



# ISO 19650 Guidance D: Developing information requirements

[UK BIM FRAMEWORK HOME](#)

Editions (Guidance D)

Aa Edition	≡ Date of release	≡ Description
<a href="#">Edition 1</a>	September 2020	First release as Guidance D. Note this guidance text first appeared in ISO 19650 Part 2 Guidance edition 3. About exchange information requirements first appeared in ISO 19650 Guidance edition 4
<a href="#">Edition 2</a>	February 2021	Update to accommodate the asset information requirements of ISO 19650-3
<a href="#">Edition 3</a>	November 2021	Update to include health and safety based examples of developing information requirements
<a href="#">Edition 4</a>	February 2022	Section 'B.5 Example about cleaning, maintenance, use and replacement of high-level glazing' added
<a href="#">Edition 5</a>	November 2022	Removed the word 'Part' from the title of the document to remove possible confusion with parts of ISO 19650.

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# Abbreviations and acronyms

Refer to  [Abbreviations and acronyms.](#)

# About this guidance (executive summary)

The guidance framework supports the UK implementation of the ISO 19650 series.

This guidance document (guidance D) sits within an overall guidance framework as shown in Figure 1.

Guidance D is written to support the implementation of each published ISO 19650 standard.

## Who is this guidance written for?

This guidance is for individuals and organizations involved in defining information requirements and information exchange activities on behalf of the appointing party, lead appointed party and the appointed parties.

## Who is this guidance ‘of particular interest to’ and why?

This guidance is of interest to parties throughout the asset delivery lifecycle who seek to produce reliable information requirements that meet defined purposes, and enable effective delivery of information across project lifecycle.

## Key takeaways

- Information requirements should define how and when information should be exchanged in the project/asset lifecycle. They should be structured in a consistent manner to enable effective information delivery and automated verification of
- Information requirement resources include organizational information requirements (OIR), asset information requirements (AIR) and project information requirements (PIR). Collectively, they define the inputs for appointment level information requirements (exchange Information requirements (EIR)).
- EIR define the purposes and function of information, information requirements, format, and level of information needed by the appointing The resource establishes the appointing party's requirement for a particular exchange with a specific lead appointed party.
- Information requirements should be developed in a certain order to gradually build up their detail to tell a consistent story, fulfil their purpose for the project and fulfil their purpose for the receiver's

As with all guidance supporting the UK BIM Framework, we invite comment and feedback on this guidance D at [guidancefeedback@ukbimframework.org](mailto:guidancefeedback@ukbimframework.org).

<https://whimsical.com/guidance-structure-X1BF9Phan3rc6o1Qyrb5Bg>

Figure 1: ISO 19650 guidance framework

# 1.0 About information requirements

## 1.1 Introduction

Information requirements are the most important concept of information management as they define the inputs for the whole information management ecosystem. This section provides guidance for information requirements:

- Organizational information requirements (OIR)
- Asset information requirements (AIR)
- Project information requirements (PIR)
- Exchange information requirements (EIR).

## 1.2 Background

### 1.2.1 The principles of information management

Before undertaking a project (either in the delivery or operational phase) consideration must be given to specifying the information as well as the physical asset (for example, a brick, a boiler or even an entire building).

Information management is about making sure that the right information is delivered to the right destination at the right time to meet a specific purpose. Information requirements consider both structured and unstructured information.

Table 1 in ISO 19650-1 clause 4.3 defines examples of four information management perspectives which provide a good starting point in understanding why different stakeholders require information.

### 1.2.2 Information requirements explained

ISO 19650-1 defines the term “information requirement” in clause 3.3.2 but a more detailed explanation is given here.

According to the ISO 19650 series, information should be created for a specific purpose - for someone to make use of it.

Information requirements specify the precise information someone needs so that when it is received they can action that purpose successfully. Working collaboratively means that we should always create information with its use in mind.

In this section the following terms are used:

- Information provider – individual/team/ organization who generates and/or produces the information
- Information receiver (specifier) – individual/ team/ organization who will receive the information (for its own use or on behalf of others).

These terms are found in ISO 19650-1 clauses 3.2.3 and 3.2.4 and during an asset’s lifecycle most people within the appointing and appointed parties will be both.

For example, information could be needed to update a spreadsheet, to be used as reference information when designing, to make a decision and/or to manufacture from (as indicated in Figure 2).



**Figure 2: Flow of information delivery**

From an information management perspective, and to define information requirements we have to turn this workflow around.

The starting point is that the information receiver (specifier) stipulates their requirements. To do this they first have to understand the purposes for which they require information. The information

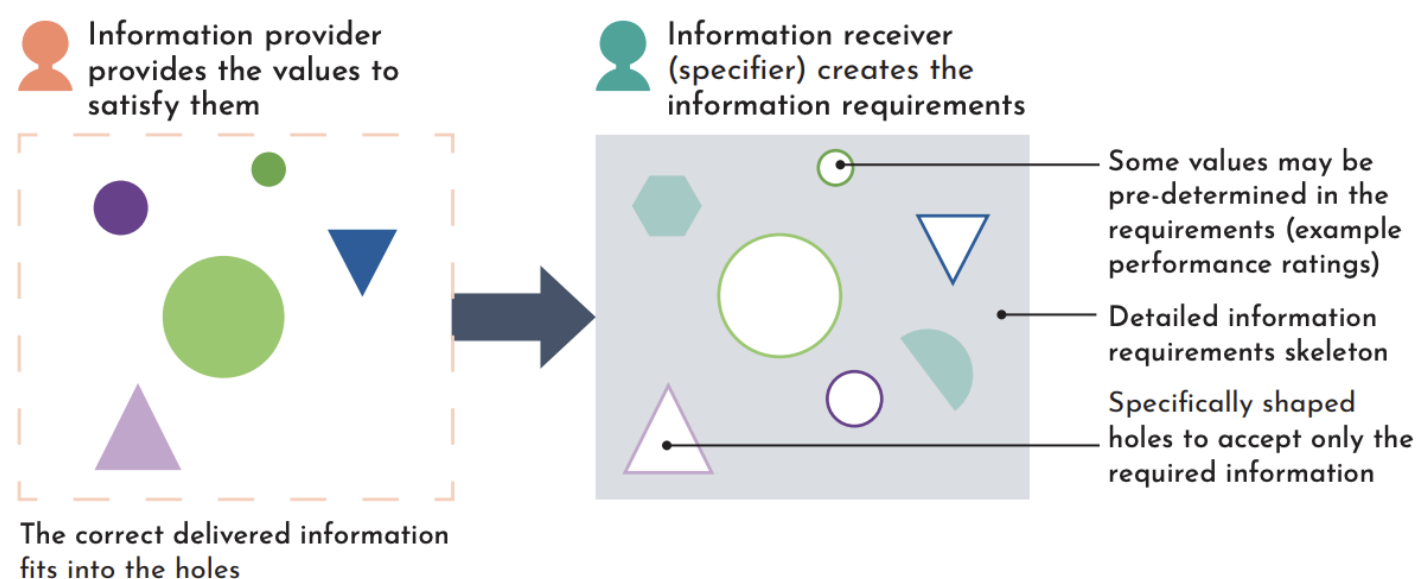
required can then be defined and communicated to the information provider, so they then understand the scope of what they need to produce. ISO 19650 Parts 2 and 3 emphasize this by each starting with the assessment and need activity in clause 5.1 (illustrated in Figure 3).

The activities in Figure 3 precede the activities in Figure 2 (see ISO 19650-1 Figure 6). You should not provide someone with information unless they have told you what they require.



**Figure 3: Flow of information requirements**

Information requirements are like a skeleton or frame containing many holes of different shapes and sizes (see Figure 4). These holes specify the requirements of the information needed to fill them correctly. The information providers then exchange the information deliverables with the information receiver (specifier) thereby filling in the holes.



**Figure 4: Information requirements skeleton**

### 1.2.3 Why information requirements are needed

According to a variety of sources such as McKinsey [1] and Constructing Excellence [2] the built environment sector is one of the least productive and most unpredictable of the global industry sectors. Given that delivery and/or operational projects are rarely planned holistically, the way information is generated tends to be ad-hoc and reactive. This also means that software applications are rarely used to their full potential. These issues create risk before any related activity even starts. Furthermore, indiscriminate use of technology can exacerbate this by generating more information than can be handled or by masking the lack of a plan.

As a sector, we tend to be reactive and poor at planning and consequently think about things too late in the asset lifecycle.

We have to change this mind-set, and everyone (including clients) has a part to play in this.

Without understanding what information is needed, it is very difficult and inefficient to plan how any such information is going to be delivered, the timescales required, and the resources needed.

Good quality information requirements are vital to resolve this situation.

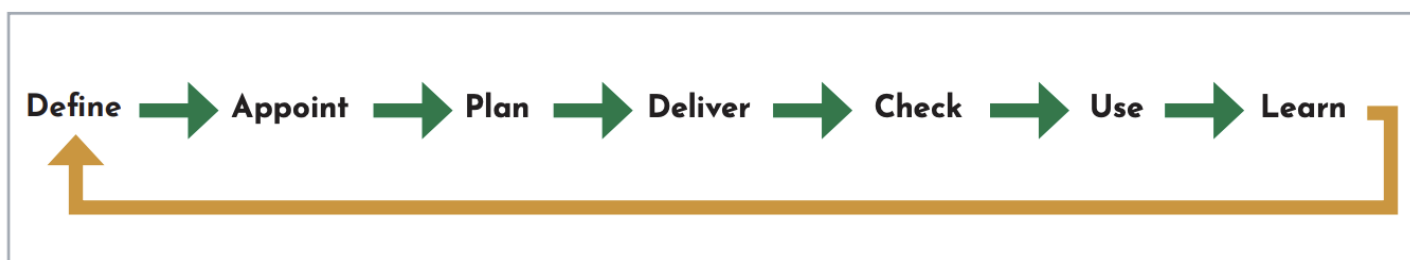
Information requirements are fundamental to the ISO 19650 series. Once defined they inform:

- the tendering and appointment process
- information delivery planning
- information generation and delivery
- the authorization and acceptance process by comparing deliverables against requirements
- the appropriate use of the

See the information requirements cycle shown in Figure 5.

Information requirements underpin the golden thread of information, which is a key concept in the BS 8536 [3] series. See also ISO 19650-1 Figure 4.

Without information requirements there is no information management process.



**Figure 5: The information requirements cycle**

An information receiver (specifier) asking for information unexpectedly will have a negative impact on the way the information producer is working. This can prove to be extremely disruptive, especially if project programmes are tight.

Information requirements should be developed in a certain order to gradually build up their detail to:

- tell a consistent story
- fulfil their purpose for the project
- fulfil their purpose for the receiver's (specifier's)

Simply referring to the "UK BIM Framework" (or worse still the outdated terminology of "BIM level 2") or copying and pasting examples from standards and guidance without explicitly defining what is needed will not meet the requirements of the ISO 19650 series.

Furthermore, defining information requirements is not a tick box exercise; poor inputs tend to produce poor outputs leading to risks and unpredictability as already noted.

Poor information requirements (input) = poor information delivered (output)

[1] 2017 McKinsey Global Reinventing Construction Through a Productivity Revolution

[2] 2018 Glenigan, Construction Excellence, CITB, UK Industry Performance Report

[3] BS 8536-1:2015 Briefing for design and construction – Part 1: Code of practice for facilities management (Buildings infrastructure) and BS 8536-2: 2016 Briefing for design and construction – Part 2: Code of practice for asset management (Linear and geographical infrastructure)

### 1.2.3.1 Information risk

People need useful information to help them carry out their activities effectively; likewise, most technology solutions need structured or defined information to work efficiently.

The more precisely the information requirements reflect the receiver's (specifier's) needs, then the more likely the provider will be able to successfully deliver the appropriate information. If information requirements are not sufficiently precise, information providers will be left to make their own assumptions and interpretation and what is needed. This can lead to error and increased risk – which in turn can lead to programme and budget being exceeded.

For example, a contractor (as a lead appointed party) is going to use a digital setting out methodology on site and requires dimensional information to be taken from the geometrical models. These details are not included in the information requirements provided by the contractor. Without this knowledge, the designers produce traditional setting out drawings. They end up wasting time, money and effort creating drawings that are not required.

It is vital that information requirements are defined as early as possible. They are needed to support tender appointments across the whole of the asset lifecycle. As noted in section 1.2.2, ISO 19650 Parts 2 and 3 support this by requiring that information requirements are established in the assessment and need and invitation to tender activities, including those of the lead designer, project manager or facilities management contractor. See ISO 19650-2 clauses 5.1.2 and 5.2.1, and also ISO 19650-3 clauses 5.1.2 and 5.2.1.

Precise information requirements help to manage risk around information exchange. This is especially important given the complexity of the wide variety of people who may contribute to an information exchange as well as the multitude of technologies that may be in use.

### 1.2.3.2 Information waste

ISO 19650 Parts 2 and 3 both include clause 5.6.2 b) which is explicit about not generating wasteful information. To support this, information requirements should seek to avoid waste. All parties, including the client or asset owner, should only define the information they require, so that they can fulfil their own actions. For example, a client or asset owner (appointing party) should not try to define information for purposes which will be actioned by a delivery team.

Time will be spent creating, managing, issuing and checking information over many iterations of change. If the information is not required, this is wasted time and resource, which increases the costs of the information provider and may increase the costs for the information receiver (specifier).

For example, a client should not require information for thermal analysis purposes unless they or a separate delivery team will be carrying out thermal analysis activities. However, they may require information that confirms thermal performance in support of operational activities. In this instance, it is down to the delivery team to define the information that they need in order to carry out thermal analysis to assure the thermal performance.

Information receivers (specifiers) should only ask for the information they need.

To reduce wasted effort an appointing party (a client or asset owner/operator) with a portfolio of assets should consider how they can generate consistent information requirements across their assets to avoid duplication and error. However, it is really important that amendments are introduced as appropriate to make the information requirements specific to the project or asset and also to the particular appointment being made.

## 1.2.4 How information requirements are defined and communicated

Information requirements should be considered in two parts:

### 1.2.4.1 The purposes for information (high-level requirements)

This is the most important part of defining information requirements and is the starting point. It is about understanding the day-to-day reasons why information is required, see ISO 19650-1 clause 5.1. This helps to form high-level requirements. These are equivalent to “interested parties’ information requirements” in ISO 19650-1 Figure 2.

To define information requirements, start with the reasons why information is needed before the information itself is considered.

### 1.2.4.1 The information that is needed (detailed requirements)

Describing information generally is subjective. However, information in accordance with the ISO 19650 series can be described across four main facets:

1. Purpose (the need that the information will fulfill). For example, to convey fire performance of
2. Content, this is split into:
  - Content summary (the overall content of the information). For example fire strategy information or elemental cost
  - Content breakdown (geometrical and alphanumerical information across an object hierarchy). For example, a wall with the property ‘fire rating’ or for the project, a property called ‘cost limit’
3. Form (how it is presented). For example, a schedule or a
4. Format (how it is encoded). For example, PDF or IFC(-SPF).

These are equivalent to “appointment information requirements” in ISO 19650-1 Figure 2.

The level of information need is a framework for defining information across these facets and is referenced in ISO 19560-1 clause 11.2. In accordance with this, information should be defined across the following three sub-divisions:

1. Geometrical information
2. Alphanumerical information
3. Documentation

Level of information need is explained further section 2 of this guidance.

Where there is generic or industry accepted means of delivering of an information requirement, such as a topographical survey, this should be referenced. In this instance, it is not necessary to specify the contents of the survey to the nth degree. However, if there is something specific that is required in the survey then this should be stated. A pragmatic approach is helpful.



The need for each information requirement to articulate each facet may be determined by context.

For example, an appointing party (client) specifies a fire strategy deliverable only in terms of its content summary. The other facets of content breakdown, form, purpose and format are left to the delivery team to determine. For another requirement the client specifies more facets by requiring a topographical survey (content summary), which shows the building, car park and access routes (content breakdown), delivered as a drawing (form) in PDF (format).

Information requirements should be structured in a consistent way as far as possible to make understanding of delivery easier and to enable automated checking rules to be established.

Using structured tools such as databases and spreadsheets will help achieve this.

A recommended approach would be to establish a master set of information requirements using rationalized purposes plus the level of information need framework then filtering them according to each use case and/or appointment. This would then assist production of appointment specific information requirements and help ensure there is no duplication and no gaps in information delivery. See Figure 6.

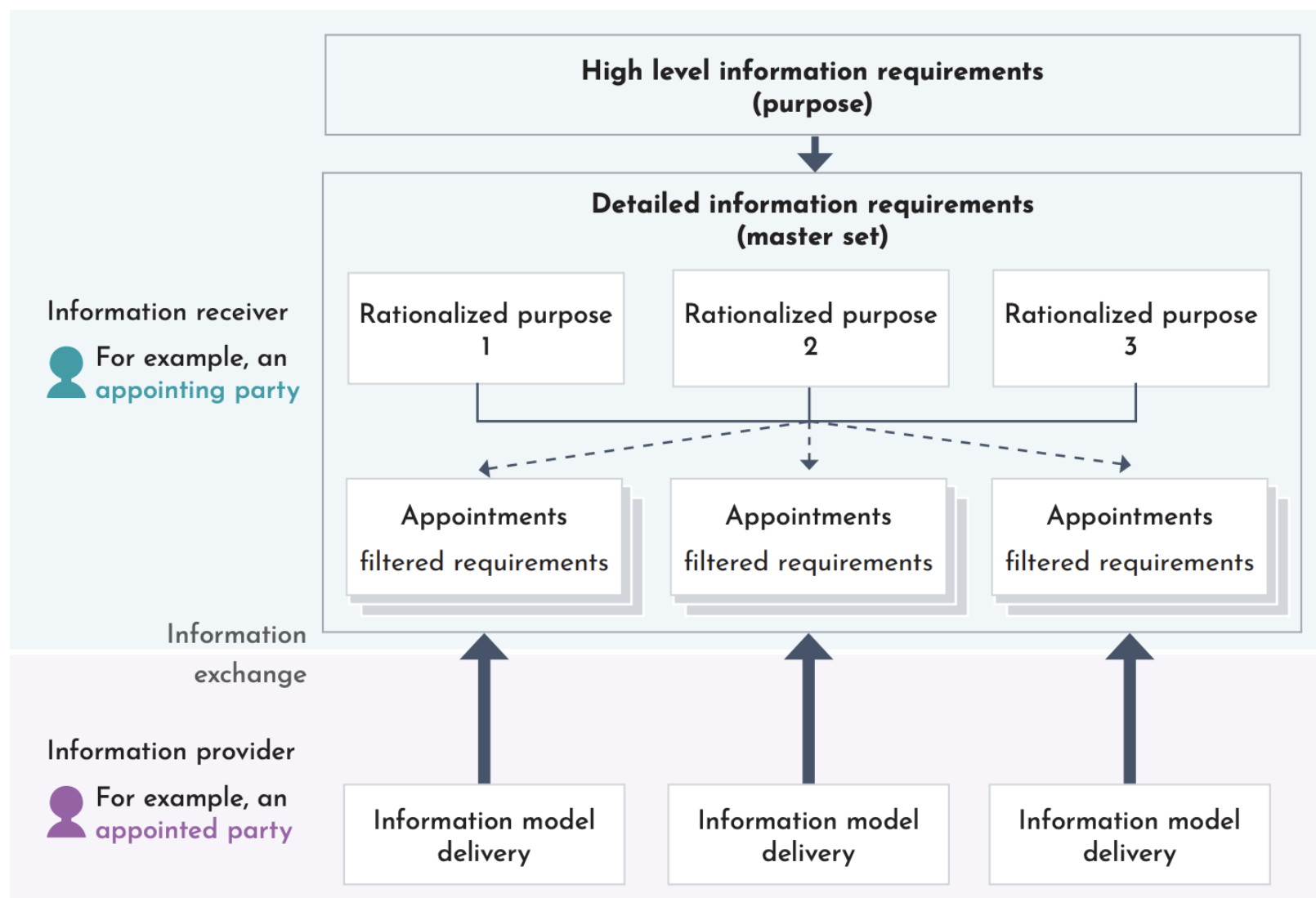


Figure 6: Breakdown of information requirements

### 1.2.5 Who has information requirements?

ISO 19650 Parts 2 and 3 both consider, in detail, the information requirements from appointing to lead appointed parties and then again to appointed parties. For the appointed party this includes information requirements from both the appointing party and lead appointed party.

However, information requirements can exist in the opposite direction and between task/delivery Teams. In fact every party within a project is likely to have them.

For the rest of this guidance section 1.0, the focus is on the appointing party (the project client or representative, or the asset owner or operator). The appointing party will always require information both during and at the end of a project whether it is to help make decisions, for statutory/regulatory reasons, to manage the facility or to sell it on.

## 1.3 Information requirements at strategic organizational level

### 1.3.1 Introduction

During the running of an organization, the principles and processes defined in ISO 19650-1 and ISO 19650-3 should be applied to define information requirements. This gives rise to Organizational information requirements (OIR).

For their relationship between the different information requirements see ISO 19650-1 Figure 2.

### 1.3.2 Organizational information requirements (OIR)

OIR are explained in ISO 19650-1 clause 5.2 and ISO 19650-3 clause 5.1.2.

Organizations must consider information requirements around in-use (including operation) before they consider information requirements around project delivery.

See **Annex A** in this guidance for examples of OIR.

OIR are the starting point for all information management activities. OIR detail the high-level information required by an organization across its whole asset portfolio and its different departments (such as human resources, information technology, finance, facilities management and operations/production). The information requirements from all the assets and departments should be rationalized and joined up to help streamline the business.

Since the UK BIM Framework is specifically about the lifecycle of physical/built assets the focus in this guidance is on this part of the OIR.

OIR enable understanding of the high-level information needed about assets throughout their lifecycle. This helps the appointing party run their business in an informed and effective manner and to understand the information needs of their clients and stakeholders.

#### 1.3.2.1 What they are for

OIR ensure the correct information feeds back into an organization's wider business function to support strategic business decisions. OIR are therefore an important resource to support the organization.

#### 1.3.2.2 When they are defined

As part of the organization's business activities.

#### 1.3.2.3 Who creates them?

The appointing party, for example, the project client, the asset owner or their representative.

#### 1.3.2.4 What they include

##### Identify the high-level activities for which information is required

To begin this process, it is worth considering the high-level activities that require information within an organization. This will help to create a structure. Examples of these high-level activities can be found in the following standards:

- ISO 19650-3 annex 2
- BS 1192-4:2014 clause 2
- ISO 55001:2014 annex

Examples include:

(Extracted/adapted from the high-level activities in ISO 19650-3, Annex A.2)

- Health and safety compliance and management
- Environmental management
- Capital investment and lifecycle costing
- Risk assessment and management
- Maintenance and repairs
- Asset operations
- Space utilization
- Asset modifications.

It may be helpful to group these activities into strategic, tactical or operational groups.



Note these high-level activities can inform the structure but are not sufficient to be used as OIR themselves. It has been observed that these examples have appeared within exchange information requirements (EIR) with no more detail provided. OIR used in this way do not tell the provider what information is required, they are merely a starting point for the receiver (specifier).

### **Identify the purposes for which information is required**

As well as defining the activities for which information is required, it is also important to define the reasons why information is needed. These are the organization-based purposes and could be to satisfy (for example):

- Objectives/outcomes
- Stakeholders (including staff, end-users, shareholders)
- Regulators (including building control, planning, auditors, inspectors)
- Policies (including quality management)
- Business operation tasks (including corporate reporting, applications, auditing, procuring maintenance contractors, analyzing space utilization).

These can be used to generate a matrix of information needs against information activities where each associated information requirement is defined.

Once completed the OIR set the scene for the next two requirements, the:

1. Asset information requirements (AIR)
2. Project information requirements (PIR)

### **1.3.2.5 When the information is exchanged to meet them**

Information is exchanged to meet the OIR whenever the AIR and PIR are responded to.

## **1.4 Information requirements at high-level for assets and projects**

### **1.4.1 Introduction**

During the operational and delivery phases of the asset lifecycle, the principles and processes defined in ISO 19650 Parts 1, 2 and 3 should be applied to define information. This gives rise to two types of information requirements which are derived from OIR. These are:

1. Asset information requirements (AIR)
2. Project information requirements (PIR).

### **1.4.2 Asset information requirements (AIR)**

AIR are explained in ISO 19650-1 clause 5.3 and ISO 19650-3 clause 5.1.4.

See **Annex A** in this guidance for examples of AIR.

The process of defining the OIR will generate a set of high-level requirements across the organization. These can then be developed to relate to specific assets in the form of AIR.

#### **1.4.2.1 What AIR are for**

AIR set out the asset related information which the asset owner/operator needs, either for themselves or for their stakeholders.

#### **1.4.2.2 When AIR are defined**

Defining AIR is an important organizational business activity to support asset management, as well as design and construction projects. AIR have to be defined prior to any related appointment.

For appointing parties with multiple assets, it is sensible to consider how the AIR can be rationalized in a streamlined and efficient way using a consistent structure as far as practicable.

#### **1.4.2.3 Who creates them?**

The appointing party, for example the asset owner or their representative. The creation of AIR is led by the internal team responsible for asset and facilities management (where they exist).

#### **1.4.2.4 What they include**

AIR are derived from the purposes for which the appointing party requires information. These can include:

- Relevant OIR such as corporate policies
- Monitoring asset use and condition
- Monitoring energy consumption or running costs
- Asset stakeholders who require information for example, visitors or users

With the AIR in place the information to be delivered can then be defined more precisely in EIR (ISO 19650-3 clause 5.2.2).

#### **1.4.2.5 When information is exchanged to meet the AIR**

Information is exchanged to meet the AIR whenever the EIR (ISO 19650-3) are responded to.

### **1.4.3 Project information requirements (PIR)**

PIR are explained in ISO 19650-1 clause 5.4 and ISO 19650-2 clause 5.1.2. See [Annex A](#) in this guidance for examples of PIR.

See also ISO 19650-1 Figure 2 for the relationship between the OIR and PIR.

PIR, like OIR, are high-level and identify what information will be needed for the key decision points determined by the appointing party. There is only one set of PIR per project.

PIR are partly derived from OIR. They enable understanding of the high-level information the appointing party requires during a design and construction project

#### **1.4.3.1 When PIR are defined**

Some of the PIR content may have already been defined within OIR that are applicable to design and construction projects. For example, statutory requirements or corporate project delivery policies.

Any additional PIR should be identified and added to those derived from OIR at the inception of a design and construction project, before the appointments for any consultants or contractors are tendered.

Organizations with many projects may find it helpful to consider and define their PIR as a separate off-line exercise from any particular project being started.

#### **1.4.3.2 Who creates PIR?**

The appointing party, for example the project client, the asset owner (indirectly through OIR) or their representative.

#### **1.4.3.3 What they include**

PIR are derived from the purposes for which the appointing party requires information. These can include:

- Relevant OIR such as corporate key performance indicators (KPIs)
- Project business case for example, financial information to establish value for money and affordability
- Strategic brief for example, strategic programme to establish opening date for a school
- Project stakeholders who require information for example, local residents
- Project tasks which the appointing party themselves need to carry out for example, completing an application.

With the PIR in place the information to be delivered can then be defined more precisely in EIR (ISO 19650-2 clause 5.2.1).

#### **1.4.3.4 When information is exchanged to meet the PIR**

The activity of requiring information and then delivering it is called an information exchange.

ISO 19650-2 clause 5.1.2 recommends that the appointing party considers the project plan of work in establishing the PIR. This enables key decision points and associated activities such as information exchange to be anchored against a defined plan, for example, the RIBA plan of work.

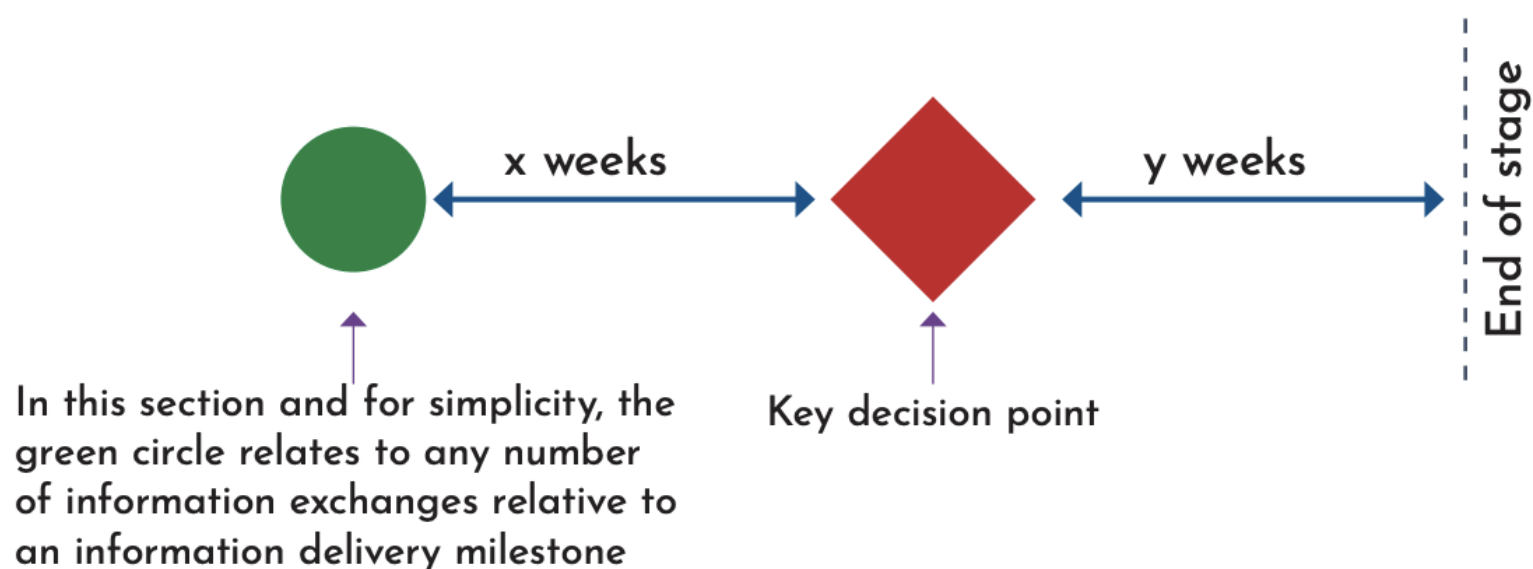
Key decision points are when the appointing party and other stakeholders make informed decisions about the project such as, whether or not it is financially viable to proceed to the next stage or decisions about appointment of the project team. These decisions are made using information received from information providers.

A key decision point can be “y” weeks before the end of a work stage or after the beginning of a work stage. Note that ISO 19650-1 clause 3.2.14 could be read to suggest that a key decision point aligns to the end of a work stage but key decisions can be made at any time. Examples might include decisions related to tendering or planning permission. Key decision points need to be mapped out at the start of the project, see ISO 19650-2 clause 5.1.3.

Information delivery milestones are pre-defined points that specify when the required information should be delivered to the appointing party.

Information delivery milestones should be defined relative to key decision points, for example “x” weeks before a key decision point. There are likely to be cases where multiple exchanges may occur at the same information delivery milestone, for example where information models are to be delivered for checking by different delivery teams before being used by the appointing party at a key decision point, see ISO 19650-2 clause 5.7.

When key decision points and information delivery milestones are defined it will be unlikely that all their specific dates will be known. Even so, the dates can and should be defined in relative terms as indicated in Figure 7.



**Figure 7: Key decision points and information delivery milestones**

For the purposes of this guidance on PIR, it is assumed that information delivery milestones coincide with information exchange dates. This is not necessarily the case and is considered further in the EIR section of this guidance.

Robust planning of the key decision points and information delivery milestones by the appointing party should, as far as possible, eliminate ad-hoc requests for information at the last minute.

Figure 8 shows the information delivery process associated with a number of key decision points. This is in the context of a design and build procurement (through to the end of RIBA work stage 4) and in respect of three of the lead appointed parties involved in this project.

Reference to numbers 2 to 7 reflect the information management activities set out in ISO 19560-2 clauses 5.2 to 5.7, which are as follows

2. Invitation to tender
3. Tender response
4. Appointment
5. Mobilization
6. Collaborative production of information
7. Information model delivery

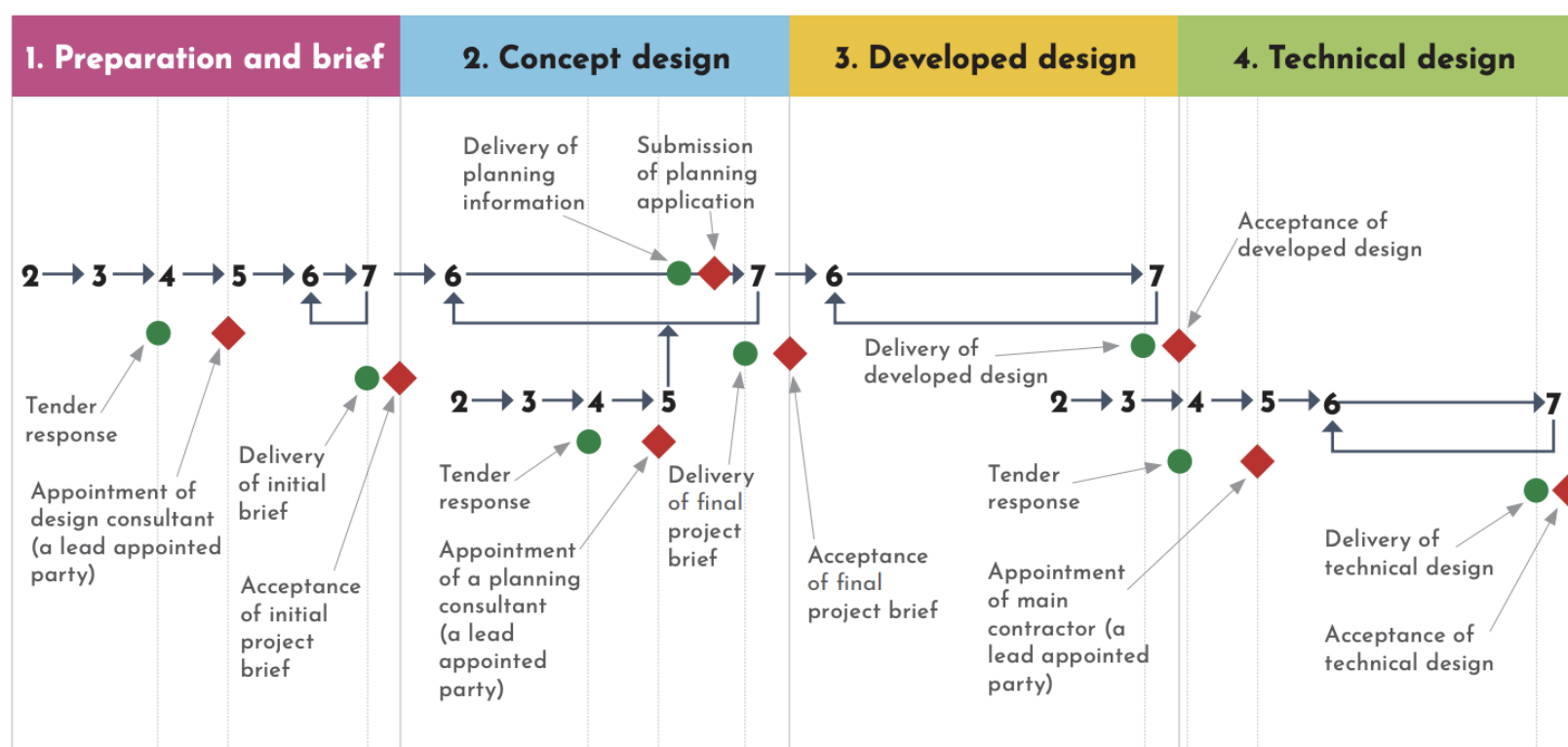


Figure 8: Example of key decision points and information delivery milestones in relation to the RIBA work stages 2013

#### 1.4.4 ISO 19650-2 clause 5.1.2

ISO 19650-2 clause 5.1.2 contains a list of seven points which have to be considered when defining the PIR. They do not have to be considered in any particular order nor, and if they are not relevant or helpful, should they be followed. The list is a tool to help the appointing party arrive at their requirements. Some appointing parties may have a set of questions that they need to answer if they are part of a wider organization or public body. Standalone clients may have other methods they use to develop their PIR – it is very much up to the organization depending on how they want to monitor, check and make use of the information.

Development of PIR should go hand in hand with the strategic project management activities being defined, rather than as a standalone activity. Note that the appointing party does not have to issue a separate document called PIR.

The points to consider as defined in ISO 19650-2 clause 5.1.2 are:

##### 1.4.4.1 Project scope

Having a basic understanding of the project is the first step to understanding what information is required

- What is it you want to build?
- What is the reason for the works?
- What is the business plan?
- What are the objectives/outcomes of the project?

##### 1.4.4.2 The intended purpose for which the information will be used by the appointing party

Like the OIR, defining PIR is very much a stepped process.

The reasons that the appointing party requires information during a project will originate from different departments and stakeholders, see section 1.4.3.3.

This should be done at a high-level and will give a solid base for the information management of the entire project.

##### 1.4.4.3. The project plan of work

This defines the stages of a project and it is generally possible to align the stages with a timescale. There is a unified plan of work that is described in BS 8536. The stages align with the

RIBA Plan of Work 2013 and the Construction Industry Council stages. Some specific types of work or project may have their own variation on a standard plan of work.

##### 1.4.4.4 The intended procurement route

Procurement is the process for 'buying' goods and services. For a design and construction project this covers the strategy, methodology and framework for tendering and appointing single or multiple parties. The procurement route affects the types of contractual relationships that are created and also how information is managed. For example, the way information flows through the project team is completely different for a design and build project compared to alliancing contracts. During invitation to tender, the procurement route and appointment structure will influence the different sets of EIR which are produced by the appointing party.

#### **1.4.4.5 The number of key decision points throughout a project**

The appointing party needs to define the number of key decision points and when they occur in relation to work stages. See [section 1.4.3.4](#) for more information.

#### **1.4.4.6 The decisions that the appointing party needs to make at each key decision point**

At the key decision points there will be decisions that the appointing party needs to make. The scope of a key decision could range from deciding whether to proceed to the next stage of a project to finalizing the internal finishes of a new-build project.

These decisions may be generated from the purposes (such as the business plan) so doing this activity of identifying the key decisions alongside defining the purposes may be beneficial. They may also be defined as part of a wider organizational activity (for example, standard decisions based on spatial information or financial information may have been pre-defined).

Like the purposes, starting with identifying the decisions enables the appointing party to determine the information required to make those decisions. It may be beneficial to do this for each key decision point in turn as the examples in [Annex A](#).

Examples of decision points include:

- Whether the energy performance of the built asset is acceptable
- Whether the overall layouts meet the needs of the staff and end-users
- What specialist equipment will be needed
- Which main contractor to select
- Whether the scheme is financially viable
- Whether it meets the organization's strategic

#### **1.4.4.4 The questions to which the appointing party needs answers, to make informed decisions**

Some organizations may have questions that they need to ask themselves during a design and construction project as part of their wider organizational strategies. This is to provide assurance that the project is performing as intended.

In this scenario, these questions (referred to as plain language questions in BS 8536 or key performance questions in business language) can also be used as a reason/purpose for requiring information. This required information essentially becomes a KPI for the project and will be required at the appropriate key decision point(s).

The reason key performance questions exist is to create more useful KPIs. Again, defining purpose first creates better requirements.

Information requirements consequently have two main benefits; firstly, they define what information is needed. Secondly they can also be used as a comparison tool to which the delivered information is compared.

The previous sections give a mixture of reasons why the appointing party could need information. These reasons can also be reworded into questions should the appointing party find this useful.

## **1.5 Information requirements at appointment level for assets and projects**

### **1.5.1 Introduction to exchange information requirements (EIR)**

Exchange information requirements (EIR) specify the information that is needed to be delivered by a lead appointed party or by an appointed party at each information exchange. EIR are defined in

sufficient detail such that they can be incorporated into the contract between an appointing party and a lead appointed party, or between a lead appointed party and an appointed party.

### **1.5.2 EIR under ISO 19650-2 and ISO 19650-3**

EIR are explained in ISO 19650-1 clause 5.5, ISO 19650-2 clauses 5.2.1 and 5.4.3 and ISO 19650-3

clauses 5.2.2 and 5.4.3. In ISO 19650-3 the EIR are written in the text as “EIR (ISO 19650-3)” so that EIR relating to the operation of the asset can be distinguished from EIR relating to the delivery of the asset. This distinction has been continued through the main text of this guidance. In the examples provided in Annex A, the terms EIR (Delivery) and EIR (Operational) are used instead. As noted above, the clauses that define EIR and EIR (ISO 19650-3) in ISO 19650-2 and ISO 19650-3 are:

1. ISO 19650-2 clause 5.2.1 and ISO 19650-3 clause 5.2.2 - Appointing party’s EIR/EIR (ISO 19650-3) to be met by lead appointed parties
2. Clause 5.4.3 in both ISO 19650-2 and ISO 19650-3 - Lead appointed party’s EIR/EIR (ISO 19650-3) to be met by appointed parties.

Since EIR/EIR (ISO 19650-3) essentially perform the same function for the appointing party and lead appointed party, this section of guidance accommodates both the appointing party’s and lead appointed party’s EIR/EIR (ISO 19650-3), with any differences explored.

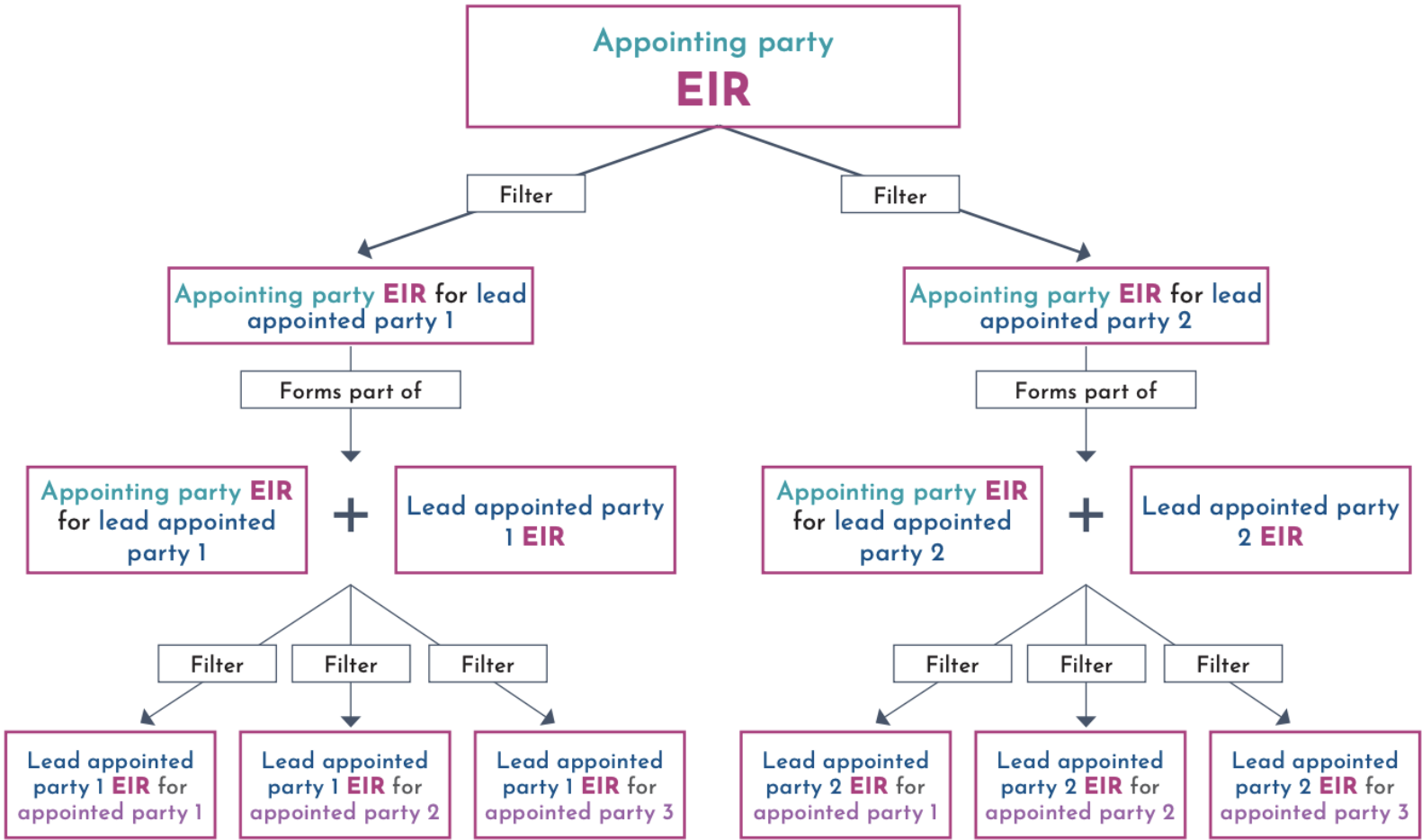
The appointing party’s process of defining OIR, AIR and PIR will satisfy ISO 19650-2 clause 5.2.1 a) by specifying the information required and the degree of granularity needed to fulfil organizational, asset and project-related activities. These will inform EIR/EIR (ISO 19650-3) (see [sections 1.4.2](#) and [1.4.3](#)).

EIR/EIR (ISO 19650-3) form part of the appointment process, which may be through an invitation to tender package, and they are in essence the information part of the employer’s requirements (ER).

Information should be considered in the same manner as any physical asset.

The EIR/EIR (ISO 19650-3) need to be defined and communicated using order and a logical approach to ensure a comprehensive appointment resource. Think of EIR/EIR (ISO 19650-3) as a specification for the exact information required.

To satisfy ISO 19650-2 or ISO 19650-3 clause 5.4.3 a), the appointing party’s EIR/EIR (ISO 19650-3) are combined with the lead appointed party’s information requirements to form the lead appointed party’s EIR (ISO 19650-3). This distinction has been continued through the main text of this guidance. In the examples provided in [Annex A](#), the terms EIR (Delivery) and EIR (Operational) are used instead.



**Figure 9: Cascade of appointing party’s and lead appointed party’s information requirements through delivery teams**

### 1.5.3 What EIR are for

EIR/EIR (ISO 19650-3) are created to ensure that the correct information is delivered to an appointing party or lead appointed party, which enables them to fulfil specific and necessary activities during a project and during the operational phase. EIR/EIR (ISO 19650-3) have several functions, including:





For the appointing party:

- Selection of those lead appointed parties who can best demonstrate delivering the requirements
- Specifying precisely what information is required at each information exchange, e. the information the lead appointed party (information provider) is to deliver (on behalf of its delivery team) to the appointing party (information receiver (specifier)), to enable the appointing party to carry out its purposes effectively
- From a technology perspective EIR enable pre- defined mappings to be established, allowing communication between systems across the project team, to improve interoperability
- Supporting the carrying out of checks to ensure that the information received from the lead appointed party is compliant with what was initially required by the appointing party.



For the lead appointed party:

- Selection of those appointed parties who can best demonstrate delivering the requirements
- Specifying precisely what information is required at each information exchange, i.e. the information the appointed party (information provider) is to deliver to the lead appointed party (information receiver (specifier)), to enable the lead appointed party to carry out its purposes effectively, and deliver the information required by the appointing party on behalf of the delivery team as a whole
- From a technology perspective EIR enable pre- defined mappings to be established, allowing communication between systems across the project team, to improve interoperability
- Supporting the carrying out of checks to ensure that the information received from an appointed party is compliant with what was initially required by both the lead appointed party and appointing party.

EIR/EIR (ISO 19650-3) need to be identified regardless of how the information is going to be delivered, be it by a geometrical model or otherwise. Since every appointment is made up of information exchanges, EIR/EIR (ISO 19650-3) will always be required to specify what information is needed.

### 1.5.3 When EIR are defined

EIR/EIR (ISO 19650-3) have to be defined prior to every appointment and issued as part of the appointment process:

For an appointing party this occurs before any consultants, specialists or contractors are selected



For a lead appointed party this occurs before any sub-contractors and specialists are selected.



The appointing party should develop one master set of EIR for each project, which is then filtered to create a tailored set for each appointment.

Therefore, where there are multiple appointments during a project there will be multiple EIR.

For appointing parties with multiple assets, it is sensible to consider how the EIR can be rationalized so that at appointment level they are specified in a streamlined and efficient way using a consistent structure as far as practicable.

### 1.5.4 Who creates EIR?

The appointing party, for example, the asset owner or their representative





The lead appointed party, for example, a designer or a main contractor, depending on the project timeline.



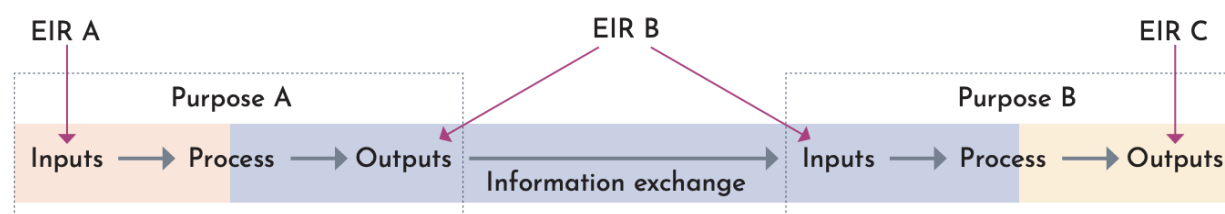
### 1.5.6 EIR contents

or this section the EIR/EIR (ISO 19650-3) is broken down into:

- Purposes
- Structuring of information
- Definition of information.

#### Purposes

The importance of purpose is highlighted throughout section 1 of this guidance. At the EIR/EIR (ISO 19650-3) stage, the purposes need to be rationalized and thought of as a mini system of inputs, processes and outputs, as shown in Figure 10.



**Figure 10: Chain of purposes connected via information exchanges**

For each purpose, inputs will be required to feed into processes, both of which will require certain information. Once processed this will generate the specific outputs that are required to feed in to the next process, and so forth.

Purposes form into chains linked by information exchanges to enable information and data to be transferred.

Establishing a set of rationalized purposes should be the starting point of defining EIR/ EIR (ISO 19650-3).

The appointing party will have already defined the asset-related purposes as part of the AIR. Any project-related purposes should be derived from the PIR.

Lead appointed parties will also have their own purposes which cover design and construction. These need to be captured as part of their EIR/EIR (ISO 19650-3).

The following list provides examples of more rationalized purposes, noting that these are not exclusive to the assigned party indicated:

Appointing party

- Asset registration (from the AIR)
- Planned maintenance (from the AIR)
- Replacement (from the AIR)
- Operational cost, e.g. as informed from energy analysis (from the AIR)
- Cost forecasting (from the PIR)

Lead appointed party

- Geometrical coordination

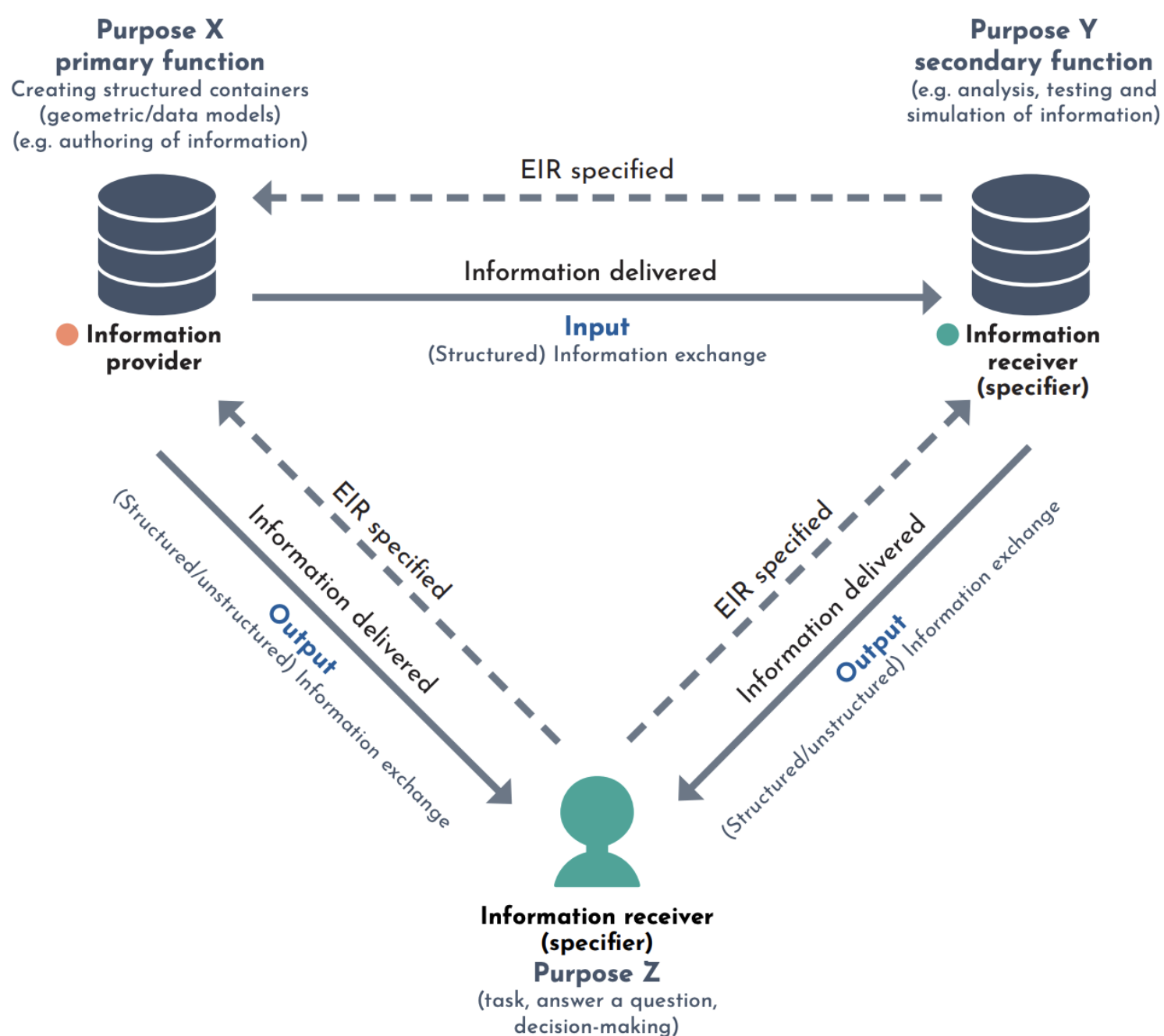
- Construction planning
- Construction costing
- Energy analysis
- Commissioning

#### Structuring of information

To achieve open, shareable information for the whole life of assets it is important that structured information is delivered, and how it is structured needs to be specified in the EIR/EIR (ISO 19650- 3).

For structured information, this would include specifying the data that is to be exported from primary purposes (authoring) for input into secondary purposes, as illustrated in Figure 11. Therefore, the secondary purposes should be considered, before the contents of the structured information for primary purposes.

Once the purpose has been accomplished, the information can be output as either structured or unstructured information, depending on its next purpose.

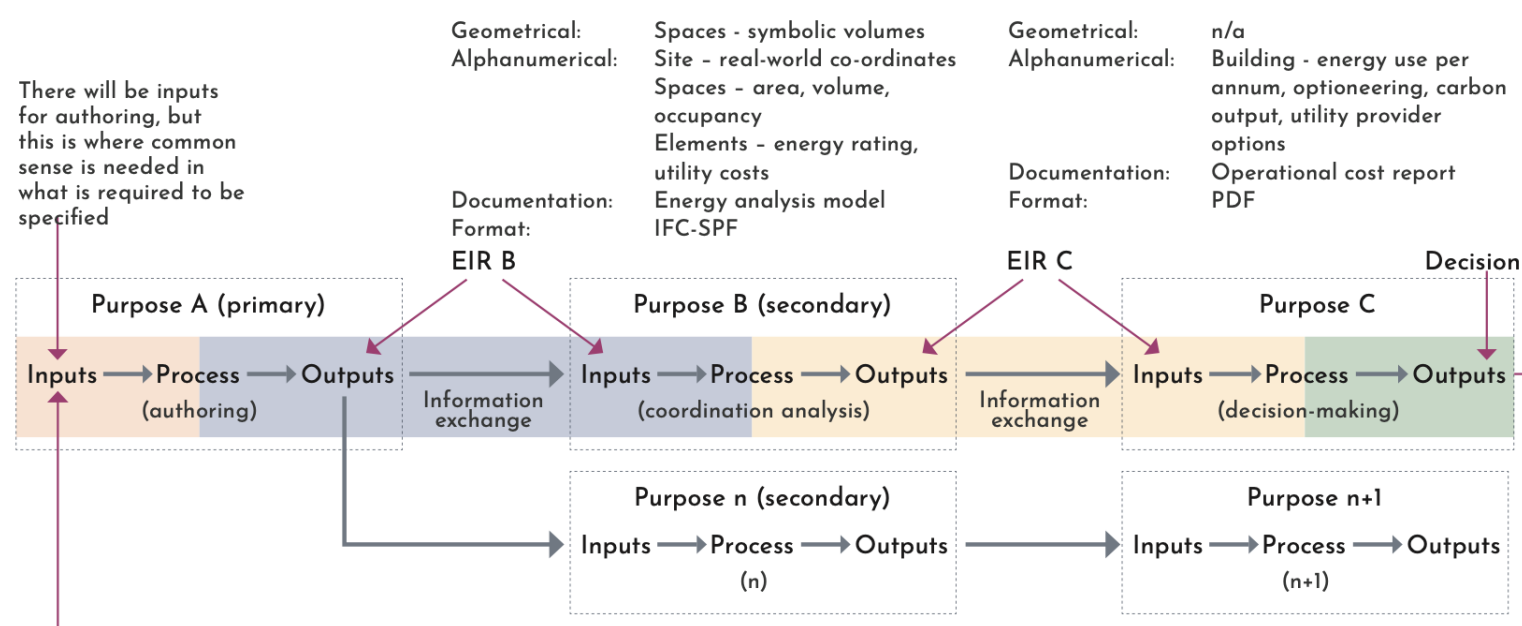


**Figure 11: Exchange information requirements between software applications and people**

Unfortunately, marketing language has moved people away from defining actual information requirements to using the terms 4D, 5D, 6D, etc. This does not help to define what these purposes are. These are just umbrella terms that have very little meaning from an information perspective. Those defining requirements should always detail what is required to a point that allows useful information to be provided.

Applying this to the chain of purposes we can start to see how structuring information is applied to a project. Figure 12 is set within the collaborative production of information activity (ISO 19650-2 clause 5.6), which is based on repetitive cyclical workflows and generally follows a pattern of authoring, analyzing and decision-making which then feeds back into the authoring process.

#### Definition of information



**Figure 12: Purpose and EIR applied to a delivery context**

To define the precise information needed information must be broken down into its constituent parts. Depending on purposes, this will likely be a mixture of structured and unstructured information.

In section 1.2.4.2 the idea of information facets was introduced as a way of describing how both structured and unstructured information could be broken down across content, form and format. Different combinations of describing these facets contribute to the EIR/EIR (ISO 19650-3).

For example, a main contractor needs information to undertake the rationalized purpose of cost. The information they require will be produced using a mixture of processes supported by technologies. This is likely to call upon forms of information including:

- Geometrical models (3D)
- 

The cost reporting technology import requires information in an open standard, and therefore the information is required in IFC-SPF and PDF format, respectively.

However, this is only part of the requirement, as the content also needs to be specified at an overall summary and breakdown level. At the summary level the model view definition is specified, as well as requiring general arrangement information. The breakdown of the content is the complex part but to simplify, this content can be broken down into geometrical and alphanumeric information across different objects.

To define all this in a more formal manner the level of information need framework should be used as referenced in ISO 19650-1 clause 11.2 and detailed further in section 2 of this guidance. Level of information need is also covered in ISO 19650-2 clauses 5.2.1 b) and 5.4.3 b).

The level of information need provides one of the building blocks of the EIR/EIR (ISO 19650-3).

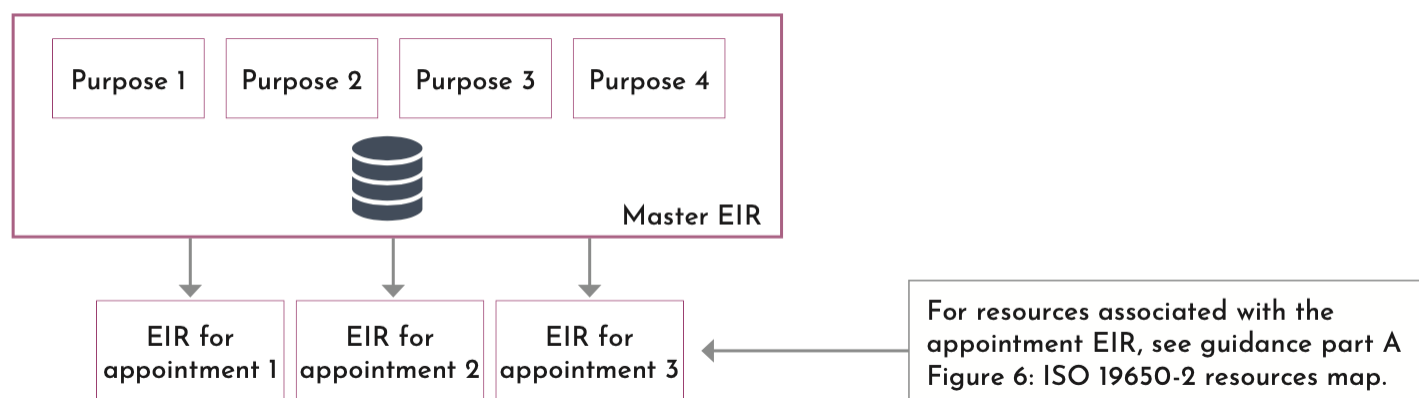
Because it can be complex to define information requirements, it is imperative that a consistent breakdown structure is created by selecting a suitable schema and classification system across all the different:

- Objects (asset types/elements) (from a pump to an entire facility)
- Attributes and properties
- Information containers.

Regardless of how information is delivered, there must be correct and consistent referencing throughout all information containers. The project's information standard will, in part, help form the composition of EIR and the asset information standard will help form the composition of EIR (ISO 19650-3).

There will be many purposes that overlap in terms of their information requirements. It is important to ensure consistency and considering the EIRs/EIR (ISO 19650-3)s holistically as overall information resources is helpful. For example, in one purpose the property OccupancyMax could be required. But the same data deliverable could be required in another purpose as MaxOccupancy. Rationalizing this will increase efficiency (see Figure 13).

There is, however, another important aspect to consider: all of these requirements are interlinked; properties reside in objects and objects reside in information containers.



**Figure 13: Formation of EIR**

Therefore, using more structured methods to define and communicate these requirements, for example, in linked tables such as spreadsheets, or even better, a database, will ensure that these relationships are maintained. This reduces the risk of duplication and contradiction and makes EIR/EIR (ISO 19650-3) easier to define.

Following industry standards such as ISO 16739- 1:2018 [4] (and the sub schema of BS 1192-4:2014 [5]) allows appointing parties and delivery teams to set up methods that can be used across different purposes and multiple projects.

Conversely, departing from these standards means that delivery teams have to respond to wide- ranging and diverse approaches. This introduces inefficiencies, taking more time and resources and potentially introducing risk. It also prevents development of open sharable information across the whole life of the asset.

In summary, and as explained in section 1.2.3.2 of this guidance, you should only specify information for the purposes needed. We have talked about building up the EIR/EIR (ISO 19650-3) by purpose, but the final EIR/ EIR (ISO 19650-3) outputs should be filtered by appointments (an appointment may contain multiple purposes).

An EIR/EIR (ISO 19650-3) that is not appointment-specific will undermine the appointment/contract. It will also overload information providers by requiring them to generate and/or deliver information that is either unnecessary, or which duplicates/ contradicts information from other information providers.

[4] ISO 16739-1:2018 Industry Foundation Classes (IFC) for data sharing in the construction and facility management industries – Part 1: Data schema

[5] BS 1192-4:2014 Collaborative production of information Part 4: Fulfilling employer's information exchange requirements using COBie – Code of practice

### 1.5.7 When information is exchanged to meet the EIR

Dates for information exchange are covered in ISO 19650-2 clauses 5.2.1 e) and 5.4.3 d) and in ISO 19650-3 clause 5.2.2 c) which is also referred to from ISO 19650-3 clause 5.4.3.

The information exchange is completed when the information receiver (specifier) accepts the information.

For an appointing party, the information delivery milestones are defined relative to the key decision points (see section 1.4.3.4). In this section it was assumed that the information exchange dates coincided with the information delivery milestones. In practice, the actual dates of the exchange need to be specified when defining the EIR/EIR (ISO 19650-3),

and there may be multiple dates for each information delivery milestone.

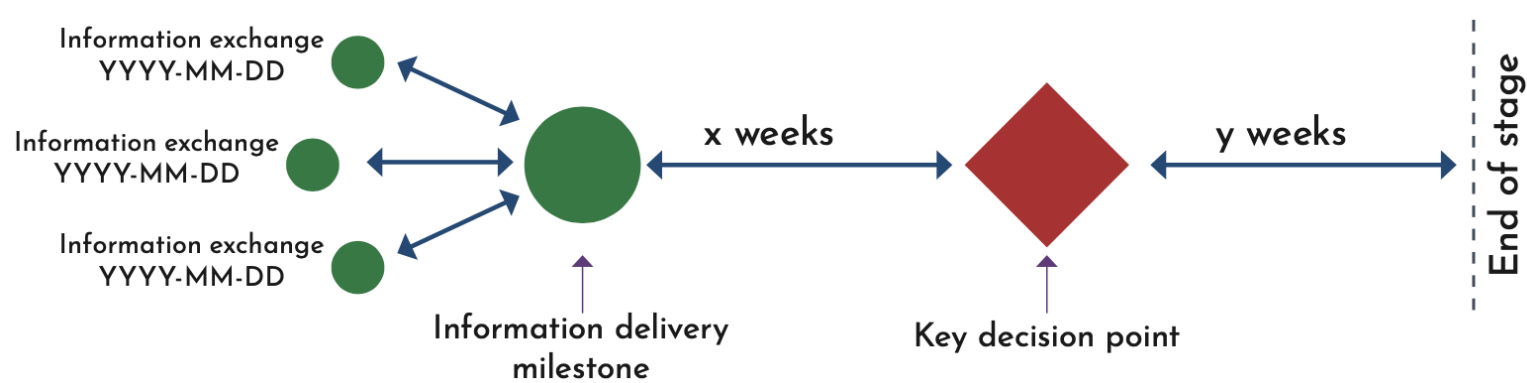
These dates signify when the information is to be submitted by the information provider into the common data environment (CDE) workflow. There will be a period of time between the information being submitted and it being accepted to allow for the governance process defined in ISO 19650-2 clause 5.7.4. This will need to be factored in - see Figure 14.

For lead appointed parties, their own governance processes must also be considered when setting dates (see ISO 19650-2 clause 5.7.2). Information exchanges for the lead appointed party should be defined around:

- Information required for secondary structured information purposes, for example, coordination analysis
- Information required for certain other purposes, for example, planning or work

Ideally, specific dates should be defined, but if this is not realistic a time period relative to the information delivery milestones could be sufficient instead.

Similar considerations regarding information exchange dates and information delivery milestones apply to appointments in the operational phase under ISO 19650-3. In this case the information exchange dates and delivery milestones will be related to the trigger event that has been responded to. For small trigger responses, such as minor repairs or simple maintenance jobs, there might just be one information exchange at the end. More complex triggers, such as larger scale redecoration or condition survey jobs, might need two or more exchanges.



**Figure 14: Key decision points, information delivery milestones and information exchanges**

### 1.5.8 Additional information for ISO 19650-2 clauses 5.2.1 and 5.4.3 and ISO 19650-3 clause 5.2.2

#### Acceptance criteria

Acceptance criteria are covered in ISO 19650-2 clauses 5.2.1 c) and 5.4.3 c) and also in ISO 19650-3 clause 5.2.2 d). Where structured information has been specified, these acceptance criteria can be turned into automated rules, which can check the information.

There are four resources that provide project- wide or asset-wide rules to govern how the information requirements are defined, delivered and checked:

1. The project's information standard or asset information standard
2. The project's information production methods and procedures or asset information production methods and procedures
3. Reference information
4. Shared

These resources are referred to in ISO 19650- 2 clauses 5.1.4, 5.1.5, 5.1.6. and in ISO 19650-3 clauses 5.1.6, 5.1.7, 5.1.8

These rules create a baseline for the acceptance criteria and ensure that the information delivered matches the original requirements before the information is then used by the appointing party or lead appointed party. In addition to the obvious rule that the required information has been delivered, other rules include that:

- The information is correctly constructed (for example, follows correct conventions/syntax, uses the correct case, is spelt correctly and the delimiters are correct)
- The metadata is correct (for example, value type and units)
- Any definition for a value, either precisely or by a range, is satisfied.

The robustness of these rules is dependent upon:

- Nomenclature (how things should be named)
- Industry standards/conventions
- Schemas
- Classification
- Dictionaries
- 

Tip: To support delivery teams in generating acceptable information it may be helpful to provide examples of what is expected.

#### Supporting information for EIR in ISO 19650-2

Supporting information is covered in ISO 19650-2 clauses 5.2.1 d) and 5.4.3 e).

Supporting information should be provided to aid understanding of the contents of the EIR and the acceptance criteria. The more specific the detail that is made available to those tendering, the more chance they have of understanding exactly what needs to be delivered and will be accepted. For example, it is not helpful to copy and paste blocks of text from standards or other external references, when specific insight would be better.

## 1.6 The relationship: information requirements

Once they are defined, the PIR become the high- level purposes which provide the basis for the more detailed EIR. This is where the project information needs are broken down to appointment level and combined with any project relevant AIR.



Figure 15 shows the relationship between the four types of information requirements in relation to the overall breakdown.

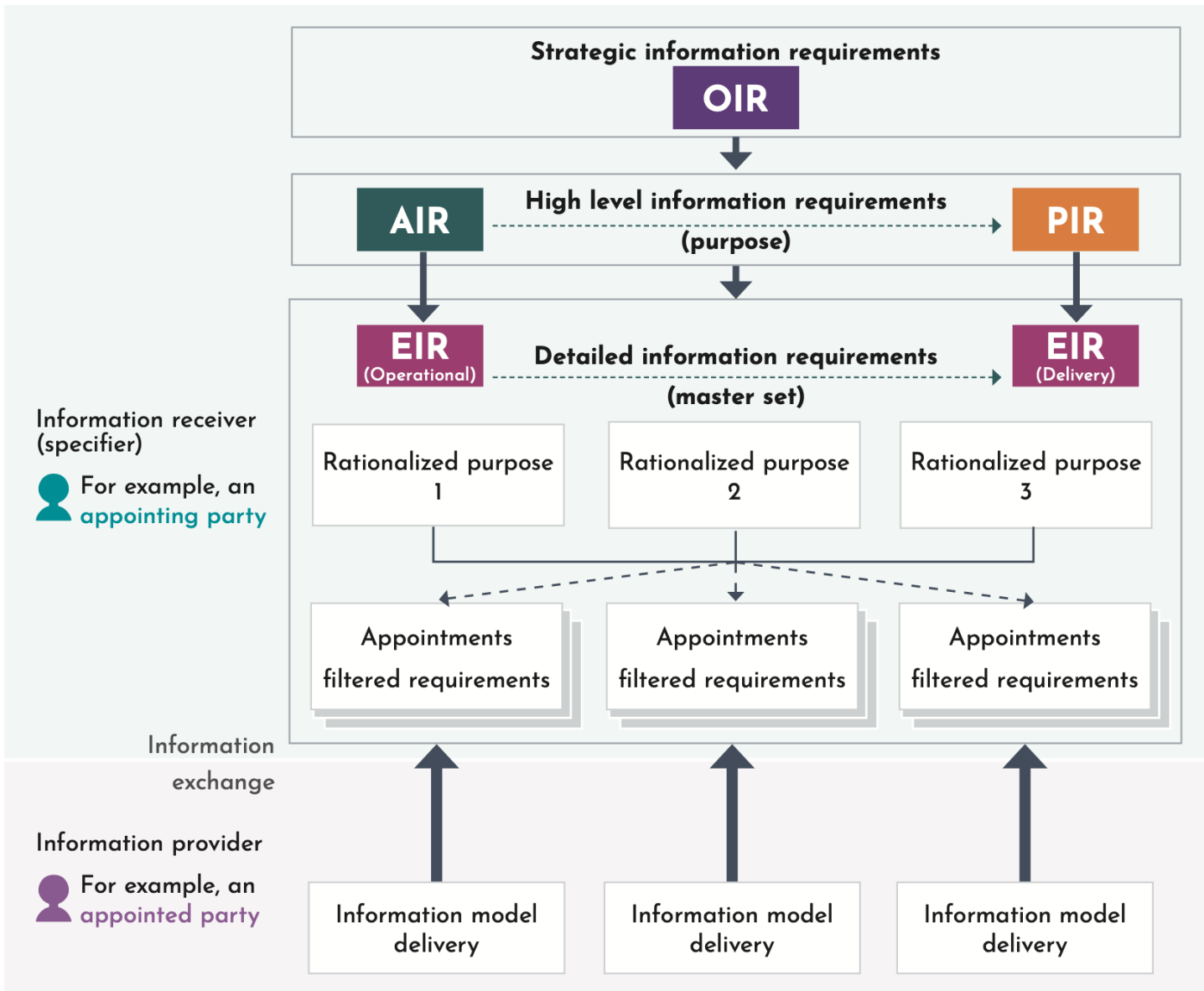
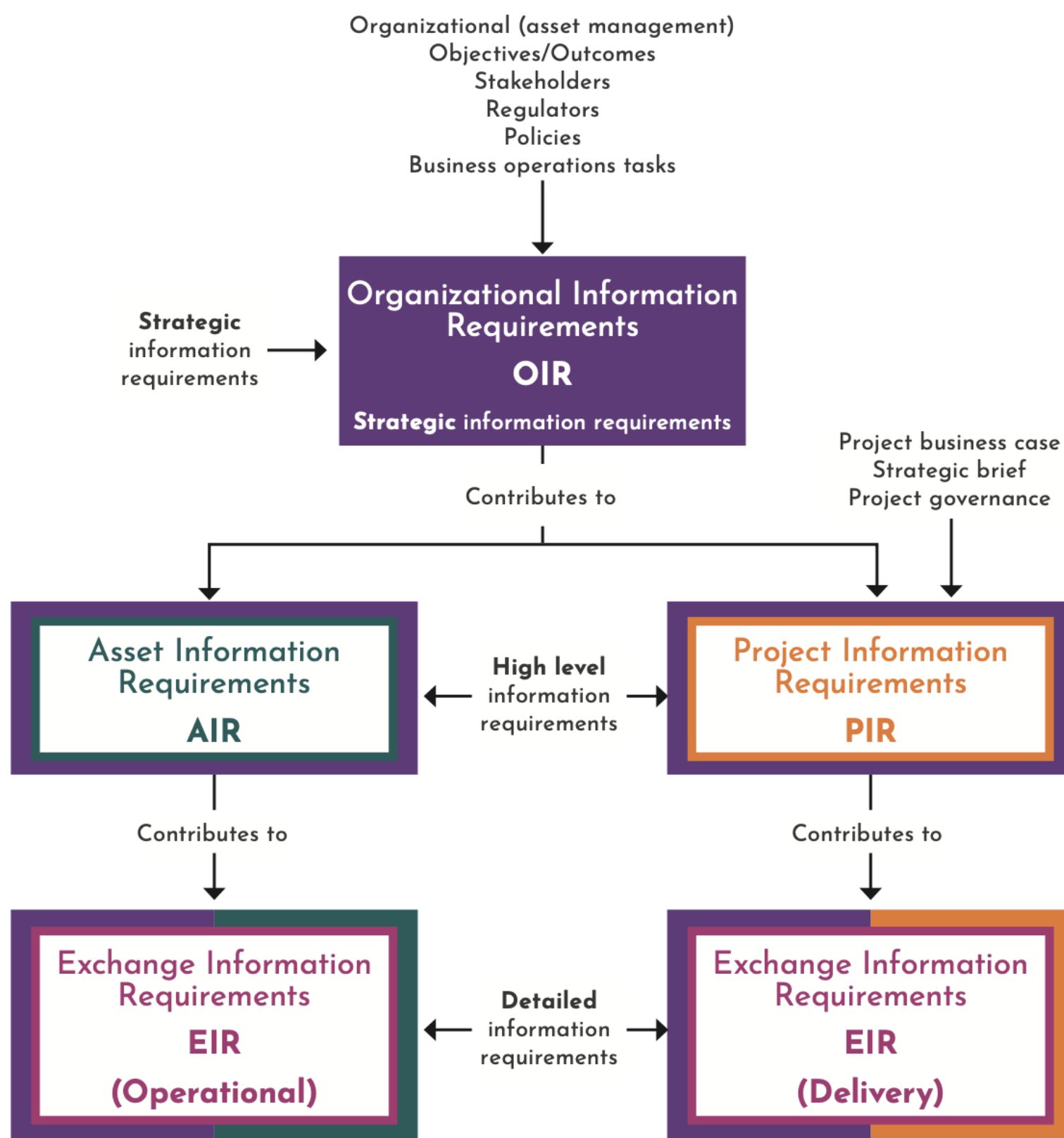


Figure 15: The four types of information requirements in the context of the breakdown of information requirements

## 1.7 Conclusion

Information requirements should always be based on purposes and defined in sufficient detail to enable each purpose to be effectively actioned. Collectively information requirements tell a story which precisely covers all the information required. When defining information requirements ask yourself “If I had to provide this information would I know what I had to deliver?”

Figure 16 amplifies part of Figure 2 from ISO 19650- 1 clause 5.1. It shows in more detail how the four different information requirements relate to one another.



**Figure 16: Hierarchy of information requirements extended**

Information is needed throughout an asset's lifecycle. Although historically, the built environment sector has tended to concentrate on design and construction projects it is the in- use phase where information requirements are being used long-term and the AIM is updated (see Figure 17). This must be rectified, and is addressed repeatedly in the ISO 19650 series.



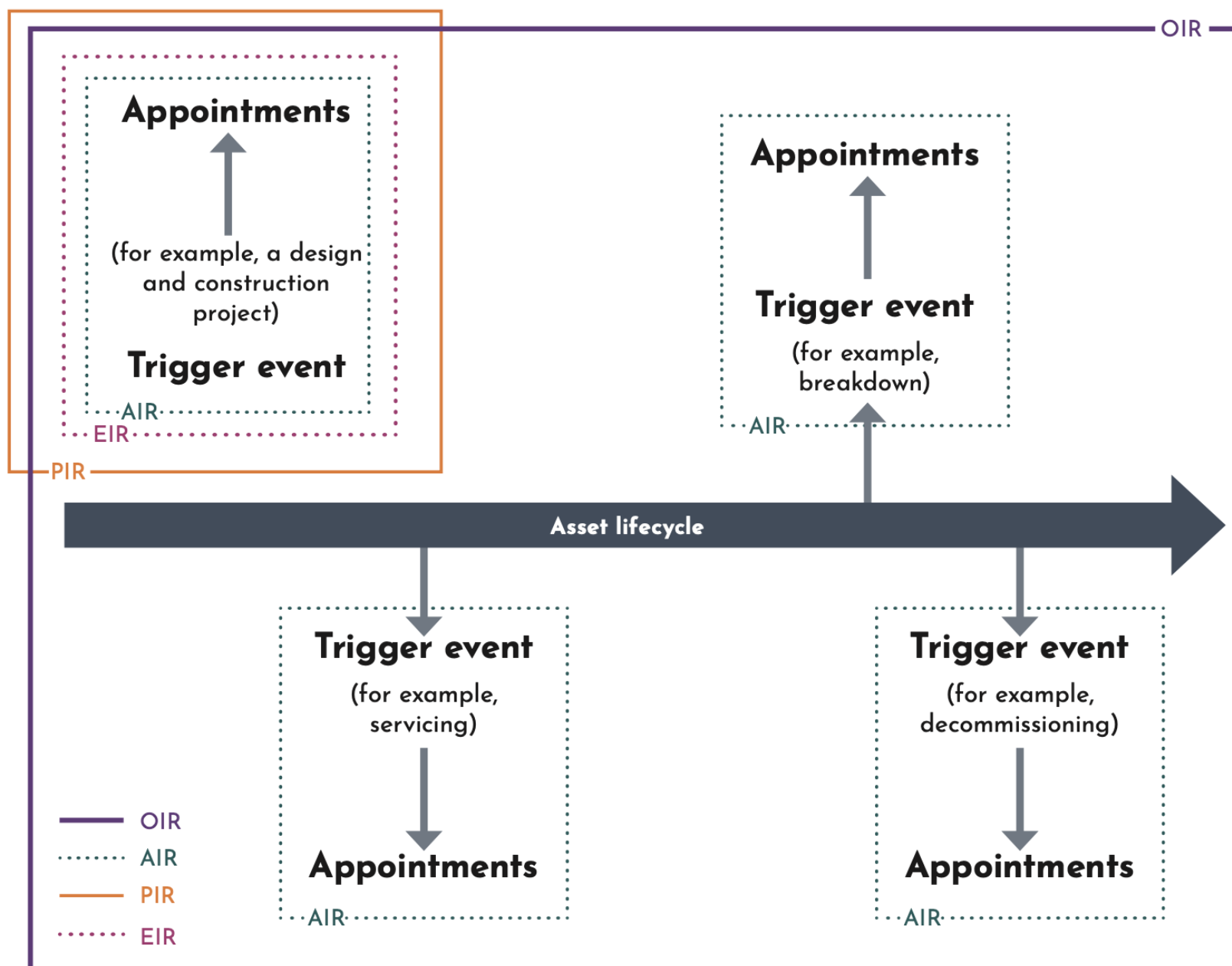


Figure 17: The dominance of the OIR and AIR throughout an asset's life

## 1.8 Checklist of actions/key points to consider

Information requirements are made up of two parts:

1. Why information is required (purpose)
  2. What information is required.
- Purposes do not have to be shared with anyone outside the organization, they are simply a mechanism to allow the correct information requirements to be defined.
  - There will be times when purposes are In this scenario, deal with those purposes which are known and make it clear in the information requirements that there could be others.
  - The appointing party should only define information requirements for their own purposes and to their necessary level of information need, not encroaching on the remit of a delivery team. For example, specifying delivery software when there is no purpose in doing
  - Purposes can also be in the form of questions which aid the definition of KPIs which are themselves information requirements.
  - Do not include details in information requirements that should be in other information resources such as the information standard.
  - Information is a broad term and can mean different things to different people. In this guidance, information is made up of four main facets but not all of these need to be identified to define information effectively.
  - Information requirements are important in the tendering process of all appointed parties (for example, consultants and contractors), to procure the appropriate delivery teams. Detailed information requirements should be developed in conjunction with other tender information prior to any appointments being tendered.
  - The ISO 19650 series predominantly deals with the information requirements of an appointing party downwards. However, information requirements can exist in the opposite direction and between task/delivery teams. In fact every party within a project is likely to have them.

- Information requirements are particularly helpful to identify requirements, which need to be. While they should include all the information the receiver (specifier) is expecting, it is not helpful if the extensive listing of obvious requirements masks those that are particularly needed. Where it is possible to reference a generic group of information – set either by industry practice/ standards or organizational procedures, to meet an information requirement this should be done. Some common sense is needed.
- People undertaking the information management function should have the appropriate skills to understand the different facets of information and to be able to break information requirements down correctly using standard schemas and classification systems.
- Information requirements have to be precisely defined; statements such as “Information requirements are to reflect the “UK BIM Framework” (or even the outdated term “BIM Level 2”), are not a means of specifying information requirements.

## 2.0 About the level of information need

### 2.1 Introduction

Level of information need is a framework for defining the quality, quantity and granularity of information, as explained for the first time in ISO 19650-1 clause 11.2.

Historically in the UK, level of definition was the term used to refer to the aggregate of level of detail and level of information. In practice, it has been found that understanding of the concepts and principles for defining information requires a clearer framework.

This was the motivation for introducing the level of information need framework in the ISO 19650 series.

Note that, as stated in section 6.5.1 of ISO 19650 Concepts and Principles Guidance “level of information need” should not be abbreviated.

### 2.2 What is level of information need?

The level of information need is a framework to define the quality, quantity and granularity of information requirements. To find out more about the level of information need please refer to BS EN 17412-1:2020 Building Information Modelling: Level of Information Need. Concepts and principles.

The level of information need is used to communicate clearly the degree of information required according to its purpose; no more and no less.

The level of information need framework helps to define the minimum information requirements with respect to each purpose.

Any additional information is considered waste and should not be defined by the appointing party, nor provided by any appointed party, as referred to in section 1.2.3.2.

The “over definition” or “under definition” of information requirements are both considered risky, as they do not support the efficient generation and use of information.

If we look at Figure 4 in section 1.2.2 again, it is the level of information need framework that allows first the information receiver (specifier) (appointing party or lead appointed party) to define the different “shapes” and “sizes” of the information deliverables in a standardized way. Using the level of information need, the information receiver (specifier) can define the quality (green or purple circles, blue or pink triangles), quantity (two triangles and three circles) and granularity (small or big circles) of information.

Then the same framework should be used by the information provider (appointed party) as a reference/skeleton to provide the values to satisfy the information requirements, and therefore to produce information deliverables.

Thanks to the use of the level of information need framework on both sides, the delivered information is structured in a consistent way to enable automated checking (as stated in section 1.2.4.2).

Different purposes might require different information deliverables; therefore, the level of information need should be different.

Defining the level of information need without a clear purpose is not in line with ISO 19650-1.

At the same delivery milestone, an information container should be the result of one or multiple information requirements defined for each purpose using the level of information need framework.

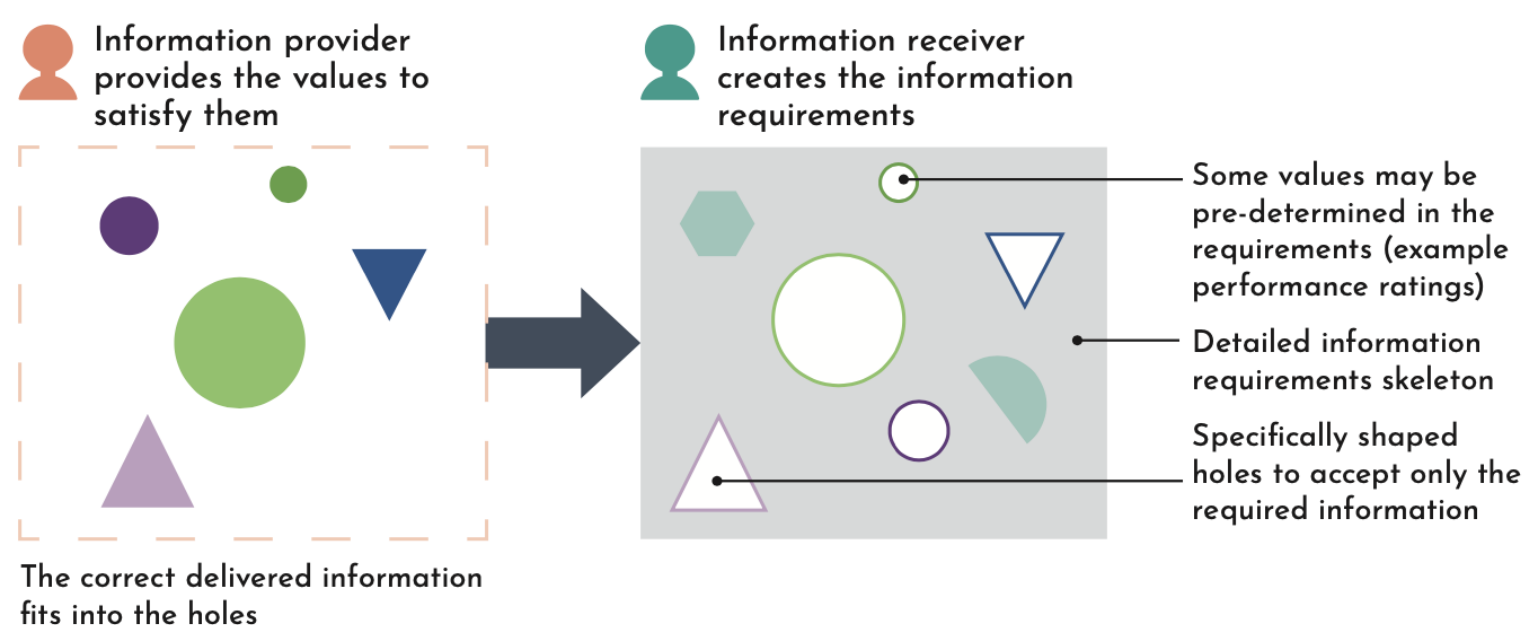


Figure 18: Information requirements skeleton (Figure 4 guidance section 1.2.2)

## 2.3 Why the level of information need framework important

The level of information need framework is fundamental to enabling the successful information exchange of every information deliverable (as seen in section 1.2.3). But in practice, most of the time the information need is not defined at all, or it is too generic. It is therefore open to interpretation and difficult to check automatically.

As noted in [section 2.1](#), the concept of “level of definition” was established in the UK as an aggregate of the “level of detail” and “level of information” for information deliverables. Metrics were set (from 1 to 7) and those numbers were used to indicate the geometrical representation and the alphanumerical requirements. But those metrics were too generic and could not be used to automatically check if information deliverables fulfilled the appointing party’s needs in terms of quality, quantity and granularity. In addition, the definitions of those metrics were dissociated from the purpose of the information, contributing to poor information management and under/overproduction of deliverables.

For example, there are instances where the “level of information” of an air terminal during the construction phase of a project has been defined using the metric “4”, without specifying for which purpose(s) the object will be used, or the associated alphanumerical information required (sound frequency, sound pressure, name of manufacturer). Thus, the metric “4” does not enable automated checking rules to be established and is open to interpretation, leading to increased risks for the project.

If the level of information need framework is not used, different parties will continue to specify poor information requirements, and this will increase project risks and wasteful production of information.

## 2.4 Who defines the level of information need?

The appointing party (client) defines the level of information need of each information deliverable.

Not all appointing parties will have the skills to define the level of information need framework in detail. In this case, the appointing party is required to define at least the purpose for which the information is needed.

ISO 19650-1 allows for an inexperienced appointing party to seek assistance with completing its information management activities. This could be from one of the prospective lead appointed parties or from an independent third party (see examples 3, 4, 5 in [section 2.5](#)) being careful not to create conflicts of interest.

For example, an asset owner might have to provide the quantity of embodied carbon of their asset to the building authority, but they do not have the skills to define in detail the level of information need required to fulfil this purpose. In this case, the asset owner may define the purpose “embodied carbon analysis” and they will seek assistance from the lead appointed party or an independent third party to define the level of information need required.

During design and construction, it is possible that a greater granularity is required than has been defined by the appointing party within the level of information need framework. In this instance, the lead appointed party should establish the appropriate granularity to support their work, but using the level of information need framework defined by the appointing party as a base.

## 2.5 When the level of information need is defined

Level of information need is defined every time an information requirement is established, either by the appointing party or the lead appointed party. This can happen at different stages throughout the life of an asset.

For example:

- 2.5.1 An appointing party (asset owner) can define the level of information need when defining their Asset Information Requirements (AIR)
- 2.5.2 An appointing party (client) can define the level of information need during a tender phase to specify the quality, quantity and granularity of information they need
- 2.5.3 A lead appointed party (designer) can define the level of information need during the preliminary design phase to define what is needed to perform accessibility analysis
- 2.5.4 A lead appointed party (main contractor) can define the level of information need during the construction phase to define what information is needed to perform health and safety analysis on site
- 2.5.5 A lead appointed party (specialist manufacturer for a heritage project) can define the level of information need during the production phase to define what is needed to 3D print a replacement component.

It is possible that the level of information need is defined by the same appointing party with a different granularity of information as the project progresses, decisions are made, and more information becomes available. But, it is vital that the whole definition of level of information need is made at the beginning of each appointment and it is not unnecessarily changed or developed part- way through.

For example, at the feasibility stage of a project, a quantity surveyor might require just the number of occupants to produce an order of cost estimate of a building typology (a school). At detailed design, instead, the quantity surveyor might require the gross internal floor area to perform more detailed cost planning.

## 2.6 How to define the level of information need

The level of information need is a framework for defining information across the facets (purpose, content, form and format) described in section 1.2.4.2 of this guidance.

Information should be defined across the following three sub-divisions, as illustrated also in Figure 11 of ISO 19650-1 for the Project Information Model (PIM) and the Asset Information Model (AIM):

- Geometrical information
- Alphanumerical information
- Documentation.

Each sub-division of level of information need is defined in detail in BS EN 17412-1.

An appointing party should specify their information requirements using the level of information need framework defining:

1. The purpose why information is needed And then, if the aspect is applicable:
2. The Geometrical information to fulfil the purpose
3. The Alphanumerical information to fulfil the purpose
4. The Documentation to fulfil the purpose





# Annex A - General examples of developing information requirements

The examples provided here are to demonstrate what information requirements could look like, and the contents shown are for **illustrative purposes only**.

The intention of these examples is to explain the concept of how information requirements go on a journey providing a link from the purposes through to the information to satisfy them. They provide the thinking process required to start to build information requirements.



These examples are accompanied by a database and a process video that can be accessed by selecting '[ACCESS EXAMPLE DATABASE](#)'. The database is a proof of concept, which brings together several concepts and attempts to make the links between them, consolidating many of the tables shown in the following examples.

## LINE OF SIGHT VIDEO (select to play)

Vendors may think how they take the base structure and develop tools, which hide the complexity using a simple user interface. The video illustrates how information requirements can be determined in respect of an organization's net zero policy. We welcome your [feedback](#) on this content so that it can be developed further.






### How to read and understand these examples

These examples support the guidance provided in the main section of this document. Please read them in conjunction with that text, not in isolation.

The examples are presented as a range of scenarios, covering a range of situations where an asset owner or project client (appointing party) might have a need for information.

Within each scenario, the example is structured into sub-sections, dealing with the relevant types of information requirement. The sub-sections show how information requirements build on each other.

The information requirements themselves have been signposted to match **Figure 17** in this guidance:

-  Organizational information requirements (OIR)
-  Asset information requirements (AIR)
-  Project information requirements (PIR)
-  Exchange information requirements (EIR) for operational phase
-  Exchange information requirements (EIR) for delivery phase

There is a commentary within the examples that summarizes the thought process and the actions of the appointing party (presented as an imaginary Organization X).

There is also one example for a delivery phase lead appointed party EIR (see A.6), written from the perspective of a main contractor as the lead appointed party. In this example, there are no corresponding OIR, AIR or PIR.

The OIR, AIR and PIR sub-sections in each scenario have a straightforward structure, because these information requirements are high-level and do not need to be described in great detail.

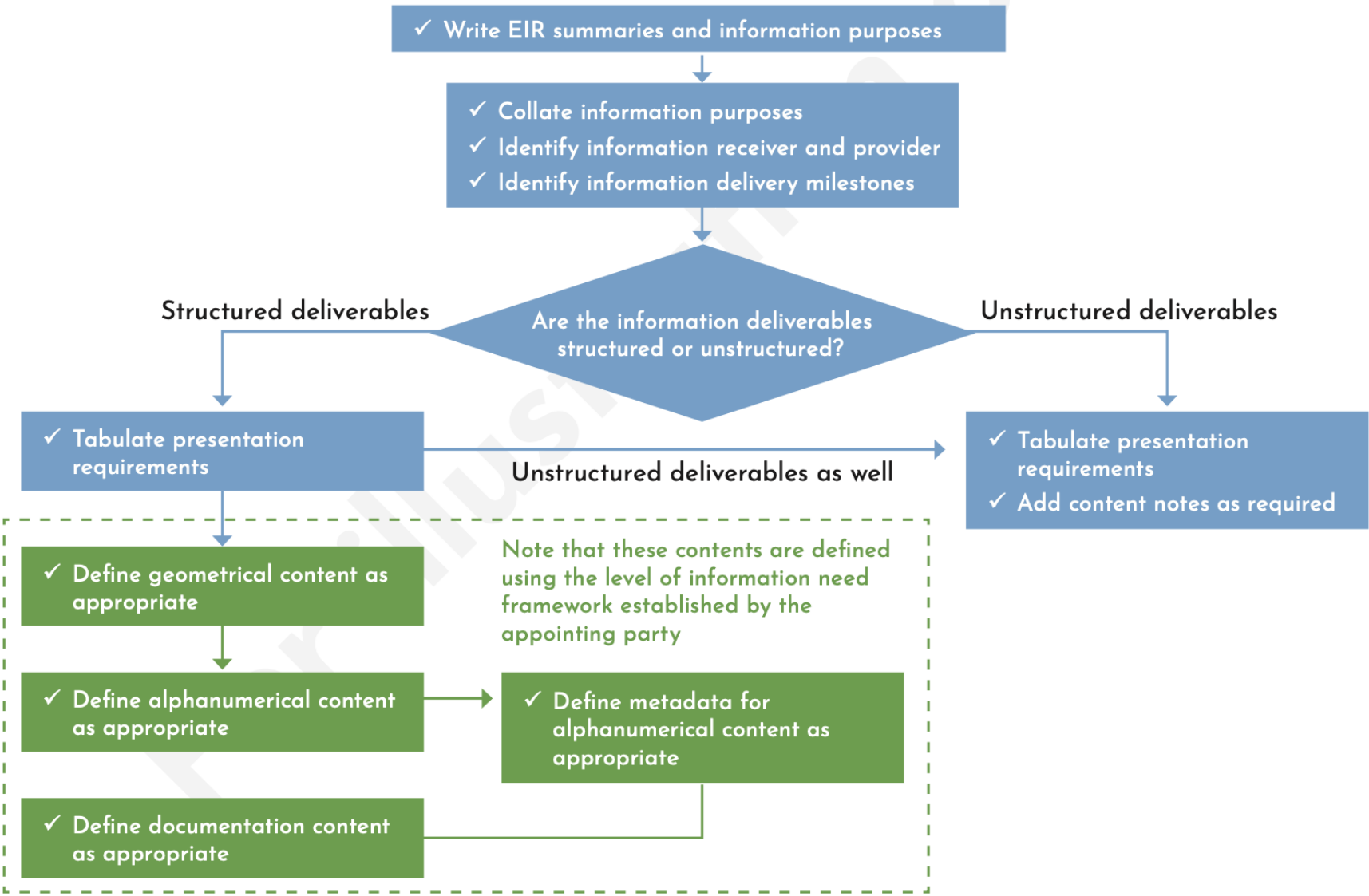
The EIR (Operational) and EIR (Delivery) sub-sections have a more complex structure because these information requirements do need to be set out in detail. The process of defining EIR is illustrated in the flow chart in Figure A.1. The process starts with defining the purposes for each information requirement, then identifying information provider(s) and information receiver(s), and then summarizing the information delivery milestones.

The next step is to divide the information items into structured and unstructured information. For the purpose of these examples structured information is information (data) which is machine-readable and can be queried (asked a question of).

Examples of structured information include databases, models and spreadsheets. Unstructured information cannot be queried by machine and needs to be interpreted by a person to make sense of it. Examples include drawings, reports, images, sound recordings.


In both cases the presentation requirements are tabulated, but for unstructured information any notes about the expected contents that are deemed unusual are also added.

Finally, the detailed requirements for structured information are captured, following the arrangement defined in the level of information need framework. This is shown in sub-divisions of geometrical information, alphanumerical information and documentation. A fourth table is included to capture metadata requirements associated with alphanumerical information.



**Figure A.1: Flow chart for preparing AIR or EIR**

As noted in section 1.2.4.2 of this guidance it is recommended that a master set of EIR is established and then filtered according use case and/or appointment/function being procured. This assists the production of appointment specific information requirements and helps to ensure that there are no duplication or gaps in information delivery (see **Figure 6**)



There are several views set-up in the database to show the filtered information for each appointment. Therefore only the requirements particular to a specific appointment are only ever issued as part of the appointment process.

[ACCESS EXAMPLE DATABASE](#)

## A.1 Example addressing project statutory approvals



### A.1.1 Organizational information requirements

OIR



- **Policy:** Statutory compliance Organization X has, of course, a policy of statutory compliance and has established the following OIR as a result.
  1. The organization needs confirmation that all necessary statutory approvals have been obtained.

For this organization, there are no OIR associated with project statutory approvals. These are all considered within the PIR.

A.1.2 Asset information requirements

AIR

There are no asset information requirements considered in this example.

A.1.3 Project information requirements

PIR

Organization X has reviewed its OIR and its project tasks related to land registry applications and the Health and Safety Executive (HSE) notifications in relation to a new development project. Organization X has established two PIR as a result of this.

- **Project Task:** Land registry application
  1. Site location and area information
- **Project Task:** Notifying the HSE
  1. Project F10 form to be completed, construction information

A.1.4 Exchange information requirements

EIR

A.1.4.1 Purposes

Organization X has reviewed its PIR related to statutory project approvals and has determined the EIR and associated information purposes. These are presented in Table A.1. Note, these do not need to be shared with delivery team, they are an internal task to help arrive to the correct information required.

Table A.1: EIR summaries and purposes for statutory approvals

PIR	EIR (Delivery)	Information purpose - to support:
1. Site location and area information	Site location plan with boundaries clearly marked and the overall site area in m2 for information delivery milestone 2	<ul style="list-style-type: none"><li>o Statutory registration (Land Registry)</li></ul>
2. Project F10 form to be completed, construction information required	Sub-contractor numbers and programme dates. To be completed once main contractor is appointed.	<ul style="list-style-type: none"><li>o Statutory registration (HSE)</li></ul>

Organisation X can now consolidate the purposes, identify information delivery milestones and the type of party that will provide the required information, for EIR arising from PIR. These are given in Table A.2.

Table A.2: Prerequisites for statutory approval

Information is required to meet these purposes - to support:	<ul style="list-style-type: none"><li>• Statutory registration (Land Registry)</li><li>• Statutory registration (HSE)</li></ul>
Information specifier/receiver Information provider	Organization X's Project Manager Architectural design team (site location plan) and main contractor (sub-contractor numbers and programme)
Information delivery milestones	Site location plan at information delivery milestone 2. Sub-contractor details at information delivery milestone 4.


A.1.4.2 Specifying the detail

This is the section where the content of the EIR is developed in terms of the presentation of information and the content breakdown of the information.

A.1.4.2.1 Presentation and content

Organization X now needs to consider the overall content, form and format of the information (i.e. how the information is to be presented and encoded). In this example, this is done with reference to Uniclass 2015. Consideration is therefore given to components shown in Table A.2 of location plan, sub-contractor details and programme. Based on this, Organization X has decided that it needs to receive the types of information listed in Table A.3. Table A.3 also includes content requirements that Organization X has identified are beyond what a typical information provider (in this case the project design team or main contractor) might be expecting.

Table A.3 and similar tables throughout Annex A are focused on specifying what the information is rather than the containers that will deliver it (which will be determined by the delivery team). The information provided below can form the metadata for containers during the delivery phase.



In the database example, the Table A.3 forms part of the information presentation tables.

[ACCESS EXAMPLE DATABASE](#)

Table A.3: Presentation details for statutory approvals EIR

Item	Content summary (based on Uniclass 2015)	Form (based on Uniclass 2015)	Format	Information exchange date	Plain language description	Content comments
Unstructured information						
1	PM_30_10_80: Site boundary information	FI_60_25: Drawing rendition	PDF	At information delivery milestone 2	Site location plan	OS Map with a red line to denote the site boundary, the wider estate including campus A to be marked out in blue
2	PM_60_20_55: Nominated subcontractor or supplier work information	FI_90_75: Schedule or table	PDF	At information delivery milestone 4	Sub-contractor list	To include names and contact details
3	PM_60_30_20: Contract programme information	FI_80_65: Programme	PDF	At information delivery milestone 4	Construction programme	For delivery team to determine

Note, there is no structured information required

#### A.1.4.2.4 Content breakdown – structured information

In this example, there is no content breakdown for structured information since the items in Table A.3 are all unstructured information

## A.2 Example addressing maintenance and repairs



### A.2.1 Organizational information requirements

#### OIR

- **Policy:** Maintenance Policy

Organization X has formulated its maintenance policy and has established the following organizational information requirements (OIR)

1. Remove the backlog of reactive maintenance through better maintenance management and reduced reliance on equipment manufacturers.

- **Business operations task:** Emergency repairs

Organization X has reviewed its business operations and established the following OIR as a result.

1. Minimum loss of production arising from equipment/asset failure

### A.2.2 Asset information requirements

#### AIR

Organization X has renewed its OIR and has established the following three asset information requirements (AIR) as a result.

1. All new assets are to be managed more proactively using a computer aided facilities management (CAFM) system.
2. Procure maintenance contracts independent of manufacturers' maintenance contracts.
3. All new assets are to be accompanied with a maintenance plan to cover their expected life.

4. Information is required to enable emergency repairs to a failing or failed

A.2.3 Project information requirements

PIR

There are no PIR for maintenance and repairs, so there is no content at this point of this example.

A.2.4 Exchange information requirements (operational)

EIR  
(Operational)

A.2.4.1 Identifying information purposes

Organization X has reviewed each of the AIR in respect of the maintenance policy and its emergency repair tasks and has determined the exchange information requirements (EIR) and associated information purposes. These are presented in Table A.4.

Table A.4: EIR summaries and purposes for maintenance and repairs

AIR	EIR (Operational)	Information purpose - to support
1. All new assets are to be managed more proactively using a computer aided facilitates management (CAFM) system	Reactive maintenance is to be kept to a minimum and managed through a CAFM system. The CAFM system will also retain a register of all assets and their locations and it will be updated as assets are maintained and/or replaced. The CAFM system will be developed and tested during the delivery phase.	<ul style="list-style-type: none"><li>Planned/preventive maintenance</li><li>Reactive maintenance</li><li>The generation of a register of assets</li><li>Replacement of the asset</li></ul>
2. Procure maintenance contracts independent of manufacturers maintenance contracts	Assets that require planned maintenance are to be identified and recorded in an asset register. In-house tendering of maintenance contracts takes eight weeks so the asset register is required at least eight weeks prior to the commencement of operation of any new asset	<ul style="list-style-type: none"><li>Planned/preventive maintenance</li><li>The generation a register of assets</li></ul>
3. All new assets are to be accompanied with a maintenance plan to cover their expected life	Maintenance plans should form part of the O&M manual for the building/infrastructure. They need to be suitably identified so that they can be assigned to the asset within the CAFM system	<ul style="list-style-type: none"><li>Planned/preventive maintenance</li></ul>
4. Information is required to enable emergency repairs to a failing or failed asset	Reactive maintenance instructions and/or troubleshooting guide should form part of the O&M manual for the building/ infrastructure	<ul style="list-style-type: none"><li>Reactive maintenance</li></ul>

Organization X can now consolidate the purposes, identify information delivery milestones and the type of party that will provide the required information. These are given in Table A.5.

Table A.5: Prerequisites for maintenance and repairs EIR (Operational)

Information is required to meet these purposes - to support	<ul style="list-style-type: none"> <li>Planned/Preventive maintenance</li> <li>Reactive maintenance</li> <li>The generation of a register of assets</li> <li>Replacement of the asset</li> </ul>
Information receiver (specifier) Information provider	Organization X's Estates Department The contractor appointed for the maintenance/replacement activities or the main contractor for a new build project
Information delivery milestones	Spatial information is required at information delivery milestone 3 to support CAFM development and testing Asset register and maintenance plans are required eight weeks prior to asset operation or by handover (whichever is the earliest) The remainder of the O&M manual is required by handover of new build assets

#### A.2.4.2 Specifying the detail

This is the section where the content of the EIR (Operational) is developed in terms of the presentation of information and the content breakdown of the information. The tables in this sub-section should be developed together as they will inform each other and cross-refer.

##### A.2.4.2.1 Presentation

Organization X now needs to consider the overall content, form and format of the information (i.e. how the information is to be presented and encoded). In this example this is done with reference to Uniclass 2015. Consideration is therefore given to components shown in Table A.5 of spatial information, the asset register, maintenance plans and the remainder of the O&M manual. Based on this consideration, organization X has decided what types of information it needs to receive and has also identified if this information is structured (Table A.6A) or unstructured (Table A.6B). In respect of the unstructured information, Organization X has also identified content requirements where these are beyond what a typical information provider (in this case the main contractor) might be expecting.



In the database example Tables A.6 form part of the information presentation tables.

[ACCESS EXAMPLE DATABASE](#)

**Table A.6A: Presentation details for structured information for maintenance and repairs EIR (Operational)**

Item	Content summary (based on Uniclass 2015)	Form (based on Uniclass 2015)	Format	Information exchange date	Plain language description
<b>Structured information</b>					
1	PM_80: Asset management information <ul style="list-style-type: none"> <li>PM_80_10_05: Asset guarantee and warranty information</li> <li>PM_80_10_10: Asset register</li> </ul>	FI_30_40: Information Exchange	XLSX	Spatial information is required at information delivery milestone 3 Asset register and maintenance plans are required eight weeks prior to asset operation or by handover (whichever is the earliest) The remainder of the O&M manual is required by handover of new build assets	COBie spreadsheet based on the COBie 2.4 schema

**Table A.6B: Presentation details and content comments for unstructured information for maintenance and repairs EIR (Operational)**



Item	Content summary (based on Uniclass 2015)	Form (based on Uniclass 2015)	Format	Information exchange date	Plain language description	Content comments
<b>Unstructured information</b>						
2	PM_80: Asset management information  (Listed in the following order for the assets described in table B3)	FI_90_50: Manual	PDF	By handover	O&M manual	
2.1	PM_60_60_15: Contact information	FI_90_24: Directory	PDF		Project directory	Contact information should be linked to the COBie contact tab. Content to include emergency contact information in the event of a failing asset
2.2	PM_70: Testing, commissioning and completion information:				PM_70: Testing, commissioning and completion information:	For delivery team to determine
2.2.1	• PM_70_15_10: Building management systems (BMS) commissioning information	FI_90_13: Certificate	PDF		BMS commissioning certificates	For delivery team to determine
2.2.2	• PM_70_15_29: Fire safety acceptance information	FI_90_72: Report + FI_90_13: Certificate	PDF		Fire safety reports and certificates	For delivery team to determine
2.2.3	• PM_70_75_36: Heating installation test information	FI_90_72: Report + FI_90_13: Certificate	PDF		Heating system test reports and certificates	For delivery team to determine
2.2.4	• PM_70_85_52: Manufacturer information	FI_90_21: Data sheet	PDF +XLSX		Manufacturers product data sheets	Content to include trouble shooting and short-term repair
2.2.5	• PM_70_85_55: Operating instruction	FI_90_50: Manual	PDF		Operating instruction for assets	For delivery team to determine
2.3	PM_70_90: Record information:				As constructed information	For delivery team to determine
2.3.1	• PM_70_90_15: Control system record information	FI_60_25: Drawing Rendition	PDF		Control system record drawings	For delivery team to determine



Item	Content summary (based on Uniclass 2015)	Form (based on Uniclass 2015)	Format	Information exchange date	Plain language description	Content comments
<b>Unstructured information</b>						
2.3.2	• PM_70_90_27: Electrical systems record information	FI_60_25: Drawing Rendition	PDF		Electrical system record drawings	For delivery team to determine
2.3.3	• PM_70_90_30: Fire system record information	FI_60_25: Drawing Rendition	PDF		Fire system record drawings	For delivery team to determine
2.3.4	• PM_70_90_52: Mechanical systems record information	FI_60_25: Drawing Rendition	PDF		Mechanical system record drawings	For delivery team to determine
2.3.5	• PM_70_90_04: Architectural record drawings	FI_60_25: Drawing Rendition	PDF		Architectural record drawings	For delivery team to determine
2.4	PM_80_10_05: Asset guarantee and warranty information	FI_90_21: Data sheet	PDF		Guarantees and warranties	For delivery team to determine
2.5	PM_70_85_50: Maintenance schedule information	FI_90_75: Schedule or table	PDF	Eight weeks prior to asset operation or by handover (the earliest)	Maintenance schedules	Content to include schematic information of main risers and service corridors

#### A2.4.2.2 Content breakdown – structured information

Organization X will now detail the exact contents of structured information using up to four tables to define object information and metadata [6]. In this example details have been tabulated only for item 1 in Table A.3A since this is the only structured information deliverable. For the purpose of illustration, consideration has been given to structured information in respect only of the following [7] and in reference to IFC 2x3 notation:

- Project
- Building
- Building Storey
- Space
- Door
- Pump
- System.

IFC notation has been used as the primary base schema as many purposes will be covered not just those for maintenance and operations. The COBie sub-schema can still be obtained through this.

Note, additional classifications can be used to apply the net level of granularity to the object structure. It is advisable to start with industry standard taxonomies (grouped lists of information) to reduce the need for mapping (which is a more sustainable approach).

[6] Refer back to the “How to read and understand these examples” section for an explanation of these tables in specifying information details


[7] This is likely to be just a sub-section of structured information requirement

#### Object – Geometrical Information

In this example, no geometrical information is required to fulfil the requirements of the COBie 2.4 spreadsheet deliverable so there is no corresponding table for item 1 in Table A.6A.

#### Object – Alphanumerical Information

Table A.7 shows **some** of the IFC attributes and properties considered for each object listed in A.1.2.2.3. A tick indicates information to be provided and stating n/a is good practice to confirm information that is not required. Note that there is a minimum number of fields which are mandatory in COBie and must be delivered regardless. This example only shows some of these mandatory fields. In addition, AcousticRating is not defined as part of the COBie schema and is an additional property captured in the Attribute tab.



In the database example Table A.7 has been replaced with metadata Table A.9 to enable appointment specific views to be created and forms part of the alphanumerical information. However, the thinking in Table A.7 is still required before Table A.9 can be created.

[ACCESS EXAMPLE DATABASE](#)

Table A.7: Alphanumerical details for item 1 in maintenance and repairs EIR (Operational)

Object (Asset)	Name (Occurrence/Component)	Name (Type)	NominalHeight	Manufacturer	ModelLabel	InstallationDate	AcousticRating
Project	✓	n/a	n/a	n/a	n/a	n/a	n/a
Building	✓	n/a	n/a	n/a	n/a	n/a	n/a
Building Storey	✓	n/a	n/a	n/a	n/a	n/a	n/a
Space	✓	n/a	n/a	n/a	n/a	n/a	n/a
Door	✓	✓	✓	✓	✓	✓	✓
Pump	✓	✓	✓	✓	✓	✓	n/a
System	✓	n/a	n/a	n/a	n/a	n/a	n/a

Object – Documentation information

To delve into greater granularity than that shown in Table A.6B unstructured information can be assigned to objects, this enables the party specifying which asset requires what documentation.

Schemas such as IFC and COBie enable documents to be associated to objects therefore supporting Organization X's requirements as indicated in Table A.8.



In the database example, Table A.8 forms part of the documentation information tables.

[ACCESS EXAMPLE DATABASE](#)

Table A.8: Documentation details for item 2 in maintenance and repairs EIR (Operational)


Object (Asset)	DocumentName	DocumentCategory (based on Uniclass 2015)	DocumentDescription
Project	✓	PM_60_60_15: Contact information	✓
Building	✓	PM_80: Asset management information	✓
Building Storey	✓	PM_70_90_04: Architectural record drawings	✓
Door	✓	PM_70_85_52: Manufacturer information	✓
Pump	✓	PM_70_85_52: Manufacturer information PM_70_85_55: Operating instruction PM_70_90_52: Mechanical systems record information	✓
Space	n/a	n/a	n/a

Note, tick = required

Note, more objects (assets) would be included

Metadata (value type and units) for alphanumeric information

Organization X has reflected on Table A.7 and has determined that value types and units are as shown in Table A.9. They have also provided example values to indicate the nature of the expected content.

In the database example, Table A.9 forms part of the alphanumeric information tables.

[ACCESS EXAMPLE DATABASE](#)

Table A.9: Metadata for alphanumeric information

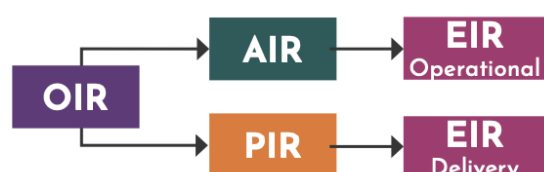
Object and Attribute/ Property	Metadata(1) e.g. data type	Metadata(2) e.g. units	Metadata(3) e.g. example value	Metadata(4) e.g. placeholder value
Project.Name	Alphanumeric	n/a	See information standard for value	No placeholder allowed
Building.Name	Alphanumeric	n/a	See information standard for value	No placeholder allowed
BuildingStorey.Name	Alphanumeric	n/a	See information standard for value	No placeholder allowed
Space.Name	Alphanumeric	n/a	See information standard for value	No placeholder allowed
DoorStyle.Name	Alphanumeric	n/a	See information standard for value	No placeholder allowed
DoorStyle/ NominalHeight]	Numeric	mm*	1000	0
Door.Name	Alphanumeric	n/a	See information standard for value	No placeholder allowed
Door/InstallationDate]	Alphanumeric	n/a	2020-03- 23T1700:00:00	1900-12-31T23:59:59
Door/AcousticRating]	Alphanumeric	dB	35	n/a
PumpType.Name	Alphanumeric	n/a	See information standard for value	No placeholder allowed
PumpType/ NominalHeight]	Numeric	mm*	1000	0
Pump.Name	Alphanumeric	n/a	See information standard for value	No placeholder allowed
Pump/InstallationDate]	Alphanumeric	n/a	2020-03- 23T1700:00:00	1900-12-31T23:59:59

*Note that the metadata (units) for Type.NominalHeight is shown as mm here but in the COBie schema this would be conveyed in the Facility.LinearUnits field. When using standard schemas some of this information will be documented therefore this may only be necessary for properties which sit outside industry standard schema.*

A.2.4.3 Transferring to exchange information requirements (delivery)

The EIR (Operational) set out above could be used during asset/facility management to bring existing assets/facilities into line with the OIR in A.2.1. Whenever a new delivery phase project is set up then these EIR (Operational) will be handed to the project team included in the EIR (Delivery).

A.3 Example addressing environmental management



### A.3.1 Organizational information requirements

#### OIR

Organization X has formulated its environmental policies and has established the following organizational information requirements (OIR).

1. Reduce energy consumption by 50% by 2030, relative to 2015 levels
2. Show reduced levels of embedded carbon/m<sup>3</sup> for all new developments
3. Provide evidence of sustainable materials sourcing for all new developments.

### A.3.2 Asset information requirements

#### AIR

Organization X has reviewed its OIR and has established the following three AIR as a result.

1. All new built assets must achieve an EPC 'A' rating
2. All new assets are to have an embedded carbon value which is lower than the corporately defined value for that asset type
3. All wood used must be from sustainable sources

### A.3.3 Project information requirements

#### PIR

Organization X has reviewed its environmental management policies. There are no PIR directly coming from the environmental policy or the carbon policy since these have already been covered in its OIR and its AIR.

However, there is an aspect of its strategic brief that supports localized workforces on projects and minimizing travel distances to work for its contractors. Organization X has established a PIR as a result of this.

- **Strategic brief:** 80% of the sub-contractors will be based within a 30-mile radius of the site
  1. Evidence required at information delivery milestones 4, 5 and 6 concerning the location of sub-contractor businesses

### A.3.4 Exchange information requirements

#### EIR

#### A.3.4.1 Purposes

Organization X has reviewed its AIR and PIR related to environmental management and has determined the EIR (Operational) and EIR (Delivery) and associated information purposes. These are presented in Table A.10 and A.12.

**Table A.10: EIR (Operational) summaries and purposes for environmental management**

AIR	EIR (Operational)	Information purpose - to support:
1. All new built assets must achieve an EPC 'A' rating	Evidence needs to be provided at each information delivery milestone during a new build project, to prove that the proposed design/construction meets this target for regulated in-use energy consumption.	<ul style="list-style-type: none"> <li>Regulatory sign-off</li> <li>Organizations carbon footprint agenda</li> </ul>
2. All new assets are to have an embodied carbon value which is lower than the corporately defined value for that asset type	Each new asset's proposed/ actual embodied carbon to be compared to the corporate benchmark at each information delivery milestone during a new build project.	<ul style="list-style-type: none"> <li>Organizations carbon footprint agenda</li> </ul>
3. All wood used must be from sustainable sources	Certification that the project is FSC compliant is needed at handover for each new asset.	<ul style="list-style-type: none"> <li>Organizations sustainability agenda</li> </ul>

Organization X can now consolidate the purposes, identify information delivery milestones and the type of party that will provide the required information for EIR arising from AIR and PIR. These are given in Table A.11 and A.13.

**Table A.11: Prerequisites for environmental management EIR based on AIR**

Information is required to meet these purposes - to support:	<ul style="list-style-type: none"> <li>Regulatory sign-off</li> <li>Organizations carbon footprint agenda</li> <li>Organizations sustainability agenda</li> </ul>
Information specifier/receiver Information provider	Organization X's Safety, Health & Environment Department  The design team or the main contractor for a new build project
Information delivery milestones	Regulated energy consumption information is required for each project key decision point, including handover)  Embodied carbon information is required for each project key decision point, including handover)  FSC certification compliance is required at project handover

**Table A.12: EIR (Delivery) summaries and purposes for environmental management**

PIR	EIR	Information purpose - to support:
1. Evidence required at information delivery milestones 4, 5 and 6 concerning the location of sub-contractor businesses	Reports on the locations of sub-contractors working on a new build project, required at information delivery milestones 4, 5 and 6.	<ul style="list-style-type: none"> <li>Organizations sustainability agenda</li> </ul>

**Table A.13: Prerequisites for environmental management EIR based on PIR only**

Information is required to meet these purposes - to support:	<ul style="list-style-type: none"> <li>Organizations sustainability agenda</li> </ul>
Information specifier/receiver Information provider	Organization X's Safety, Health & Environment Department  Main Contractor
Information delivery milestones	Sub-contractor location report required at information delivery milestones 4, 5 & 6




A.3.4.2 Specifying the detail for EIR (Operational)

This is the section where the content of the EIR (Operational) is developed in terms of the presentation of information and the content breakdown of the information.

A.3.4.2.1 Presentation and content

Organization X now needs to consider the overall content, form and format of the information (i.e. how the information is to be presented and encoded). In this example this is done with reference to Uniclass 2015. Consideration is therefore given to components shown in Table A.11 of energy consumption information, embodied carbon information and FSC compliance information.

Based on this consideration, Organization X has decided that it needs to receive the types of information listed in Table A.14. Table A.14 also includes content requirements that Organization X has identified are beyond what a typical information provider (in this case the project design team or main contractor) might be expecting.



In the database example, Table A.14 forms part of the information presentation tables.

[ACCESS EXAMPLE DATABASE](#)

Table A.14: Presentation details for EIR (Operational) environmental management

Item	Content summary (based on Uniclass 2015)	Form (based on Uniclass 2015)	Format	Information exchange date	Plain language description	Content comments
Unstructured information						
1	• PM_XX_XX_XX: Energy analysis information	FI_90_72: Report	PDF	At each information delivery milestone	Energy report	EPC value to be included
2	• PM_80_10_25: Energy performance certificate	FI_90_13: Certificate	PDF	At handover	EPC certificate	For delivery team to determine
3	• PM_30_30_10: Carbon calculation information	FI_90_72: Report	PDF	At handover	Carbon report	Embodied carbon values for all new assets
4	• PM_70_15: Compliance and certification information	FI_90_13: Certificate	PDF	At handover	FSA certificate	For delivery team to determine

Note, there is no structured information required

A.3.4.2.2 Content breakdown – structured information

In this example, there is no content breakdown for structured information since the items in Table A.11 are all unstructured information.

A.3.4.3 Specifying the detail for EIR (Delivery)

This is the section where the content of the EIR (Delivery) is developed in terms of the presentation of information and the content breakdown of the information.

A.3.4.3.1 Presentation and content

Organization X now needs to consider the overall content, form and format of the information (i.e. how the information is to be presented and encoded). In this example this is done with reference to Uniclass 2015. Consideration is therefore given to components shown in Table A.12 of sub-contractor location report. Based on this, Organization X has decided that it needs to receive the type of information

listed in Table A.15. Table A.15 also includes content requirements that Organization X has identified are beyond what a typical information provider (in this case the project design team or main contractor) might be expecting.





In the database example, Table A.15 forms part of the information presentation tables.

ACCESS EXAMPLE DATABASE

Table A.15: Presentation details for environmental management EIR based on PIR

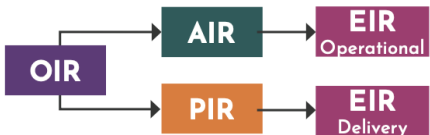
Item	Content summary (based on Uniclass 2015)	Form (based on Uniclass 2015)	Format	Information exchange date	Plain language description	Content comments
Unstructured information						
1	PM_60_60_15: Contacts information	Report	PDF	At information delivery milestones 4, 5 and 6	Sub-contractor travel report	Evidence to be provided showing the distance between each sub-contractors base and the site together with calculations showing this exceeds 80%

Note, there is no structured information required

A.3.4.3.2 Content Breakdown – structured information

In this example, there is no content breakdown for structured information since the item in Table A.15 is unstructured information.

A.4 Example addressing asset operations



A.4.1 Organizational information requirements

OIR

Organization X has reviewed its range of business operations tasks around operating its assets and has identified the following OIR as a result.

- **Business operations task:** Insurance renewal
  1. Confirmation of renewal of buildings and contents insurance

A.4.2 Asset information requirements

AIR

Organization X has reviewed its OIR and has established the following asset information requirements (AIR) as a result:

1. Information required to review buildings and contents

A.4.2.1 Identifying information purposes

Organization X has reviewed its OIR and has determined the AIR and associated information purposes as presented in Table A.16.

A.4.3 Project information requirements

PIR

Organization X has reviewed its asset operations activities. There are no PIR directly coming from the business operations tasks since these have already been covered in its OIR and its AIR.

However, there is an aspect of its project business plan related to a maximum value for operational energy costs of any new- build asset. Organization X has established a PIR as a result of this.

- Project business plan: The operational energy costs of the facility should be no more than £X per year per
  1. Annual running costs per m² to be estimated at information delivery milestones 2, 3 and 4 during design.

A.4.4 Exchange information requirements

EIR

A.4.4.1 Purposes

Organization X has reviewed its AIR and PIR related to asset operations and has determined the EIR (Operational) and EIR (Delivery), and associated information purposes. These are presented in Table A.16 and A.18

Table A.16: EIR (Operational) summaries and purposes for asset operations

AIR	EIR (Operational)	Information purpose - to support:
1. Information required to renew buildings and contents insurance	Provide total Gross Internal Area (GIA) and number of storeys for each built asset in the estate	<ul style="list-style-type: none"><li>o Insurance renewal</li></ul>

Organization X can now identify the information delivery milestones and the type of party that will provide the required information. These are given in Table A.17

Table A.17: Prerequisites for asset operations EIR based on AIR

Information is required to meet these purposes - to support:	<ul style="list-style-type: none"><li>• Insurance renewal</li></ul>
Information specifier/receiver Information provider	Organization X’s Estates Department Estate surveyor or main contractor in the case of a new-build project
Information delivery milestones	GIA and number of storeys required at handover for any new-build project, and on completion of any construction works carried out on an asset during its operational life

Table A.18: EIR (Delivery) summaries and purposes for asset operations

PIR	EIR	Information purpose - to support:
1. Annual running costs per m2 to be estimated at information delivery milestones 2, 3 and 4 during design.	Provide estimate of annual running costs per m2 at the precision appropriate to the design state, for information delivery milestones 2, 3 and 4.	<ul style="list-style-type: none"><li>o Operational costing</li></ul>

Table A.19: Prerequisites for asset operations EIR based on PIR

Information is required to meet these purposes - to support:	<ul style="list-style-type: none"> <li>Operational costing</li> </ul>
Information specifier/receiver Information provider	Organization X's Operations Department Building services design consultant
Information delivery milestones	Operational energy calculations presented as £/m2, at information delivery milestones 2, 3 and 4.


A.4.4.2 Specifying the detail for EIR (Operational)



This is the section where the content of the AIR is developed in terms of the presentation of information and the content breakdown of the information. The tables in this sub-section should be developed together as they will inform each other and cross-refer.

A.4.4.2.1 Presentation

Organization X now needs to consider the overall content, form and format of the information (i.e. how the information is to be presented and encoded). In this example, this is done with reference to Uniclass 2015. Consideration is therefore given to components shown in Table A.16 of gross internal area and number of storeys. Based on this consideration, Organization X has decided that it needs to receive the types of information listed in Table A.20. As all the information is structured, there is no need to split the table into structured and unstructured parts.



In the database example, Table A.20 forms part of the information presentation tables.

[ACCESS EXAMPLE DATABASE](#)

Table A.20: Presentation details EIR (Operational) for asset operation

Item	Content summary (based on Uniclass 2015)	Form (based on Uniclass 2015)	Format	Information exchange date	Plain language description
Structured information					
1	PM_80: Asset management information <ul style="list-style-type: none"> <li>Asset register</li> </ul>	FI_30_40: Information Exchange	XLSX	At completion of construction works	COBie spreadsheet based on the COBie 2.4 schema

Note, there is no unstructured information required

A.4.4.2.2 Content breakdown – structured information

Organization X will now detail the exact contents of structured information using up to four tables to define object information and metadata [8]. In this example there is only item 1 in Table A.20. For the purpose of illustration, consideration has been given to structured information in respect only of the following [9] and in reference to IFC 2x3 notation:


- Building
- Building Storey
- Site

Object – Geometrical Information

In this example, no geometrical information is required to fulfil the requirements of the COBie 2.4 spreadsheet deliverable so there is no corresponding table for the item in Table A.20.

Object – Alphanumerical Information

Table A.21 shows **some** of the IFC attributes and properties considered for each object listed in A.4.4.2.2. A tick indicates information is to be provided and stating n/a is good practice to confirm that information is not required. Note that there is a minimum number of fields that are mandatory in COBie and must be delivered regardless. This example only shows some of these mandatory fields. In addition, GrossFloorArea is not defined as part of the COBie schema and is an additional property captured in the Attribute tab.



In the database example Table A.21 has been replaced with metadata Table A.22 to enable appointment specific views to be created and forms part of the alphanumerical information. However the thinking in Table A.21 is still required before Table A.22 can be created.

[ACCESS EXAMPLE DATABASE](#)

[8] Refer back to the “How to read and understand these examples” section for an explanation of these tables in specifying information details

[9] This is likely to be just a sub-section of structured information requirements

**Table A.21: Alphanumerical details for item 1 in EIR (Operational) for asset operations**


Object (Asset)	Name	Description	ClassificationReference. ItemReference	ClassificationReference. Name	GrossFloorArea
Building	✓	✓	✓	✓	✓
Building Storey	✓	n/a	n/a	n/a	n/a
Site	✓	✓	n/a	n/a	n/a

**Object – Documentation information**

In this example, no documentation information is required so there is no corresponding table for item 1 in Table A.20.

**Metadata alphanumerical information**

Organization X has reflected on Table A.20 and has determined that value types and units are as shown in Table A.19. They have also provided example values to indicate the nature of the expected content.



In the database example, Table A.22 forms part of the alphanumerical information tables.

[ACCESS EXAMPLE DATABASE](#)

**Table A.22: Metadata for alphanumerical information**


Object and Attribute/ Property	Metadata(1) e.g. data type	Metadata(2) e.g. units	Metadata(3) e.g. example value	Metadata(4) e.g. placeholder value
Building.Name	Alphanumeric	n/a	See information standard for value	No placeholder allowed
Building.Description	Alphanumeric	n/a	See information standard for value	No placeholder allowed
Site.Name	Alphanumeric	n/a	See information standard for value	No placeholder allowed
Site.Description	Numeric	mm	See information standard for value	No placeholder allowed
Building. ClassificationReference. ItemReference	Alphanumeric	n/a	See information standard for value	No placeholder allowed
Building. ClassificationReference. Name	Alphanumeric	n/a	See information standard for value	No placeholder allowed
BuildingStorey.Name	Alphanumeric	n/a	2020-03- 23T1700:00:00	1900-12-31T23:59:59
Building [GrossFloorArea]	Numeric	m <sup>2</sup>	10000	No placeholder allowed

#### A.4.4.3 Specifying the detail for EIR (Delivery)

This is the section where the content of the EIR (Delivery) is developed in terms of the presentation of information and the content breakdown of the information.

##### A.4.4.3.1 Presentation and content

Organization X now needs to consider the overall content, form and format of the information (i.e. how the information is to be presented and encoded). In this example, this is done with reference to Uniclass 2015. Consideration is therefore given to components shown in Table A.19 of operational energy calculations. Based on this, Organization X has decided that it needs to receive the type of information listed in Table A.23. Table A.23 also includes content requirements that Organization X has identified are beyond what a typical information provider (in this case the project design team or main contractor) might be expecting.



In the database example, Table A.23 forms part of the information presentation tables.

[ACCESS EXAMPLE DATABASE](#)

Table A.23: Presentation details for asset operations EIR based on PIR

Item	Content summary (based on Uniclass 2015)	Form (based on Uniclass 2015)	Format	Information exchange date	Plain language description	Content comments
Unstructured information						
1	PM_80_30_90: Utilities cost information	Report	PDF	At information delivery milestones 2, 3 and 4	Utilities cost report	To contain - Energy usage of equipment, walls, roof and floor U-values, whole facility monthly energy cost, whole facility annual energy cost

Note, there is no structured information required

## A.5 Example addressing capital investment and lifecycle costing



### A.5.1 Organizational information requirements

#### OIR

Organization X has reviewed its range of business operations tasks around its capital investment and lifecycle costing activities and has identified the following two OIR as a result.

- **Business operations:** Strategic Asset Management
  1. Management accounts to include actual expenditure and full year forecasts across revenue and project budgets.
- **Business operations:** Purchasing of specialist equipment.
  1. Specialist equipment to be purchased by departments and accounted within departmental accounts.

### A.5.2 Asset information requirements

#### AIR

Organization X has reviewed each of the OIR in respect of its capital investment and lifecycle costing and has established the following AIR.

- **Business operations task:** Strategic Asset Management Portfolio
  1. Financial actuals, full year and full project forecasts to be delivered monthly
- **Business operations task:** Purchasing of specialist equipment
  1. The purchasing of specialist equipment will be conducted by the estates department and form part of corporate reporting

### A.5.3 Project information requirements

#### PIR

Organization X has reviewed its capital investment and lifecycle costing activities. There are no PIR directly coming from the business operations tasks since these have already been covered in its OIR and its AIR.

However, there is a project task and some aspects of its project business plan related to the negotiation of funding for a new project, the financial revenue generated by any new-build asset and the investment target for any new-build asset. Organization X has established three PIR as a result of this.

- **Project task:** Secure funding from lenders
  1. Area/occupancy information and visualizations required at key decision points 1 and 2 to demonstrate to lenders what the facility will look like to support the business case for development
- **Project business plan:** The facility will need to generate £X turnover in the first year
  1. Area/occupancy information of retail departments and benchmark sales figures per m2 to be provided at key decisions 1 and 2
- **Project business plan:** The investment target will be between £X-£Y
  1. Project cost information to be provided at each key decision point.

### A.5.4 Exchange information requirements

#### EIR

#### A.5.4.1 Purposes

Organization X has reviewed its AIR and PIR related to capital investment and lifecycle costing and has determined the EIR (Operational) and EIR (Delivery), and associated information purposes. These are presented in Tables A.24 and 26.



**Table A.24: EIR (Operational) summaries and purposes for capital investment and lifecycle costing**

AIR	EIR (Operational)	Information purpose - to support:
1. Financial actuals, full year and full project forecasts to be delivered monthly	Monthly financial Information to include capital investment, actual operating costs, life expectancy forecasts.	<ul style="list-style-type: none"> <li>o Cost forecasting</li> <li>o Operational costs</li> </ul>
2. The purchasing of specialist equipment will be conducted by the estates department and form part of corporate reporting	Accurate schedules of all specialist equipment to be installed in new-build projects and to replace existing equipment are needed for the estates department to order the correct quantities	<ul style="list-style-type: none"> <li>o Procurement of goods</li> </ul>

Organization X can now identify the information delivery milestones and the type of party that will provide the required information. These are shown in Table A.25.

**Table A.25: Prerequisites for capital investment and lifecycle costing for EIR based on AIR**

Information is required to meet these purposes - to support:	<ul style="list-style-type: none"> <li>• Cost forecasting</li> <li>• Operational costs</li> <li>• Procurement of goods</li> </ul>
Information specifier/receiver Information provider	<p>Organization X's Finance Department (for finance information) and Estates Department (for equipment schedules)</p> <p>New-build main contractor or Estates Department (for finance information) and new-build design team (for equipment schedules)</p>
Information delivery milestones	<p>Finance information is required monthly</p> <p>Equipment schedules are required eight weeks before the start of construction (stage 5) on a new-build project</p>

**Table A.26: EIR (Delivery) summaries and purposes for capital investment and lifecycle costing**

PIR	EIR (Delivery)	Information purpose - to support:
1. Area/occupancy information and visualizations required at key decisions 1 and 2 to demonstrate to lenders what the facility will look like to support the business case for development	High level rendered images and report with space areas, space occupancy levels and total occupancy levels for information delivery milestones 1 and 2	<ul style="list-style-type: none"> <li>• Funding negotiation</li> </ul>
2. Area/occupancy information of retail departments/units and benchmark sales figures per m2 to be provided at key decisions 1 and 2	Schedule of proposed retail departments/units for the lettings department to add benchmark sales figures to each space at information delivery milestones 1 and 2	<ul style="list-style-type: none"> <li>• Financial sales forecasting</li> </ul>
3. Project cost information to be provided at each key decision point	Capital project cost reports to be provided at each information delivery milestone	<ul style="list-style-type: none"> <li>• Cost estimating and cash flow forecasting</li> </ul>

**Table A.27: Prerequisites for capital investment and lifecycle costing EIR based on PIR**

Information is required to meet these purposes - to support:	<ul style="list-style-type: none"> <li>• Funding negotiation</li> <li>• Financial sales forecasting</li> <li>• Cost estimating and cash flow forecasting</li> </ul>
Information specifier/receiver Information provider	Organization X's Finance Department  Architectural design team (rendered images and retail space schedule) and cost consultant (cost estimates and cash flows)
Information delivery milestones	Rendered images and space schedule at information delivery milestones 1 and 2.  Cost estimates and cash flow forecasts at information delivery milestones 1 to 6.

#### A.5.4.2 Specifying the detail for EIR (Operational)

This is the section where the content of the EIR (Operational) is developed in terms of the presentation of information and the content breakdown of the information. The tables in this sub-section should be developed together as they will inform each other and cross-refer.

##### A.5.4.2.1 Presentation

Organization X now needs to consider the overall content, form and format of the information (i.e. how the information is to be presented and encoded). In this example this is done with reference to Uniclass 2015. Consideration is therefore given to components shown in Table A.25 of finance information and equipment schedules. Based on this consideration, Organization X has decided what types of information it needs to receive and has also identified if this information is structured (Table A.28A) or unstructured (Table A.28B). In respect of the unstructured information, Organization X has also identified content requirements where these are beyond what a typical information provider might be expecting.



In the database example, Tables A.26 form part of the information presentation tables.

[ACCESS EXAMPLE DATABASE](#)

**Table A.28A: Presentation details for structured information for capital investment and lifecycle costing EIR (Operational)**

Item	Content summary (based on Uniclass 2015)	Form (based on Uniclass 2015)	Format	Information exchange date	Plain language description
Structured information					
1	PM_60_50_58: Order information	FI_90_75: Schedule or table	XLSX	Eight weeks before start of construction	Specialist equipment schedule

**Table A.28B: Presentation details and content comments for unstructured information for capital investment and lifecycle costing EIR (Operational)**

Item	Content summary (based on Uniclass 2015)	Form (based on Uniclass 2015)	Format	Information exchange date	Plain language description	Content comments
Unstructured information						
2	PM_60_50_25: Cost forecast information	FI_90_72: Report	PDF	Monthly	Cost plan	For delivery team to determine
3	PM_80_30_63: Operational cost information	FI_90_72: Report	PDF	Monthly	Operational cost plan	To also include equipment life expectancy forecasts (updated annually)

A.5.4.2.2 Content breakdown – structured information

Organization X will now detail the exact contents of structured information using up to four tables to define object information and metadata [10]. In this example there is only item 1 in Table A.28A. For the purpose of illustration, consideration has been given to structured information in respect only of the following [11]: and in reference to IFC 2x3 notation:

- Electric Appliance
- Medical Device


Object – Geometrical Information

In this example, no geometrical information is required so there is no corresponding table for item 1 in Table A.28A.

Object – Alphanumerical Information

Table A.29 shows the IFC attributes and properties required for each object listed in

A.5.4.2.2. A tick indicates information is to be provided and stating n/a is good practice to confirm that information is not required.



In the database example Table A.29 has been replaced with metadata Table A.30 to enable appointment specific views to be created and forms part of the alphanumerical information. However the thinking in Table A.29 is still required before Table A.30 can be created.

[ACCESS EXAMPLE DATABASE](#)

[10] Refer back to the “How to read and understand these examples” section for an explanation of these tables in specifying information details

[11] This is likely to be just a sub-section of structured information requirements

Table A.29: Alphanumerical details for item 1 in capital investment and lifecycle costing EIR (Operational)


Object (Asset)	Name (Occurrence/Component)	Description (Occurrence/Component)	Manufacturer	ModelLabel	ModelReference
ElectricAppliance	✓	✓	✓	✓	✓
MedicalDevice	✓	✓	✓	✓	✓

Object – Documentation information

In this example, no documentation information is required so there is no corresponding table for item 1 in Table A.28A.

Metadata (value type and units) for alphanumerical information

Organization X has reflected on Table A.29 and has determined that value types and units are as shown in Table A.30. They have also provided example values to indicate the nature of the expected content.



In the database example, Table A.30 forms part of the alphanumerical information tables.

[ACCESS EXAMPLE DATABASE](#)

Table A.30: Metadata for alphanumerical information


Object and Attribute/Property	Metadata(1) e.g. data type	Metadata(2) e.g. units	Metadata(3) e.g. example value
ElectricAppliance.Name	Alphanumeric	n/a	See information standard for value
ElectricAppliance.Description	Alphanumeric	n/a	Vacuum station
ElectricApplianceType [Manufacturer]	Alphanumeric	n/a	ABC@Manufacturer.com
ElectricApplianceType [ModelLabel]	Alphanumeric	n/a	MXC7564
ElectricApplianceType [ModelReference]	Alphanumeric	n/a	(Catalogue number)
MedicalDevice.Name	Alphanumeric	n/a	See information standard for value
MedicalDevice.Description	Alphanumeric	n/a	Vacuum station
MedicalDevice [Manufacturer]	Alphanumeric	n/a	ABC@Manufacturer.com
MedicalDevice [ModelLabel]	Alphanumeric	n/a	MXC7564
MedicalDevice [ModelReference]	Alphanumeric	n/a	(Catalogue number)

A.5.4.3 Specifying the detail for EIR (Delivery)

This is the section where the content of the EIR is developed in terms of the presentation of information and the content breakdown of the information.

A.5.4.3.1 Presentation and content

Organization X now needs to consider the overall content, form and format of the information (i.e. how the information is to be presented and encoded). In this example, this is done with reference to Uniclass 2015. Consideration is therefore given to components shown in Table A.27 of rendered images, space schedules, cost estimates and cash flow forecasts. Based on this, Organization X has decided that it needs to receive the type of information listed in Table A.31. Table A.31 also includes content requirements that Organization X has identified are beyond what a typical information provider (in this case the project design team or main contractor) might be expecting.



In the database example, Table A.31 forms part of the information presentation tables.

[ACCESS EXAMPLE DATABASE](#)

Table A.31: Presentation details for capital investment and lifecycle costing EIR based on PIR

Item	Content summary (based on Uniclass 2015)	Form (based on Uniclass 2015)	Format	Information exchange date	Plain language description	Content comments
Unstructured information						
1	PM_40_30_62: Photorealistic visualization information	FI_60_95: Visualization	JPEG	At information delivery milestones 1 and 2	Visualization imagery	External views from all vantage points approaching the store.  Internal views of premium stock areas and cafe
2	PM_10_80_75: Space design information	FI_90_75: Schedule or table	PDF	At information delivery milestones 1 and 2	Schedule of accommodation	To include max and min occupancy levels
3	PM_10_80_75: Space design information	FI_60_25: Drawing rendition	PDF	At information delivery milestones 1 and 2	Departmental layout drawings	Coloured area plans of each department
4	PM_60_50_23: Cost estimate information	FI_90_72: Report	PDF	At information delivery milestones 1 to 6	Project cost forecast report	For delivery team to determine

Note, there is no structured information required

#### A.5.4.3.2 Content breakdown – structured information

In this example, there is no content breakdown for structured information since the items in Table A.31 are all unstructured information.

## A.6 Example for lead appointed party EIR (Delivery) related to logistics planning

A lead appointed party cascades the appropriate EIR (Delivery) received from the appointing party down to the appointed parties in their delivery team. Each appointed party should only receive EIR relevant to their work in the delivery team. While doing this, the lead appointed party can add some of their own EIR as necessary for each appointed party. This is in line with ISO 19650-2 clause 5.4.3. You will notice in the EIR database this information is only present in the lead appointed party views

### A.6.1 Purposes

In this example, the main contractor is a lead appointed party on one of Organization X's projects. The project is using offsite manufactured components and the main contractor has identified a specific information requirement for them to receive information in relation to how these components are lifted on site. The lead appointed party has identified the EIR (Delivery) and the information purpose as shown in Table A.32.

**Table A.32: Lead appointed party EIR (Delivery) summaries and purposes for offsite component lifting**

Information requirement	EIR (Delivery)	Information purpose - to support:
Information to show how the lifting of offsite manufactured components can be conducted safely	Time sequencing analysis of component delivery and installation to feed into the project programme and the site logistics plan.  Manufacturer information concerning offsite components	<ul style="list-style-type: none"> <li>Simulation</li> </ul>

The main contractor can now consolidate the purposes, identify information delivery milestones and the type of party that will provide the required information, for these lead appointed party EIR. These are given in Table A.33.

**Table A.33: Prerequisites for lead appointed party EIR (Delivery) relating to offsite manufactured components**



Information is required to meet these purposes - to support:	o Simulation
Information specifier/receiver Information provider	Main contractor's Design Manager Design consultant responsible for offsite components + manufacturer of the components
Information delivery milestones	Time sequence of delivery and installation, and manufacturer information required during work stage 4

### A.6.2 Specifying the detail

This is the section where the content of the EIR is developed in terms of the presentation of information and the content breakdown of the information.

#### A.6.2.1 Presentation and content

The main contractor now needs to consider the overall content, form and format of the information (i.e. how the information is to be presented and encoded). In this example this is done with reference to Uniclass 2015. Consideration is therefore given to components shown in Table A.33 of time sequence of delivery and installation of components. Based on this, the main contractor has decided what types of information it needs to receive and has also identified if this information is structured (Table A.34A) or unstructured (Table A.34B). In respect of the unstructured information, the main contractor has also considered content requirements where these are beyond what a typical information provider might be expecting but none are specified in this example.

 In the database example, Tables A.34 form part of the lead appointed party information presentation table.  
[ACCESS EXAMPLE DATABASE](#)

**Table A.34A: Presentation details for structured information for lead appointed party EIR (Delivery) relating to offsite manufactured components**

Item	Content summary (based on Uniclass 2015)	Form (based on Uniclass 2015)	Format	Information exchange date	Plain language description
<b>Structured information</b>					
1	<ul style="list-style-type: none"> <li>PM_XX_XX_XX: Sequencing</li> <li>PM_60_70_17: Construction phase health and safety information</li> </ul>	FI_60_50: Model rendition	IFC-SPF	Six weeks before the end of work stage 4	IFC model IFC2x3 (no official MVD) use Coordination View 2.0

**Table A.34B: Presentation and content details for unstructured information for lead appointed party EIR (Delivery) relating to offsite manufactured components**

Item	Content summary (based on Uniclass 2015)	Form (based on Uniclass 2015)	Format	Information exchange date	Plain language description	Content comments
<b>Unstructured information</b>						
2	PM_70_85_52: Manufacturer information	FI_90_21: Data sheet	PDF	YYMMDD	Product data sheet	For delivery team to determine



A.6.2.2 Content breakdown – structured information

The main contractor will now detail the exact contents of structured information using up to four tables to define object information and metadata [12]. In this example there is only item 1 in Table A.34A. For the purpose of illustration, consideration has been given to structured information in respect only of the following [13] and in reference to IFC 2x3 notation:

- Element Assembly

Object – Geometrical Information

In this table all the objects which are required to be federated to enable the time sequencing analysis to take place would need to be listed. For the purposes of this example, only the objects which are significant have been listed.



In the database example, Table A.35 forms part of the lead appointed party geometrical information table.

[ACCESS EXAMPLE DATABASE](#)

[12] Refer back to the “How to read and understand these examples” section for an explanation of these tables in specifying information details

[13] This is likely to be just a sub-section of structured information requirements


Table A.35: Geometrical details for item 1 in lead appointed party EIR (Delivery) relating to offsite manufactured components

Object (Asset)	Detail	Dimensionality	Location	Appearance	Parametric Behaviour
ElementAssembly	Simplified/generic detail, accurate dimensions. Each component to show lifting hooks (DiscreteAccessory) in the following positions: <ul style="list-style-type: none"><li>• HookPosition X,</li><li>• HookPosition Y</li><li>• CenterOfMass X</li><li>• CenterOfMass Y</li></ul>	3D	Absolute to real world coordinates	Colour of the material	n/a

Note, further information about the date can be added, as different objects may be required at different times

Object – Alphanumerical Information

Table A.36 shows the fields/parameters required for each object listed in A.6.2.2. A tick indicates information is to be provided and stating n/a is good practice to confirm that information is not required.




In the database example Table A.36 has been replaced with metadata Table A.38 to enable appointment specific views to be created and forms part of the alphanumerical information. However the thinking in Table A.36 is still required before Table A.38 can be created.

[ACCESS EXAMPLE DATABASE](#)

Table A.36: Alphanumerical details for item 1 in lead appointed party EIR (Delivery) relating to offsite manufactured components

Object (Asset)	MaximumWeightPerHook	ElementWeight
ElementAssembly	✓	✓

Object – Documentation information



In the database example, Table A.37 forms part of the lead appointed party documentation information table.

[ACCESS EXAMPLE DATABASE](#)

Table A.37: Alphanumerical details for item 1 in lead appointed party EIR (Delivery) relating to offsite manufactured components


Object (Asset)	MaximumWeightPerHook	ElementWeight
ElementAssembly	✓	✓

Note, tick = required

Note, further information about the date can be added, as different document information for different objects may be required at different times

Metadata (value type and units) for alphanumerical information

Organization X has reflected on Table A.36 and has determined that value types and units are as shown in Table A.25. They have also provided example values to indicate the nature of the expected content.



In the database example, Table A.38 forms part of the lead appointed party alphanumerical information table.

[ACCESS EXAMPLE DATABASE](#)

Table A.38: Metadata for alphanumerical information

Object and Attribute/ Property	Metadata(1) e.g. data type	Metadata(2) e.g. units	Metadata(3) e.g. example value	Metadata(4) e.g. placeholder value
ElementAssembly .MaximumWeightPerHook	Numeric	kg	10000	No placeholder allowed
ElementAssembly .ElementWeight	Numeric	kg	8000	No placeholder allowed

## Annex B - Health and safety based examples of developing information requirements

The examples here are to demonstrate what information requirements could look like in the context of four different health and safety based scenarios. As with Annex A, the intention of these examples is to explain the concept of how information requirements are developed progressively starting off with establishing information purposes by considering an organization's policies.

The examples support the guidance provided in the main section of this document. Please read them in conjunction with that text, not in isolation. With each scenario that is provided the example is structured into sub-sections, to explore each type of information requirement.

The information requirements themselves have been signposted to match **Figure 17** in this guidance:

OIR

Organizational information requirements (OIR)

AIR

Asset information requirements (AIR)

PIR

Project information requirements (PIR)

Exchange information requirements (EIR) for operational phase

**EIR**  
(Operational)

**EIR**  
(Delivery)

Exchange information requirements (EIR) for delivery phase

There is a commentary within the examples that summarizes the thought process and the actions of the appointing party (presented as an imaginary Organization X). For the AIR/EIR content, this process follows [Figure A.1: Flow chart for preparing the AIR or EIR](#) and considers unstructured deliverables only.

**B.1 Example addressing asbestos in buildings owned by the organization**



**B.1.1 Organizational information requirements (OIR)**

**OIR**

- Policy: To prevent exposure from asbestos

Organization X must comply with its legal responsibilities to protect people from risks related to exposure to asbestos.

OIR     The organization needs information on the location and risks from asbestos in buildings and sites owned or controlled by it, or where it has to any extent, a maintenance or repair obligation, and to demonstrate the active management of these risks.

**B.1.2 Asset information requirements (AIR)**

**AIR**

Organization X has reviewed its OIR and has identified the following AIR as a result:

AIR     All assets constructed or manufactured before the year 2000 require an up-to-date Asbestos Management Plan, Asbestos Management Survey and Asbestos Register, which collectively identify the location and condition of Asbestos-Containing Materials (ACMs) known or presumed to exist, the risk from these materials and how they will be actively managed, in buildings and sites owned or controlled by the organization. These resources shall be available digitally through the asset information model (AIM) and in hard copy.

**B.1.3 Project information requirements (PIR)**

**PIR**

Organization X has reviewed its OIR and notes the specific requirements in both the Construction (Design and Management) Regulations 2015 (CDM) and the Control of Asbestos Regulations 2012 (CAR) for all Asbestos -Containing Materials (ACMs) to be identified, risk assessed and removed or remediated as required. Where it is foreseeable that asbestos may be disturbed in the project, action must be taken.

PIR:

1. A risk study of the proposed construction work scope and how this work may be affected by any presumed or identified ACMs. The study should take information from the digital Asbestos Register (AR), Asbestos Management Plan and any relevant

Asbestos Survey and be generated as part of concept design. The findings of the risk study shall become part of the Pre-Construction Information for the Project.

- 2. An asbestos refurbishment or demolition survey prior to any construction work starting. This will be required for all areas, where work may disturb the fabric of any building built before the year 2000, in order to identify hidden or presumed ACMs.
- 3. Information that will be used to suitably plan, manage, monitor and co-ordinate asbestos risks associated with the project's construction work.
- 4. Information that confirms the compliant removal, storage and transport of asbestos to a licensed disposal site undertaken as part of the project and readiness for safe re-occupation.
- 5. A correct record of ACMs that have been removed or remediated as part of the project to update the digital AR and inform the Asbestos Management Plan.

B.1.4 Exchange information requirements



B.1.4.1 Purposes

Organization X has reviewed its AIR and PIR for health and safety compliance relating to asbestos and has determined its operational and delivery EIR and associated information purposes.

Table B.1: EIR (Operational) summaries and purposes for asbestos

AIR	EIR (Operational)	Information purpose
All assets constructed or manufactured before the year 2000 require an up-to-date Asbestos Management Plan, Asbestos Management Survey and Asbestos Register, which collectively identify the location and condition of asbestos-containing materials known or presumed to exist, the risk from these materials and how they will be managed. These resources shall be available digitally through the AIM and in hard copy.	An Asbestos Management Plan, an Asbestos Survey and an Asbestos Register as set out in CAR12 L143 (Managing and working with Asbestos), specific to the asset being maintained. This will identify all relevant risk information relating to asbestos removed in the project or at any other time, and what still remains or is presumed to remain.	To enable the asset manager to actively manage the risks associated with the presence or presumption of asbestos in the organization's buildings, assets or sites. The Asset Information Model (AIM) will be updated from the Project Information Model (PIM) (where generated).

- CAR12 L143 (Managing and working with Asbestos: <https://www.hse.gov.uk/pubns/books/l143.htm>

Table B.2: EIR (Delivery) summaries and purposes for asbestos

PIR	EIR (Delivery)	Information purpose (covering all Delivery EIR)
1. A risk study of the proposed construction work scope and how this may be affected by any presumed or identified ACMs. The study should take information from the digital Asbestos Register (AR), Asbestos Management Plan and any relevant Asbestos Survey and be generated as part of concept design.	1.1 Risk study capturing ACM risks and survey strategy. All existing surveys should be reviewed against criteria set out in HSG264. Risk study findings to be incorporated into the Pre-Construction information. 1.2 Identify gaps and update digital AR.	To enable the asbestos risks associated with the project to be suitably planned, managed, monitored and co-ordinated to achieve compliance with statutory duties. The Asset Information Model (AIM) will be updated from the Project Information Model (PIM).
2. An asbestos Refurbishment or Demolition survey prior to any construction work starting. This will be required for all areas, where work may disturb the fabric of any building built before the Year 2000, to identify hidden or presumed ACMs.	2.1 Asbestos refurbishment or demolition survey to update the digital AR. Findings from the survey to be incorporated into the Pre-Construction Information.	
3. Information that will be used to plan, manage, monitor and co-ordinate asbestos risks associated with the project's construction work.	3.1 Plan of work for the safe removal of ACMs as identified in the digital AR. 3.2 Arrangements for the unplanned discovery of ACMs 3.3 Arrangements for the active management of ACMs remaining in the asset (must include adequate measures for— (a) monitoring the condition of any asbestos or any substance containing or suspected of containing asbestos (b) ensuring that information about the location and condition of any asbestos or any such substance is— (i) provided to every person liable to disturb it, and ii) made available to the emergency services.	
4. Information that confirms the compliant removal, storage and transport of asbestos to a licensed disposal site undertaken as part of the project and confirms readiness for re-occupation.	4.1 Notification to the appropriate enforcing authority for relevant work. 4.2 Asbestos Plan of Work 4.3 Certificate of Reoccupation following licensed removal work.	
5. A correct record of ACMs that have been removed or treated as part of the project to update the digital AR and inform the Asbestos Management Plan.	5.1 Updated digital AR. 5.2 Updated Asbestos Management Plan.	

- [HSG264 \(Asbestos: The Survey Guide\)](#)

#### **B.1.4.2 Specifying the detail**

This is the section where the content of the EIR is developed in terms of the presentation and content breakdown of the information.

In this example, Organization X has considered the overall content, form and format of the structured information it needs to meet its purpose in respect to **PIR 1**:

1. A risk study of the proposed construction work scope and how this may be affected by any presumed or identified ACMs. The study should take information from the digital Asbestos Register (AR), Asbestos Management Plan and any relevant Asbestos Survey and be generated as part of concept design.

To keep this example brief, the EIRs resulting from PIRs 2 to 5 and from the AIR are not included. The two information requirements that respond to PIR 1 are to be delivered by the Principal Designer and are as follows.



**Table B.3: Detailed EIR (Delivery) for asbestos**

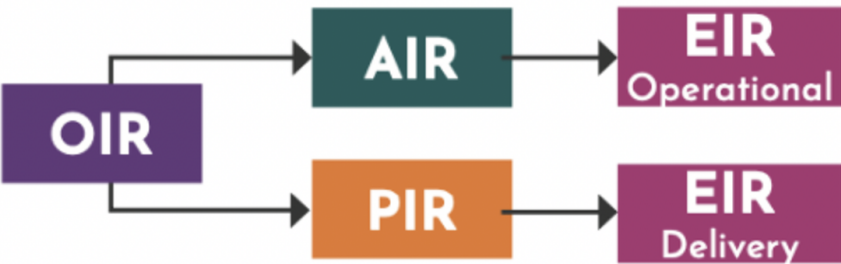
Information requirement (Delivery)	Level of information need	Acceptance criteria <sup>1</sup>	Supporting information	Key dates
Risk study capturing ACM risks and additional survey requirements	The risk study shall capture each relevant ACM risk, the likelihood of its occurrence and the potential, impact should it occur. The study shall consider the implications of the assessment for the project, identifying design and construction constraints. The risk study shall determine the asbestos risks that shall be eliminated, reduced or controlled by subsequent design and construction work. A gap analysis shall also be provided to determine the nature and extent of any additional survey work required together with the information needed to enable it to be effectively planned.	<p>The risk study shall be provided as a digital report and in hard copy.</p> <p>The Risk Study shall be incorporated into the Pre Construction Information and shall be provided to every designer or contractor appointed or being considered for appointment.</p>	<p>HSG 264 Asbestos: The Survey Guide and the Approved Code of Practice to the Control of Asbestos Regulations (CAR) 2012 – The client shall provide existing information on asbestos that is available in the digital Asbestos Register (AR), Asbestos Management Plan and any relevant Asbestos Survey or other resource that is reasonable to obtain.</p> <p>Managing Health and Safety in Construction. Guidance to the CDM Regulations 2015 (L153 CDM 2015).</p>	The risk study shall be exchanged by the end of the Briefing stage to inform concept design activities.
Asbestos Register	<p>A digital Asbestos Register (AR) for the project shall be maintained in a structured searchable format for the purposes of both providing information to the Principal Designer and for capturing the findings of the risk study. Both digital and hard copy versions of the AR shall record all ACMs known or presumed to exist and other material sampled and tested.</p> <p>Attributes (fields and entries) in the digital AR shall enable the 3D location, condition and risks from ACM's to be recorded, used and shared.</p> <p>The digital AR shall contain an audit trail recording access to it by any party during the project.</p>	<p>The digital AR shall be integrated into the project's geometrical models. It shall allow examination, automation and visualisation in the treatment and communication of the ACMs and asbestos risks by all participants throughout the project lifecycle. The digital AR shall be compatible and able to be integrated with the asset information model.</p> <p>It shall contain links to pre-existing Asbestos Management Plan(s).</p> <p>The searchable format of the digital AR must enable any duty holders in the project to identify, record, share and use all the asbestos data and risk information obtained.</p> <p>A regular report demonstrating who has accessed the digital Asbestos Register shall be provided to the Client.</p>	Note: if the client had a particular template for the AR (digital or hard copy) then this would be provided as reference information.	The AR shall be exchanged at the end of each project stage and as requested by the client.

- [HSG 264 Asbestos](#)
- [Approved Code of Practice to the Control of Asbestos Regulations \(CAR\) 2012](#)
- [Managing Health and Safety in Construction. Guidance to the CDM Regulations 2015 \(L153 CDM 2015\).](#)



B.2 Information that will enable us to become an exemplar for health and safety

Note: the focus here is on putting in place “class leading” standards of Health and Safety information management to demonstrate that in this project, elevated risks (as defined in PAS 1192-6 [2]) are managed using digital techniques, which integrate structured and unstructured information with geometrical models.



B.2.1 Organizational information requirements (OIR)



- Policy: To be an exemplar organization for Health and Safety

Organization X aims to put into place “class leading” standards of Health and Safety information management in order to demonstrate that project risks are managed using digital techniques.

OIR The organization needs to maintain information systems that enable the identification and tracking of foreseeable elevated risks in design, installation and operation. This needs to be done at the earliest opportunity. Treatment and management of these risks shall be to an exemplary standard.

B.2.2 Asset information requirements (AIR)



Organization X has reviewed this OIR and has identified the following AIR as a result:

AIR To require the asset information model (AIM) to contain current elevated risk information complete with an audit trail, in a way that integrates structured and unstructured information with geometrical models. The information must include health and safety information that significantly affects the safe and healthy operation of the asset.

B.2.3 Project information requirements (PIR)



Organization X has reviewed its OIR and has identified the following PIR as a result:

PIR To require the project information model (PIM) to contain current elevated risk information complete with an audit trail, in a way that integrates structured and unstructured information with geometrical models. The PIM shall enable sharing and collaboration in risk management in order to optimise risk treatment in the project.

B.2.4 Exchange information requirements (EIR)



B.2.4.1 Purposes

Organization X has reviewed its AIR and PIR related to health and safety compliance and has determined its EIR (operational and delivery) and associated information purposes.

Note: that the EIR (operations) and EIR (delivery) content is the same as the AIR and PIR. However, they are presented separately as the information purposes are different.

Table B.4: EIR (Operational) summaries and purposes for health and safety

AIR	EIR (Operational)	Information purpose
To require the asset information model (AIM) to contain current elevated risk information complete with an audit trail, in a way that integrates structured and unstructured information with geometrical models. The information must include health and safety information that significantly affects the safe and healthy operation of the asset.	Maintain from the outset of the appointment, information models that integrate structured and unstructured information with geometrical model(s). Ensure interoperability of information between all parties so that they can store, manage, retrieve, monitor and share elevated risk information.	To enable the person responsible for managing health and safety in the asset to fulfil their responsibilities for risk assessment and management of health and safety during the operational use of the asset. This is to meet statutory requirements and to achieve class-leading performance, as well as to optimise risk identification and management.

Table B.5: EIR (Delivery) summaries and purposes for health and safety

PIR	EIR (Delivery)	Information purpose
To require the project information model (PIM) to contain current elevated risk information complete with an audit trail, in a way that integrates structured and unstructured information with geometrical models. The PIM shall enable sharing and collaboration in risk management in order to optimise risk treatment in the project.	Maintain from the outset of the appointment, information models that integrate structured and unstructured information with geometrical model(s). Ensure interoperability of information between all parties so that they can store, manage, retrieve, monitor and share elevated risk information.	To enable all appointed parties to collaborate effectively with the Client (appointing party), the Principal Designer (lead appointed party) and Principal Contractor (also a lead appointed party). This is to meet statutory requirements and to achieve class-leading performance, as well as to optimise risk identification and management.

B.2.4.2 Specifying the detail

This is the section where the content of the EIR is developed in terms of the presentation of information and the content breakdown of the information.

Organization X has considered the overall content, form and format of the structured information it needs to meet its purpose. These details are set out in the table below.

Table B.6: Detailed EIR (Delivery and Operational) for health and safety

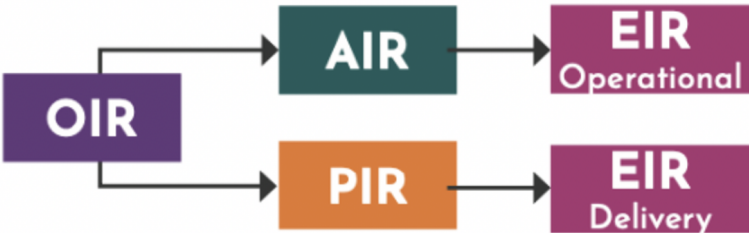
Information requirement (Delivery and Operational)	Level of information need	Acceptance criteria <sup>3</sup>	Supporting information	Key dates
To require the project information model (PIM) and the asset information model (AIM) to contain current elevated risk information complete with an audit trail, in a way that integrates structured and unstructured information with geometrical models. The information models shall enable sharing and collaboration in risk management in order to optimise risk treatment*	Risks to include attributes listed in PAS 1192-6 Annex A. The outputs shall allow filtering, analysis and proactive risk management through various metrics. Risks shall include those affecting cleaning, maintenance and use in the operational phase	All attributes for shared information and risk information to be included as set out in PAS 1192-6:2018 Annex A. Risk information to be capable of filtering by level of risk, by risk mitigation type and by risk owner, as a minimum. Terms used to be capable of sharing with an unambiguous, common meaning.	Documentation of any detailed risk analysis on which the EIR are to be based.	Digital elevated risk information to be exchanged at the initiation and completion of each appointment and as requested in between**

\* Note that because it is likely that multiple appointments may be working with risk information then this EIR will appear multiple times (i.e. for each relevant appointment).

\*\* Risk information may be required by the appointing party at any time during an appointment.

[3] In addition to any requirements set out in the information standard and information production methods and procedures.

### B.3 Example addressing an aspect of organizational health and safety compliance



#### B.3.1 Organizational information requirements (OIR)



- Policy: Health and safety compliance

Organization X, has to provide safe services, systems and equipment. It has established the following organizational information requirement (OIR) to cover a specific aspect of this, namely service providers.

OIR     The organization needs information about service providers to maintain and deal with incidents associated with safety critical services, systems and equipment.

#### B.3.2 Asset information requirements (AIR)



Organization X has reviewed its OIR and has identified the following AIR as a result:

AIR Up to date information on all asset management service providers (such as consultants, contractors and suppliers) of and their relationship to, safety critical services, systems and equipment to enable routine maintenance and the rapid response to trigger events.

B.3.3 Project information requirements (PIR)



Organization X has reviewed its OIR and has identified the following PIR as a result:

PIR Capture and maintain details of all services providers (such as consultants, contractors and suppliers) of and their relationship to safety critical services, systems and equipment to enable significant asset maintenance, repair or replacement projects.

B.3.4 Exchange information requirements (EIR)



B.3.4.1 Purposes

Organization X has reviewed its AIR and PIR related to health and safety compliance and has determined the EIR and associated information purpose. Both AIR and PIR will be met by information exchanged via an asset (operational) management contract or a project (delivery).

Table B.7: EIR (Operational) summaries and purposes for health and safety compliance

AIR	EIR (Operational)	Information purpose
Up to date information on all asset management service providers (such as consultants, contractors and suppliers) of and their relationship to, safety critical services, systems and equipment to enable routine maintenance and the rapid response to trigger events.	Schedule of contact and service details of all organizations delivering asset management services for safety critical services, systems and equipment.	Management of health and safety at work by the employer organization responsible for asset management or project delivery.

Table B.8: EIR (Delivery) summaries and purposes for health and safety compliance

PIR	EIR (Delivery)	Information purpose
Capture and maintain details of all services providers (such as consultants, contractors and suppliers) of and their relationship to safety critical services, systems and equipment.	Schedule of contact and service details of all organizations delivering any safety critical services, systems and equipment for use in the construction project.	To collate, track and handover to the operational user, the suppliers of safety critical services, systems and equipment used during the Project.

B.3.4.2 Specifying the detail

In this section the content of the EIR (delivery) is developed in terms of the presentation and the content breakdown of the information.

Organization X has considered the overall content, form and format of the structured information it needs to meet its purpose. These details are set out in the table below.

Table B.9: Detailed EIR (Delivery and Operational) for health and safety compliance

Information requirement (Delivery and Operational)	Level of information need	Acceptance criteria <sup>4</sup>	Supporting information	Key dates
Schedule of contact details and service details of all organizations delivering project services under the appointment for safety critical services, systems and equipment*	<ol style="list-style-type: none"> <li>1. Name and contact details</li> <li>2. Safety critical services delivered</li> <li>3. Summary of work carried out</li> <li>4. Evidence of health and safety competence (for example SSIP or PAS 91 compliance).</li> </ol>	Information to be provided in CSV format.	Example populated CSV file.	All information updated at each information exchange point.

[4] In addition to any requirements set out in the information standard and information production methods and procedures.

\* Note that because it is likely that multiple appointments may be working on safety critical services, systems and equipment then this EIR will appear multiple times (i.e. for each relevant appointment).

## B.4. We require a compliant Health and Safety File for project completion and for asset operation



### B.4.1 Organizational information requirements (OIR)



- Policy: Receipt of a suitable and sufficient Health and Safety File at completion of any relevant construction project

Organization X, like all other organizations, has to comply with health and safety legislation and has established the following OIR as a result.

OIR     Receipt by the asset manager of the Health and Safety File at completion of any relevant construction project from the Principal Designer or Principal Contractor (where the duty has been transferred) which complies with the Construction (Design and Management) Regulations 2015 (CDM) and its incorporation into the asset information model. The file shall be appropriate to the characteristics of the project, and contain relevant health and safety information to be taken into account during any subsequent project. It shall be retained and made available to anyone who needs it for as long as it is relevant

### B.4.2 Asset information requirements (AIR)



Organization X has reviewed its OIR and has identified the following AIR as a result:

AIR     The asset information model shall contain all of the information from the Health and Safety File. It shall contain relevant health and safety information to be taken into account during any subsequent construction work.

### B.4.3 Project information requirements (PIR)





Organization X has reviewed its OIR and has identified the following PIR as a result:

PIR     A Health and Safety File containing all of the information that is appropriate to the characteristics of the project shall be prepared, reviewed, revised and updated by the Principal Designer (or Principal Contractor where the duty has been transferred) as the project progresses.

B.4.4 Exchange information requirements (EIR)



B.4.4.1 Purposes

Organization X has reviewed its AIR and PIR and has determined the EIR and associated information purpose.

Table B.10: EIR (Operational) summaries and purpose for a compliant Health and Safety File

AIR	EIR (Operational)	Information purpose
The asset information model shall contain all of the information from the Health and Safety File. It shall contain relevant health and safety information to be taken into account during any subsequent construction work.	The contents of the Health and Safety file shall be imported into the asset information model.	The purpose of the information in the Health and Safety File is to provide the asset manager with all information to allow likely health and safety risks to be identified and addressed in any subsequent construction work.

Table B.11: EIR (Delivery) summaries and purpose for a compliant Health and Safety File

PIR	EIR (Delivery)	Information purpose
A Health and Safety File containing all of the information that is appropriate to the characteristics of the project shall be prepared, reviewed, revised and updated by the Principal Designer (or Principal Contractor where the duty has been transferred) as the project/construction work progresses.	A Health and Safety File that is appropriate to the characteristics of the project shall be prepared, reviewed, revised and updated in a structured and searchable format, which is compatible and can be integrated with the asset information model.	The purpose of the Health and Safety File is to provide the asset manager with all relevant information to allow likely health and safety risks to be identified and addressed in any subsequent construction work.

B.4.4.2 Specifying the detail

This is the section where the content of the EIR is developed in terms of the presentation and the content breakdown of the information.

Organization X has considered the overall content, form and format of the unstructured information it needs to meet its purpose. These details are set out in the table below.

Note that the information requirements that respond to the PIR are to be delivered by the Principal Designer. In the scenario where the Principal Designer’s appointment concludes before the end of the project, the duty to deliver the Health and Safety File passes to the Principal Contractor. In this case, the EIR for the Principal Contractor should then reflect this change.

Table B.12: Detailed EIR (Operational) for a compliant Health and Safety File

Information requirement (Operational)	Level of information need	Acceptance criteria <sup>5</sup>	Supporting information	Key dates
The contents of the Health and Safety file shall be imported into the asset information model.	As this is an 'import' EIR the level of information need shall be established through the EIR (Delivery).	Information shall be provided in a structured and searchable format that is compatible with the asset information model.		The Health and Safety File shall be imported into the asset information model within four weeks of project completion.

**Table B.13: Detailed EIR (Delivery) for a compliant Health and Safety File**

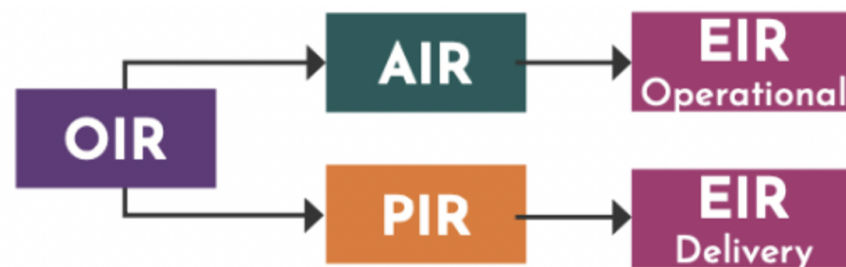
Information requirement (Delivery)	Level of information need	Acceptance criteria <sup>6</sup>	Supporting information	Key dates
A Health and Safety File that is appropriate to the characteristics of the project shall be prepared, reviewed, revised and updated in a structured and searchable format, which is compatible and can be integrated with the asset information model.	<p>The Health and Safety File shall be progressively developed as follows:</p> <ol style="list-style-type: none"> <li>1. Established with key headings</li> <li>2. Populated with relevant, proportionate information on hazards not eliminated through the design process</li> <li>3. Checked and validated as-built information containing relevant, proportionate information on hazards not eliminated during the construction process, together with relevant information for the maintenance, repair or replacement of plant and equipment</li> </ol>	Information shall be clear, concise and understandable and provided in a structured and searchable format that is compatible with the asset information model.	Managing Health and Safety in Construction. Guidance to the CDM Regulations 2015 (L153 CDM 2015).	<p>Health and Safety File to be populated and exchanged as follows:</p> <ol style="list-style-type: none"> <li>1. With key headings by completion of the concept stage to ensure alignment with the asset information model</li> <li>2. With relevant design risk information before related construction work starts</li> <li>3. Authorized as-built information, together with relevant information for the maintenance, repair or replacement of plant and equipment, by completion of the project.</li> </ol>

Managing Health and Safety in Construction. Guidance to the CDM Regulations 2015 (L153 CDM 2015).

[5] In addition to any requirements set out in the information standard and information production methods and procedures.

[6] In addition to any requirements set out in the information standard and information production methods and procedures.

## B.5 Example about cleaning, maintenance, use and replacement of high-level glazing



### B.5.1 Organizational information requirements (OIR)



- Policy: To safely install clean, maintain and replace high-level glazing.

Organization X, like all other organizations, has to comply with health and safety legislation and has established the following OIR as a result.

1. The organization needs information that will enable its managers and contractors to safely install, clean, maintain, use (i.e. open and close windows) and replace its high-level glazing.

### B.5.2 Asset information requirements (AIR)



Organization X has reviewed its OIR and has identified the following AIR as a result:

1. Information is needed to manage the risks of cleaning, maintaining and using high level glazing in buildings owned or controlled by the organization.
2. Information is needed to confirm that the recommendations of the project risk study have been adopted when the high-level glazing is replaced.

### B.5.3 Project information requirements (PIR)



Organization X has reviewed its OIR and has identified the following PIR as a result:

1. A risk study progressively completed through the entire design process, which determines an appropriate solution(s) for all high-level glazing in the scope of the project to be safely installed, cleaned, maintained, used and replaced
2. Information that will be used to plan, manage, monitor and co-ordinate glazing risks associated with the project's construction work
3. Information to confirm the high-level glazing installation has adopted the recommendations of the risk study.
4. As built information of the high-level glazing and information to show how it will be safely cleaned, maintained, used and replaced.

Note that this PIR represents one aspect of information that will be required as part of the Health and Safety File – please see example [B.4](#) for more information

### B.5.4 Exchange information requirements (EIR)



#### B.5.4.1 Purposes

Organization X has reviewed its AIR and PIR related to health and safety compliance for high-level glazing and has determined its operational and delivery EIR and associated information purpose.

Table B.14: EIR (Operational) summaries and purposes for high-level glazing

AIR	EIR (Operational)	Information purpose (covering all Operational EIR)
1. Information is needed to manage the risks of cleaning, maintaining and using high-level glazing in buildings owned or controlled by the organization.	Risk information and details of safe systems of work to show how the high-level glazing will be safely cleaned, maintained and used.	To enable the ongoing management of health and safety risks associated with high-level glazing in the asset. Plus to keep up to date with product substitutions during the asset life cycle.
2. Information is needed to confirm that the recommendations of the project risk study have been adopted when the high level glazing is replaced.	Information to confirm that appropriate safe solution(s) from the project risk study has been adopted.	

Table B.15: EIR (Delivery) summaries and purposes for high-level glazing

PIR	EIR (Delivery)	Information purpose (covering all Delivery EIR)
1. A risk study progressively completed through the entire design process, which determines an appropriate solution(s) for all high-level glazing in the scope of the project to be safely installed, cleaned, maintained, used and replaced.	A risk study that 1. Captures the high-level glazing risks 2. Considers the design options and recommends an appropriate safe solution (s), taking into account foreseeable risks that may develop during the life cycle of the glazing.	The purpose of the EIR Delivery information is to:  1. To enable the high-level glazing risks associated with the project to be suitably planned, managed, monitored and co-ordinated to ensure compliance with statutory duties and maintenance of design intent.  2. Record that an appropriate safe solution from the risk study has been adopted.  3. Provide the asset manager with the information needed to manage the risks of cleaning, maintaining, using and replacing the high-level glazing.  4. To update the Health and Safety file with record information about the high-level glazing
2. Information that will be used to plan, manage, monitor and co-ordinate glazing risks associated with the project’s construction work.	Risk information and details of safe systems of work contained in the Construction Phase plan.	
3. Information to confirm the high-level glazing installation has adopted the recommendations of the risk study.	Formal confirmation that the design intent has been maintained and that an appropriate safe solution(s) from the risk study has been adopted.	
4. As built information of the high-level glazing and information to show how it will be safely cleaned, maintained, used and replaced.	As built information (to include, for example, anchor points) and information to show how the high-level glazing will be safely cleaned, maintained, used and replaced (for example, access zones).	

Commentary:

- 1. The first EIR details the overall design intent



2. The second EIR confirms that works will be installed/carried out safely in line with the design intent
3. The third EIR confirms that the overall design intent has been maintained
4. The fourth EIR provides the as built information to support the ongoing application of the design intent

#### B.5.4.2 Specifying the detail

This is the section where the content of the EIR is developed in terms of the presentation and the content breakdown of the information.

To keep this example brief, only the first PIR is considered in detail here. Organization X has considered the overall content, form and format of the information it needs to meet its purpose in respect to **PIR 1: a risk study progressively completed through the entire design process...**

The example is for a design appointment (note that the information requirements would also be included in the EIR for a construction appointment). The information requirement arising from PIR 1 is set out in table B.16.

**Table B.16: Detailed EIR (Delivery) for high-level glazing**

Information requirement (Delivery)	Level of information need	Acceptance criteria <sup>1</sup>	Supporting information	Key dates
A risk study that 1. Captures the high-level glazing risks 2. Considers the design options and recommends an appropriate safe solution (s), taking into account foreseeable risks that may develop during the life cycle of the glazing.	<p>The risk study shall:</p> <ol style="list-style-type: none"> <li>1. contain an assessment of the risks associated with cleaning, maintenance, use and replacement of the high-level glazing including: <ul style="list-style-type: none"> <li>• location</li> <li>• type of glazing and system used (e.g. prefabricated, unitised system ),</li> <li>• workplace risks,</li> <li>• access requirements, requirements for specialist contractors and any specialised equipment or cleaning chemicals required</li> <li>• change of use.</li> </ul> </li> </ol> <p>It shall take into account height and geometry of placement position, lifting attachments, size and weight of components plus wind loadings at all project stages.</p> <ol style="list-style-type: none"> <li>2. recommend appropriate safe solution (s), taking into account foreseeable risks that may develop during the life cycle of the glazing.</li> </ol>	The findings of this risk study (including the identified hazards, proposed risk treatments and agreed actions) shall be structured into a digital format that enables the routine monitoring of compliance and is made available to all users who need this information.	<p>Workplace Health, Safety and Welfare L24</p> <p>Managing Health and Safety in Construction. Guidance to the CDM Regulations 2015 (L153 CDM 2015)</p> <p>BRE 2006 Guidance Note Highly Glazed Buildings – Assessing and managing the risks.</p> <p>CIRIA C632 Guidance - Glazing at Height.</p>	The risk study shall be exchanged at the end of concept design stage and each following design stage.



[1] In addition to any requirements set out in the information standard and information production methods and procedures.

- Workplace Health, Safety and Welfare L24
- Managing Health and Safety in Construction. Guidance to the CDM Regulations 2015 (L153 CDM 2015)
- CRIA C632 Guidance on Glazing at Height

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