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NATSPEC National BIM Guide

Appendix B
AS ISO 19650 Resources
Descriptions

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NATSPEC BIM

AS ISO 19650 Aligned

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Construction
Information

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Formatting conventions

In addition to the text formatting conventions used for Section headings, Clause titles, Table headings, etc, the Table below shows other text formats used in this document:

Text type	Example	Indicates
Italicised text	*Project BIM Brief*	Name of a specific document or standard.
Violet text	Data Reuse	Cross reference to a Section, Clause, Table, Diagram, etc
Blue text on blue fill	See the *ABAB AIR Guide*	References to relevant sources of information.
Blue underlined text	www.natspec.com.au	Hyperlink/weblink

In this document:

- '*National BIM Guide'* or '*Guide*' means the *NATSPEC National BIM Guide*.

- 'Appendix*'* means this Appendix: *Appendix B - AS ISO 19650 Resources Descriptions*.

- Numbering of Tables, Diagrams and Figures is derived from the Clause in which they appear

1   INTRODUCTION

Purpose

This Appendix provides brief descriptions of the documents that support the information management processes described in AS ISO 19650 Parts 1, 2 and 3. It can be used as companion reference document to the *NATSPEC National BIM Guide* and other BIM documents.
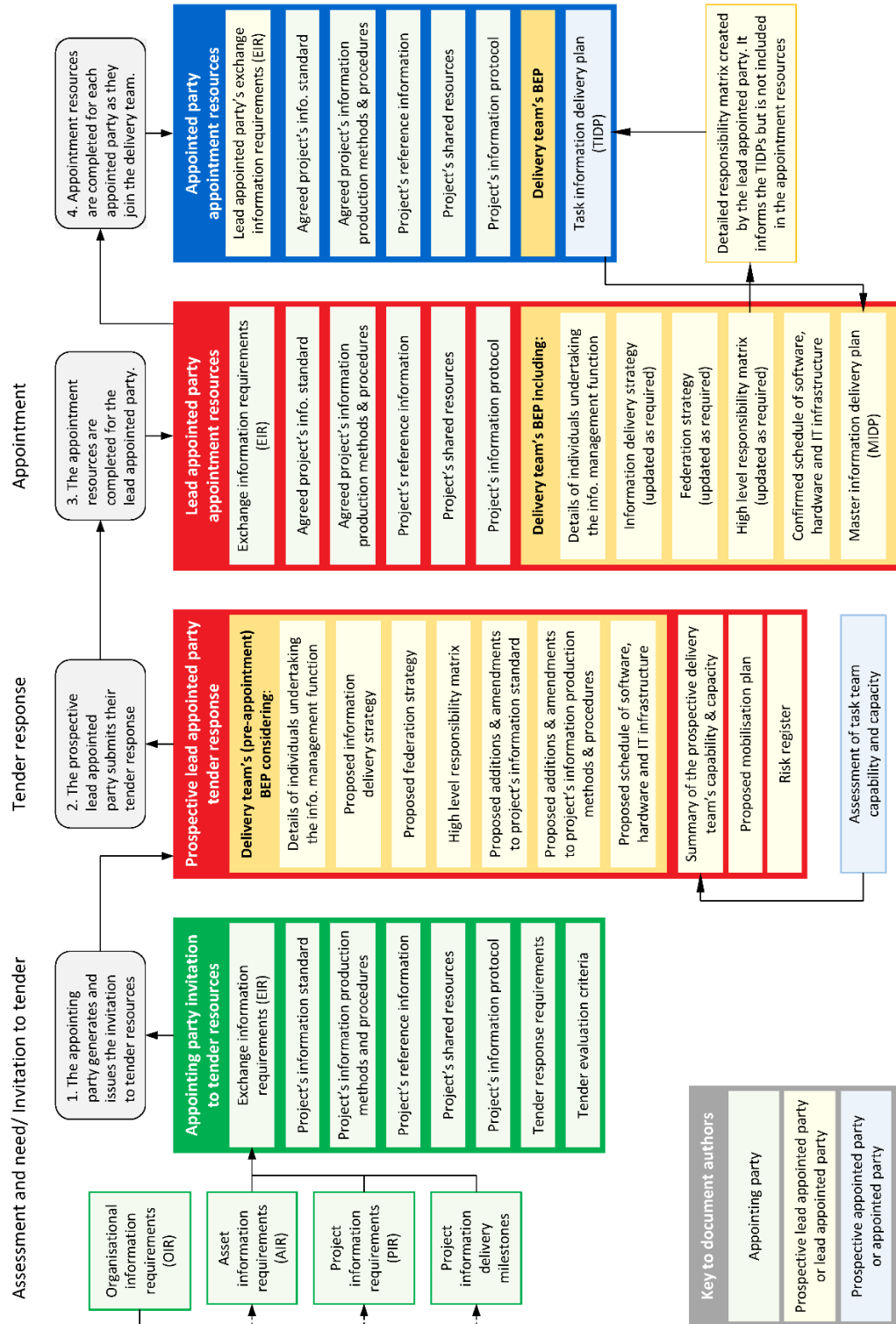
Figure 1 shows relationships between documents.

Figure 1 AS ISO 19650 resource documents

2   ASSESSMENT AND NEED RESOURCES

These resources are created by the appointing party as part of the preparation for developing the invitation to tender resources.

2.1   Organisational information requirements

Refer to AS ISO 19650.3 clause 5.1.2.

Organisational information requirements (OIR) explain the information needed to inform high-level strategic objectives within the appointing party's organisation, not just for projects, but more broadly. They include information required for:

- strategic business operation.
- strategic asset management.
- portfolio planning.
- regulatory duties.
- policy making.

Ideally, OIR are documented before any project planning is considered. Existing OIR may need to be reviewed and/or updated in this context.

Note: OIR inform asset information requirements (AIR) and project information requirements (PIR) but are generally not issued as part of tender documentation.

2.2   Project information requirements

Refer to AS ISO 19650.2 clause 5.1.2.

Project information requirements (PIR) explain the information the appointing party needs to inform decision making at key decision points throughout the project.

Notes:

- PIR are partly derived from OIR. Other sources include statutory and regulatory requirements.
- The project plan and project management processes provide the context for defining PIR.
- There is only one set of PIR per project.

- PIR inform the EIR for appointments but are not explicitly expressed as PIR in tender or appointment documentation.

2.3   Asset information requirements

Refer to AS ISO 19650.3 clause 5.1.4.

Asset information requirements (AIR) define the asset-related information the asset owner/operator needs, either for themselves or for their stakeholders to operate and maintain their assets.

AIR are typically grouped under categories such as:

- Managerial.
- Technical.
- Commercial.
- Legal.
- Financial.

AIR are important for supporting asset management as a key organisational activity and should be defined before any project-related appointments are made.

AIR and the use of BIM for asset and facility management are covered in more detail in *Appendix C – BIM Use & Enabler Descriptions*.

Also refer to the *ABAB AIR Guide* for a description of a process for defining AIR: https://www.abab.net.au/

2.4   Project information delivery milestones

Refer to AS ISO 19650.2 clause 5.1.3.

Information delivery milestones are defined to determine when information models will be exchanged from the delivery team to the appointing party and/or between delivery teams.

Information delivery milestones:

- are aligned with the project's plan of work;

- should be scheduled to support key decision points and project progression;
- are not always date specific as they are determined before or during the invitation to tender stage; and
- are typically located at the beginning or end of project stages as a minimum.

Project BIM Brief

Project BIM Briefs (PBB) are not described in AS ISO 19650 but can serve a similar function to the project information requirements (PIR) and exchange information requirements (EIR) documents. Like them, they are created by the appointing party as part of developing the invitation to tender resources.

AS ISO 19650.1 Section 5, AS ISO 19650.2 clause, 5.1.2 and AS ISO 19650.3 clause 5.1.4 effectively replace the role of the PBB.

The Guide retains a PBB template for potential uses including:

- Specifying BIM requirements on simple projects.
- As a framework for discussion and consideration of BIM requirements during early client meetings.
- Creating a preliminary draft or executive summary of requirements as a starting point for the more detailed definition of requirements in the AIR and PIR Templates.

The PBB Template has a similar structure to the other templates to assist coordination.

3 INVITATION TO TENDER RESOURCES

These resources are created by the appointing party for inclusion in the invitation to tender provided to prospective lead appointed parties.

3.1 Exchange information requirements

Refer to AS ISO 19650.2 clause 5.2.1.

Exchange information requirements (EIR) are appointment specific – they are derived from the PIR (which are informed by the OIR) and AIR, and only include those information requirements relevant to an appointment. Note that PIR are not explicitly expressed as such to tenderers; they just become part of an EIR.

Apart from documenting information requirements, EIR define:

- the purpose and function of information;
- its format; and
- the level of information need required by the appointing party.

Level of information need

AS ISO 19650.1 incorporates the concept of level of information need, a framework for specifying the extent and granularity of information needed at key information exchanges during a built asset's lifecycle.

The framework is described in EN 17412-1 *Building Information Modelling - Level of Information Need — Part 1: Concepts and principles*.

Its purpose is to guard against delivery team members producing too much information or information that is too detailed.

Level of information need encompasses all information types of deliverables and applies metrics appropriate to each.

3.2 Project's information standard
Refer to AS ISO 19650.2 clause 5.1.4.

This documents specific information standards required for the project by the appointing party's organisation. It can cover topics such as:

- Requirements associated with information exchanges.
- Schema for structuring and classifying information.
- Methods for assigning level of information need.
- Standards relevant to the use of information during the operational phase of the asset.

The project's information standard determines the formatting of information containers within the CDE.

3.3 Project's information production methods and procedures
Refer to AS ISO 19650.2 clause 5.1.5.

These document specific information production methods and procedures required for the project by the appointing party's organisation. They can cover topics such as:

- Capture of existing asset information.
- Generation, review or approval of new information.
- Security or distribution of information
- Delivery of information to the appointing party.

3.4 Project's Reference information
Refer to AS ISO 19650.2 clause 5.1.6.

This is information useful or relevant to prospective appointed parties when tendering and throughout the project. Its provision avoids potential duplication of effort and unnecessary risk allowances in pricing. It can include – but not be limited to information about:

- the brief;

- the site;
- adjoining assets and utilities;
- existing assets; or
- conditions of development.

3.5 Project's Shared resources
Refer to AS ISO 19650.2 clause 5.1.6.

This is information provided for similar reasons as reference information but to help promote consistency of information to facilitate its exchange including:

- templates for BIM Execution Plan (BEP), etc;
- templates for documents, drawings and models;
- style libraries for text, lines, hatch, etc;
- object libraries including 2D symbols and 3D objects.

3.6 Project's information protocol
Refer to AS ISO 19650.2 clause 5.1.8.

This documents the rights and obligations of parties entering into an appointment for the production or management of information. These relate to items such as:

- Use of the project's CDE, existing asset information and shared resources.
- Warranties and liabilities relevant to the project information model (PIM).
- Intellectual property rights.
- Use of information during the project, including licensing terms.
- Re-use of information following appointment or termination.

It is included in invitations to tender and appointment documentation.

The protocol for the operational phase of the assets (covered in AS ISO 19650.3) is referred to as the asset information protocol.

Note: A Project information protocol has not been developed specifically for Australia. Seek legal advice if adapting a protocol from elsewhere to ensure it does not conflict with other contractual documents, or ambiguities

are not introduced through the use of different terminology for similar items.

3.7 Tender response requirements and evaluation criteria

Refer to AS ISO 19650.2 clause 5.2.3.

These document the requirements the appointing party expects tendering organisations to meet in their tender submission. They can include:

- the information management competency of individuals;
- an assessment of the delivery team's capability and capacity;
- the proposed mobilisation plan;
- an information delivery risk register;
- tender evaluation criteria including weightings.

4 TENDER RESPONSE RESOURCES

These resources are created by the prospective lead appointed parties in response to the appointing party's invitation to tender.

4.1 (pre-appointment) BIM Execution Plan

Refer to AS ISO 19650.2 clause 5.3.2

Also see National BIM Guide clause 5.8.

4.1.1 Items for consideration for inclusion in the BIM Execution Plan (BEP)

AS ISO 19650.2 clause 5.3.2 states that the prospective lead appointed party shall consider the inclusion of the items listed below. 'shall consider' provides flexibility in selecting items and the extent of information provided for each based on their assessment of project requirements.

AS ISO 19650.2 clause 5.4.1 requires most of the items to be updated or confirmed after appointment.

4.1.2 Details of individuals undertaking the information management function

Refer to AS ISO 19650.2 clause 5.3.2.

These include names and professional résumés of the individuals proposed to undertake the information management function on behalf of the delivery team.

4.1.3 Proposed information delivery strategy

Refer to AS ISO 19650.2 clause 5.3.2 and 5.4.1.

This documents:

- the delivery team's approach to meeting the appointing party's EIR;
- a set of objectives/goals for the collaborative production of information; and
- an overview of the delivery team's organisational structure including task teams and commercial relationships.

It is updated as required to reflect any changes agreed after appointment.

4.1.4 Proposed federation strategy

Refer to AS ISO 19650.2 clause 5.3.2.

This high-level document sets out how different information models relate to each other. Models are typically differentiated by discipline or system. It can take the form of a table or relationship diagram.

The federation strategy informs the information container breakdown structure.

4.1.5 Information container breakdown structure

Refer to AS ISO 19650.2 clause 5.4.2.

Sets out the hierarchical organisation of information containers in the CDE. It is used to develop the responsibility matrices. It can take the form of a table or relationship diagram.

4.1.6 High-level responsibility matrix

Refer to AS ISO 19650.2 clause 5.3.2.

A high-level responsibility matrix is developed by a prospective lead appointed party to identify the information deliverables they plan to provide in response to the appointing party's EIR. This ensures there is no duplication of effort between delivery teams and clarifies what, at high level, they expect to deliver.

It forms part of the pre-appointment BIM Execution Plan.

After appointment it is refined into a detailed responsibility matrix which in turn informs a delivery team's TIDP(s) and MIDP.

The structure of the high-level responsibility matrix is usually determined by the container breakdown structure.

4.1.7 Proposed additions or amendments to the project's information standard

Refer to AS ISO 19650.2 clause 5.3.2.

These are as required to facilitate the effective:

- exchange of information between task teams;
- distribution of information to external parties; or
- delivery of information to the appointing party

4.1.8 Proposed additions or amendments to the project's information production methods and procedures

Refer to AS ISO 19650.2 clause 5.3.2.

These are as required to facilitate the effective:

- capture of existing asset information;
- generation, review, approval and authorisation of information;
- security and distribution of information; and
- delivery of information to the appointing party.

4.1.9 Proposed schedule of software, hardware and IT infrastructure

Refer to AS ISO 19650.2 clause 5.3.2 and 5.4.1.

This documents the software, hardware and IT infrastructure proposed to support the information delivery strategy (which it should cross reference).

It is updated as required to reflect changes agreed after appointment.

4.1.10 Assessment of task team capability and capacity

Refer to AS ISO 19650.2 clause 5.3.3.

This is an assessment by each task team of their experience and proficiency with:

- the information production methods and procedures required by the appointing party; and
- the software, hardware and IT infrastructure proposed.

Evidence such as certification and accreditation may be requested. Capacity can be demonstrated by reference to performance on similar projects.

4.1.11 Summary of the delivery team's capability and capacity

Refer to AS ISO 19650.2 clause 5.3.4.

This provides a clear picture of the delivery team's overall capability and capacity.

It is produced by the lead appointing party by aggregating each task team's assessments of their capability and capacity.

4.1.12 Proposed mobilization plan

Refer to AS ISO 19650.2 clause 5.3.5.

This is a tool for the lead appointed party to plan their mobilisation for information management after appointment. It also informs the appointing party of their proposed approach.

It can take the form of a schedule, table or Gantt chart that can include details of:

- Configuring and testing software, hardware and IT infrastructure including the CDE.
- Testing workflows including information exchanges.
- Producing information management plans or guides for the delivery team.
- Educating and training the delivery team about project goals and strategy, and the use of project software, hardware and IT infrastructure, etc.
- Project kick-off meetings and workshops.
- Recruiting, on-boarding and supporting new delivery team members.

4.1.13 Risk register

Refer to AS ISO 19650.2 clause 5.3.6.

This is an assessment of project risks including information management risks and appointment risks. It helps identify appropriate risk-mitigation measures.

The risk register can group risks under headings such as:

- Assumptions.
- Information delivery milestones.
- Information protocol.
- Information delivery strategy.
- Methods, Procedures and Information Standards.
- Mobilisation, capability and capacity.

5   APPOINTMENT RESOURCES

These resources are created by the lead appointed party when seeking information from appointed parties after it has been appointed on completion of the tender process.

The resources include those created by appointed parties in response, which are then coordinated and collated by the lead appointing party.

5.1   Lead appointed party's exchange information requirements

Refer to AS ISO 19650.2 clause 5.4.3.

These document the lead appointed party's exchange information requirements (EIR) for each appointed party. They are included in the appointment of each appointed party

5.2   Delivery team's BIM execution plan

Refer to AS ISO 19650.2 clause 5.4.1.

Also see National BIM Guide clause 5.9.

The (Pre-appointment) BIM Execution Plan (BEP) is updated as required to reflect changes agreed after appointment.

AS ISO 19650.2 only requires the items it lists to be considered for inclusion in the pre-appointment BEP. After appointment it requires many of these items to be updated or confirmed.

The BEP should be updated throughout the project as required to reflect the delivery team's approach.

5.3   Detailed responsibility matrix

Refer to AS ISO 19650.2 clause 5.4.2.

This is a further development of the high-level responsibility matrix that describes:

- What information is to be produced.
- Which task team is responsible for its production.
- When the information is to be exchanged, and with whom.

It highlights information dependencies and in the information delivery planning process it sits between the development of the high-level responsibility matrix and the information delivery plans.

LOD Tables, MEA Schedules, etc

Responsibility matrix is a generic AS ISO 19650 term. The content and format of individual matrices will depend on the needs of the project.

Level of Development (LOD) Tables, Model Element Authoring (MEA) Schedules, Minimum Modelling Matrices (MMM), etc are specialised types of responsibility matrices for managing collaborative modelling processes.

Their main purpose is to make clear who is responsible for modelling what, and when on a project. They assign responsibilities for model elements to individual modelling/ authoring parties (usually by discipline) and define the LOD required for each model element at prescribed project phases or milestones.

LOD Tables are included in the BIM Execution Plan (BEP) Template.

5.4   Task information delivery plan (TIDP)

Refer to AS ISO 19650.2 clause 5.4.4.

This is a plan developed by each task team that schedules out the information they will deliver (analogous to a documentation schedule). It includes:

- Information container (file) name and title.
- Predecessors or dependencies.
- Level of information need.
- Estimated time required for production.
- Author.
- Delivery milestones.

It enables task teams 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.

5.5   Master information delivery plan (MIDP)

Refer to AS ISO 19650.2 clause 5.4.5.

This is a compilation of all the TIDPs within a delivery team. It enables the lead appointed party to coordinate all the TIDPs to make sure related deliverables are in the right logical sequence and they will all fit within the overall delivery schedule.

5.6   Ancillary appointment resources

In addition to the resources created by the lead appointed party, other previously created resources that can be provided to appointed parties include:

- agreed project's information standard;
- agreed project's information production methods and procedures;
- project's reference information;
- project's shared resources;
- project's information protocol;
- details of individuals undertaking the information management function;
- information delivery strategy updated as required;
- federation strategy updated as required;
- confirmed schedule of software, hardware and IT infrastructure.

Information model

The subject of this Appendix is the documents that support the information management processes described in AS ISO 19650.

The product of these processes is the information model comprising the asset information model (AIM) and project information model (PIM) as described in AS ISO 19650.1 clauses 5.6 and 5.7.

AS ISO 19650.2 section 5.6 describes requirements for the collaborative production of information including quality assurance checks and reviews.

AS ISO 19650.2 section 5.7 describes requirements associated with the delivery of the information model including submission, review and acceptance processes.

6 PROJECT CLOSEOUT RESOURCES

Refer to AS ISO 19650.2 clause 5.8.2.

On project completion the appointing party, in collaboration with each lead appointed party records lessons learnt in a suitable location. Ideally, these should be captured progressively throughout the project.

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CONTACT INFORMATION

PHONE	1300 797 142
FAX	1300 797 143
EMAIL	mail@natspec.com.au
WEB	www.natspec.com.au

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