active within the clause:**

Lead appointed party

Contributing parties to the clause:

Appointed parties

When the activity within the clause should be carried out:

During completion of and then throughout the appointment

The level of the activity:

Appointment

Insight:

The master information delivery plan (MIDP) is the compilation of all the task information delivery plans (TIDPs) within a delivery team. Its purpose is to allow the lead appointed party to check the delivery plans across different task teams, to make sure these fit with the overall delivery team schedule of activities and to make sure that any related deliverables are in the right logical sequence.

There is no minimum list of contents for an MIDP provided in ISO 19650-2. However, as an MIDP is a collation of TIDPs then the contents list of a TIDP is a good starting point. Whilst the information author responsible for an information container production is specified, the task team actually responsible for each information container could also be a valuable feature to add to the MIDP contents list.

A delivery team's MIDP has to be kept up to date with any changes in the individual TIDPs that form part of it. It should also be updated to include additional TIDPs from new appointed parties/task teams joining the delivery team.

Summary of activities within the clause (as appropriate):

n/a

ISO 19650-2 related clauses:

5.4.2 Establish the delivery team's detailed responsibility matrix

5.4.4 Establish the task information delivery plan(s)

Clause: 5.4.6 Complete lead appointed party's appointment documents**The primary party active within the clause:**

Appointing party

Contributing parties to the clause:

Lead appointed party

When the activity within the clause should be carried out:

During completion of the appointment

The level of the activity:

Appointment

Insight:

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.

Summary of activities within the clause (as appropriate):

n/a

ISO 19650-2 related clauses:

5.2.1 Establish the appointing party's exchange information requirements

5.1.4 Establish the project's information standard

5.1.8 Establish the project's information protocol

5.4.1 Confirm the delivery team's BIM execution plan

5.4.5 Establish the master information delivery plan

Clause: 5.4.7 Complete appointed party's appointment documents**The primary party active within the clause:**

Lead appointed party

Contributing parties to the clause:

Appointed party

When the activity within the clause should be carried out:

During completion of the appointment

The level of the activity:

Appointment

Insight:

It is important that each of the five resources listed are included within the appointed party's appointment documents. The information protocol contained in the appointed party's appointment documents will usually be the same as that in the lead appointed party's appointment documents, with any relevant changes to reflect their particular appointment.

Summary of activities within the clause (as appropriate):

n/a

ISO 19650-2 related clauses:

5.4.3 Establish the lead appointed party's exchange information requirements

5.1.4 Establish the project's information standard

5.1.8 Establish the project's information protocol

5.4.1 Confirm the delivery team's BIM execution plan

5.4.4 Establish the task information delivery plan

ISO 19650-2 clause 5.5 Mobilization

Clause: 5.5.1 Mobilize resources

The primary party active within the clause:

Lead appointed party

Contributing parties to the clause:

Task team(s)/appointed parties

When the activity within the clause should be carried out:

Before any information is generated within a task team

The level of the activity:

Appointment

Insight:

The alignment of an activity with a documented process is a common theme throughout the ISO 19650 series. The mobilization activities should therefore follow the mobilization plan submitted with the delivery team's tender response (see ISO 19650-2 clauses 5.3.5 and 5.3.7).

ISO 19650 clause 5.5.1 addresses the mobilization of resources covering individuals specifically. The mobilization activity should result in individuals being available, educated and trained such that they can generate information and deliver the information model for authorization and acceptance.

Mobilization of resources covers three core activities which are set out in clause 5.5.1.

Confirm the resource availability of each task team

For example: Are the individuals carrying out the information management function, as well as all the information authors named in the task information delivery plan (TIDP), available? Remember the hidden resources 'the back of house' needed to support, configure and procure systems. This includes administration of common data environment solutions and management teams.

There will be times when the intended team members are no longer available when the appointment starts. This situation needs to be managed, by identifying and upskilling new team members to take their place. The important aspect is to make sure that the new team members have equivalent or better skills than those they are replacing.

This activity should address gaps found in the assessment of task team capacity in 5.3.4 and where necessary will feed in to the next points on developing and delivering education and training.

Develop and deliver education

The intention of this activity is to develop appointed party knowledge about the information management resources, required processes and associated obligations.

Develop and deliver training

The intention here is to ensure that individuals are competent (skilled) to generate or manage information.

Tip: make sure that the time for mobilization confirmed in the mobilization plan is actually allocated to planning and implementing training. Time required could include the lead times for training providers/content providers.

Mobilization of resources may not be a one-off activity and will need to be repeated when new individuals join the delivery team and/or other circumstances change.

A successful outcome of 5.5.1 would be sufficient individuals who are knowledgeable and competent to generate or manage information.

Any risks generated through this mobilization activity should be recorded in the delivery team's risk register.

Clause: 5.5.1 Mobilize resources**Summary of activities within the clause (as appropriate):**

- Review the mobilization plan
- Review each TIDP
- Establish the availability of individuals
- Implement education and training as required
- Update the risk register as required
- Repeat mobilization of resources as and when necessary

ISO 19650-2 related clauses:

5.3.4 Establish the delivery teams capability and capacity

5.3.5 Establish the delivery team's mobilization plan

5.3.6 Establish the delivery team's risk register

5.3.7 Compile the delivery team's tender response

5.4.7 Complete appointed party's appointment documents

5.5.2 Mobilize information technology

5.5.3 Test the project's information production methods and procedures

Clause: 5.5.2 Mobilize information technology

The primary party active within the clause:

Lead appointed party

Contributing parties to the clause:

Appointing party and task team(s)/appointed parties

When the activity within the clause should be carried out:

Before any information is generated within a task team.

The level of the activity:

Appointment

Insight:

As noted in the insight to clause 5.5.1, the alignment of an activity with a documented process is a common theme throughout the ISO 19650 series. The mobilization activities should therefore follow the mobilization plan submitted with the delivery team's tender response (see ISO 19650-2 clauses 5.3.5 and 5.3.7).

ISO 19650 clause 5.5.1 addresses the mobilization of technology - both hardware and software. It covers the common data environment (CDE) and any other technology underpinning the generation and exchange of information specifically.

The mobilization activity should result in technology being in place, configured and suitably tested to support the generation and exchange of information between all members of the project team. This is to ensure that information can be confidently exchanged between members of the delivery team and between the appointed parties and the appointing party.

Mobilization of information technology covers five core activities which are set out in clause 5.5.2.

Procure, implement, configure and test software, hardware and IT infrastructure

Mobilization of information technology is about more than just getting the hardware delivered - it also needs the software to be installed and it all needs to be tested. A further consideration is ensuring that software versions and add-ons do not impact on interoperability.

It is therefore important to ensure that the right technologies are in place and there is enough of them (in terms of licensing for example).

Tip: it is crucial that service level agreements and terms and conditions will effectively support the duration of the appointment (for example, consider the timing of renewal agreements).

Configure and test the project's common data environment (CDE)

Although the project's CDE solution is enabled by the appointing party, the lead appointed party has to ensure that it is tested and will support sharing and publishing of the delivery team's information. This requires co-operation of the appointing party.

For example, this might include testing delivery team specific work-flow, setting up access and administration permissions.

Configure and test the delivery team's CDE

When the delivery teams uses its own CDE solution, in addition to the project's CDE solution, then this too has to be configured and tested to support information sharing. Where this is the case a crucial area to address is the connectivity to the project's CDE solution.

Test information exchanges between task teams

Each part of the information exchange process should be tested to ensure that information can be effectively shared within the delivery team.

Test information delivery

Each part of the information delivery process should be tested from the delivery team's perspective. This is likely to require the co-operation of the appointing party.

A successful outcome of 5.5.2 would be assurance that information technology will support the generation and management of information.

Any risks generated through this mobilization activity should be recorded in the delivery team's risk register.

Clause: 5.5.2 Mobilize information technology**Summary of activities within the clause (as appropriate):**

- Review the lead appointed party's appointment documents
- Review the mobilization plan
- Review each TIDP
- Review the available technologies already in place plus commercial arrangement for information technologies required or to be maintained
- Update the risk register as required
- Repeat mobilization of information technology as and when necessary

ISO 19650-2 related clauses:

5.3.5 Establish the delivery team's mobilization plan

5.3.6 Establish the delivery team's risk register

5.3.7 Compile the delivery team's tender response

5.4.7 Complete appointed party's appointment documents

5.5.1 Mobilize resources

5.5.3 Test the project's information production methods and procedures

Clause: 5.5.3 Test the project's information production methods and procedures

The primary party active within the clause:

Lead appointed party

Contributing parties to the clause:

Task team(s)/appointed parties

When the activity within the clause should be carried out:

Before any information is generated within a task team.

The level of the activity:

Appointment

Insight:

As noted in the insight to clause 5.5.1, the alignment of an activity with a documented process is a common theme throughout the ISO 19650 series. The mobilization activities should therefore follow the mobilization plan submitted with the delivery team's tender response (see ISO 19650-2 clauses 5.3.5 and 5.3.7).

Clause 5.5.3 is focussed on ensuring that the methods and procedures for information production and exchange are understood by all members of the delivery team and can be implemented from the outset of the information generation activities.

This will involve testing the project's information production methods and procedures.

For example, testing will include a review of the federation strategy and information container breakdown structure to establish that they remain appropriate. If this is not the case, refinement should be explored to ensure that the information container breakdown structure supports the federation strategy.

For example, testing the visibility of information containers and the information within them to ensure that security requirements for the management of sensitive information can be adhered to.

In thinking about information production, the lead appointed party may need to develop shared resources for use by the delivery team.

The final activity within this clause is to ensure that the project's information production methods and procedures are cascaded to every task team within the delivery team.

Although the activities within clause 5.5.3 are assigned to the lead appointed party, they should be undertaken in a collaborative manner including all delivery team members.

A successful outcome of 5.5.3 would be assurance that the project's information production methods and procedures will support the generation and management of information.

Any risks generated through this mobilization activity should be recorded in the delivery team's risk register.

Summary of activities within the clause (as appropriate):

- Review and test the project's information production methods and procedures
- Make refinements as required
- Communicate the project's information production methods and procedures to all task teams

ISO 19650-2 related clauses:

5.1.5 Establish the project's information production methods and procedures

5.3.5 Establish the delivery team's mobilization plan

5.3.6 Establish the delivery team's risk register

5.3.7 Compile the delivery team's tender response

5.4.7 Complete appointed party's appointment documents

5.5.1 Mobilize resources

5.5.2 Mobilize information technology

ISO 19650-2 clause 5.6 Collaborative production of information

Clause: 5.6.1 Check availability of reference information and shared resources

The primary party active within the clause:

Task team(s)/appointed parties

Contributing parties to the clause:

n/a

When the activity within the clause should be carried out:

Prior to generating information

The level of the activity:

Appointment

Insight:

Access to reference information and shared resources should be checked by each task team (appointed party) when generation of information is about to start. Reference information and shared resources are initially provided by the appointing party (clause 5.2.2) and can then be reviewed and extended by the lead appointed party (clause 5.4.3 e).

Reference information and shared resources are held in the project's common data environment (CDE) and lack of access could be caused by a number of reasons, including:

- The relevant information was never shared through the CDE;
- The task team/appointed party has not been given access rights to the information, or these rights have lapsed or been revoked;
- Relevant information was shared, but has become obsolete; or
- New requirements for reference information or shared resources have arisen which are not covered by the information currently available.

Lack of access to reference information or to shared resources, for whatever reason, should be reported to the lead appointed party as soon as possible. Ideally this should be before the task team generates any of its own information. The task team should also assess any impact on its information delivery plan, and report this to the lead appointed party as well.

Summary of activities within the clause (as appropriate):

- Review what reference information and shared resources are accessible in the project's CDE, in sufficient time before technical work and generation of information starts, and then compare this with the task team's requirements.
- Report any shortfall to the lead appointed party.

ISO 19650-2 related clauses:

5.1.6 Establish the project's reference information and shared resources

5.2.2 Assemble reference information and shared resources

Clause: 5.6.2 Generate information**See ISO 19650 guidance C to understand how an information container transitions between states****The primary party active within the clause:**

Task team(s)/appointed parties

Contributing parties to the clause:

n/a

When the activity within the clause should be carried out:

After mobilization and throughout the appointment

The level of the activity:

Appointment

Insight:

Individuals generating information (as with all members of the project team) have a responsibility for robust information management.

The task information delivery plan (TIDP) is the primary consideration in generating information as efficiently and effectively as possible in a collaborative manner. The TIDP identifies which information containers an author is responsible for generating. While generating this information, the project's information production methods and procedures (i.e. the process for information production) and the project's information standard should be carefully reviewed to ensure compliance from the outset.

Note that clause 5.6.2 (b) is explicit about information that should not be generated. This is to encourage the generation of appropriate, useful and useable information. For example it is wasteful to produce information that exceeds the level of information need and/or duplicates information generated by another task team.

An example of avoiding duplication would be the architectural task team referencing the structural engineering containers rather than recreating structural elements in their geometrical models.

As well as working in accordance with ISO 19650-2, it's important that there is effective communication between those individuals generating information and across the delivery team. This may be via the CDE or more informally for example, email, online meetings or just "picking up the phone".

When generating information that requires an element of co-ordination with other information it's good practice to establish regular exchanges between task teams via the CDE. For example, geometrical models requiring co-ordination might be exchanged on a fortnightly basis (although this frequency should be flexible depending on the requirements of the delivery team and the project). Any co-ordination issues should be resolved between task teams and if this is not possible, the issue should be escalated to the lead appointed party.

Summary of activities within the clause (as appropriate):

- Refer to the TIDP, the project's information production methods and procedures and the project's information standard
- Generate information taking account of the level of information need described in the TIDP
- Co-ordinate information as required
- Resolve co-ordination issues, escalate if necessary

ISO 19650-2 related clauses:

5.4.2 Establish the delivery team's detailed responsibility matrix

5.4.3 Establish the lead appointed party's exchange information requirements

5.4.4 Establish the task information delivery plan(s) 5.5.1 Mobilize resources

5.6.1 Check availability of reference information and shared resources

5.6.3 Undertake quality assurance check

5.6.4 Review information and approve for sharing

Clause: 5.6.3 Undertake quality assurance check**See ISO 19650 guidance C to understand how an information container transitions between states****The primary party active within the clause:**

Task team(s)/appointed parties

Contributing parties to the clause:

n/a

When the activity within the clause should be carried out:

Before an information container is shared

The level of the activity:

Appointment

Insight:

Checking the quality of the information container is in two parts. The first part is checking the information container from the outside (in essence the wrapper). The second part is checking the contents and this is dealt with in ISO 19650-2 clause 5.6.4.

The project's information production methods and procedures sets out the process for undertaking the "outside check". This activity might be aligned with the appointed party's ISO 9001 Quality Management System, if that was appropriate/agreed.

The project's information standard then determines the information container requirements considering its:

- Unique ID;
- Status;
- Revision; and
- Classification;

Some checks could be carried out automatically via common data environment workflow.

If the information container check is unsuccessful the information container should be rejected with the information author informed of corrective action required.

Once an information container has been successfully checked and has been marked as checked, its contents should be reviewed as set out in ISO 19650-2 clause 5.6.4.

Summary of activities within the clause (as appropriate):

- Review the project's production methods and procedures
- Review the project's information standard
- Undertake the check
- If the check is successful then mark the information container as checked
- If the check is unsuccessful reject the information container and advise the information author

ISO 19650-2 related clauses:

5.4.7 Complete appointed party's appointed documents

5.6.2 Generate information

5.6.4 Review information and approve for sharing

Clause: 5.6.4 Review information and approve for sharing

See ISO 19650 guidance C to understand how an information container transitions between states

| | | |
|--|---|--|
| The primary party active within the clause: Task team(s)/appointed parties | Insight: <p>Checking the quality of the information container is in two parts. The first part is checking the information container from the outside (in essence the wrapper) and this is dealt with in ISO 19650-2 clause 5.6.3. The second part is checking the contents (this clause).</p> <p>Following the successful quality assurance check of an information container (ISO 19650-2 clause 5.6.3), the task team undertakes a review of the information within the container. The objective of this review is to ensure the information that is going to be shared is in accordance with the lead appointed party's exchange information requirements and the task information delivery plan (TIDP).</p> <div style="border: 1px solid #add8e6; padding: 5px; margin: 10px 0;"> <p>Tip: the TIDP may record additional information containers beyond those needed to meet the lead appointed party's information requirements to support development and/or coordination activities by/with other task teams.</p> </div> <p>The lead appointed party, in agreement with the task team(s), should have established a consistent methodology for undertaking this review and will have recorded this within the project's information production methods and procedures.</p> <p>Only when a review is complete and successful can the information (within the information container) be approved with the information container then assigned a suitable status code for sharing. In the UK, the recommended status codes for information containers are defined in ISO 19650-2 clause NA.4.2 (refer also to guidance C section 6.0- About the Common Data Environment).</p> <p>If the information review is unsuccessful the information container should be rejected. A record should be made of why the review was unsuccessful plus any amendments that need to be made to the information by the task team.</p> | |
| Contributing parties to the clause: n/a | | |
| When the activity within the clause should be carried out: After the quality assurance check of an information container, and prior to sharing within the project CDE. | | |
| The level of the activity: Appointment | | |

Summary of activities within the clause (as appropriate):

- Review the lead appointed party's exchange information requirements and the TIDP
- Review the project's information production methods and procedures
- Carry out the information check
- If the check is successful then approve the information container and assign the appropriate status code
- If the check is unsuccessful reject the information container and record why alongside the amendments needed

ISO 19650-2 related clauses:

5.4.7 Complete appointed party's appointment documents
5.6.2 Generate information
5.6.3 Undertake quality assurance checks
5.6.5 Information model review
NA.4.2 Status

Clause: 5.6.5 Information model review**See ISO 19650 guidance C to understand how an information container transitions between states****The primary party active within the clause:**

This is a delivery team (lead appointed party plus all appointed parties) wide activity

Contributing parties to the clause:

n/a

When the activity within the clause should be carried out:

As required during information generation and then prior to information model authorization.

The level of the activity:

Appointment

Insight:

An important distinction between this clause and clauses 5.6.3 and 5.6.4 is that 5.6.5 is concerned with the delivery team's information model. The preceding two clauses are concerned with individual information containers.

Delivery teams should plan and undertake timely information model reviews to ensure the delivery team's information model is continuously coordinated. The review is repeated, as necessary, until the information model is ready for authorization by the lead appointed party.

Each review will consider the appointing party's exchange information requirements, acceptance criteria and the master information delivery plan (MIDP). It will be carried out in accordance with the processes set out in the project's information production methods and procedures.

If the information containers in the information model do not align with the MIDP, this will indicate a breakdown in the appointment's change control process.

It is important that the logistics to deliver and manage all information model reviews for each information delivery milestone, are established and reflected in the project's information production methods and procedures, the BIM execution plan and the MIDP.

Summary of activities within the clause (as appropriate):

- Review the project's information production methods and procedures
- Review the BIM execution plan
- Review the MIDP
- Identify the information containers for review using the information container status code
- Review the information model

ISO 19650-2 related clauses:

5.4.6. Complete lead appointed party's appointment document

5.6.4 Review information and approve for sharing

5.7.1 Submit information model for lead appointed party authorization

ISO 19650-2 clause 5.7 Information model delivery

Clause: 5.7.1 Submit information model for lead appointed party authorization

See ISO 19650 guidance C to understand how an information container transitions between states

The primary party active within the clause:

Task team(s)/appointed parties

Contributing parties to the clause:

n/a

When the activity within the clause should be carried out:

At the start of a process of information exchange with the appointing party

The level of the activity:

Appointment

Insight:

This clause is the first step in the process of delivering the information model as an information exchange to the appointing party and having it accepted as Published information. Each task team seeks the lead appointed party's authorization of their relevant information containers.

The process of submission should be in accordance with project's information production methods and procedures.

In line with the UK National Annex, the information containers within the information model would have a status code of S6 or S7 depending on whether the information exchange is happening before or at Plan of Work stage 6 (Handover) - see BS 8536-1 for further information about the Plan of Work stages.

Summary of activities within the clause (as appropriate):

- Review the project's information production methods and procedures
- Assign a status code of S6 or S7 as appropriate to the information containers within the information model
- Submit the information containers

ISO 19650-2 related clauses:

5.4.7 Complete appointed party's appointment documents

5.7.2 Review and authorize the information model

NA.4.2 Status

Clause: 5.7.2 Review and authorize the information model

See ISO 19650 guidance C to understand how an information container transitions between states

The primary party active within the clause:

Lead appointed party

Contributing parties to the clause:

Task team(s)/appointed parties

When the activity within the clause should be carried out:

During the process of information exchange with the appointing party

The level of the activity:

Appointment

Insight:

This clause is the second 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 lead appointed party reviews the information model to check that it is suitable to be submitted to the appointing party.

The information model is checked to make sure that it:

- addresses the exchange information requirements (both those set by the appointing party and those introduced by the lead appointed party) including acceptance criteria (for example, any formatting requirements documented in the project's information standard)
- contains all the appropriate deliverables from the master information delivery plan
- meets the acceptance criteria set out by the appointing party, and that it
- meets the level of information need.

A successful review will mean that the information model is authorized by the lead appointed party which triggers each task team to submit their information containers to the appointing party (see clause 5.7.3).

An unsuccessful review will mean that the information model is rejected. In this case the task team is instructed on amendment and re-submission of their information.

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.

An information exchange that is just within the delivery team (because the information model is not being delivered to the appointing party) will be complete after successful conclusion of this step and will not involve ISO 19650-2 clauses 5.7.3 and 5.7.4.

Summary of activities within the clause (as appropriate):

- Review the exchange information requirements (appointing party and lead appointed party)
- Check the information model
- If the review is successful then move to clause 5.7.3 as appropriate
- If the review is unsuccessful, reject the information model and instruct task teams accordingly

ISO 19650-2 related clauses:

5.4.6 Complete lead appointed party's appointment documents

5.4.7 Complete appointed party's appointment documents

5.6.2 Generate information

5.7.1 Submit information model for lead appointed party authorization

5.7.3 Submit information model for appointing party acceptance

Clause: 5.7.3 Submit information model for appointing party acceptance**See ISO 19650 guidance C to understand how an information container transitions between states****The primary party active within the clause:**

Task team(s)/appointed parties

Contributing parties to the clause:

n/a

When the activity within the clause should be carried out:

During the process of information exchange with the appointing party

The level of the activity:

Appointment

Insight:

This clause is the third 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 appointed party submits their information through the project's common data environment.

Summary of activities within the clause (as appropriate):

n/a

ISO 19650-2 related clauses:

5.7.2 Review and authorize the information model

5.7.4 Review and accept the information model

Clause: 5.7.4 Review and accept the information model

See ISO 19650 guidance C to understand how an information container transitions between states

| | |
|---|--|
| The primary party active within the clause: Appointing party | Insight: 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: <ul style="list-style-type: none"> • 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. <div style="background-color: #e6f2ff; padding: 5px;"> For example, if information model delivery is not complete, its output as reference information for another delivery team will be unreliable. </div> The published information will then be available as reference information for other delivery teams. This may then trigger a new appointment process. |
| Contributing parties to the clause: n/a | |
| When the activity within the clause should be carried out: During the process of information exchange with the appointing party | |
| The level of the activity: Appointment | |

Summary of activities within the clause (as appropriate):

- 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

ISO 19650-2 related clauses:

- 5.2.1 Establish the appointing party's exchange information requirements (where a new appointment is triggered)
- 5.4.6 Complete lead appointed party's appointment documents
- 5.6.2 Generate information
- 5.8.1 Archive the project information model
- 5.8.2 Capture lessons learned for future projects (in reality this applies at an appointment level as well as at project level)

ISO 19650-2 clause 5.8 Project close-out

Clause: 5.8.1 Archive the project information model

The primary party active within the clause:

Appointing party

Contributing parties to the clause:

n/a

When the activity within the clause should be carried out:

At project close-out

The level of the activity:

Project

Insight:

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.

Summary of activities within the clause (as appropriate):

n/a

ISO 19650-2 related clauses:

n/a

Clause: 5.8.2 Capture lessons learned for future projects**The primary party active within the clause:**

Appointed party

Contributing parties to the clause:

Lead appointed party

When the activity within the clause should be carried out:

Throughout the project, but particularly at close-out

The level of the activity:

Project and appointment

Insight:

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 participant 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.

Summary of activities within the clause (as appropriate):

n/a

ISO 19650-2 related clauses:

n/a

3.0 About the 2021 National Annex

The National Annex for ISO 19650-2:2018 has been revised and was released in February 2021 in BS EN ISO 19650-2:2018 & Revised NA. This guidance refers to the previous National Annex as the “2018 National Annex” and the new National Annex as the “2021 National Annex”. The need to update the 2018 National Annex was based largely upon feedback received for how that National Annex did not perform as efficiently as expected.

A few of the reasons, some of which stem back to experience of trying to implement BS 1192:2007¹, included:

- Using terminology (e.g. Volume) from the withdrawn 1192 series which was no longer defined anywhere
- Providing a Field ID for information containers, but not making clear what types of information containers it should be applied to (as it did in BS1192:2007)
- Lack of agreement (within the user community) on which “Type” codes to assign within the Field ID resulting in multiple codes that could be applied to the same information container type. This was because some “Type” codes focussed on the contents of the information container whereas others focused on the presentation or form of the information container
- Lack of agreement on which organisation should be in the originator code (should it be the author of the contents/Task Team or should it be the lead designer/main contractor directly appointed by the client?)

- Lack of agreement on which role codes should be applied to certain originators. For example, an interior designer (I) is also a subcontractor (X) by appointment but also a specialist designer (Y). So should a façade contractor have their own code like an interior designer or would they be a subcontractor or specialist designer? This stemmed from the fact that disciplines and roles were being confused and interchanged
- Uncertainty about what the A1, A2, A3 etc. status codes meant in terms of purpose.

These, as well as other reasons, led to the conclusion that the National Annex must be updated to resolve the confusion caused by the 2018 National Annex and BS 1192:2007.

This guidance provides an insight into the changes and their impacts and gives examples of how the 2021 National Annex can be applied along with the considerations including those parts that have not changed.

¹ BS 1192:2007 Collaborative production of architectural, engineering and construction information. Code of practice

3.1 Changes in the 2021 National Annex

3.1.1 Information Container ID Applicability

Change

The 2021 National Annex makes it clear that the Field codification described in the National Annex only applies to files whereas the 2018 National Annex did not make this distinction. The project's information standard (developed and maintained by the appointing party in agreement with lead appointed parties) should define which file types the Field codification should be applied to.

Justification

The 2018 National Annex was not clear on which information containers this ID applied to, for example: files, layers, directories, or objects. Clarity was requested as the Field ID in the 2018 National Annex did not logically suit layers or objects. Information containers that are layers should refer to BS EN ISO 13567-2 and this is clarified in the 2021 National Annex.

Potential benefits

Clarity on the use of the Field codification.

Potential negative impact

No negative impact is anticipated unless the 2018 National Annex was applied to anything other than files.

3.1.2 Field/String Length

Change

The 2021 National Annex removes the 2018 National Annex recommended limit on the field lengths. It does however contain a recommendation that these should be kept as short as possible. The structure of the information container ID is now guided by the use of the delimiter as defined by 2021 National Annex clause NA.2.3.

Requirements for field lengths should be defined in the project's information standard.

Justification

Both BS 1192:2007 and the 2018 National Annex were inconsistent in applying some field limits but not others, meaning that standardization across industry was still not possible. In addition, feedback reported that those restrictions made it difficult to apply to some projects/types in some cases. What was established was that the field length was less important providing the delimiter was used properly.

Potential benefits

Perceived restrictions imposed by BS 1192:2007 and the 2018 National Annex that some felt were detrimental to their projects have been withdrawn and appointing parties are now free to identify the appropriate field lengths for their projects.

Potential negative impact

Previous field lengths that were based on the 2018 National Annex could be affected by an appointing party's decision to change them to suit their personal preference. Without careful consideration of field lengths by the appointing party there could be inconsistency across an organization and a project.

If solutions offered by software vendors are rigid and can only accommodate 2018 National Annex requirements then they will now need to accommodate flexibility guided by the delimiter.

3.1.3 Project Identifier

Change

Recommended field length restrictions have been removed.

Justification

The restriction of 2-6 characters recommended by BS 1192:2007 and the 2018 National Annex did not lead to substantive standardization anyway. The restriction has been removed entirely in the 2021 National Annex.

Potential benefits

There is now more evident flexibility for the appointing party in determining the field length. This change does not limit any previous approach.

Potential negative impact

There are no potential negative impacts providing the delimiter is used correctly.

3.1.4 Originator Identifier

Change

Change of field length - recommended field length restrictions have been removed.

Originator Code clarification - clarity has been provided on which organization specifically the originating identifier should represent.

Justification

Change of field length - the restriction of 3-6 characters recommended by BS 1192:2007 and the 2018 National Annex did not lead to substantive standardization anyway. The restriction has been removed entirely in the 2021 National Annex.

Originator Code clarification - feedback indicated uncertainty about who the originator code should be assigned to, with some considering it should be a task team and others that it should be a lead appointed party. The 2021 National Annex makes it clear that the originator code represents the organization of the information author identified in a TIDP (see ISO 19650-2 clause 5.4.4).

Although the lead appointed party is "accountable" for ensuring the timely and complete production of information as agreed in its MIDP, each appointed party is "responsible" for generating the information assigned to it. This responsibility, and the agreed deliverables defined in the TIDP must be contractually agreed as defined in clause 5.4.7 of ISO 19650-2. Note, a single organization can be responsible for managing information (lead appointed party) and generating information (appointed party) - refer to [ISO 19650 guidance documents 2 and A](#) for examples.

Potential benefits

Change of field length - there is now more evident flexibility for the appointing party in determining the field length. This change does not limit any previous approach.

Originator Code clarification - there is now clear direction on who the originating code should be assigned to. The appointing party can also generate an accurate record of who the information originators were on their project. For example, rather than recording a lead appointed party (such as a main contractor) as the originator of all information containers in their control, the originator code will indicate the actual organization who generated an information container (such as the steelwork fabricator).

Potential negative impact

Change of field length - there are no potential negative impacts providing the delimiter is used correctly.

Originator Code clarification - those who have considered the "originator" to be a lead appointed party or another organization that doesn't naturally carry out clause 5.4.4 of ISO 19650-2 may be impacted and may need to reconsider their approach in using this field.

3.1.5 Functional Breakdown Identifier

Change

Change of field Length - recommended field length restrictions have been removed.

Change of field name - the field name has been changed from "Volume/System" to "Functional Breakdown".

Justification

Change of field Length - the restriction of 1 or 2 characters recommended by BS 1192:2007+A2:2016 and the 2018 National Annex did not lead to substantive standardization anyway. The restriction has been removed entirely in the 2021 National Annex.

Change of field name - "Volume" was removed because it is not a term defined or used in the ISO 19650 series.

"System" was not a suitable replacement because "system" has different meanings depending on the source or use (for example, Uniclass 2015 has a different understanding of system when compared with BuildingSMART IFC definitions or that defined in BS ISO 81346-12²).

"Functions" can relate to systems or volumes (as explained in ISO 19650-1 clause 10.4) and was agreed to be the most flexible term to adopt. Various breakdown structures could be considered when developing the federation strategy as explained in ISO 19650-1.

Potential benefits

Change of field length - there is now more evident flexibility for the appointing party in determining the field length. This change does not limit any previous approach.

Change of field name - the new field can be used much more flexibly in comparison to the superseded "volume/system" field. This means that if users wish they may still adopt an embedded strategy even though the name has changed. For example, under the superseded volume/system term users may have split volumes into various packets of design based on function such as ventilation design, mixed services design or piling design. This allowed the filtering of information containers based on aspects of the design. This approach may still be applied to help those trying to find information to understand the contents. Sometimes however, users may want to split the information containers by something other than design function.

Those who were unfamiliar with, or did not understand, the term "Volume/system" in BS 1192:2007+A2:2016 and the 2018 National Annex will no longer be exposed to it.

Potential negative impact

Change of field length - there are no potential negative impacts providing the delimiter is used correctly.

Change of field name - guidance, literature or training resources that still use "Volume/system" terminology will require an update. Tools such as document management platforms that have named column values for this field ID as "Volume/system" will also need updating. If this cannot be done, this may be mitigated by inserting a clarification about what this withdrawn term means.

² BS ISO 81346-12:2018 Industrial systems, installations and equipment and industrial products. Structuring principles and reference designations. Construction works and building services

3.1.6 Spatial Breakdown Identifier

Change

Change of field Length - recommended field length restrictions have been removed.

Change of field name - the new name of "Spatial Breakdown" was introduced to align to ISO 19650 terminology and to allow for wider scope in infrastructure.

Justification

Change of field Length - the restriction of 2 characters recommended by BS 1192:2007 and the 2018 National Annex did not lead to substantive standardization anyway. The restriction has been removed entirely in the 2021 National Annex.

Change of field name - the BS 1192:2007 and 2018 National Annex label for this field "Levels/Location" covers two spatial descriptors so the rationale was to simply call it "Spatial" to represent either. Furthermore, as ISO 19650 makes it clear a spatial breakdown has to be considered, "Spatial Breakdown" was assigned as a replacement.

Potential benefits

Change of field length - there is now more evident flexibility for the appointing party in determining the field length. This change does not limit any previous approach.

Change of field name - although the name has changed, a previous use and approach to this field can be retained if preferred. Spatial breakdowns can go into significant detail to complement a federation strategy but this degree of detail may not be needed for the information container ID. What can be achieved with the broader definition of "Spatial Breakdown", is the ability to link information containers to more than just locations and levels, such as sections, elevations, spatial zones or connections such as risers, secure/unsecure locations, lift shaft, chainage etc.

An additional benefit could also be that multiple buildings, structures or services as part of a single project could be assigned a "Spatial Breakdown" code.

Potential negative impact

Change of field length - there are no potential negative impacts providing the delimiter is used correctly.

Change of field name - guidance, literature or training resources that still use "Levels/locations" terminology will require an update. Tools such as document management platforms that have named column values for this field ID as "Levels/locations" will also need updating. If this cannot be done, this may be mitigated by inserting a clarification about what this withdrawn term means.

3.1.7 Form Identifier

Change

Change of field Length - recommended field length restrictions have been removed.

Change of field's purpose - rather than describe the type of document as in BS 1192:2007 and the 2018 National Annex, this field now describes the form that the information is presented in.

Justification

Change of field Length - the restriction of 2 characters recommended by BS 1192:2007 and the 2018 National Annex did not lead to substantive standardization anyway. The restriction has been removed entirely in the 2021 National Annex.

Change of field's purpose - the previous recommended values in BS 1192:2007 and the 2018 National Annex were a mix of selectable codes, including "content" (such as a survey), "form" (such as a drawing) and combination of "content" and "form" (for example a schedule of accommodation told you that its form was a schedule and its content was about accommodation). This led to confusion as more than one code could be applied to certain information containers. As another example, a 3D topographical survey could have been recorded as a survey (SU) or a 3D model (M3).

In the 2021 National Annex this field only captures the form that the information has been presented in (in reference to the form codes set out in BS ISO 29845:2011³). Using the previous example, the same 3D topographical survey would be recorded as a model (M). Had the same information been recorded on a drawing (D) or as a list (L) of coordinates, the form would have changed to reflect this.

This focuses on the form of presentation used rather than content and type, which may be covered by the classification metadata.

Potential benefits

Change of field length - there is now more evident flexibility for the appointing party in determining the field length. This change does not limit any previous approach. Note that even though the standard codes are single characters, the field itself does not have a length limit.

Change of field's purpose - this field now allows a project team member to search by how information has been presented rather than its content, which would be covered by classification metadata. As the common data environment is intended to aid with the location and discovery of information, the ability to filter by a smaller set of permitted values will improve the likelihood of information being found. In addition, the omission of overlapping descriptions (such as schedule and schedule of accommodation) allows less ambiguity in the application of this field. This improves the ability to locate relevant information. As the 2021 National Annex permits the expansion of recommended codes, an organization's existing list could be integrated with that included in the 2021 National Annex, so long as it is recorded within the project's information standard.

Potential negative impact

Change of field length - there are no potential negative impacts providing the delimiter is used correctly.

Change of field's purpose - this narrowing of codes from the 2018 National Annex to focus on "Form" may take some getting used to.

In addition, some may find the selection of an appropriate form difficult for deliverables that potentially use multiple forms of presentation. The 2018 National Annex (clause NA.3.6 Note 2) recommends that for information containers with complex forms the principal form is used to define the code. For example:

- A model including specification information has a model (M) Form code
- A drawing derived from a model has a drawing (D) Form code
- A drawing including tables or images has a drawing (D) Form code
- A report including photographs has a textual (T) Form code
- A report including tables has a textual (T) Form code
- A photograph of a drawing has an image (I) Form code.

Note: further examples of how the Form code can be assigned are set out BS ISO 29845.

3.1.8 Discipline Identifier

Change

Change of field Length - recommended field length restrictions have been removed.

Change of field's purpose - the "Role" field in BS 1192:2007 and the 2018 National Annex has been changed to identify the "discipline" which an information container relates to.

Justification

Change of field length - the restriction of 1 or 2 characters recommended by BS 1192:2007 and the 2018 National Annex did not lead to substantive standardization anyway. The restriction has been removed entirely in the 2021 National Annex.

Change of field's purpose - The role codes in BS 1192:2007 and the 2018 National Annex had conflicts, mingling between contractual status (such as client, contractor and sub-contractor) and job title such architect or building surveyor (the particular use of architect in the list was inappropriate because of its protected status). This created confusion resulting in examples of a subcontractor being identified by an "X" code (subcontractor) on one project, on another being assigned "Y" code (specialist designer) and another again the "M" code (mechanical engineer) when in fact their work is the same on all three projects and technically all three code assignments are correct.

It was considered important to focus either on the roles (people/organizations) or on the discipline (the tasks carried out). The agreement was to focus on Discipline only.

Note that the discipline code for producing information management resources could be assigned a discipline code "X" (non-discipline specific or not applicable), "O" (other discipline), or a two character project-specific code.

Potential benefits

Change of field length - there is now more evident flexibility for the appointing party in determining the field length. This change does not limit any previous approach.

Change of field's purpose - The "Discipline" identifier allows improved flexibility for identifying each information container's discipline while retaining who produced the information from the Originating Identifier. In the case of a multi-disciplinary organization this enables each technical team to be identified separately (for example, the architecture team (A code), the civil engineering team (C code) and the ground engineering team (G code). Alternatively, there may be a one to one relationship between originator and discipline for example, a building surveying organization might be the only one producing building surveying content (B code).

Potential negative impact

Change of field Length - there are no potential negative impacts providing the delimiter is used correctly.

Change of field's purpose - certain approaches to using the old role field are not possible with the 2021 National Annex. For example, appointing parties (clients) and lead appointed parties (such as a main contractor) would have been assigned codes that no longer apply.

In addition, it was common for main contractors to assign the BS 1192: 2007 and 2018 National Annex role code of subcontractor or specialist designer so they could separate their consultants from their trade contractors. Now, where there is a broad discipline code, such as E, electrical engineering, the “Functional Breakdown” code could be used to identify the sub-divisions of this discipline, such as lighting, low voltage or high voltage power or data cabling. It is recommended that this be reviewed and standardized clearly in the project information standard and accompanying information production methods and procedures.

3.1.9 Unique Number Identifier

Change

Recommended field length restrictions have been removed.

Justification

The restriction of 4 - 6 digits recommended by BS 1192:2007 and the 2018 National Annex did not lead to substantive standardization anyway. The restriction has been removed entirely in the 2021 National Annex.

Potential benefits

There is now more evident flexibility for the appointing party in determining the field length. This change does not limit any previous approach.

Potential negative impact

There is potential for less cross-sector standardization on field length.

3.1.10 Status

Changes to Shared Status

Change

Removal of Shared status codes - status code S6 and S7 in BS 1992:2007+A2:2016 and the 2018 National Annex have been removed.

Addition of a new Shared status code - status code S5 is a new code, specifically aligned to ISO 19650-2 clause 5.7.3 - appointing party review and acceptance.

Change to Shared status codes - status codes S1, S2, and S3 are now aligned with ISO 19650-2 clause 5.6.5 (information model review) and S4 is aligned with ISO 19650-2 clause 5.7.1 (submit information model for lead appointed party authorization). S4 has also had its purpose reworded.

Justification

Removal of Shared status codes S6 and S7 - by explicitly aligning the status codes with ISO 19650-2 activities, user confusion about what to apply when, should be eradicated.

Addition of a new Shared status code S5 - it was recognized that some clients or specific approval routes may need to have dedicated suitability codes for clauses 5.7.1 and 5.7.3. New status code S5 was therefore introduced in the 2021 National Annex to distinguish between the activities of sharing information containers for review and authorization (S4) and sharing them for review and acceptance (S5).

Although ISO 19650-2 clauses 5.7.1 and 5.7.3 record these tasks as being performed separately, there might be instances where they are combined into a single activity, for example where a delivery team contains only one organization that is both lead appointed party and appointed party.

Change to Shared status code S4 - the introduction of new Shared status code S5, meant it was possible to refine the previously ambiguous definition of Shared status code S4 "Stage Approval" by aligning S4 with clause 5.7.1 of ISO 19650-2.

Potential benefits

Removal of Shared status codes S6 and S7 - if these codes were unclear to users before, then this removal is going to help with adoption of the 2021 National Annex.

Addition of a new Shared status code S5 - uncertainty about when to use Shared status code S4 in regards to clause 5.7.1 and 5.7.3 of ISO 19650-2 is now removed as S4 is complimented with S5. The different steps in the information review process can now be clearly distinguished through these separate Shared status codes.

Change to Shared status code S4 - as noted above, uncertainty about when to use Shared status code S4 is now removed.

Potential negative impact

Generally: any previous processes, guidance or training that referred to the Shared status codes in BS 1192: 2007+A2:2016 or the 2018 National Annex will need revising to reflect the 2021 National Annex.

Changes to Published Status

Change

Removal of Published status code - status code CR has been removed.

Clarification of Published status codes A1, An etc. - the 2021 National Annex now provides distinction between authorization and acceptance (these are separate activities within the ISO 19650-2 process). Note 2 has been added to clarify that Published status codes do not imply particular reasons for issuing information and these should be explained in the project's information standard.

The B codes are now deprecated (which means that people are strongly advised not to use them).

Justification

Removal of Published status code CR - this status code was duplicating one of the A status codes.

Clarification of published status codes A1, An etc. - The A codes introduced in the 2018 National Annex were more nuanced than the A code of BS 1192:2007. This was to reflect the increased complexity of the information management process. The 2021 National Annex provides a more general approach to support authorization or acceptance of information containers at any point in the project life-cycle, not just at handover from design to construction. Neither BS 1192:2007+A2:2016 nor the 2018 National Annex provided a suitable solution for this approach.

The 2021 National Annex clarifies that the purpose for issuing a Published information container should be documented in the project's information standard, alongside each An status code, for example:

- *A4 = Authorized and Accepted as suitable for construction* (if using the RIBA 2020 stage outcome definition for stage 4 which defines a stage 4 completed deliverable as construction ready)
- *A5 = Authorized and accepted as suitable as a construction record* (if using the RIBA 2020 stage outcome definition for stage 5).

Now, if a user wants to know if the drawing they have is for construction or not, they would refer to the assigned status code and the project information standard defines.

Note that the default definition of project stages for the 2021 National Annex is as per BS 8536⁴ and although an alternative can be used (the RIBA plan of work, CIC, APM, GRIP, PCF), the stage outputs must be defined in the project's information standard explaining exactly what each code represents in terms of what uses or purposes its suitable for by the recipients.

⁴ BS 8536-1:2015 Briefing for design and construction - Part 1: Code of practice for facilities management (Buildings infrastructure)

Potential benefits

Removal of Published status code CR - there is no longer any duplication with the A1-An codes meaning an An code can be used to reflect final issue information containers.

Clarification of the Published status codes A1-An - uncertainty about when to use the Published status codes is now removed providing that these are properly documented in the project's information standard.

Potential negative impact

Generally: any process, guidance or training that referred to the Published status codes in BS 1192: 2007+A2:2016 or the 2018 National Annex will need revising to reflect the 2021 National Annex.

3.1.11 Classification

Change

The requirement for the CDE to enable each information container to be assigned classification as metadata has not changed, nor has the requirement for information containers to be classified in accordance with Uniclass 2015 as the UK implementation of ISO 12006-2:2018. However, 2021 National Annex clause NA4.4 now provides direction that the Uniclass 2015 PM table should be used where possible as the source for classification metadata.

Justification

The combination of the information container unique ID with classification metadata provides a consistent and systematic way of identifying information containers. This helps both people and technology to locate information containers because their identity becomes largely predictable. It also establishes a means of aligning information containers in various information management resources. For example, where an exchange information requirement (EIR) is for a fire safety strategy with classification PM_40_20_30, the relevant task information delivery plan identifies that an information container titled fire safety strategy with classification PM_40_20_30 is to be delivered. Note, that if the functional breakdown field is identifying information content, care should be taken not to duplicate between the functional breakdown code and the classification metadata. In this instance, the classification code should complement or extend the functional breakdown code.

The Uniclass 2015 PM table has been developed to classify information container content and is therefore a suitable and manageable reference point.

Potential benefits

1. Selection of classification metadata is more straightforward because there is direction to a specific Uniclass 2015 table rather than to the entire Uniclass 2015 system
2. The convention for information container classification becomes consistent across multiple delivery teams and across multiple projects
3. Information container classification becomes predictable and logical. Reliance on free text descriptions to identify information can be reduced
4. Information deliverables can be aligned across information planning resources and with EIR. This provides a mechanism for automating the verification of information deliverables.

Potential negative impact

The adoption of any classification system is not without its complications; a classification system is never complete and is always in development. The contents of the PM table may change throughout the life of an appointment or a project. It is therefore important for the appointing party (client) to record the status and revision date of the version of the PM table to be used in the project's information standard and to take a considered review before implementing any subsequently updated versions.

Where an information container includes mixed information (for example, a business case containing cost models) a higher level of the PM table hierarchy could be used - in this case PM_50_30 Economic viability information.

As it is an appointment resource, any changes to the project's information standard would need to be agreed with parties already appointed.

3.2 Applying the 2021 National Annex

Guidance explaining how to apply the 2021 National Annex throughout the whole delivery phase will be released in the next edition of ISO 19650 guidance 2. We would like to invite you to propose situations or scenarios that you would like us to address in the next edition – please let us have these by emailing feedback@ukbimframework.org

3.2.1 Application guidance for assessment and need

This section of guidance relates to a client body as an appointing party. Information is exchanged between the appointing party and appointed parties either way, as file-based information containers.

At the very earliest stages of a project very little will be known about the information that will be produced and exchanged throughout the project. But somethings need to be considered, even before any appointments are made and design has taken place. The appointing party should consider how they will want information to be stored, exchanged and retrieved, including in the strategic stage of a project. Even at this stage, there will be some information to manage. These considerations could then be defined as part of the information standard and the information production methods and procedures as defined by ISO 19650-2 clause 5.1.4 and clause 5.1.5 (see [ISO 19650 Guidance E](#)). Any requirements detailed in these resources (such as the information container unique ID and assigned metadata) must then be supported through the implementation of the common data environment workflows and technical solutions (see ISO 19650-2 clause 5.1.7).

The 2021 National Annex provides an appointing party with a standardized approach for how the information container unique ID and metadata assignments should be approached. At this stage, the appointing party need only define in their project information standard that the unique ID and metadata conform to “BS EN ISO 19650-2:2018 & Revised NA” and then specify any project particulars including:

- The project code. This should be defined noting that it must be used by all
- Any known organizations. Each should have an assigned originator code
- If Functional Breakdown has been considered before any appointed parties are engaged, then this should be explained and relevant codes assigned. If not, clarify “XX” should be used
- If Spatial Breakdown has been considered before any appointed parties are engaged, then this should be explained and relevant codes assigned. If not, clarify “XX” should be used
- Any additions the appointing party wishes to make to the Form and Discipline codes should be recorded. If not, then a note stating no changes apply or just referencing the annex will suffice
- The length of the Number field.

3.2.2 Application guidance for the remainder of the delivery phase

As noted above, we would like to invite you to propose situations or scenarios relating to the remainder of the delivery phase (covering any or all parties) that you would like us to address in the next edition - please let us have these by emailing feedback@ukbimframework.org

4.0 Information management process summary

The summary provides a helicopter view of the processes according to ISO 19650-2 (although it should be noted that it does not indicate every possible instance of involvement across the parties).

The following pages show the process in each stage in more detail.

Key:



Activity to be undertaken



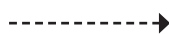
Decision point



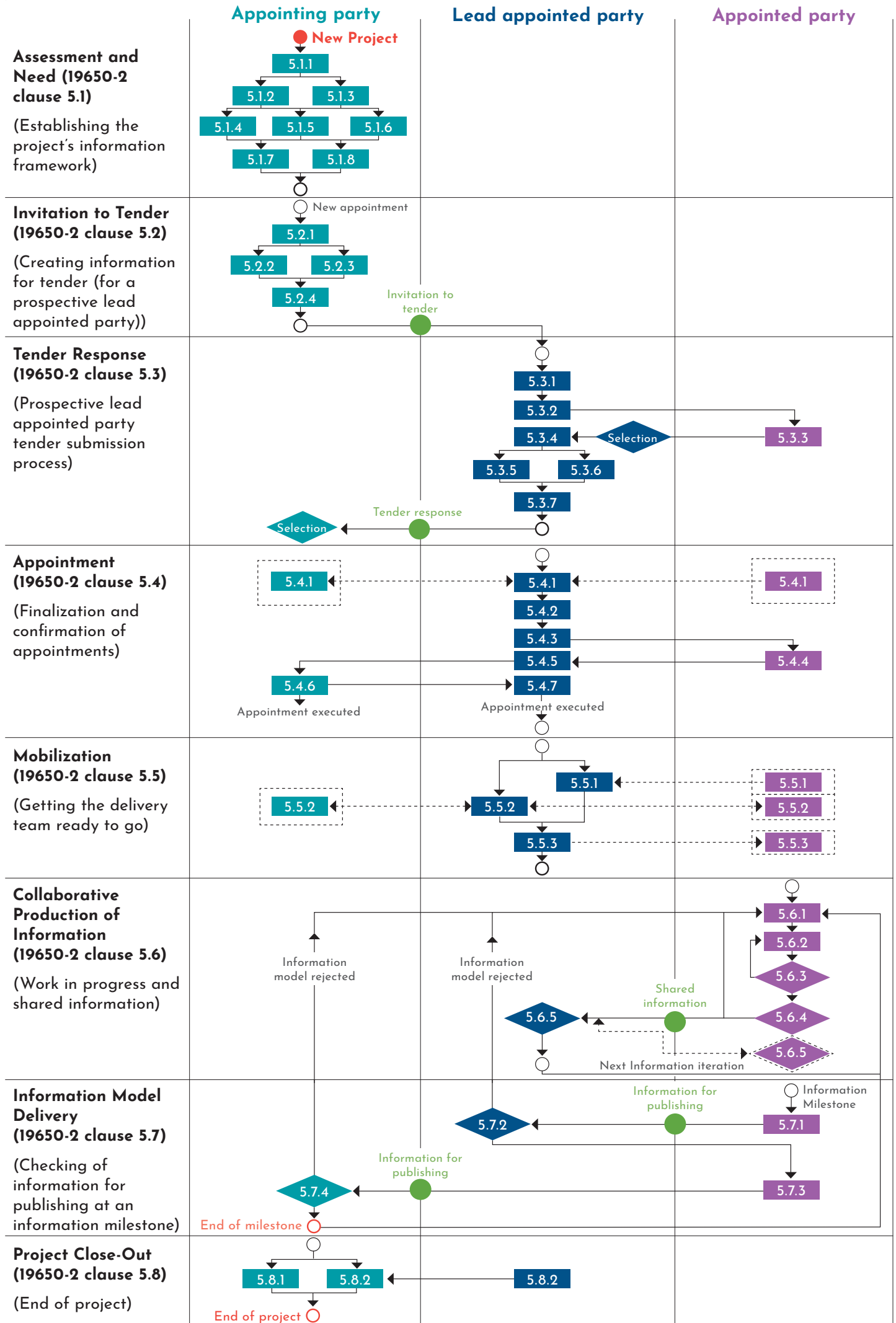
Information exchange



Sequence flow



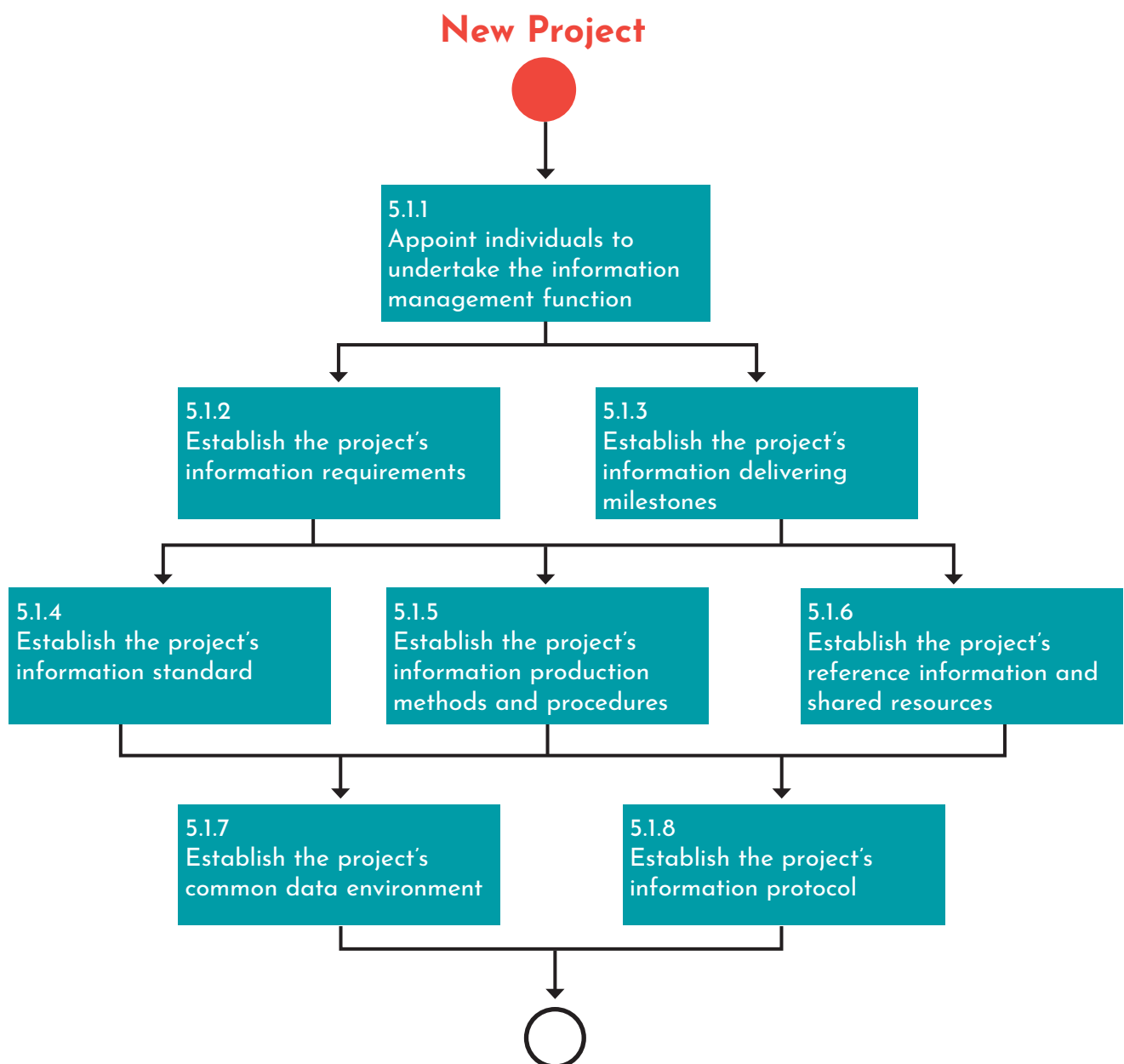
May contribute to or be informed of



Assessment and Need (19650-2 clause 5.1)

(Establishing the project's information framework)

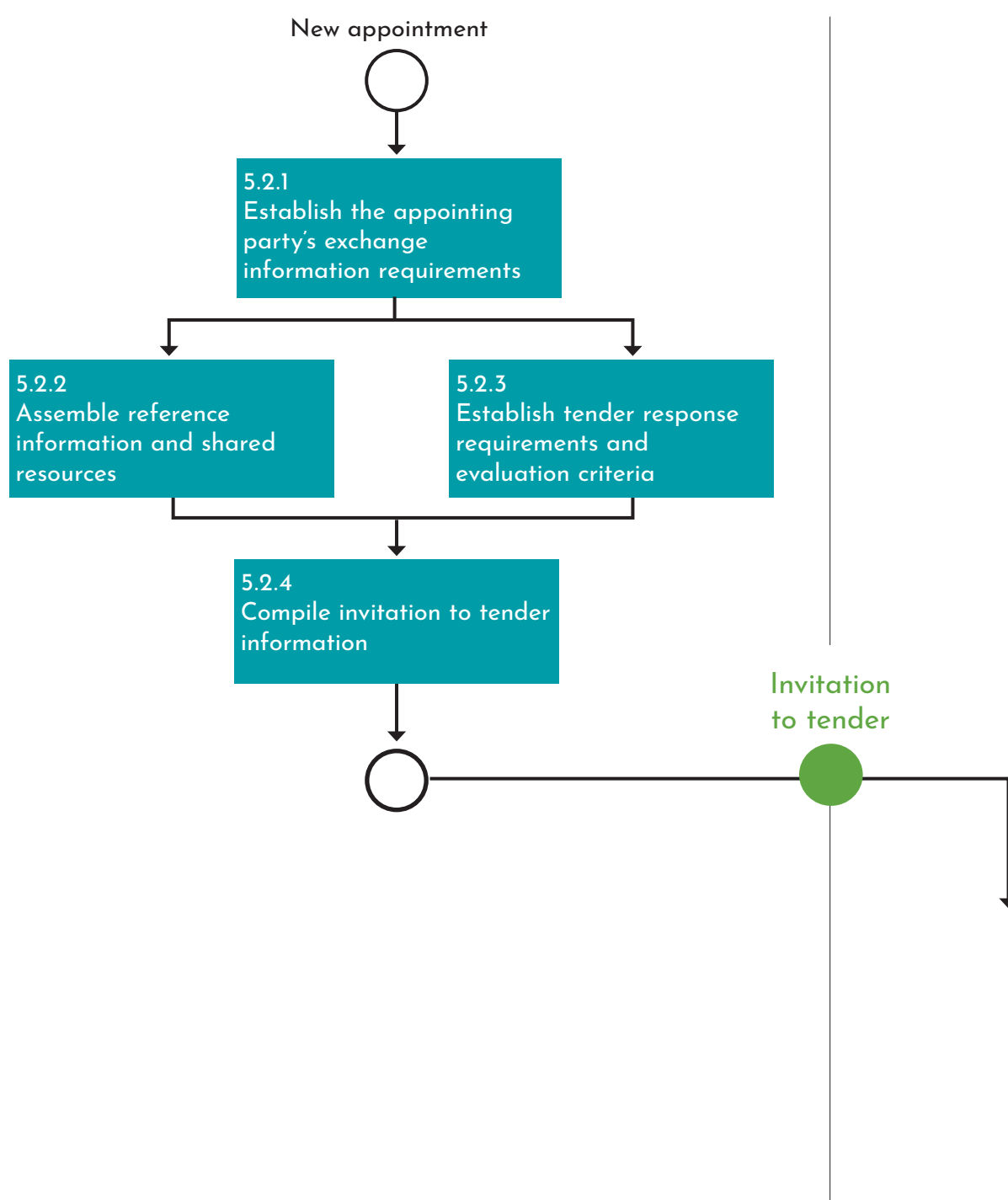
 Appointing party



Invitation to Tender (19650-2 clause 5.2)

(Creating information for tender (for a prospective lead appointed party))

Appointing party



Tender Response (19650-2 clause 5.3)

(Prospective lead appointed party tender submission process)



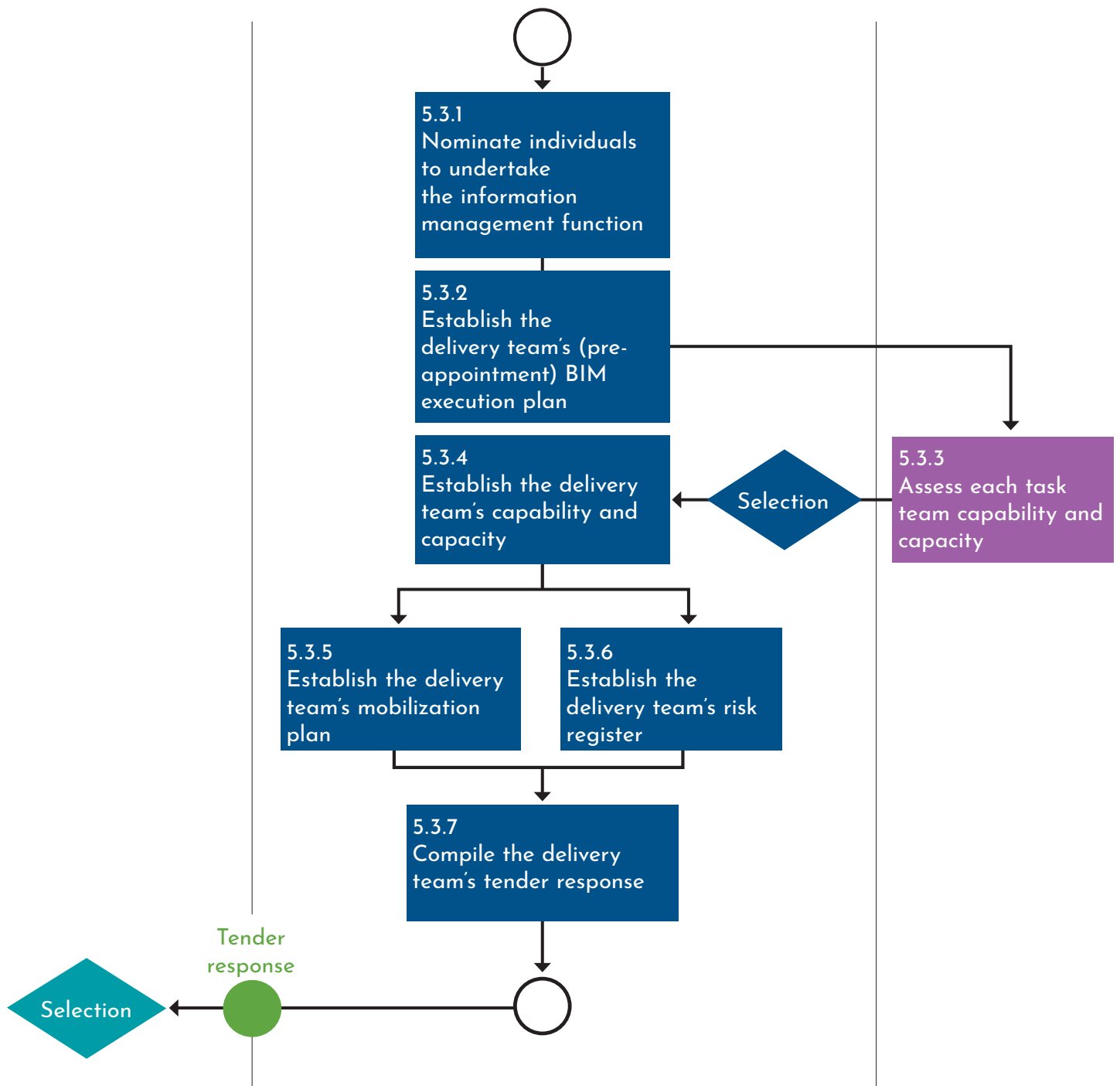
Appointing party



Lead appointed party



Appointed party



Appointment (19650-2 clause 5.4)

(Finalization and confirmation of appointments)



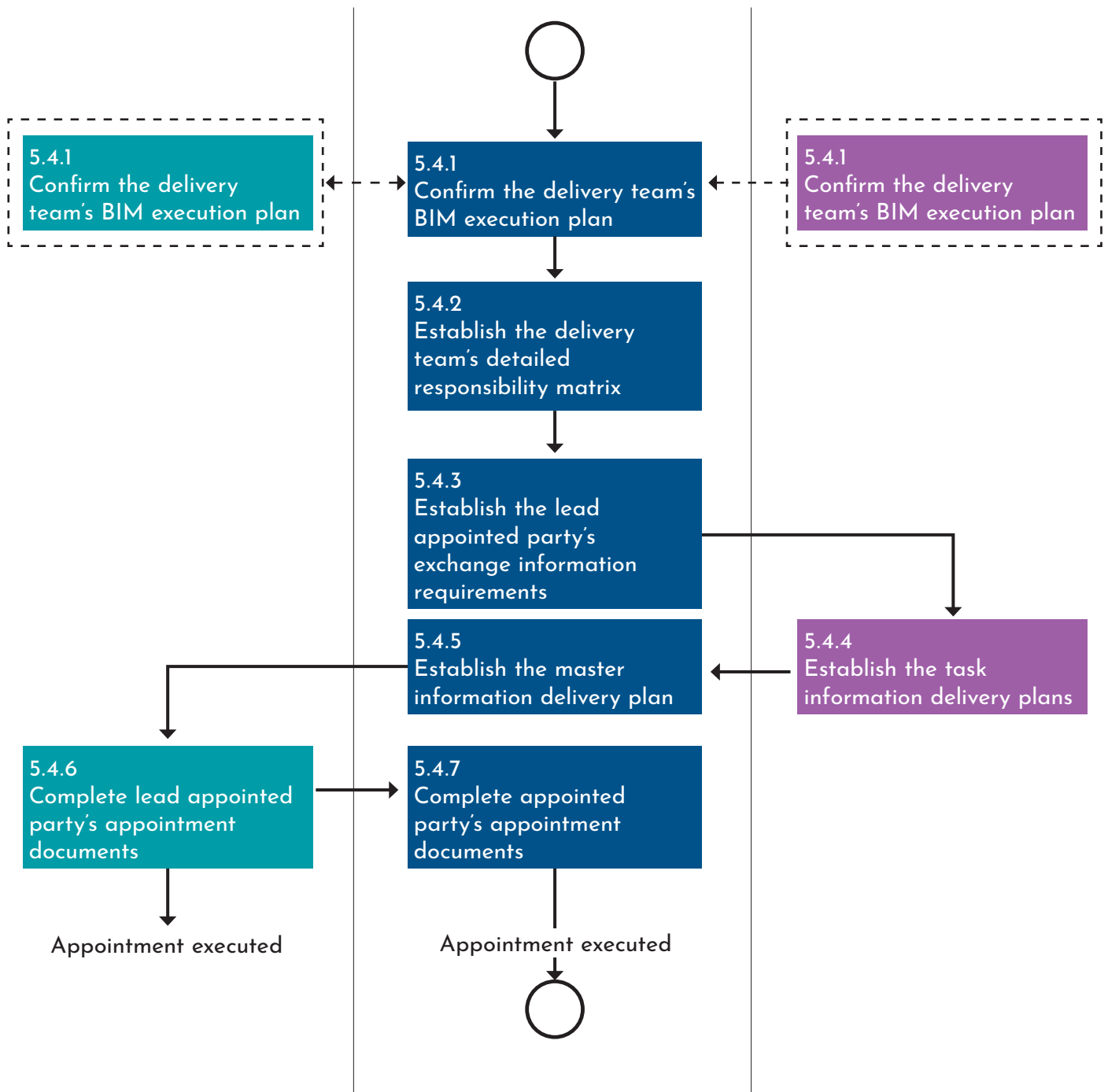
Appointing party



Lead appointed party



Appointed party



Mobilization (19650-2 clause 5.5)

(Getting the delivery team ready to go)



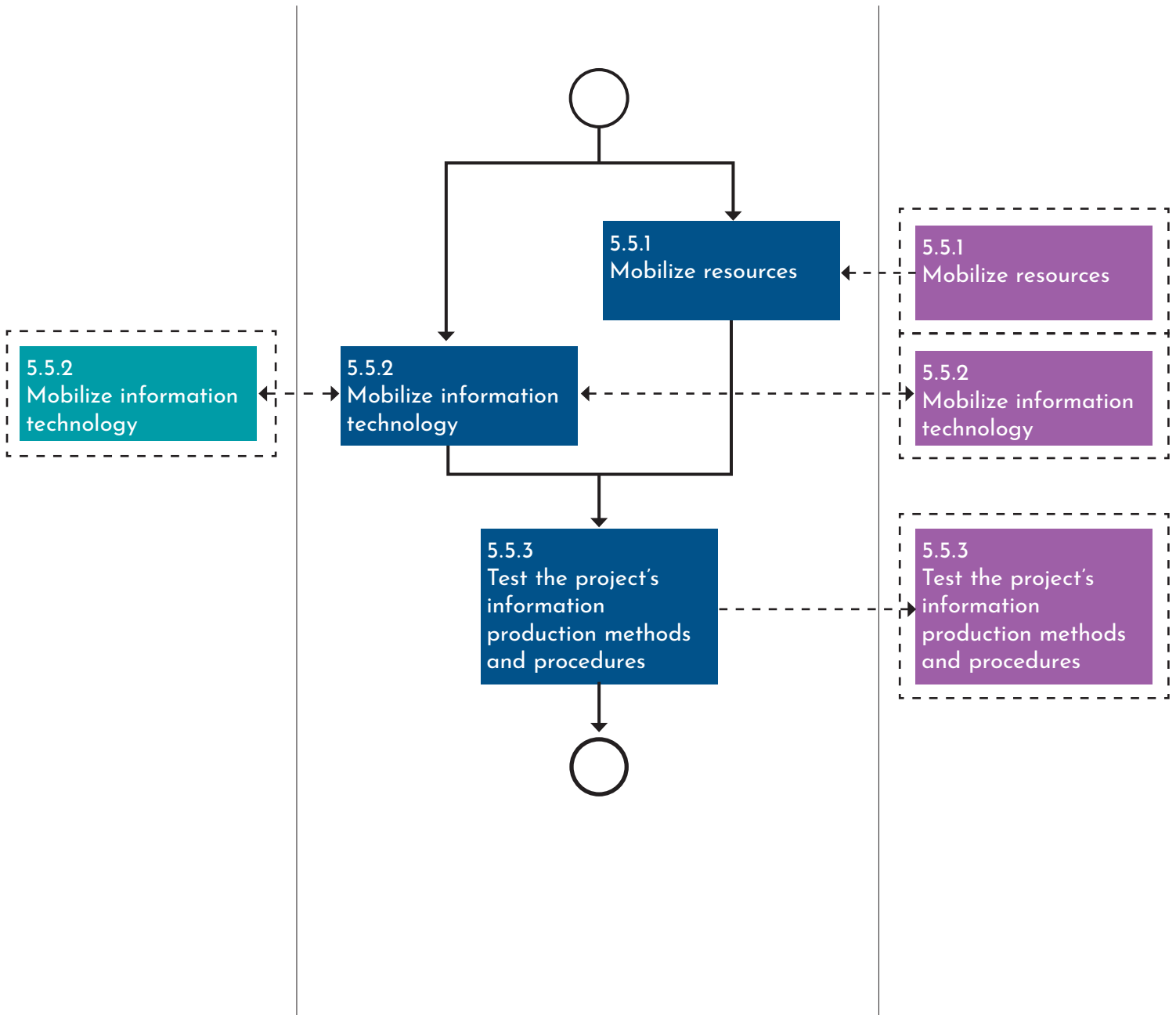
Appointing party



Lead appointed party



Appointed party



Collaborative Production of Information (19650-2 clause 5.6)

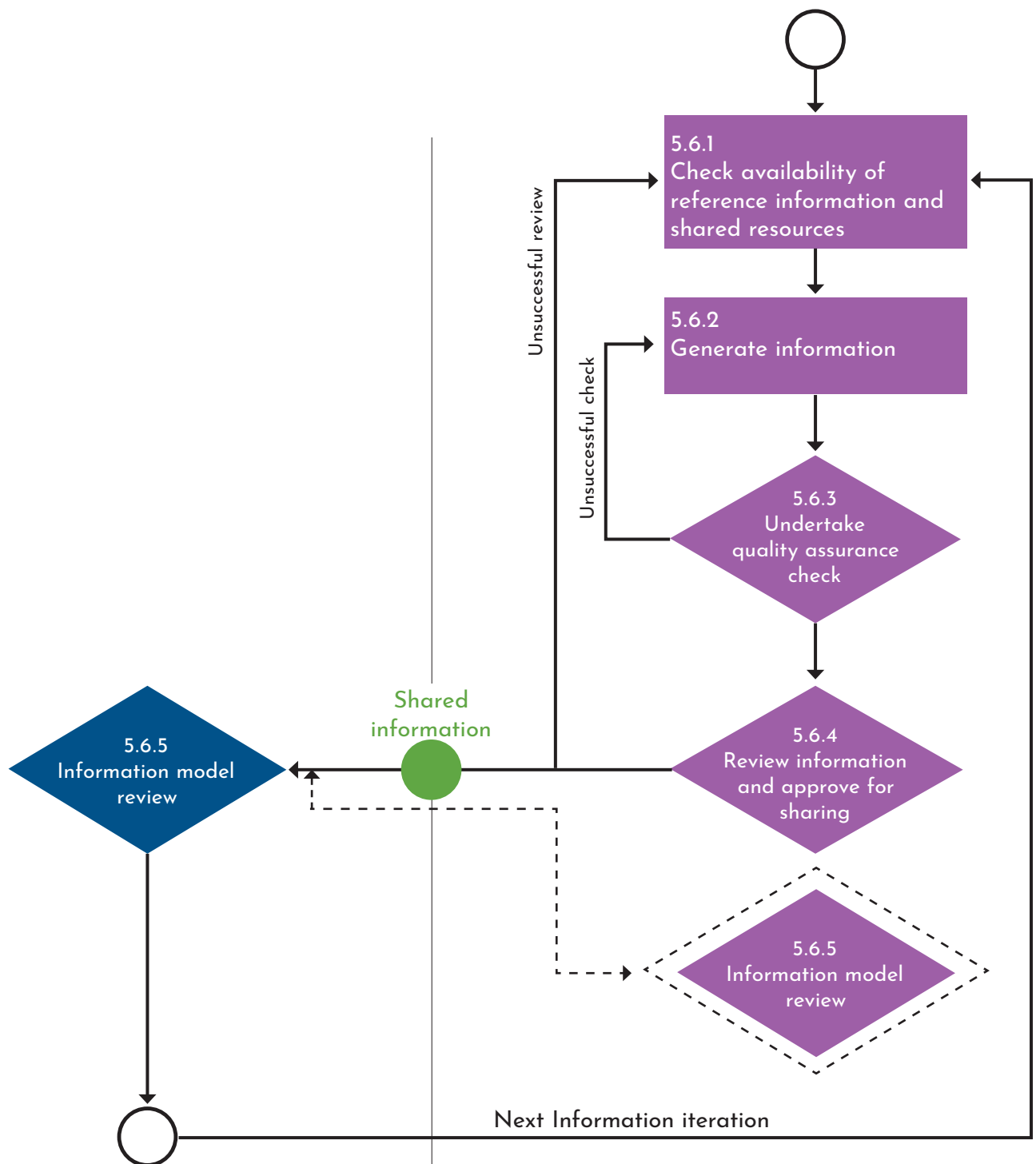
(Work in progress and shared information)



Lead appointed party



Appointed party



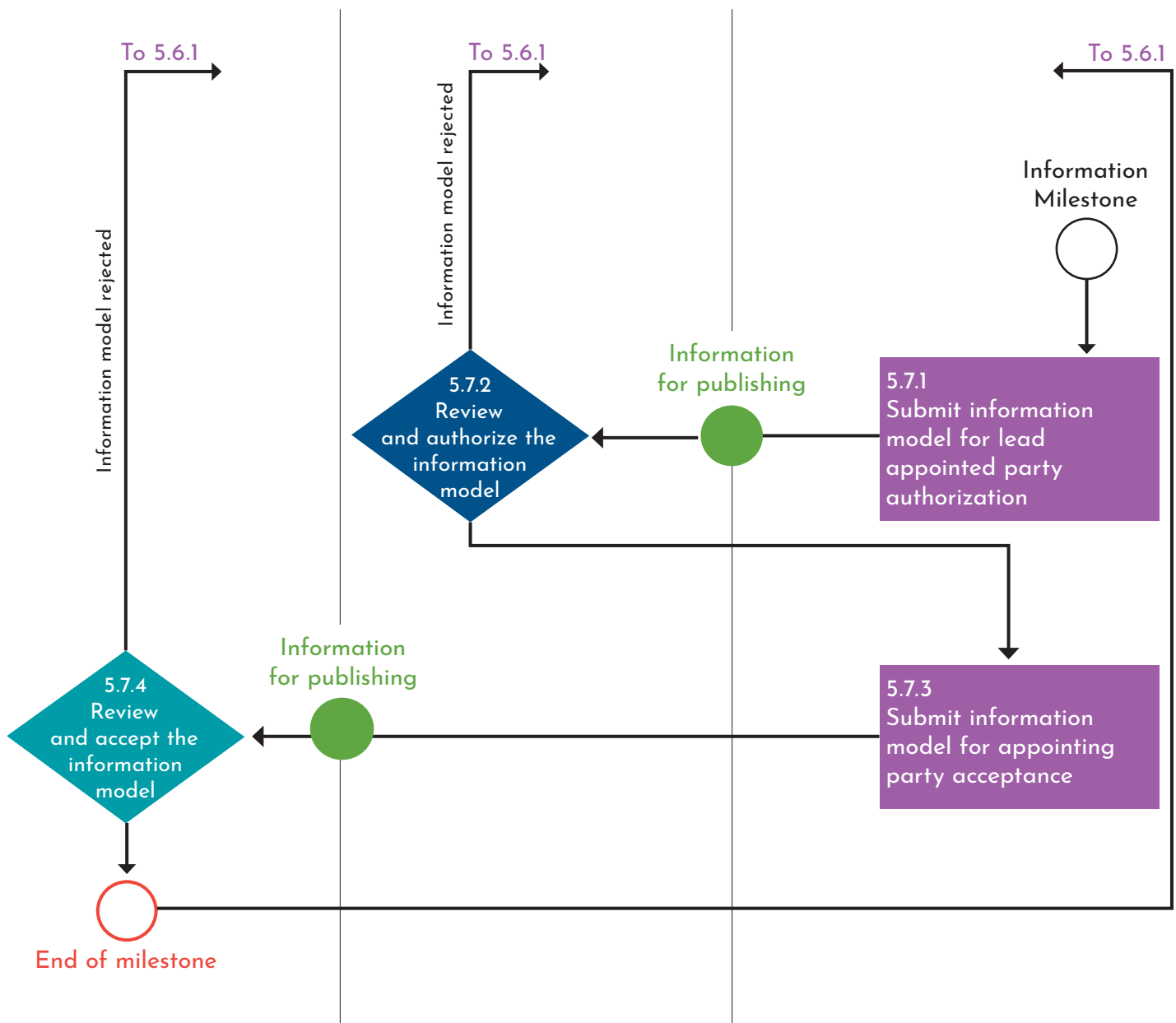
Information Model Delivery (19650-2 clause 5.7)

(Checking of information for publishing at an information milestone)

 Appointing party

 Lead appointed party

 Appointed party



Project Close-Out (19650-2 clause 5.8)

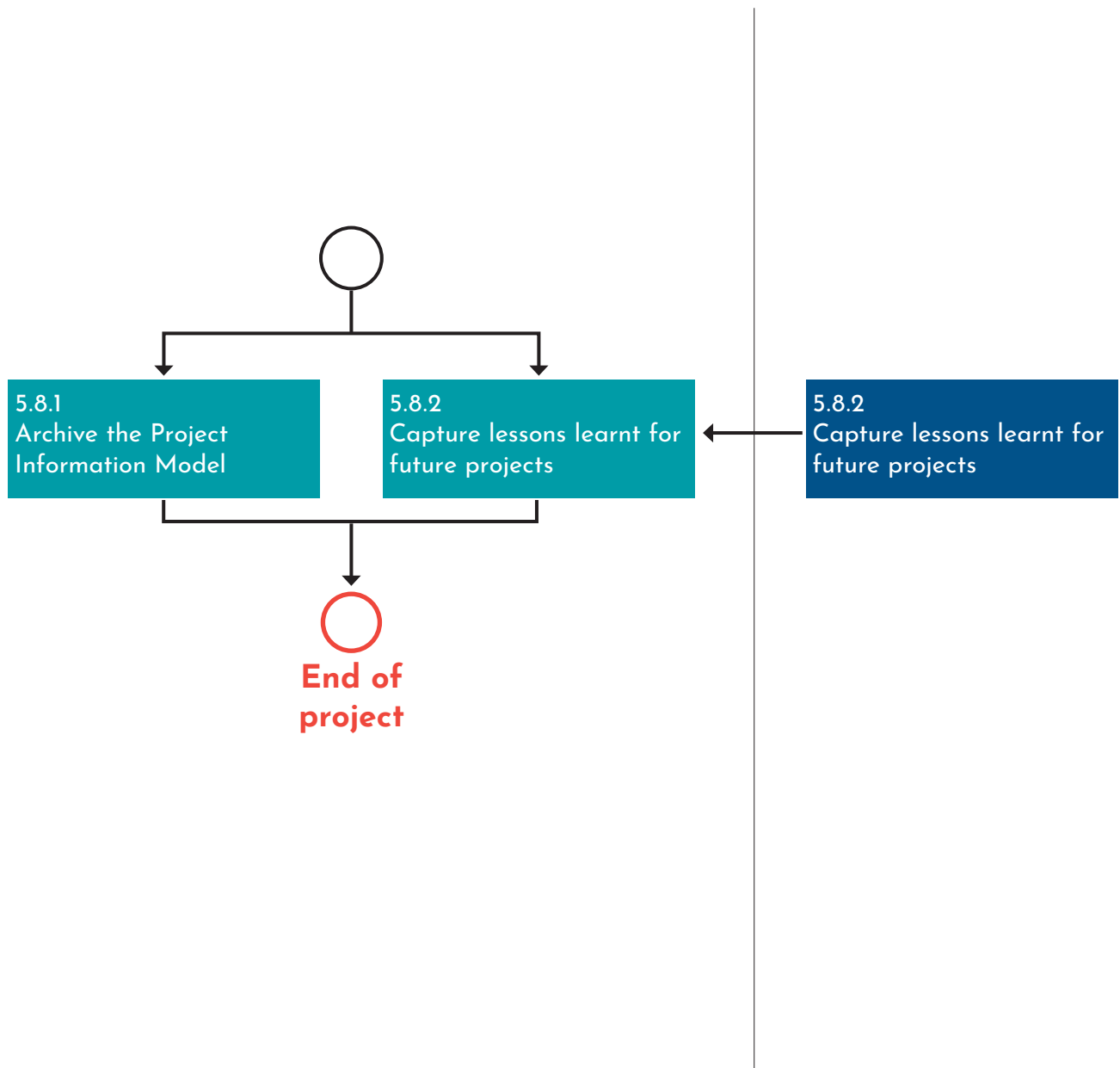
(End of project)



Appointing party



Lead appointed party



5.0 Summary

ISO 19650 guidance part 2 has provided an explanation about the parties, teams and activities involved in the processes for project delivery.

It should be referred to by practitioners and those implementing the ISO 19650 series across a project, within an appointment or within an organization.

The sixth edition also provided an introduction to the 2021 National Annex. The next edition will extend this guidance to cover implementation of the 2021 National Annex beyond the assessment and need activities associated with the delivery phase of a project.

Please do let us have your feedback by emailing us at guidancefeedback@ukbimframework.org.

Please also remember that standards within the ISO 19650 series are available at www.bsigroup.com.

Visit www.ukbimframework.org to see how the ISO 19650 standards plus other standards within the UK BIM Framework map to the design, build, operate and integrate process.

Engage with the UK BIM Framework

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Enabling Digital Transformation

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