



NATSPEC National BIM Guide

Appendix D

Defining Information Requirements

Guidance and resources for using the AIR, PIR and EIR Templates to document information requirements

October 2022



AS ISO 19650 Aligned

NATSPEC//
Construction
Information

NATSPEC National BIM Guide Appendix D – Defining information requirements

October 2022

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Comments

NATSPEC welcomes comments or suggestions for improvements to the *NATSPEC National BIM Guide* and encourages readers to notify us immediately of any apparent inaccuracies or ambiguities. NATSPEC also encourages users to share their experiences of applying it on projects with us.

Contact us via email at bim@natspec.com.au.

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NATSPEC believes that digital information, including 3D Modelling and Building Information Modelling will provide improved methods of design, construction and communication for the Australian construction industry. Further, NATSPEC supports open global systems. This will result in improved efficiency and quality. Visit the NATSPEC BIM Portal bim.natspec.org.

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	<i>Project BIM Brief</i>	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 <i>ABAB AIR Guide</i>	References to relevant sources of information.
Blue underlined text	www.natspec.com.au	Hyperlink/weblink

In this document:

- The 'AIR Template' means the *NATSPEC Asset Information Requirements (AIR) Template*.
- The 'EIR Template' means the *NATSPEC Exchange Information Requirements (EIR) Template*.
- The 'PIR Template' means the *NATSPEC Project Information Requirements (PIR) Template*.
- The 'Template' means the applicable NATSPEC Information Requirements Template.
- The 'National BIM Guide' or 'Guide' means the *NATSPEC National BIM Guide*.
- Numbering of Tables, Diagrams and Figures is derived from the Clause in which they appear

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1 INTRODUCTION

1.1 Purpose and value

The templates provide a framework for developing and documenting information requirements for a project. They include items that need to be considered as part of this process, and guidance and references to information that supports decision making. Templates also foster a consistent approach across industry, organisations and projects. On projects this helps get everyone on the same page from the beginning and be productive from day one.

1.2 Audience

It is the responsibility of the appointing party to define their information requirements so they can be included in the invitation to tender documentation sent to prospective lead appointed parties.

The templates are primarily for appointing parties who do not already have well-documented information requirements or requirements aligned to AS ISO 19650 principles. Appointed parties with limited experience of defining information requirements should consider professional assistance with this task.

1.3 Function of each template

The templates are for documenting the appointing party's information requirements as described in AS ISO 19650:

- *Asset information requirements (AIR) Template*: For documenting the asset information required and its format only, i.e. not when it is required or the level of information need at the time.
- *Project Information requirements (PIR) Template*: For documenting the project information required and its format only, i.e. not when it is required or the level of information need at the time.
- *Exchange information requirements (EIR) Template*: For documenting the collated AIR and PIR, the project milestones at which information is to be delivered and the level of information need at each.

(A template for organisational information requirements (OIR) is proposed for future development.)

Responsibilities for providing required information: As the above requirements are often defined prior to the appointment of appointed parties, it is not always possible to say exactly who will be responsible for providing the information at that time. However, organising requirements by discipline or similar in the EIR will assist allocating these responsibilities during the development of the BEP.

The templates can be used to document requirements for a specific project or to document an organisation's general requirements which can then customised to reflect the specific requirements of individual projects.

Providing templates for each type of information requirements helps break down the task of defining them into manageable units. It also enables responsibilities for developing them to be assigned to the most appropriate parties, e.g. AIR by the Facility or Asset Manager.

1.4 Template features and structure

The templates include the following features and structure:

1.4.1 AS ISO 19650 aligned

Templates embody AS ISO 19650 principles and their content is structured around concepts and processes described in the standard.

1.4.2 Commercial, Management and Technical sections

Template sections are based on the three aspects of producing information identified in AS ISO 19650.1, Section 5:

- **Commercial**: Aspects of information delivery relevant to appointment or contract conditions.
- **Management**: Management processes to be adopted for the implementation of BIM.
- **Technical**: Technical requirements or provisions that support the delivery and management of information.

Given the interconnected nature of BIM practice, they represent relatively broad groupings of topics.

1.4.3 Workflow based

Clauses follow an order based on a workflow for progressively defining information requirements. In general, entries in later clauses build on those in earlier clauses. A flow chart of the workflow embodied in the AIR, PIR and EIR Template clauses is included in [Figures 4, 5 and 6](#) respectively.

1.4.4 Consistent structure

To assist navigation and the collation of their content, the templates share a consistent structure.

The BIM Execution Plan (BEP) Template will also follow a similar structure to assist mapping between requirements and proposed responses to them.

Sections 1 – 3: Common initial clauses

All templates share the same initial clauses (3.1 – 3.5) for entering details that are applicable to all information requirements, e.g. project details, procurement strategy. They provide context for the information requirements described in the following sections and directly influence their definition. This arrangement enables each template to function as a stand-alone document but facilitates merging them when required.

Section 3: Commercial requirements – AIR, PIR or EIR-specific

Clauses in this section follow a similar pattern in all templates but are specific to the commercial requirements of AIR, PIR or EIR, e.g. information purposes, information deliverables.

Section 4: Management requirements – AIR, PIR or EIR-specific

Clauses in this section cover overarching management requirements such as information quality assurance, information security and privacy and CDE management. In describing these requirements, reference may be made to standards and procedures described in more detail in the [Technical](#) section.

Section 5: Technical requirements – AIR, PIR or EIR-specific

This section includes details of information technology, project infrastructure requirements and technical standards applicable to the project.

The places for documenting standards and project reference information applicable to a project in the templates are grouped into categories described in AS ISO 19650.2. The approach recommended by AS ISO 19650.2 of making Standards and project reference information available in a CDE prior to issuing invitations to tender has many advantages that should not be overlooked. It is more efficient than sending them individually to each prospective appointed party and enables them to be updated and managed more reliably – everyone has ready access to the same current information.

It also has other advantages for the templates. Rather than incorporating large amounts of content from existing standards and procedures in the templates and other project documentation, it is more effective to simply cite them or their relevant clauses. It also provides the flexibility for authors of project documentation to cite standards and procedures appropriate to their project. The Technical section of templates includes directories (tables) for listing the documents cited.

2 USING THE TEMPLATES

2.1 Introduction

Templates are not an end in themselves, but aids that support project management tasks by providing a framework for capturing key decisions and information. Undertaking a well-considered process for formulating information requirements should remain the focus.

To accommodate a wide range of users, the templates assume a ‘blank sheet’ starting point and embody a first-principles approach to progressively defining requirements in more detail from the beginning to the end of each template.

The templates function like worksheets for an iterative development process. Sometimes this means that the content of one table – when completed – may form the basis for one that appears later in the template. In these instances, the content can either be copied and pasted from one to the other or, alternatively, the content can be left in place and the table amended, e.g. by adding additional columns or rows, to match the other.

If you have sufficient experience to bypass steps in the process, do so. Likewise, if your organisation already has effective standards or approaches in place for items in the templates, they can be incorporated. This will often be the case for traditional deliverables such as drawings, schedules and specifications.

2.2 Suggested process for use

Figure 2.2 shows the workflow supported by the templates. It reflects the functions of each template described in 1.3 Function of each template.

The following principles can be adopted when defining information requirements:

Start with the end in mind

Determine the complete set of information required for all purposes by the end of the project before working back from that point and progressively breaking it down into subsets of information required at each point in the project.

Define spatial assets before physical assets

The spaces that house activities are the intrinsic assets of a facility. They also provide a logical framework for organising project or physical asset information, so it helps to establish them first.

Determine AIR and PIR before EIR

As Exchange Information Requirements (EIR) represent the subsets of information requirements – both AIR and PIR – associated with each appointment, it is generally best to start with a consolidated set of AIR and PIR before breaking them down by appointment. If the composition of the prospective delivery team is not known prior to tender, information requirements can be grouped by discipline to assist assigning EIR by appointment later.

Determine AIR before PIR

Asset information requirements provide a good starting point for the definition process because they are a smaller, more readily defined set of information requirements than PIR.

Structure information requirements around appointments

AS ISO 19650 recognises that responsibilities for providing information in response to requirements specified in the invitation to tender cannot realistically be assigned to parties or individuals until appointments are made. However, it makes sense to keep which parties are likely to be responsible in mind during the information requirements definition process, so AS ISO 19650 recommends expressing recommendations in such a way that they can be readily incorporated into project-related appointments.

Simply following the usual practice of grouping items such as deliverables by discipline or trade goes a good way towards satisfying this recommendation.

The workflow for using the templates adopts the approach of not indicating which parties should be responsible for providing specific sets of information until the last step of defining EIR, i.e. after defining what information is required, when and at what level of information need.

This approach enables information requirements to be considered as a whole before assigning responsibilities for its delivery. However, none of this precludes template users assigning responsibilities at any stage they wish.

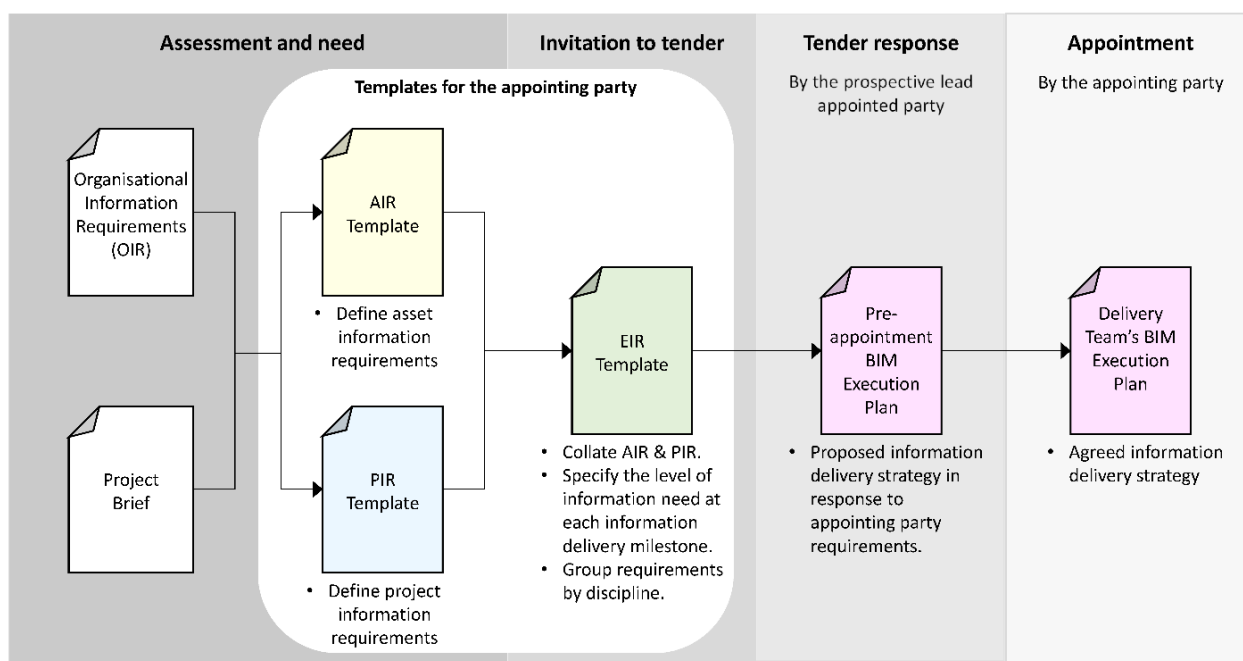


Figure 2.2: Template workflow

Tips

- Coordinate template content with items documented elsewhere to avoid duplication of effort and the risk of inconsistencies, e.g. deliverables such as drawings may already be included in drawing schedules, etc. In most instances it is better practice to reference this information than to duplicate it.
- Before defining information requirements for tender purposes, establish – through discussion/negotiation between parties – broad expectations about the granularity of definition to be provided in the context of available time and resources.
- Similar discussions/negotiations should take place to establish broad expectations about the level of detail to be provided in the prospective BIM Execution Plan.
- Do not approach the definition of information requirements as a rigidly linear process. Start work at a general, high level across multiple facets before progressively defining each. A wholistic approach helps avoid becoming buried in details to the extent that the overall process suffers.
- Consider the implications of defining requirements in highly granular forms such as LOD tables. How frequently are the intended recipients likely to refer to them? Are they likely to be maintained or updated to remain useful? If the answers to these questions are generally in the negative, consider alternative means of presenting or communicating requirements.

Useful references

UK BIM Framework *ISO 19650 Guidance Part D: Developing information requirements* can assist understanding of the processes embodied in this template.

The following documents include checklists and plain language questions that can be used to prompt answers about information requirements:

- *ABAB Asset Information Requirements Guide Appendix A.*
- *BS 8536: Briefing for design and construction:*
 - Part 1: Code of practice for facilities management (Building infrastructure) Annexes A and G.
 - Part 2: Code of practice for asset management (Linear and geographical infrastructure) Annexes A and G.

2.3 Storing template information

For convenience of access and use, templates are provided as editable text documents. However, a completed template may not always be the most effective repository of information. Some of their content may be better located in a searchable project database or common data environment (CDE) and referenced by the document.

2.4 Editing the templates

Templates are provided as Word documents that are meant to be edited by users to document their project-specific requirements.

2.4.1 Text formatting used in templates

The boxed green text is 'Hidden text' which serves as guidance for the template user. This is how it should appear:

Guidance text is not intended to be seen by the final recipients of the document and is turned off or deleted prior to the issue of the completed Template.

To show Guidance text in the document:

- **Word 2003 users:** Go to the **Tools** menu, choose **Options** (last item), click on the **View** tab and make sure that **Hidden text** is ticked (under the Formatting marks heading).
- **Word 2007 users:** Click on the **Office** button, choose **Word options** (last item), click on **Display** and make sure that **Hidden text** is ticked.
- **Word 2010 users:** Go to **File** menu, choose **Options** (last item), click on **Display** and make sure that **Hidden text** is ticked.

If you still have problems viewing Guidance, please contact NATSPEC on 1300 797 142.

Dark red text followed by: **[complete/delete]** (known as prompts) indicates that information prompted by the text should be entered after the colon. If the wording of the prompt is not appropriate for the project, it can be edited to suit. If the item is not relevant, simply delete it.

Normal italicised text, e.g. *NATSPEC National BIM Guide* indicates the name of a document or standard.

Bold text other than headings, e.g. **BIM meeting schedule** indicates a cross reference to a section, clause or schedule elsewhere in the document.

2.4.2 Instructions for use

Step 1: Save the template to the required location on your system.

Step 2: Make sure the Guidance text is visible: If you cannot see any green boxed text when you open the document, then the Guidance text needs to be turned on by adjusting the settings in Word. **Figures 2.4.2a and 2.4.2b** show a page with Guidance text turned off and on.

Step 3: Edit project identification items: Edit the cover page, headers and footers to suit the project and remove the word 'Template'.

Step 4: Delete items not required for the project including text, prompts and schedules/matrices. To cover a wide range of project requirements, templates include a comprehensive set of items. Few projects will use all of them. Retaining items 'just in case they might be needed' creates confusion and makes it more difficult to find relevant information when required.

Step 5: Complete prompts. Enter text at the prompt by placing your cursor anywhere between the square brackets [].

Step 6: Edit schedules/matrices by adding and deleting columns and rows as required and entering text in cells.

Step 7: Add any additional material that is required but not in the Template.

Step 8: Delete all pages before the Table of Contents except the cover.

Step 9: Add your organisation's logo to the cover if you wish. The version number and date on the cover are those of the Template. Edit them to apply to the project and to conform to your organisation's standards and practices.

Step 10: Delete Guidance text.

Step 11: Final proof: Check spelling, grammar, internal cross references, cross references to other documents, drawings, models, etc.

Step 12: Update the Table of Contents.

Asset Information Requirements (AIR)

Asset information requirements (AIR)
AIR are the pieces of information required by the appointing party to support their decision making during the operational phase of assets. The information provided by the delivery team led by the lead appointed party in response to the AIR constitutes the asset information model (AIM).

AIR are prepared by the appointing party, or Appointing Parties with limited experience of construction projects, it is recommended that they engage a design professional with solid experience in the particular project type to assist them. AIR should be expressed in a way that enables them to be readily incorporated into the exchange information requirements (EIR) for asset management appointments, e.g. grouped by discipline and/or trade.

Refer to AS ISO 19650 1, Section 5, and AS ISO 19650 2, Clause 5.1.3.

Using this Template
While project information requirements (PIR) share similar requirements as AIR, this AIR Template is designed specifically for developing AIR, so is recommended for this purpose.

This Template includes prompts for eliciting AIR and provides a structure for organising them effectively.

Refer to the Commentary at the front of this document for an explanation of its structure and instructions for its use.

1 THIS AIR DOCUMENT

1.1 AS ISO 19650 alignment
This document is aligned with the requirements of the AS ISO 19650 series of standards and uses the terminology from them throughout. Refer to them for details of the requirements and definitions of terms. Definitions of terms can also be found on the ISO Online Browsing Platform (OBP): <https://www.iso.org/obp/ui>

1.2 Purpose
This document defines the asset information requirements (AIR) for the project described on the cover.

If the cover is omitted because this document is being combined with others, it may be necessary to edit the text above to identify the project to which it applies. In this case, provide the similar details to those on the cover to unambiguously identify the project.

1.3 Application
This AIR document is to provide inputs to the project information requirements and exchange information requirements (EIR) which forms part of the invitation to tender documentation.

Applicable project phases: [\[complete/delete\]](#)

Examples of options – adjust wording to suit project:

- This AIR document applies to the design phases only of the project, up to and including the handover of AIM and/or PIM from the Design team to the Construction team.
- This AIR document applies to the construction phases only of the project, from the handover of AIM and/or PIM from the Design team to the Construction team and up to and including the handover of models from the Construction team to the operators of the completed built asset.
- This AIR document applies to the design and construction phases of the project, up to and including the handover of models from the Design and Construction teams to the operators of the completed built asset.

The last option offers the most opportunities to realise the potential benefits of BIM.

Coordinate with **COMMERCIAL** Project design scope.

2 PROJECT DETAILS

2.1 Project description
Outline description: [\[complete/delete\]](#)

Insert a brief description of the project including its purpose and/or refer to documents that describes it in more detail.

Figure 2.4.2a Guidance text displayed

Asset Information Requirements (AIR)

1 THIS AIR DOCUMENT

1.1 AS ISO 19650 alignment
This document is aligned with the requirements of the AS ISO 19650 series of standards and uses the terminology from them throughout. Refer to them for details of the requirements and definitions of terms. Definitions of terms can also be found on the ISO Online Browsing Platform (OBP): <https://www.iso.org/obp/ui>

1.2 Purpose
This document defines the asset information requirements (AIR) for the project described on the cover.

1.3 Application
This AIR document is to provide inputs to the project information requirements and exchange information requirements (EIR) which forms part of the invitation to tender documentation.

Applicable project phases: [\[complete/delete\]](#)

2 PROJECT DETAILS

2.1 Project description
Outline description: [\[complete/delete\]](#)

2.2 Project goals
The appointing party's goals for the project are shown in the Project goals table.

Project goals table

Priority	Goal description

3 COMMERCIAL

3.1 Project design status
Design development status: [\[complete/delete\]](#)

3.2 Procurement strategy
The project procurement strategy is shown in the Project procurement strategy table.

Project procurement strategy table

Project procurement strategy:	
Contractor engagement: indicative date:	

Appointing Party's asset management approach: [\[complete/delete\]](#)

3.3 Project team members
The contact details for key stakeholders who have contributed to the development of the AIR are shown in the Project team members table.

Project team members table

Figure 2.4.2b Guidance text not displayed

3 SAMPLE CONTENT - ALL TEMPLATES

The following sample content is provided to prompt consideration of what might be included – the content entered in templates will depend on the requirements of the project.

3.1 Project information delivery milestones

A **Project information delivery milestones table** is one way of summarising or presenting simple sets of program information. A traditional Gantt chart or critical path program showing these items in context will generally be a more effective planning tool.

Example of a completed **Project information delivery milestones table**

Delivery milestone	Weeks before*	Key decision point	Weeks before**	End of project phase
Delivery of initial brief	2	Acceptance of initial brief	1	Preparation and brief
Submissions of bids from planning consultants	2	Appointment of planning consultant	4	Conceptual Design
Delivery of schematic design	2	Acceptance of schematic design	2	Schematic Design
Delivery of developed design	3	Acceptance of developed design	4	Design Development
Delivery of tender documentation and list of proposed tenderers	1	Issue of tender packages	1	Tender Documentation
Delivery of tender evaluations	2	Notification of successful tenderer	2	Contract documentation
Delivery of contract documentation	1	Signing of contract	1	Contract documentation
Delivery of as-built and record documentation	3	Acceptance of as-built and record documentation	2	Commissioning/Handover

* Weeks before the key decision point ** Weeks before end of project phase

Dates can be substituted for lead times if they have been determined.

3.2 Asset information purposes

Asset information purposes table showing examples of information purposes and corresponding AIR. There may be multiple information requirements for each purpose. In this instance only one is shown.

Information purpose	Asset information requirements
Asset management	
Regulatory compliance	Information to support essential services/fire safety measures certification
Business cases	Identification of assets crucial to satisfying the needs of occupants, visitors and clients/customers.
Capacity and utilisation of spaces	Identification of peak demand periods on a daily, weekly, monthly and annual basis for the facility as whole and nominated areas to assist allocation of resources.
Capacity / performance / utilisation of systems and products	Estimates of maximum capacity and performance of crucial systems within the range of design (or expected) operating conditions.
Security and surveillance	Identification of assets critical to maintaining the security of the facility.
Disaster management	Emergency close down and restart information for major building systems including the triggers for these actions.
Impact analysis (energy, sustainability, etc)	Estimates of expected energy and water usage in a specified format. Information on using systems for measuring energy and water usage.
Cost management	Service and replacement costs. Cash flow analysis of operational period.
Operations	The type and format of information required by the existing or proposed CAFM system.
Maintenance and repairs	Warranties and service agreements for nominated assets including their expiry date.
Replacement / upgrade	Condition of existing assets. Expected life of existing and new assets.
Repurposing / alteration	Estimated replacement cost of nominated existing assets.
Decommissioning and disposal	Identification of existing assets likely to need decommissioning and disposal in the next year/two years/five years/ten years.

3.3 Project information purposes

Project information purposes table showing examples of information purposes and corresponding PIR. There may be multiple information requirements for each purpose. In this instance only one is shown.

Information purpose	Project information requirements
Design	
Regulatory compliance	NCC compliance analysis of design including design elements based on deemed to satisfy requirements and proposed performance-based solutions. Information to support development and building applications.
Business cases	Estimates of construction and operating costs. Rental value estimates. Sensitivity analysis of return on investment.
Cost management	Elemental breakdown of costs. Cash flow analysis of construction period.
Existing conditions modelling	Scope and detail of existing conditions to be modelled.
Communication of design intent	Schedule of accommodation and room data sheets for user group consultation. Models and renderings for stakeholder consultation. Marketing images.
Capacity / performance	Summaries of maximum allowable occupancy rates for rooms and spaces for the NCC class of building. Estimates of maximum capacity and performance of crucial systems within the range of design (or expected) operating conditions.
Amenity	Summaries of space per person, access to facilities and outdoor spaces, and thermal and acoustic comfort, lighting levels and outlook.
Safety in design	Risk assessment of design elements identifying functional and safety risks and the measures proposed to mitigate them. Applicable WHS legislation clauses.
Accessibility	Reports on conformance with standards and proposed additional measures.
Impact analysis (energy, sustainability, etc)	Nominated schemes and ratings targets. Calculations or results of rating tool use demonstrating performance levels relative to a scheme/s.
Construction	
Documentation	Coordinated graphic and written descriptions of the design including materials, products, systems and methods of construction adequate to accurately set out and construct the works. Specification of the required standards of quality.
Phase planning (4D modelling)	Work breakdown structure, scope, e.g. primary structural and enclosure elements only, structure, enclosure and services. Proposed method of linking the model to the construction program.
Construction programming	Program including durations and dependencies of key construction activities and identification of critical path activities. Updating procedures and responsibilities.
Site utilisation planning	Location of site amenities, material and waste storage and stockpile areas, pick up and set down areas, access/exit paths, cranes, hoists, lifting paths, etc.
Construction system design	Formwork, propping, retaining and scaffolding proposals. Mock ups and construction methodology trials. Prefabrication and preassembly proposals.
Prefabrication	Coordinated graphic and written descriptions of components and assemblies adequate for off-site fabrication and site installation.
Digital fabrication	Identification of items proposed for digital fabrication. Assessments of fabricator's capabilities and capacities.

Digital control and planning (digital layout)	Location of onsite control points. Scope: grids, RLs, penetrations including waste pipes, setdowns, service hangers. Required file formats.
Record modelling	Purpose of record modelling, scope, e.g. As-Designed model, As-Built model, accuracy requirements, verification procedures, responsibilities.
Environmental protection	Sedimentation control plans, vehicle decontamination/washdown areas, waste management plans, dust and noise control measures, tree protection measures.
Health and safety	Location of potential onsite hazards, e.g. asbestos, overhead power lines, underground high voltage cables, gas lines, disused tanks, contaminated soil. Risk assessments of materials and methods of construction and proposed mitigation measures including protection. Provisions for on-site first aid. Safe Work Method Statements. Applicable WHS legislation clauses.
Security and surveillance	Risk assessments of potential security problems and proposed mitigation measures including surveillance systems. Procedures for reporting and responding to security breaches. Applicable policies and management plans.
Project management – appointing Party	(Additional to those required by appointed parties for delivering the project.)
Monitoring and control	Progress reports including performance against cost, time and quality targets.
Contract administration	Reports on contract administration activities including claims for variations and extensions of time, their assessment and responses, e.g. approval or rejection.
Health and safety	Risk assessment report. H&S incident reports.
Security and surveillance	Risk assessment report. Security breach reports.

3.4 Deliverables

Examples of types of deliverables:

Models

Site/civil
Geotechnical
Architectural
Quantity surveying
Structural
Mechanical
Electrical
Hydraulic

Fire engineering
Conveying (lifts, etc)
Landscaping
Contractor
Facade
Energy analysis
Sustainability analysis

Drawings

General

Title sheet
Drawing List
Master Schedule

Overall Arrangement

Location Plan
Site Plans and Grid Setouts
Overall Plans
Overall Elevations and Sections
Fire egress plans
Life Safety Compliance Diagrams
Acoustic Compliance Diagrams
Thermal Compliance Diagrams

General Arrangement Plans

Demolition Plans
Geotechnical plans
Structural Setout Plans
Floor Plans
Partition Plans
Enclosure Plans
Finishes Plans
Furniture, Fixtures and Equipment Plans
Signage Plans
Reflected Ceiling Plans
Reflected Soffit plans

General Arrangement Elevations and Sections

Site/civil elevations and sections
Demolition elevations and sections
Structural elevations and sections
Architectural Elevations and Sections
Internal Elevations
Enclosure Elevations

Detail Arrangement

Demolition Detailed Arrangements (all projections)
Structural Setout Detailed Arrangements (all projections)
Prefabricated Items Detailed Arrangements
Detail Arrangements (all projections) grouped and organised to suit project requirements

Details - Building

Demolition Details
Structural Details
Details (all projections) grouped by project requirements

Details - Assemblies

Windows – Details and Member Profiles
Louvres - Details and Member Profiles
Doors - Details and Member Profiles
Wet Areas - Generic Details
Partitions – Generic Details
Ceilings and soffits - Generic Details
Signage - Details

Details - Fitout Assemblies

Cabinetwork Details
Fabricated Metalwork Details
System furniture Details

Documents**Textual documents**

Authority approvals
 Bills of quantities
 Briefs
 Certificates
 Contract administration proforma (Variation quotation requests, extension of time claims, etc)
 Cost plans
 Occupant user guides for building systems
 Operation and maintenance manuals
 Product and materials data sheets
 Product evidence of conformity
 Product safety data sheets
 Reports
 Room data sheets
 Schedules
 Specifications
 Test results
 Warranties

Graphic documents

Assembly diagrams
 Bar charts
 Fire emergency plans
 Functional relationship diagrams
 Maps

 Organisational structure diagrams
 Process or procedural diagrams
 Programs or Gantt charts

Images

Laser scans, point clouds
 Photographs
 Renderings

Others**Audio-visual media**

Animations (4D, walkthroughs, flyovers, etc)
 Audio recordings
 Videos

Physical entities

Models
 Prototypes, mock ups
 Samples

Uniclass 2015 PM Project Management table lists many document types.

3.5 Deliverables formats

Example of a completed **AIM or PIM deliverables format table**

Deliverable	File type	Physical format	No. of copies *
Models	Native file format and IFC 2x3	N/A	N/A
Drawings	Native file format and PDF/A	A1	2
Documents	PDF/A	A4 bound	2
Photographic images	JPEG	N/A	N/A
Videos, animations	MP4	N/A	N/A
Data	Native file format and CSV	N/A	N/A

* Unless noted otherwise, the number of hard copies at handover to the operational phase of the asset.

3.6 Spatial object properties

Examples of Spatial object properties.

Property category	Generic property name	Description & comments	Example
General ID & description	Space ID	Unique room number / designation	301
	Space name	Room name / description	Office
	Designation/ Reference/ Mark (US term)	A code or tag applied to items in project documentation for coordination and cross referencing.	RM-301
Location	Building (if there are more than one)	Building number or name	Building 2 'Collins'
	Zone	A predefined group of spaces	Northeast
	Storey or Level	Level number	3
Geometrical quantities	Height, length, width, floor area, wall area, ceiling area, volume	There are many ways of measuring building elements. Define this required for the project.	205 m ² GFA
Function	Function classification or category	For grouping spaces of similar type for searching and reporting purposes.	Admin
Occupancy	NCC classification	The NCC building class based on the purpose for which a space was designed, constructed or adapted to be used.	Class 5
	Maximum No. of occupants	The maximum number of occupants for the NCC classification.	20
	Design occupancy load	The number of occupants the space and services were designed for.	18
Surface finishes	Floor finish, Wall finish, Ceiling finish	Descriptions of the surface finishes for each surface identified.	Carpet, Painted P/B, Acoustic tiles
Condition	Condition rating	Overall condition rating based on assessment. Rating scale to be nominated, e.g. <i>IPWEA PN3</i> scale 1 – 5	2
	Condition assessment date	Date of overall condition assessment (Format: YYYY-MM-DD).	2018-06-22

3.7 Physical asset classes

Examples of physical asset classes. The items included in the AIM are generally only those classes of assets described as maintainable assets, i.e. requiring regular monitoring and maintenance to ensure they perform satisfactorily and reliably. They include items that would significantly affect the amenity or safety of a building if they failed.

The following list of typical maintainable assets is similar to the one included in *The COBie Guide*.

Asset class ID codes are from the Virtual Building Information System (VBIS).

The many additional assets that could be included in the PIM for design and construction purposes have not been listed.

Examples of AIM physical asset classes

Asset class ID	Asset class	Asset class ID	Asset class
	HVAC systems		Plumbing systems
ME-AHU	Air handling units	HY-To	Toilets, WCs
ME-Bo	Boilers	HY-WT	Water treatment units
ME-CHr	Chillers		
ME-ACPR	Compressors		Fire suppression systems
ME-CT	Cooling towers	ME-Da-FD	Fire dampers
ME-ACFCU	Fan coil units	FS-PFE	Portable fire extinguishers
ME-Fa	Fans	FS-FHR	Fire Hose Reels
ME-AFP	Filters	FS-Pu	Pumps
ME-EMS	Motors		
ME-Pu	Pumps		Electrical systems
ME-ATU-VAV	Variable air volume units	EL-EL	Emergency lighting
	Security control systems	EL-EL-Ex	Exit signs (illuminated)
SE-CCTV-Ca	Cameras	EP-SB-DB	Distribution boards
SE-ACon-Con	Controllers	EP-SG	Switchgear
SE-ID-MS	Sensors	EL-Li-Lu	Luminaires
	Vertical transportation systems		Electrical generator systems
VT-Es	Escalators	EP-Ge	Generator
VT-Li	Lifts	EP-Ge-FTP	Fuel pumps
		EP-Ge-BFT	Fuel tanks
	Kitchen equipment		Washroom equipment
KE-Di	Dishwashers	FFE-ED-Ha	Hand dryers
RE-CF	Freezers	FFE-SD	Soap dispensers
KE-	Fryers	FFE-TPD	Toilet paper dispenser

Asset class ID	Asset class	Asset class ID	Asset class
RE-IM	Icemakers	WA-IW-IWB	Wastebins
KE-CE-Ov	Ovens		
KE-KEH	Kitchen exhaust hoods		Architectural elements
RE-CR	Refrigerators	ST-DFR	Doors – Fire rated
KE-CE-St	Stoves	ST-DNR	Doors – Non-rated
KE-FWDU	Waste disposal units	ST-FF	Finishes - Floor
WA-WW-GT	Grease traps	FFE-PF-Wa	Finishes – Internal walls
		ST-CeF	Finishes - Ceilings
	Site drainage systems	ST-Wi	Windows
HY-Gr-SWPG	Grates		
HY-Pu	Pumps		Landscaping
HY-Ta-St	Stormwater tanks	LS-Ir	Irrigation systems
		EL-Li-Lu-Ex	Luminaires - External

3.8 Physical asset object properties

Examples of physical asset object properties.

Property category	Generic property name	Description & comments	Example
General ID & description	Asset ID	Asset designation code from a nominated system	MEC-AHU05
	Asset name	Description of the asset	Horizontal Fan-Coil Unit
	Designation/ Reference/ Mark (US term)	A designation code or tag applied to items in project documentation for coordination and cross referencing.	AHU-0105
Location	Space ID	Unique room number / designation	101
	Space name	Room name / description	Office
Parent system or assembly	System ID	Designation code or short name from a nominated system	MSA-01
	System name	Description of the system	Mechanical supply air system serving first floor
Classification or category	Asset classification or category	Classification or category code from nominated system	Pr_70_65_03_29
	Asset type: Fixed or moveable	Complete value with: 'Fixed' or 'Movable'	Fixed
Manufacture & supply	Make / Manufacturer	Name of the manufacturer (or assembler). COBie uses their email address	sales@coolaircon.com
	Product / Model number	Model number or designator (or product line) as assigned by the manufacturer	CA-680

Property category	Generic property name	Description & comments	Example
	Product / Model name	Model name (or product line) as assigned by the manufacturer	Cool Air Slimline
	Serial number	Serial number assigned to the occurrence of the product	3005 2337 1800 2554
	Acquisition date	Date the item was purchased (YYYY-MM-DD)	2017-11-16
	Barcode	Bar code given to occurrence of the product (Number below the barcode graphic)	6157 2289 3005 2337 1800 2554
Warranties	Warranty start date	Format: YYYY-MM-DD	2023-03-19
	Warranty end date	Format: YYYY-MM-DD	2023-03-22
	Warranty identifier	Identifier assigned to warranty	MECH-FCU-CA-AHU-0105
Life cycle & maintenance	Expected Life	Expected serviceable life of object	25 years
	Maintenance frequency	Scheduled time interval for maintenance tasks	6 months
Temporal	Start date	Start date of an activity or task. (Included in model elements/objects for phase planning.)	2022-09-02
	End date	End date of an activity or task. (Included in model elements/objects for phase planning.)	2022-09-22
	Duration	Duration of an activity or task in the nominated units of time	20 days
Performance	Output & Input measurements at commissioning	Measurements of the outputs & inputs to building services equipment, e.g. power output & full-load current rating of a motor	11 kW & 41 Amps
	Efficiency measurement at commissioning	Key efficiency measurement for building services equipment, typically the ratio of output capacity to input/intake capacity.	90%
Condition	Condition rating	Overall condition rating based on assessment. Rating scale to be nominated, e.g. <i>IPWEA PN3</i> scale 1 – 5	2
	Condition assessment date	Date of overall condition assessment (Format: YYYY-MM-DD).	2018-06-22
Financial	Asset tax type	Taxation group to which the item belongs	Capitalised
	Asset insurance type	Insurance rating for the item	Real

3.9 Standards and project reference information

3.9.1 Project information standards

Examples of project information standards.

Generic description	Examples
International, national or industry standards (Topics noted below)	
Information management using BIM	ISO 19650 <i>Organization of information about construction works — Information management using building information modelling</i> Part 1: <i>Concepts and principles</i> : 2019 Part 2: <i>Delivery phase of the assets</i> : 2019 Part 3: <i>Operational phase of the assets</i> : 2021
Information acceptance criteria	ISO 19650.4:2022 <i>Organization of information about construction works — Information management using building information modelling</i> Part 4: <i>Information exchanges</i>
Information security	AS ISO 19650.5:2021 <i>Organization of information about construction works — Information management using building information modelling</i> Part 5: <i>Security-minded approach to information management</i>
Information for health and safety	ISO/CD 19650-6 <i>Organization of information about construction works — Information management using building information modelling</i> Part 6: <i>Health and safety</i> (Under development)
Information delivery	AS ISO 29481.1:2018 <i>Building information models - Information delivery manual</i> , Part 1: <i>Methodology and format</i> AS ISO 29481.2:2018 <i>Building information models - Information delivery manual</i> , Part 2: <i>Interaction framework</i>
Asset management	AS ISO 55000:2014 <i>Asset Management – Overview, principles and terminology</i> AS ISO 55001:2014 <i>Asset Management – Management systems – Requirements</i> AS ISO 55002:2019 <i>Asset Management – Management systems – Guidelines for the application of ISO 55001</i> AMBoK Publication 000: <i>Framework for Asset Management – Asset Management Council (AMC)</i> AMBoK Publication 001: <i>Companion Guide to ISO 55001 – Asset Management Council (AMC)</i> AGAM01-18: <i>Guide to Asset Management – Austroads 2018</i> <i>International Infrastructure Management Manual (IIMM)</i> – Institute of Public Works Engineering Australasia (IPWEA) 2020
Facility management	AS ISO 41001:2019 <i>Facility management – Management systems – Requirements with guidance for use</i> AS ISO 41011:2019 <i>Facility management – Vocabulary</i> AS ISO 41012:2019 <i>Facility management – Guidance on strategic sourcing and the development of agreements</i> ISO 15686 series <i>Buildings and constructed assets – Service life planning</i> Construction-Operations Building Information Exchange (COBie) Whole Building Design Guide
Quality management	AS/NZS ISO 9001:2016 <i>Quality management systems – Requirements</i>

Generic description	Examples
Level of information need standards	
	<p>EN 17412-1:2020 <i>Building Information Modelling – Level of Information Need – Part 1: Concepts and principles</i></p> <p>ISO/DIS 7817 <i>Building information modelling – Level of information need – Concepts and principles</i> (ISO standard based on EN 17412-1 under development)</p> <p><i>BIMForum Level of Development (LOD) Specification</i></p> <p>Minimum Modelling Matrix (M3) United States Army Corps of Engineers (USACE)</p>
Information container/file naming standards	
	<p>National Annex to BS EN ISO 19650-2:2021</p> <p>IEC 82045-1:2001 <i>Document management – Part 1: Principles and methods</i></p>
Classification systems and tables	
Multi-table national systems	<p>OmniClass</p> <p>Uniclass 2015</p>
Element classification systems	<p><i>Australian Cost Management Manual (ACMM)</i></p> <p>Volume 1 – <i>Cost Planning and Cost Analysis</i></p> <p>Volume 2 – <i>Sub-element - Definition</i></p> <p>UniFormat</p> <p>OmniClass Table 21 <i>Elements</i></p> <p>Uniclass 2015 Table EF <i>Elements/Functions</i></p> <p><i>New Rules of Measurement (NRM)</i> Royal Institution of Chartered Surveyors' (RICS)</p>
Work Results Classification Systems	National Classification System (NATSPEC Australia)
Subsurface utility location accuracy	<p>AS 5488.1:2022 <i>Classification of Subsurface Utility Information (SUI)</i>, Part 1: <i>Subsurface Utility Information</i></p> <p>AS 5488.2:2022 <i>Classification of Subsurface Utility Information (SUI)</i>, Part 2: <i>Subsurface utility engineering (SUE)</i></p>
Tagging and metadata standards	
	Virtual Building Information System (VBIS)
Modelling standards	
	<p><i>Open BIM Object Standard (OBOS)</i> NATSPEC and Masterspec NZ</p> <p><i>Australian and New Zealand Revit Standards (ANZRS)</i></p> <p><i>AEC (UK) CAD & BIM Standards</i></p>
CAD and drawing standards	
Layer naming, drawing conventions	AS 13567.1-1999 <i>Technical product documentation – Organization and naming of layers for CAD</i> , Part 1: <i>Overview and principles</i>

Generic description	Examples
	<p>AS 13567.2-1999 <i>Technical product documentation - Organization and naming of layers for CAD, Part 2: Concepts, format and codes used in construction documentation</i></p> <p><i>United States National CAD Standard (NCS)</i></p> <p>AS 1100 <i>Technical drawing – Parts 101, 201, 301, 401, 501</i> (2D drawings only)</p>
Clash Detection Standards	<p>Clash Detection Colour Coding Standard: Refer to the Clash detection colour schedule in the <i>NATSPEC BIM Execution Plan Template</i> (Pending).</p> <p>Clash categories and tolerances: Refer to the Clash resolution priority clause in the <i>NATSPEC BIM Execution Plan Template</i> (Pending).</p>

3.9.2 Project information production methods and procedures

Examples of project information production methods and procedures.

Generic description	Example
Model georeferencing procedures	
	<p><i>Model Setup IDM Georeferencing BIM buildingSMART 2021</i></p> <p>https://ucm.buildingsmart.org/use-case-details/2047/en</p>
CDE protocols	
	<p>DIN SPEC 91391-1:2019 <i>Common Data Environments (CDE) for BIM projects – Function sets and open data exchange between platforms of different vendors, Part 1: Components and function sets of a CDE; with digital attachment</i></p> <p>DIN SPEC 91391-2:2019 <i>Common Data Environments (CDE) for BIM projects – Function sets and open data exchange between platforms of different vendors, Part 2: Open data exchange with Common Data Environments</i></p>

3.9.3 Project reference information

Examples of Project reference information.

Generic description	Example
Project brief	
	<Project-specific document> <Appointing party design standards and specifications>
Planning and construction approval documentation	
	<Project-specific documents: Development applications, approvals including conditions of consent Traffic and parking reports>
Site information	
	Land survey Laser scans Geotechnical reports Deposited plans Relevant sections of the Local Environmental Plan Bushfire hazard zone map Atmospheric corrosivity zone maps Mines subsidence zone maps
Utilities and services information	
	Plans and diagrams from each utility service provider
Existing asset information	
	As-built plans, specifications and other project documentation Asset registers Dilapidation plans and reports

3.9.4 Project shared resources

Examples of Project shared resources.

Generic description	Example
Templates	
	<Project-specific model and drawing templates>
Style libraries	
	<Project-specific style libraries>
Object libraries	
	<Nominated commercial object library> <Project-specific object library>

4 AIR TEMPLATE WORKFLOW AND WORKED EXAMPLE

Figure 4 shows the workflow embedded in the AIR Template (numbers are Template clause numbers).

It is provided to assist navigation of template content, not to dictate a fixed approach to their use.

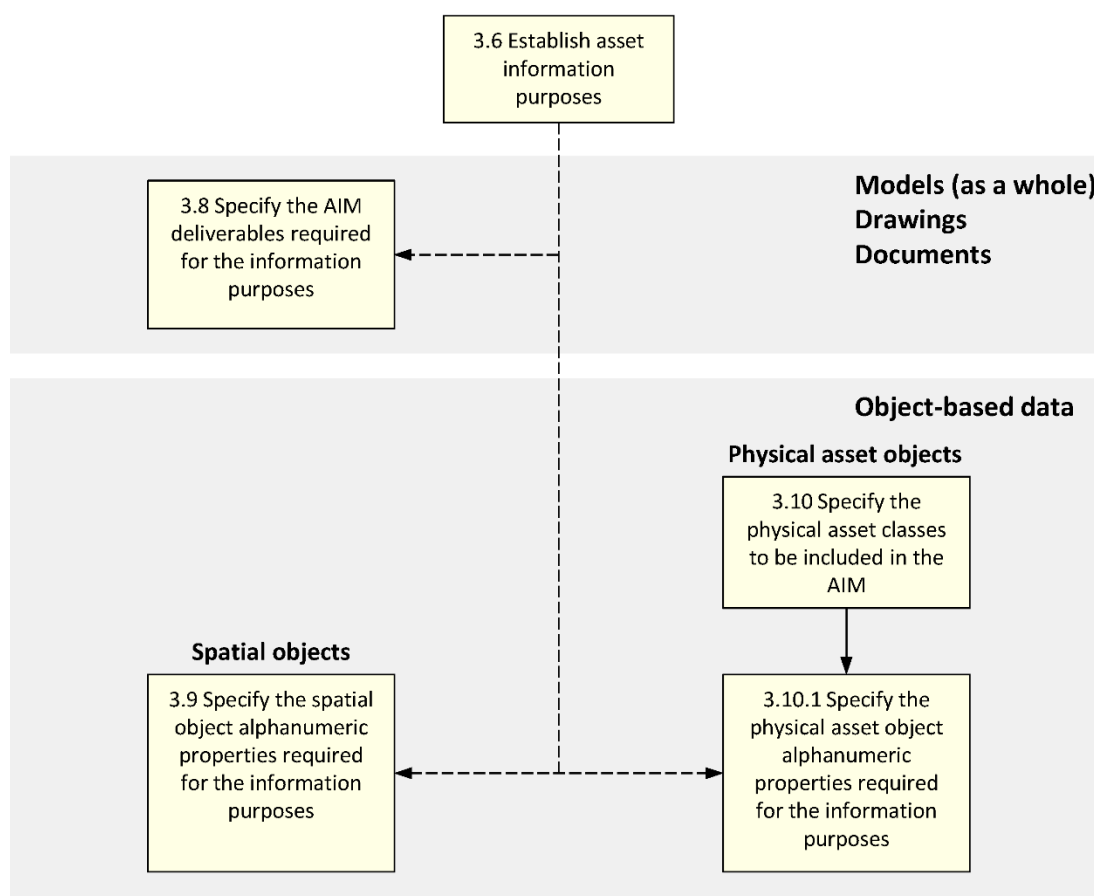


Figure 4: Workflow for defining requirements embedded in the AIR Template

4.1 AIR information purposes example

This example of a completed **Asset information purposes table** shows the type of items that could be included for a project. It should not be interpreted as normative or representing best practice.

The information purposes shown influence the deliverables and object properties that have been included in the example tables on the following pages.

Asset information purposes table

Information purpose	Asset information requirements
Asset management	
Regulatory compliance	Information to demonstrate compliance with NCC requirements and support essential services/fire safety measures certification.
Operations and Maintenance	Operation and maintenance manuals. Warranties and service agreements for nominated assets including their expiry date.

4.2 AIM deliverables example

This is an example of an **AIM deliverables table** showing some of the deliverables required for two purposes:

- Regulatory compliance: Fire safety
- Operations and management

AIM deliverables table

AIM element	Information purposes	
	Regulatory compliance: Fire safety	Operations & maintenance
Models *		
Architectural		As-Built model
Quantity surveying		
MEP		As-Built model
Drawings		
Site plan	Incl. boundary setbacks and external exit routes	As-Built drawings
Floor plans	Incl. fire compartments and exits	As-Built drawings
Reflected ceiling plans	Incl. emergency lighting and exit signs	As-Built drawings
Elevations	Incl. openings and forms of construction	As-Built drawings
Structural layouts		
MEP layouts		As-Built drawings
Documents		
Authority approvals	Approved documentation & conditions of approval	
Schedules	Incl. Fire doors, FHRs and extinguishers	
Specifications	Incl. fire performance of products and materials	
Cost plans		
Bills of quantities		
Reports	NCC compliance report.	
Construction program		
O&M manuals		✓
Warranties and service agreements		✓
Product evidence of conformity	Certification and fire test reports.	✓
Data (object-based)		
	See Asset object properties table.	

* Refers to virtual 3D models as a whole, i.e. not individual model object/elements.

4.3 AIM spatial object properties example

This is an example of a [Spatial object properties table](#) showing some of the properties required for two purposes:

- Regulatory compliance: Fire safety
- Operations and management

Spatial object properties table

Property category	Generic property name	Information purposes	
		Regulatory Compliance	Operations & Maintenance
General ID & description	Space ID	✓	✓
	Space name	✓	✓
	Designation/ Reference/ Mark	✓	✓
Location	Zone	✓	✓
	Storey or Level	✓	✓
Geometrical quantities	Height, length, width, floor area, volume	✓	✓
Function	Classification or category	✓	✓
Occupancy	NCC classification	✓	✓
	Maximum No. of occupants	✓	✓
Surface finishes	Floor finish, Wall finish, Ceiling finish	✓	✓
Maintenance	Maintenance frequency		✓
Condition	Condition rating		✓
	Condition assessment date		✓

4.4 AIM physical asset classes example

This is an example of an **AIM physical asset classes table** showing the physical asset classes required to be included in the AIM for two purposes:

- Regulatory compliance: Fire safety
- Operations and management

Only higher priority items are shown in this example.

Asset class ID codes are from the Virtual Building Information System (VBIS).

AIM physical asset classes table example

Asset class ID	Asset class
ST-DFR	Fire doors
FD-FD	Fire detectors
FS-PFE	Portable fire extinguishers
EL-EL	Emergency lighting
EL-EL-Ex	Illuminated exit signs
ME-Bo	Boilers
ME-CT	Cooling towers
ME-CHr	Chillers
ME-ACFCU	Fan coil units
ME-ATU-VAV	Variable air volume air terminal units

4.5 AIM Physical asset object properties example

This is an example of an **Asset object property table** showing some of the properties required for two purposes:

- Regulatory compliance: Fire safety
- Operations and management

Note: These are indicative of properties required for asset objects in general – they may vary for individual objects or object classes.

Asset object property table

Property category	Generic property name	Information purposes	
		Regulatory Compliance	Operations & Maintenance
General ID & description	Asset ID	✓	✓
	Asset name	✓	✓
	Designation/Reference/ Mark	✓	✓
Location	Space ID	✓	✓
	Space name	✓	✓
Parent system or assembly	System ID	✓	✓
	System name	✓	✓
Classification or category	Asset class. or category	✓	✓
	Asset type: Fixed or moveable		✓
Manufacture & supply	Make / Manufacturer		✓
	Product / Model number		✓
	Product / Model name		✓
	Serial number		✓
	Acquisition date		✓
	Barcode		✓
Warranties	Warranty start date		✓
	Warranty end date		✓
	Warranty identifier		✓
Life cycle & maintenance	Expected Life	✓	✓
	Maintenance frequency	✓	✓
Temporal	Start date		✓
	End date		✓
Performance	Output & Input measurements at commissioning		✓

Property category	Generic property name	Information purposes	
		Regulatory Compliance	Operations & Maintenance
	Efficiency measurements at commissioning		✓
Condition	Condition rating	✓	✓
	Condition assessment date	✓	✓
Financial	Asset tax type		✓
	Asset insurance type		✓

5 PIR TEMPLATE WORKFLOW AND WORKED EXAMPLE

Figure 5 shows the workflow embedded in the PIR template (numbers are Template clause numbers).

It is provided to assist navigation of template content, not to dictate a fixed approach to their use.

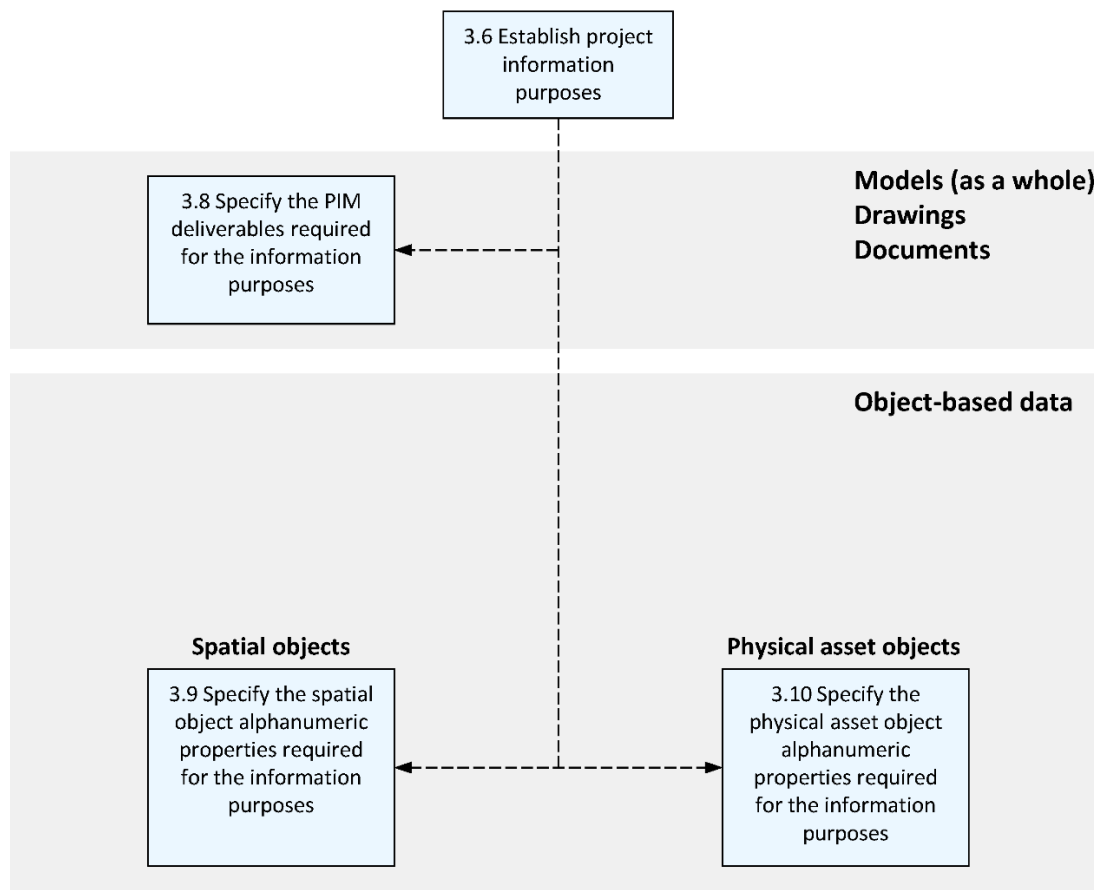


Figure 5: Workflow for defining requirements embedded in the PIR Template

5.1 PIR information purposes example

This example of a completed **Project information purposes table** shows the type of items that could be included. It should not be interpreted as normative or representing best practice.

The information purposes shown influence the deliverables and object properties that have been included in the example tables on the following pages.

Project information purposes table

Information purpose	Project information requirements
Design	
Cost management	Elemental breakdown of costs. Cash flow analysis of construction period.
Construction	
Construction programming	Program including durations and dependencies of key construction activities and identification of critical path activities. Updating procedures and responsibilities.

5.2 PIM deliverables example

This is an example of a **PIM deliverables table** showing some of the deliverables required for two purposes:

- Cost management
- (Construction) Phase planning

PIM deliverables table

PIM element	Information purposes	
	Cost management	Phase planning
Models *		
Architectural		Incl. 4D object properties
Quantity surveying	Incl. QS classifications	
MEP		Incl. 4D object properties
Drawings		
Site plan	Incl. finishes and fixtures	✓
Floor plans	Incl. FF&E	✓
Reflected ceiling plans	Incl. FF&E	✓
Elevations	Incl. FF&E	✓
Structural layouts	Incl. material grades	✓
MEP layouts	✓	✓
Documents		
Authority approvals		
Schedules		
Specifications	Incl. product and material quality	
Cost plans	✓	
Bills of quantities	✓	
Reports	Project progress reports	
Construction program		✓
O&M manuals		
Warranties and service agreements		
Product evidence of conformity		
Data (object-based)		
	See Asset object property table.	

* Refers to virtual 3D models as a whole.

5.3 PIM spatial object properties example

This is an example of a **Spatial object properties table** showing some of the properties required for two purposes:

- Cost management
- (Construction) Phase planning

Spatial object properties table

Property category	Generic property name	Information purposes	
		Cost management	Phase planning
General ID & description	Space ID	✓	✓
	Space name	✓	✓
	Designation/ Reference/ Mark	✓	✓
Location	Zone	✓	✓
	Storey or Level	✓	✓
Geometrical quantities	Height, length, width, floor area, volume	✓	✓
Function	Function classification or category	✓	
Occupancy	NCC classification		
	Maximum No. of occupants		
Surface finishes	Floor finish, Wall finish, Ceiling finish	✓	
Maintenance	Maintenance frequency		
Condition	Condition rating		
	Condition assessment date		

5.4 PIM physical asset object properties example

This is an example of an **Asset object property table** showing some of the properties required for two purposes:

- Cost management
- (Construction) Phase planning

Note: These are indicative of properties required for asset objects in general – they may vary for individual objects or object classes.

Asset object property table

Property category	Generic property name	Information purposes	
		Cost management	Phase planning
General ID & description	Asset ID	✓	✓
	Asset name	✓	✓
	Designation/ Reference/ Mark	✓	✓
Location	Space ID	✓	✓
	Space name	✓	✓
Parent system or assembly	System ID	✓	✓
	System name	✓	✓
Classification or category	Asset class or category	✓	
	Asset type: Fixed or moveable		
Manufacture & supply	Make / Manufacturer		
	Product / Model number		
	Product / Model name		
	Serial number		
	Acquisition date		
	Barcode		
Warranties	Warranty start date		
	Warranty end date		
	Warranty identifier		
Life cycle & maintenance	Expected Life		
	Maintenance frequency		
Temporal	Start date		
	End date		

Property category	Generic property name	Information purposes	
		Cost management	Phase planning
Performance	Output & Input measurements at commissioning		
	Efficiency measurements at commissioning		
Condition	Condition rating		
	Condition assessment date		
Financial	Asset tax type	✓	
	Asset insurance type	✓	

6 EIR TEMPLATE WORKFLOW AND WORKED EXAMPLE

Figure 6 shows the workflow embedded in the EIR template (numbers are Template clause numbers). It is provided to assist navigation of template content, not to dictate a fixed approach to their use.

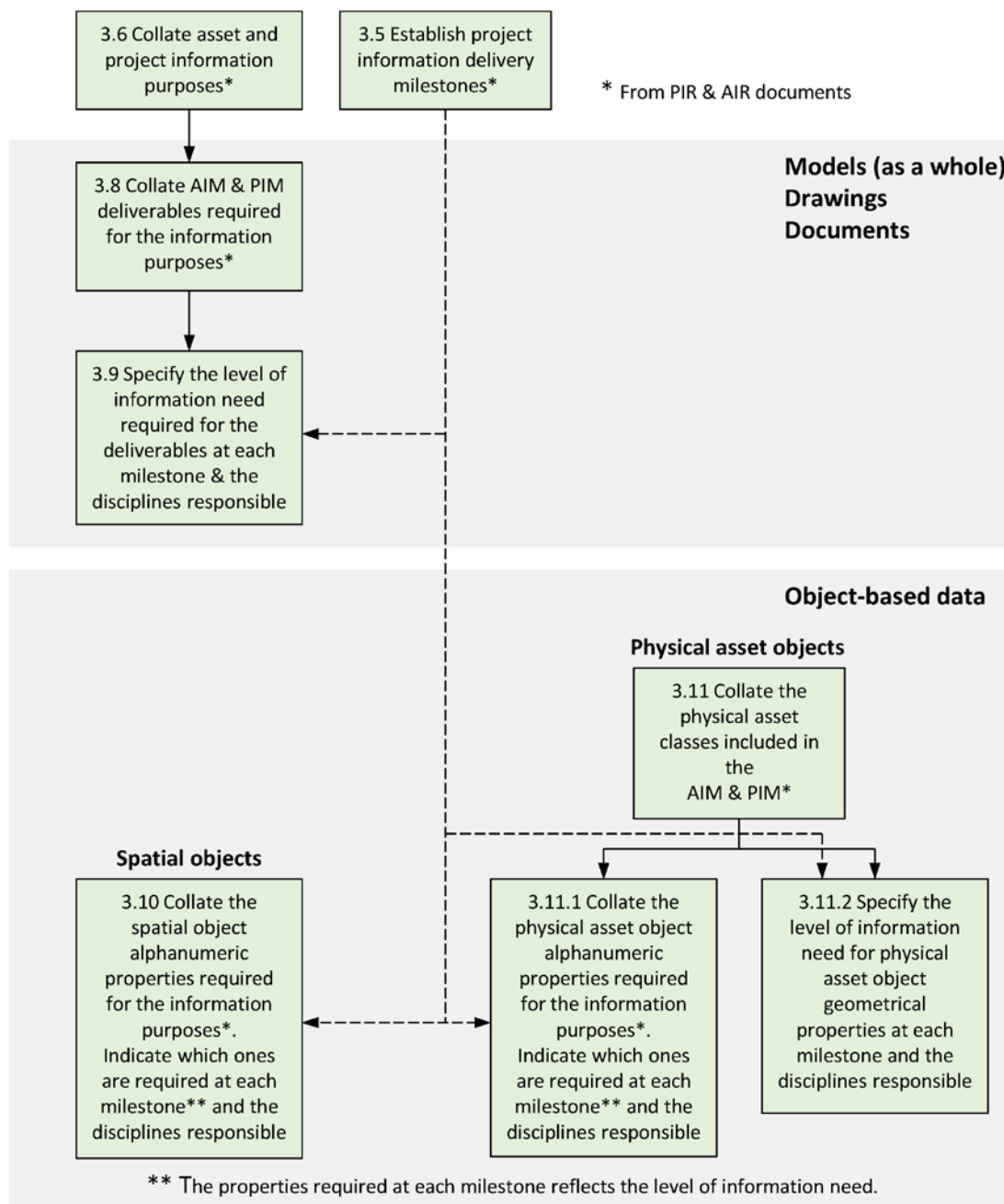


Figure 6: Workflow for defining requirements embedded in the EIR Template

Level of information need

This template employs the concept of level of information need as described in *EN 17412-1:2020* (and *ISO/DIS 7817*) *Building information modelling – Level of information need – Part 1: Concepts and principles*.

Level of information need is a framework for defining the quantity, quality and granularity of information requirements to avoid delivery team members producing too much information or information that is too detailed for its intended purpose at any given time throughout a project. It was developed to address the shortcomings of earlier metrics such as level of development (LOD), level of detail (LoD) and level of information (LoI).

Clearly defining levels of information need for deliverables is a fundamental aspect of specifying the EIR because they are appointment-based.

6.1 AIM and PIM deliverables example

This is an example of an **AIM and PIM deliverables table** showing deliverables collated from the AIR and PIR. It should not be interpreted as normative or representing best practice. The deliverables are required for two purposes from the AIR: Regulatory compliance: Fire safety and Operations and management, and two purposes from the PIR: Cost management and (Construction) Phase planning.

AIM and PIM deliverables table

AIM and PIM elements	Information purposes			
	Regulatory compliance: Fire safety	Operations & maintenance	Cost management	Phase planning
Models *				
Architectural		As-Built model		Incl. 4D object properties
Quantity surveying			Incl. quantities & QS classifications	
MEP		As-Built model		Incl. 4D object properties
Drawings				
Site plan	Incl. boundary setbacks and external exit routes	As-Built drawings	Including finishes and fixtures	✓
Floor plans	Incl. fire compartments and exits	As-Built drawings	Incl. FF&E	✓
Reflected ceiling plans	Incl. emergency lighting and exit signs	As-Built drawings	Incl. FF&E	✓
Elevations	Incl. openings and forms of construction	As-Built drawings	Incl. FF&E	✓
Structural layouts			Incl. material grades	✓
MEP layouts		As-Built drawings	Incl. service runs, fittings and plant	✓
Documents				
Authority approvals	Approved documentation & conditions of approval			
Schedules	Incl. Fire doors, FHRs and extinguishers			
Specifications	Incl. fire performance of products & materials		Incl. product and material quality	
Cost plans			✓	
Bills of quantities			✓	
Reports	NCC compliance report.		Progress reports incl. variations	
Construction program				✓
O&M manuals		✓		
Warranties and service agreements		✓		
Product evidence of conformity	Certification and fire test reports.	✓		
Data (object-based)				
	See Asset object property table.			

6.2 AIM and PIM deliverables level of information need example

This is an example of an **AIM and PIM deliverables level of information need table**. It includes all the items from the **AIM and PIM deliverables table** on the previous page and shows the level of information need (LoIN) required for each of them at some key information delivery milestones. It also indicates the discipline likely to be responsible for them. See the **Key to disciplines** below the table.

AIM and PIM deliverables level of information need table

AIM and PIM element	LoIN at end of Design Development (DD)	Discipline	LoIN at end of handover from design to construction	Discipline	LoIN at Pre-construction stage	Discipline	LoIN at end of handover from construction to operation	Discipline
Models *								
Architectural	DD models	A	As-Designed model	A	Construction models incl. 4D	J	As-Built model	J
Quantity surveying	DD models	Q	As-Designed model	Q	Construction models incl. 4D	J	As-Built model	J
MEP	DD models	M	As-Designed model	M	Construction models incl. 4D	K	As-Built model	K
Drawings								
Site plan	DD layouts	A	Final layouts incl. finishes	A	Site utilisation plan	J	As-Built plan	J
Floor plans	DD layouts incl. fire exits	A	As-Designed incl. FF&E	A	Construction plans	J	As-Built plans	J
Reflected ceiling plans	Prelim. layouts incl. exit signs	A	As-Designed incl. FF&E	A	Construction plans	J	As-Built plans	J
Elevations	DD design	A	As-Designed elevations	A	Construction elevations	J	As-Built elevations	J
Structural layouts	DD design	S	As-Designed layouts	S	Construction layouts	S	As-Built layouts	J
MEP layouts	DD design	M	As-Designed layouts	M	Construction layouts	K	As-Built layouts	K
Documents								
Authority approvals	DA Conditions of approval	A	BC or CC Cond. of approval	A	As per previous Milestone	A	Occupancy certificates	J
Schedules	DD schedules	A	As-Designed schedules	A	Construction schedules	A	As-Built schedules	J
Specifications	DD edition or perform. spec.	A	As-Designed edition	A	Construction edition	A	As-Built edition	A
Cost plans	Elemental cost plan	Q	Pre-tender cost plan	Q	Construction costings	Q	Final project cost summary	Q
Bills of quantities	First draft	Q	As-Designed edition	Q	Construction edition	Q	As-Built edition	Q
Reports	NCC analysis report.	A	As-Designed NCC compliance	A	As per previous Milestone	A	Project progress reports	J
Construction program	Preliminary program	A	Updated program	A	Initial construct. program	J	Construction time summary	J
O&M manuals	Specification of requirements	A	As per previous Milestone	A	As per previous Milestone	J	Approved O&M manuals	J
Warranties & service agree.	N/A	-	List of available warranties	A	As per previous Milestone	J	Signed warranties	J
Product evidence of	Certification and fire test reports.	A	As per previous Milestone	A	As per previous Milestone	J	As per previous Milestone	J
Data (object-based)								

AIM and PIM element	LoIN at end of Design Development (DD)	Discipline	LoIN at end of handover from design to construction	Discipline	LoIN at Pre-construction stage	Discipline	LoIN at end of handover from construction to operation	Discipline
	See Asset object alphanumeric level of information need table.							

* Refers to virtual 3D models as a whole.

Key to disciplines

A	Architecture	Q	Quantity surveying
J	Contractor	S	Structural engineering
K	Subcontractor	Z	Multiple disciplines
M	Mechanical engineering		

6.3 Spatial object level of information need example

This is an example of a [Spatial object level of information need table](#). It includes the properties from both the [AIM and PIM spatial object property tables](#) on previous pages. The level of information need (LoIN) is indicated by the properties specified at each information delivery milestone. It also indicates the discipline likely to be responsible for them. See the [Key to disciplines](#) below the table.

Spatial object level of information need table

Property category	Generic property name	Required by end of Design Development	Discipline	Required by handover from design to construction	Discipline	Required at Pre-construction	Discipline	Required at handover from construction to operation	Discipline
General ID & description	Space ID	✓	A	✓	A	✓	A	✓	A
	Space name	✓	A	✓	A	✓	A	✓	A
	Designation/Reference/Mark	✓	A	✓	A	✓	A	✓	A
Location	Zone	✓	A	✓	A	✓	A	✓	A
	Storey or Level	✓	A	✓	A	✓	A	✓	A
Geometrical quantities	Height, length, width, floor area, volume	✓	Q	✓	Q	✓	Q	✓	Q
Function	Classification or category	✓	A	✓	A	✓	A	✓	A
Occupancy	NCC classification	✓	A	✓	A	✓	A	✓	A
	Maximum No. of occupants	✓	A	✓	A	✓	A	✓	A
	Design occupancy load	✓	A	✓	A	✓	A	✓	A
Surface finishes	Floor finish, Wall finish, Ceiling finish	✓	A	✓	A	✓	A	✓	A
Maintenance	Maintenance frequency							✓	F
Condition	Condition rating							✓	F
	Condition assessment date							✓	F

Key to disciplines

A	Architecture	Q	Quantity surveying
F	Facilities/Asset Management		

6.4 Physical asset object level of information need example

This is an example of an [Asset object level of information need table](#). It includes the properties from both the [AIM and PIM asset object property tables](#) on previous pages. It is not meant to be normative – it just shows the choices made on one (theoretical) project. The level of information need (LoIN) is indicated by the properties specified at each information delivery milestone. It also indicates the discipline likely to be responsible for them. See the [Key to disciplines](#) below the table.

Note: These are indicative of properties required for asset objects in general – they may vary for individual objects or object classes.

Asset object level of information need table

Property category	Generic property name	Required by end of Design Development	Discipline	Required by handover from design to construction	Discipline	Required at Pre-construction	Discipline	Required at handover from construction to operation	Discipline
General ID & description	Asset ID							✓	F
	Asset name	✓	A	✓	A	✓	A	✓	F
	Designation/Reference/Mark	✓	A	✓	A	✓	A	✓	A
Location	Space ID	✓	A	✓	A	✓	A	✓	A
	Space name	✓	A	✓	A	✓	A	✓	A
Parent system or assembly	System ID			✓	Z*	✓	Z*	✓	Z*
	System name			✓	Z*	✓	Z*	✓	Z*
Classification or category	Asset class. or category							✓	F
	Asset type: Fixed or moveable							✓	F
Manufacture & supply	Make / Manufacturer			✓	Z*	✓	Z*	✓	Z*
	Product / Model number			✓	Z*	✓	Z*	✓	Z*
	Product / Model name			✓	Z*	✓	Z*	✓	Z*
	Serial number							✓	J/K
	Acquisition date							✓	J/K
	Barcode							✓	F
Warranties	Warranty start date							✓	J/K
	Warranty end date							✓	J/K
	Warranty identifier							✓	J/K

Property category	Generic property name	Required by end of Design Development	Discipline	Required by handover from design to construction	Discipline	Required at Pre-construction	Discipline	Required at handover from construction to operation	Discipline
Life cycle & maintenance	Expected Life							✓	F
	Maintenance frequency							✓	F
Temporal	Start date					Const. items	J	FM items	F
	End date					Const. items	J	FM items	F
Performance	Output & Input measurements at comm.							✓	J/K
	Efficiency measurements at comm.							✓	J/K
Condition	Condition rating							✓	F
	Condition assessment date							✓	F
Financial	Asset tax type							✓	F
	Asset insurance type							✓	F

Key to disciplines

A	Architecture	K	Subcontractor
F	Facilities/Asset Management	Z	Engineering disciplines *
J	Contractor		

* As applicable to the asset type, e.g. electrical engineering for electrical systems, plant and equipment.

6.5 Asset object shared properties responsibility matrix example

This is an example of an alternative to an [Asset object level of information need table](#). The discipline responsible for adding properties to asset objects at three phases of a project is indicated by a symbol or fill in the appropriate cell. See the [Key to disciplines](#) below the table.

○ = Designed intent ● = Confirmed

Asset object shared properties responsibility matrix

Property category	Generic property name	Data type	Responsibility										
			Design						Construction				FM
			A	S	C	M	E	P	J	K1	K2	K3	F
General ID & description	Asset ID	Text											●
	Asset name	Text	○	○	○	○	○	○					●
	Designation (for references)	Text	○	○	○	○	○	○	●	●	●	●	●
Location	Space ID	Text	○						●	●	●	●	●
	Space name	Text	○						●	●	●	●	●
Parent system or assembly	System ID	Text		○	○	○	○	○	●	●	●	●	●
	System name	Text		○	○	○	○	○	●	●	●	●	●
Classification or category	Asset class or category	Text											●
	Asset type: Fixed/moveable	Text											●
Manufacture & supply	Make / Manufacturer	Text	○	○	○	○	○	○	●	●	●	●	●
	Product / Model number	Text	○	○	○	○	○	○	●	●	●	●	●
	Product / Model name	Text	○	○	○	○	○	○	●	●	●	●	●
	Serial number	Text							●	●	●	●	●
	Acquisition date	Text							●	●	●	●	●
	Barcode	Text											●
Warranties	Warranty start date	Text							●	●	●	●	●
	Warranty end date	Text							●	●	●	●	●
	Warranty identifier	Text							●	●	●	●	●
Life cycle & maintenance	Expected Life	Text											●
	Maintenance frequency	Text											●
Temporal	Start date	Text							●	●	●	●	●
	End date	Text							●	●	●	●	●
Performance	Output & Input measured at commissioning	Text							●	●	●	●	●
	Efficiency measured at commissioning	Text							●	●	●	●	●
Condition	Condition rating	Text											●
	Condition assessment date	Text											●

Property category	Generic property name	Data type	Responsibility										
			Design						Construction				FM
			A	S	C	M	E	P	J	K1	K2	K3	F
Financial	Asset tax type	Text											●
	Asset insurance type	Text											●

Key to disciplines

A	Architecture	K2	Subcontractor 2: Electrical
C	Civil engineering	K3	Subcontractor 3: Plumbing
E	Electrical engineering	M	Mechanical engineering
F	Facilities/Asset Management	P	Plumbing/Hydraulic engineering
J	Contractor	S	Structural engineering
K1	Subcontractor 1: Mechanical		

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