Defence
Infrastructure
Organisation

Defence Infrastructure Organisation's Employer's Information Requirements

Version Control

Rev.	Date	Author	Review	Approved	Note
2.0	15/02/16	Fiona Moore	Graeme Tappenden	Graeme Wildridge -DIO SAPT-EStrat Pol BIM Lead	For Issue
3.0	30/06/16	Fiona Moore	Graeme Tappenden	Graeme Wildridge DIO SAPT-EStratPol BIM Lead	For Issue
4.0	19/04/18	Fiona Moore	Graeme Tappenden Nigel Wooldridge	Graeme Wildridge -DIO SAPT-EStrat Pol BIM Lead	For Issue
5.0	17/10/18	Graeme Wildridge DIO SAPT-EStrat Pol BIM Lead	Fiona Moore Graeme Tappenden	Graeme Wildridge -DIO SAPT-EStrat Pol BIM Lead	For Issue
6.0	19/08/19	Michelle Zompi	Fiona Moore - Graeme Tappenden Barry Gleeson	Graeme Wildridge -DIO SAPT-EStrat Pol BIM Lead	For Issue

Table of Contents

Foreword

DIO's Employer Information Requirements

DIO's Employers Information Requirements (EIR) is a cross organisation document that sets out the standards and processes for all information and data provision to DIO*; therefore the EIR details what is required of all suppliers as part of their delivery of information and data to DIO. Over time, as new contracts are procured, DIO's EIR will become applicable to all DIO contracts for the procurement of asset Information, including:

- Capital Framework Contracts;
- Capital Standalone Projects; and
- Operational (Facilities Maintenance) Contracts.

A supplier is required to provide a tender response to DIO's EIR in the form of a BIM Execution Plan (BEP), which is a plan prepared by suppliers to explain how the information and data will be supplied to DIO in response to and in line with the EIR. The aim of the BEP is to give assurance to DIO that suppliers will meet DIO's standard information and data delivery requirements. Standard evaluation criteria have been developed to access each supplier's BEP response as part of any DIO's EIR tender evaluation process.

DIO's Information Delivery Plans

As part of project delivery, including Post contract award Capital Framework call-off projects and Capital standalone projects, actual information and data to be delivered, and the stages at which it is required, will be listed in DIO's Information Delivery Plan (IDP) for Projects (IDP-Projects), which is prepared by DIO's Project Team and/or the appointed Technical Support Providers (TSP).

The IDP includes a Projects Information Requirements (PIR) sheet where DIO and TSPs can provide project specific information requirements which are necessary to support this EIR. Any additional requirements to the standard EIR requirements shall be approved by the DIO BIM Information Manager, without which this document will supersede, in the case of conflict and for the avoidance of doubt.

As part of Regional Delivery, including Regional Delivery Additional Work Services, information and data to be delivered, and when it is required, will be listed in DIO's IDP for Regional Delivery (IDP-Regional Delivery) **.

A supplier is required to provide a response to DIO's IDP in the form of a Master Information Delivery Plan (MIDP), a primary plan for when project information is to be prepared, by whom and using what protocols and procedures. The aim of the MIDP is to give assurance to DIO that suppliers will deliver DIO's specific information and data deliverables. The supplier's MIDP will be assessed by the appointed Information Manager.

* Including any information and data provided by DIO internally

** General maintenance activities will be collected on DIO' Information Demand Matrix (see Annex C) and paragraph 1.2.2.

1. Introduction

1.1 Document Purpose

This document confirms DIO's Employer's Information Requirements (EIR). The EIR includes information requirements, reasons and purpose to the Supplier, along with technical and commercial requirements that need to be addressed.

DIO's EIR is an essential element of a DIO's BIM Implementation and is used to set out clearly to DIO's Suppliers the structure and format of information (models, documents and data) that is required to be procured and maintained within both the Capital (Projects) and Operational (Facilities Management) phases of an asset's lifecycle.

Whilst the EIR sets outs out in general terms the format of information, the Information Delivery Plan (IDP) contains the Information Requirements.

Where specific Information is required by DIO on a project, this is contained within a project specific IDP, giving details of information required at each project stage, via a stage based IDP.

DIO's EIR relates to all information deliverables (models, documents and data), including traditional project documents, surveys, reports and appraisals and these are included in DIO's IDP.

DIO's IDP schedules required information deliverables across DIO's eight stage plan of work, stages which align with the pan industry sector unified BS8536 8 stage plan, to enable the Employer to answer project stage Plain Language Questions (PLQ), make project gateway decisions and to engage with the other project stakeholders.

DIO's Information (COBie) Demand Matrix (IDM) provides the basis for the collection and maintenance of DIO's Asset Information Model, as and when work in the procurement or maintenance of its assets are undertaken.

Note 1: The contents of this EIR shall apply to the procurement of asset information across <u>all</u> DIO's functional areas.

1.2 Responding to the EIR

1.2.1 Projects (Capital Phase) and Billable Works (Operational Phase)

The EIR, which includes an IDP long list for Framework Contracts or standalone Project Initiation, referred to as the IDP Long List elsewhere in this document, shall be responded to and then implemented by use of a Supplier's BIM Execution Plan (BEP). At tender stage the Supplier is required to complete the Pre-Contract Award Evaluation Criteria sheet with their responses to the EIR requirements and reference the key sections of their BEP.

A Project IDP will be issued on each project and shall be responded to and then implemented by use of a Supplier's Project BEP and the Master Information Delivery Plan (MIDP). Project or Post Contract Award BEPs are expected to provide a greater detail, along with referencing any project specific requirements as identified in the Project IDP.

Note 2: DIO will supply Evaluation Criteria for use by all respondents with tender and contract documents.

Note 3: Within 6 weeks following contract award, any successful Supplier will provide a fully compliant Project BEP/MIDP, which shall demonstrate how the requirements of each contracted section of the Project IDP will be met.

Note 4: For Projects, which sit outside the Framework Contract or standalone project approach, an EIR and Project IDP will be issued on a phase by phase approach.

a. The aim of separating the EIR IDP Long List and Project IDP is to ensure:
    - those elements that are standard across all projects have been agreed via the EIR and BEP; the aim being to substantially reduce the repetition of standard information on every project;
    - that only those information requirements that are project specific require a project specific BEP response; and
    - procurement of information at the appropriate phase of delivery for any project.

b. The supplier's response within the Evaluation Criteria and the BEP shall include the following content:
    - Confirmation of the Suppliers willingness to meet the EIRs; and
    - Specific response to the EIR section by section (as required in DIO's BEP evaluation criteria).

Note 5: On any project, if a Supplier, for whatever reason, believes they cannot deliver information as detailed within a compliant BEP, clarity should be sought during the Tender Phase.

Note 6: The detailed contents of the EIR shall be specifically responded to. Where in doubt the EIR takes precedence to PAS1192-2 which in turn shall take precedence over any BSI example BEPs utilised.

Note 7: In addition to the above, the 'Project specific' (Post-Contract) BEPs, together with the Information Deliverables, will need to fully meet DIO's Employers Information Requirements as provided in DIO's BEP evaluation guidance.

Note 8: Payment for any milestones, Projects or Maintenance activities, is dependent on completion of works including the provision, updating and acceptance of information within the Employers Asset Information Model Common Data Environment (AIM CDE), as appropriate to those milestones.

1.2.2 Facilities Maintenance (Operational Phase)

a. The Facilities Management (FM) Supplier shall throughout the course of the contract, as a result of their maintenance activities, update DIO's Asset Information Model Common Data Environment (AIM CDE) in accordance with DIO's Employers Information Requirements (EIR) with documents to meet the IDP and data as defined in the Asset Information Requirements (AIR) delivered via the IDM appropriate to those maintenance activities. The appropriate files and data scope to be provided for each intervention event type will be defined in collaboration with the FM Supplier to meet the EIR, IDP and AIR set;
b. The FM response including the Evaluation Criteria and BEP shall include the following content:
    - Confirmation the Supplier will meet the EIR's; and
    - Specific response to the EIR section by section (as required in DIO's BEP Evaluation Criteria).

Note 9: Payment for any maintenance activities is dependent on completion of works including the provision, updating and acceptance of information within the Employers Asset Information Model Common Data Environment as appropriate with those maintenance activities.

1.3 Procurement Routes, EIR and BEPs

The following table gives the various procurement routes and the relevant EIR and BEP documents / document titles:

Procurement	Requirement Requests	Responding Documents
Capital or Operational Framework/Contract	DIO EIR IDP Long List Evaluation Criteria	Evaluation Criteria (Pre-Contract Award Assessment) Pre-Contract BEP IDP
Capital (or FM) Standalone Project	DIO EIR Project IDP (including Project Information Requirements) Evaluation Criteria	Evaluation Criteria (Post-Contract Award Assessment) Project Pre-Contract BEP Project Post-Contract-BEP IDP including MIDP
Project/Additional Works Services under Capital (or FM) Framework/Contract	DIO EIR Project IDP (including Project Information Requirements) Evaluation Criteria	Project Post-Contract-BEP IDP including MIDP Evaluation Criteria (Post-Contract Award Assessment)

1.4 Project Specific Information

Project Information Requirements are captured within the Projects Information Requirements (PIR) sheet of the Project IDP, with parts to be completed by the DIO Project Manager, TSP Project Manager and tendering Suppliers. This must be responded to through the Post-Contract BEP and IDP including MIDP.

2. BIM Vision and Objectives

The Government Construction Strategy of May 2011 (GCS) set out a mandate for 'collaborative 3D modelling (with all documentation and data being electronic) on all appropriate centrally procured projects by 2016' and the current GCS 2016-20 continues to require Government Departments to deliver BIM with the aim of making BIM Level 2 business as usual (referred to as BIM throughout this document). DIO are continuing to evolve their BIM implementation, with the aim of enabling significant time, cost and quality improvements to the way that construction projects and importantly asset information is delivered to, by and within the organisation. BIM processes will provide DIO with an approach that enables digital information to become a key enabler of stakeholder engagement, decision making, improved asset knowledge, capability and estate planning.

It is the vision that the use of BIM will enable the Employer to receive the required information deliverables (models, documents & data) at the appropriate time, in the right format, to engage with the appropriate stakeholders, drive project and operational delivery, inform management decisions, enable efficiencies, make the right project gateway decisions, to supply appropriate information at handover and through the whole asset lifecycle, in order to operate, maintain and assess the ongoing performance of the delivered asset, and then ultimately to integrate delivered assets and their information into the Employer's asset estate Asset Information Model (AIM)

Drafting and sign off of project/asset specific information requirements, contained within the Projects Information Requirements (PIR) sheet, with the support of DIO's Client's Technical Adviser and/or Information Manager, is a key project deliverable. The IDP will provide full details of project/BIM information/data required against each project stage (including decision gateways) and in what format.

The production of DIO's Organisational Information Requirements (OIR), Asset Information Requirements (AIR), Plain Language Questions (PLQ), Information Delivery Plans (IDP) and Built Asset Security Information Requirements (BASIR), should be recognised as a lengthy process and therefore they will incrementally inform revised future versions of the standard DIO EIR and IDP Long List.

DIO's initial BIM objectives include:

a. delivery of verified (eventually digitally validated) structured information and data to support project gateway decisions, including traditional project documents, surveys, reports and appraisals;
b. improved engagement with project stakeholders;
c. building the project information into the Employer's Asset Information Model at each stage;
d. linking and/or passing verified information held in the Asset Information Model to operational and line of business systems, or otherwise reporting, that will support strategic, operational and asset management decision-making and streamlining following the practical completion of the construction works and installations;
e. assessment and management of safety and security issues using BIM tools, and establishment of DIO's BIM requirements at Framework Level.

It is anticipated that DIO's future BIM objectives could at some point include:

f. authorisation of Supplier's Technical Design using BIM tools;
g. verification and validation of the proposed scope, compared to briefing requirements, using BIM tools;
h. understanding and confirmation of full programme, sequence and logistics implications using BIM tools (4D),
i. understanding and confirmation of project costs using BIM tools (5D);

j. help with stakeholder engagement as part of Government Soft Landing (GSL) and helping post-occupancy operational performance evaluation and learning, including Whole Life Costs and Sustainability.

3. Clients Strategic Purpose

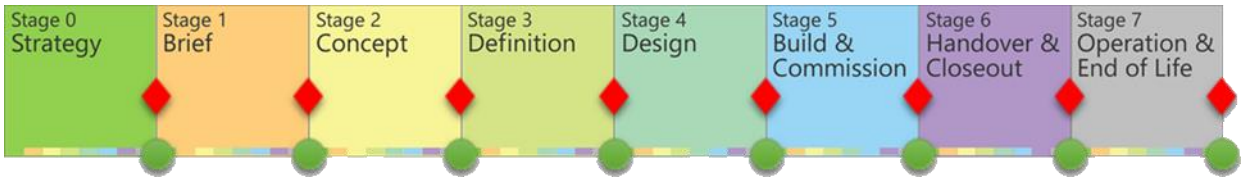
The primary use of the information (models, documents & data) will be for the following purposes:

Ref.	Purpose
01	**Registration** To allow accurate audit and reporting based on the assets registered.
02	**Use and Utilisation** To support comparison of actual utilisation with records of the intended use, capacity and planned utilisation of the Facility and to support Government Soft Landings usage reviews.
03	**Operations** To support the understanding of the anticipated cost of operations based on the normal operations of the Facility and to support Government Soft Landings operations reviews.
04	**Maintenance and Repair** To support the understanding of the anticipated resource load & cost of maintenance and repair based on the recommended maintenance tasks.
05	**Replacement** To support the understanding of the anticipated resource load & cost of asset replacement based on the expected service life of assets.
06	**Assessment and Re-use** To support the assessment of the Facility or Asset at the end of its planned use.
07	**Impacts** To support the management of the economic and environmental impacts of the Facility or Asset throughout its lifecycle.
08	**Business Case** To support the on-going evaluation of the business case, which is dependent upon the continual development of 01 and 07 above.
09	**Security and Surveillance** To support the assessment of security and surveillance and a security minded approach.
10	**Regulation and Compliance** To support the maintenance of the health and safety of the users of the Facility or Asset including maintenance of a digital record of identified risk and risk mitigation measures.
11	**Program, Cost & Carbon** To support the assessment, measurement and reporting of program (4D), cost (5D) and carbon.

Note 10: DIO owns the Intellectual Property Rights (IPR) for all information, including models, documents and data, and the supply chain use these under license.

Liability shall typically remain with the originator, and they will not be liable for unpermitted modification or amendment, or any transmission, copying or use of the Materials and the Models. This is in line with current procurement contracts, which should be referred to for additional IPR and liability.

4. Information Exchanges, Project Deliverables & Information



The purpose of this section is to communicate the timing and content of information exchanges between the Project Team/Supplier and the Employer and how information exchanges are aligned to work stages. Information may flow both ways.

To ensure that industry adopts a common way of working for capital projects and that the unified BS8536 8 stage plan is adopted even if the stage names need to be 'localised' as with the adoption by the RIBA. This is shown in the figure here.

It is common to apply a stage decision gateway process to formally close a stage and commence another. Some gateways may be more significant in terms of project progression.

Each stage gateway should be advised by a developed set of Employer Plain Language Questions (PLQ). It is common to indicate these gateway decision points as red diamonds.

Whilst information can be shared at any time during a stage, formal published information deliverables should be exchanged prior to the end of a stage to advise the decision gateways. These published information exchanges are referred to as Information Exchanges indicated by green circles or 'footballs'. These logical decision gateways and Information Exchanges are indicated on the above figure. On specific projects information exchanges, may not be required at every stage and this will be detailed in the Project IDP.

Deliverables required to inform the stage PLQ are scheduled in the Project IDP.

Note 11: The Project IDP is profiled by the EIM/TA from the standard Long List for the project and must be confirmed by the Supplier MIDP within six weeks of Supplier appointments as part of the Post-Contract BEP.

Note 12: The stage plan may be extended to identify operational phase events and enable the use of the IDP to specify information deliverables at different operational stages or intervention events. In the absence of this extension operational deliverables shall be specified in Stage 7 Operation & End of Life

The Project IDP will include:

a. Confirmation of information deliverables from the Long List to answer Employer's 'Plain Language Questions' for that phase/stage of delivery;
b. Format requirements, constraints or scope for each deliverable at each stage
c. Where discipline native models/files are required;
d. Where open standard formats are required in addition to a pdf format;
e. Where federated models/visualisations are required to support stakeholder engagement;
f. The Level of Definition (Level of Detail and Level of Information) of each deliverable at each stage;
g. The intended role (pre-appointment) or appointed Supplier for each information deliverable at each stage;

BIM Level 2 information deliverables consist of:

h. 3D models - in their native discipline (un-federated) format;
i. drawings - cut from the models, and other documents, in PDF or other specified open standards formats;
j. structured data - again cut from the models, in COBie, BS1192-4 data format, all exchanged as files and referenced in the COBie file as a transmittal sheet, and
k. Open standard 2D/3D model equivalents such as federated visualisations shall also be provided where specifically required, in an agreed format, to assist stakeholder engagement.

DIO do not request specific proprietary format files, but within the Project IDP it may state the formats they, and their Client's Technical Adviser, are able to use/access, as a guide to inform Suppliers.

4.1 Information Delivery Plan (IDP) / Master Information Delivery Plan (MIDP)

The Supplier shall review the Project Information Delivery Plan (IDP) and confirm their ability to provide the information from the appropriate resources, in the required formats, at the designated stage decision gates. Any variation from or addition to the plan as proposed, shall be clearly noted and brought to DIO's attention in the responding Post-Contract BEP as part of the tender proposal. The Employer's IDP shall form the basis of the Suppliers Master Information Delivery Plan (MIDP) for preparation and submission of information to the Employer at the appropriate stages.

Note 13: DIO will issue a Template MIDP with the IDP which will contain the minimum information requirements to be provided and to be used for the published supplier MIDP.

4.2 Level of Definition, Detail and Information

Information delivery requirements are indicated using Level of *model* Detail (LOD) and Level of Information *maturity* (LOI) aligned to the normal delivery stage, e.g. LOD3 and LOI3 for stage 3, as defined in the RIBA/NBS BIM Toolkit and indicated as D3I3 in the IDP. It is possible that the Employer's information LOD requirement may remain at D4 beyond stage 4, whilst the LOI requirement progresses in line with the stage, for example indicated by D4I6 in the IDP for stage 6.

4.3 Health & Safety / Construction Design Management (H&S/CDM)

The information deliverables in respect of the Employer's H&S/CDM duties shall be detailed in the IDP Long List and shall be used to manage/demonstrate the Employer's and Supplier's H&S/CDM obligations, specifically relating to residual risk scheduling/ management and providing supporting evidence for project gateways, as outlined in DIO's PLQs. In their BEP, the Supplier shall confirm how this information will be delivered in principle.

In line with PAS 1192-6:2018 'Specification for collaborative sharing and use of structured Health and Safety information using BIM', the Employer requires BIM model use for H&S/CDM purposes; including, but not limited to, site orientation/welfare, temporary works, designer risk assessment and risk, residual risk and mitigation measure scheduling as part of the COBie submission at each project stage. If a model is not to be provided or used for this purpose, a clear statement or reasons why not shall be provided in the Post-Contract BEP.

5. Management

This section deals with setting the standards to be used for the definition and delivery of the project, along with how the co-ordination and review processes will be managed.

5.1 Standards

The Employer expects the Supplier to deliver BIM Level 2 on projects in line with the UK's BIM Level 2 standards, the core parts of which include:

a. PAS1192-2:2013 BIM Information Management Capital Phase;
b. PAS 1192-3:2014 BIM Information Management Operational Phase;
c. Both the above supported by BS1192:2007;
d. BS1192-4:2014 COBie Production;
e. PAS1192-5:2015 Specification for Security-Minded Building Information Modelling;
f. PAS 1192-6:2018 Specification for collaborative sharing and use of structured Health and Safety information using BIM.

The Supplier shall evidence that they will meet these standards in their BEP.

Consideration shall be given to personal data that is held, in order to meet the requirements of the General Data Protection Regulation (GDPR) (EU) 2016/679.

The Supplier shall work with the Employer in the transition of the present suite of standards to the new ISO 19650 suite of documents when published and adopted by the Employer.

5.2 Roles and Responsibilities

The purpose of this section is to bring to the attention of the Supplier the allocation of roles associated with the management of the model and project information.

PAS 1192-2:2013 provides a useful cross-tabulated summary of the roles as they apply to Suppliers, including:

a. Client's Technical Adviser (TA);
b. Project Delivery Manager (PDM);
c. Supplier Information Manager (IM);
d. Lead Designer (BIM Coordinator) (LD);
e. Task Team Manager (TTM).

The following roles in connection with BIM will be taken on directly by the Employer:

a. Employer Information Manager (EIM), who will also take responsibility for Built Asset Security Management (BASM) (see PAS1192-5);
b. Employer Project Manager (EPM).

The BEP is to include appropriate competence and experience of staff members who fill the above Supplier roles.

Note 14: At Framework Level this can just be illustrative with specific details being provided as part of any subsequent Tender activities.

5.3 Collaboration Process

The purpose of this section is to define how, where and when information will be shared.

The Supplier is expected to manage their own Common Data Environment (Supplier CDE), through the nominated Supplier Information Manager (IM) and in liaison with the Employer's Information Manager (EIM). Although it is recognised that the management and system providing this service may change with the appointment of different Suppliers for different stages or phases, there will only be one CDE in operation at any one time managing one version of the truth.

The BEP and associated Evaluation Criteria shall contain details and evidence of the following:

a. Form and process of sharing information between Project Team members;
b. Form and process of publishing information to the Employer;
c. How the requirements of the IDP will be met and tracked;
d. Extent, form and frequency of model coordination and federation;
e. Frequency of collaboration and information exchange;
f. Details of model review workshops and other collaborative working practices e.g. use of model federation and coordination at design and/or site meetings.

It should be noted that:

g. Depending on the stage of the project and the Level of Definition (LOD), the Employer requires the federated discipline model to be made available at all design team meetings, so that it can be used to demonstrate the proposed design, progress and coordination. The Employer also expects the federated model to be used for stakeholder engagement;

h. The Employer, as an interim position, requires the Design Lead Supplier / Client's Technical Adviser to maintain Employer issued, shared and published information, in the Designer's Supplier CDE, with Client Shared and Client Published states for access, mark-up and use, until the Employer CDE and AIM are available;

i. Construction phase shared and published information, shall similarly be maintained in the Constructor's Supplier CDE, with Client Shared and Client Published states, but also issued to the Designers Lead Supplier / Client's Technical Adviser CDE Client Shared and Client Published, which will act as Employer CDE in the interim position;

j. The Employer will require access to the information which is held on their behalf.

5.4 Planning Work and Data Segregation

The purpose of this section is to set out requirements for the management of the modelling process. Information shall be managed in accordance with the processes described in PAS 1192-2:2013 and BS 1192:2007.

The Project/Asset IDP confirms the information delivery, information packaging and information exchange requirements for models, documents and data. All published transmittals shall be accompanied by a published COBie spreadsheet, confirming the included exchange files in the documents tab. In addition, planning for delivery of the following is to be included in the BEP:

a. Model Management

    1) Detail of procedures co-ordinated by the Information Manager.

b. Volumes, Locations, Zones and Areas

    1) Definitions of zones and the management of adjacency within the discipline models

2) Confirmation of the definition of the project volume structure.

c. Naming Conventions

There will be a single project file name convention based on the BS1192:2007 & PAS1192-2:20013 but extended to include reference to the IDP deliverable and LOD as follows:

1) **Project Number**: The Employer project reference will be used in all cases;
2) **Originator**: as assigned by the Employer in the IDP;
3) **Volume**: Supplier assigned as PAS1192-2:2013 optional Volume/Zone or 00 for ALL volumes, ZZ for Multiple or XX if Omitted;
4) **Location**: Supplier assigned as PAS1192-2:2013 optional Level/Region/Location or 00 for All Locations, ZZ for multiple, or XX if Omitted;
5) **Type**: Supplier assigned as PAS1192-2:2013 document/model/information type;
6) **Role**: Supplier assigned as PAS1192-2:2013 Role;
7) **Document Number**: Supplier assigned unique & sequential file alphanumeric document number;
8) **Status**: Supplier assigned as PAS1192-2 Status/Purpose of Issue but see below;
9) **Rev**: File revision;
10) ***IDP Ref****: IDP Delivery Ref;*
11) ***Stage****: Delivery Stage Ref e.g. DI3 for DIO Stage 3;*
12) ***LOD****: Level of Definition as LOD.LOI e.g. D3L4 (see section 4.3 above);*
13) ***Title****: Supplier assigned and optional free text descriptive title or name;*

Note: fields 8-12 are an extension to BS1192/PAS1192-2.

(a) Fields 1 & 2 are Employer assigned;
(b) Fields 3 & 4 the Volume and Location naming strategy shall be confirmed in the Post-Contrct BEP but integrated with and aligned to the strategy used previously on the project;
(c) Fields 5 & 6 shall use Employer assigned values or failing that BS standard codes;
(d) Field 8 Purpose of Issue;
(e) For WIP & Shared issues use PAS1192-2:2013 Table 3 WIP & Shared status codes,
(f) For Published use the following purpose codes for publishing of stage exchanges,

A0	Published Stage 0 Strategy
A1	Published Stage 1 Brief
A2	Published Stage 2 Concept
A3	Published Stage 3 Definition
A4	Published Stage 4 Design
A5	Published Stage 5 Build
A6	Published Stage 6 Handover
A7	Published Stage 7 Operation

Note 15: Lookup values for these assigned values shall be contained in the Picklists tab of the stage COBie sheet and Project IDP as a master record.

d. Publishing processes:

1) The contents of stage Information Exchanges will be defined in the IDP;

2) The stage Information Exchanges shall be published by the Supplier Information Manager from the Supplier CDE to complete each delivery stage;
3) All published file packages shall be accompanied by a COBie file which will be used to verify the delivery;
4) The Supplier Information Manager shall upload all information packages to the Employer CDE (Client's Technical Adviser provided) notifying the Employer Information Manager.
5) The Employer Information Manager shall verify the package and produce a Red Amber Green (RAG) acceptance report to the Supplier Information Manager.
6) Green packages shall be published into the Employer CDE AIM Published file area and the COBie data and file linkages published into the Employer CDE AIM data area for onward use.
7) Amber or Red package shall be remedied in the Supplier CDE and resubmitted for retest.
8) Detailed confirmation of use of these procedures, including specific definitions and details, shall be confirmed in the BEP and Evaluation Criteria.

5.5 Security

The purpose of this section is to communicate client specific security measures required to secure information, information access and information exchanges. Reference should be made to the DIO BIM Security Guidance Note version V3.0 dated 15 February 2015.

In line with PAS1192-5:2015 the Supplier shall consult with the Employer regarding the security requirements of the project and then respond appropriately to any project Built Asset Security Information Requirements (BASIR). All documents shall be marked with the appropriate baseline security.

Particular attention must be given to ensuring any Common Data Environments (CDEs) used meet the security requirements in terms of both cyber security and access controls/protocols for users. An appropriate procedure must be established to ensure information transmitted outside CDEs is done so as per the relevant security requirements. Any file when uploaded to the Supplier CDE or otherwise disclosed, shared, published or exchanged is to be secure to the standard required.

Security is defined in accordance with Government Security Classifications (2014) as follows:

a. OFFICIAL (and its sub-set OFFICIAL – SENSITIVE);
b. SECRET;
c. TOP SECRET;

The information security strategy will be contained with a Project Built Assets Security Information Requirements document, which will be completed as part of the early stage information delivery by the Employer and made available, as appropriate, to the Project Security Manager and Supplier Information Manager.

The Supplier Information Manager shall ensure that all files held within the CDE are held with the appropriate visible security meta-data markings and that they are not disclosed, distributed, downloaded or otherwise accessed by CDE members with inappropriate security clearance or without justified need. The Supplier CDE system shall be procured and maintained to the appropriate security level, as required by the Employer for the project.

5.6 Coordination and Clash Detection Process

The purpose of this section is to ask the Supplier to define their co-ordination process, in order to meet Employer requirements for quality control. Details shall be given of how this process will align with the Employer's contractual and process requirements, such as on-going / periodic technical review.

Please note that the Employer will expect the most recent Clash Detection Report to be included with monthly project progress reporting.

The following details of the coordination and clash detection process shall be considered:

a. Software;
b. Process overview;
c. Responsibilities;
d. Outputs;
e. Technical query workflow;
f. Tolerance strategy;
g. Clash resolution process;

The Supplier's BEP shall confirm coordination and clash avoidance processes, with reference to:

h. Volume strategy;
i. Tolerance strategy;
j. Technical query workflows;
k. Clash resolution;
l. Responsibilities for coordination and clash avoidance;
m. Software to support coordination and clash avoidance;
n. Outputs from coordination and clash avoidance processes.

5.7 Quality Assurance Plan

The purpose of this section is to enable the Supplier to communicate how the integrity, and hence quality, of the model and other data sources will be maintained.

All published information exchanges shall be verified against the IDP for the stage information exchange, using the included COBie file. Only compliant exchanges will be accepted. For this reason all data provided is to be complaint with BS1192-4:2014 & COBie UK 2012.

The Supplier shall confirm their own internal model file, data standards and compliance procedures, including references to standards and compliance software, in their BEP.

The BEP and Evaluation Criteria should refer to:

a. Quality assurance/control procedure, including data verification and validation;
b. Associated software;
c. Level of assurance.

The Employer's Information Manager must be given access to the Supplier CDE to enable compliance monitoring and audits.

5.8 Delivery Strategy for Information Exchanges and Asset Information

This section defines the information exchange standard for information and data, enabling the Employer to obtain asset information to align to the Employer's Asset Management processes at each stage. Information defined in the Project IDP and proposed by the Supplier MIDP shall be confirmed in the published information exchange COBie file, together with the published information exchange files.

Currently the Employer requires all BIM Information Exchanges to include:

a. Native authorised files – un-federated and attributable to the supply chain originator / author / contracted Supplier;

b. 2D pdfs – standard drawing outputs from the BIM, as defined at tender issue stage.
c. Federated models in IFC or other agreed format, including reference to constituent authored models and other content;
d. COBie data as defined by an agreed project Information Delivery Plan (IDP) and Supplier Master Information Delivery Plan (MIDP), confirming delivery. The single COBie exchange spreadsheet shall contain data relating to the exchanged models and other project files, which will each be referenced in the spreadsheet and a two-3D point geo positioned box/cube of Facility, Floor or Space object;
e. Other files e.g. surveys, reports etc., in pdf or other agreed open standard formats.

The BEP shall confirm that the Supplier intends to provide information in the above formats.

f. Designers and Constructors shall align their model attribute data to be consistent with the data exchange format COBie as detailed in BS1192-4:2014;
g. All object naming shall be in accordance with DIO Spec 024 including floor and space naming addendum;
h. There shall be a single COBie workbook for each Spec024 level 2 building or infrastructure facility. This shall confirm Spec 024 naming for the facility – Building or Infrastructure including Establishment and Land Parcel references;
i. The Establishment and Land Parcels shall additionally be defined in the first rows in the Floors tab and positioned as linked bounding box coordinates;
j. The Attribute and other requirements for each Spec024 object/element will be confirmed in the Asset Data Requirement Library (ADRL);
k. Classification shall be to UNICLASS 2015, NRM and SFG20 in this order as appropriate for the project with multiple element classification to BS 1192-4;
l. The AIR, IDP and MIDP can be combined as a stage specific COBie Demand Matrix (CDM) for each project or contract. It is the Employer's intension to develop the use of the Employer CDE to enable the verification of published stage information and data delivery before acceptance;
m. The presented stage COBie sheet shall therefore contain reference to all exchanged published files and required data relating to the information exchange point;
n. The Employer's Asset Information Requirements will be periodically updated as asset type and stage information and data requirements are developed;
o. COBie data shall meet the strategic purposes in section 3 appropriate to the stage.
p. The BEP shall confirm the process of data compilation between models and COBie. Individual authored model COBie sheets shall be coordinated and combined into a single federated COBie sheet for submission to the Client CDE by the Lead Supplier.

Note 16: Information will be progressively shared and published from the Supplier CDE to the nominated Client's Technical Adviser / Employer CDE, so that in normal circumstances the Client's Technical Adviser / Employer will not need access to the Supplier CDE other than for compliance purposes.

Note 17: The COBie Demand Matrix (CDM) is also referred to as the Information Demand Matrix (IDM).

5.9 Project Implementation Plan (PIP)

A Project Implementation Plan is a statement relating to the Supplier's IT and human resources capability to deliver the Project IDP and as such it shall form part of a BEP and Evaluation Criteria; these shall confirm the Supplier's intention to provide this information for each project.

5.10 Master Information Delivery Plan (MIDP)

The Master Information Delivery Plan (MIDP) shall be prepared by the Supplier and included with the Post-Contract BEP and Evaluation Criteria. This will be in response to the specific Project IDP deliverables in the template format attached to the IDP. The MIDP shall detail the models, documents and data to be provided for each required Project IDP deliverable, in what stage, to what required level of detail/information (DXIX) and by which author. Confirmation of the Supplier's intention to maintain an up to date MIDP meeting each IDP deliverable for each project stage must be provided.

The Supplier may produce additional Task Information Delivery Plans (TIDP) for their own purposes, but the Employer will not require this to be included in the response.

Note 18: A Template MIDP is attached to the Project IDP which will contain the minimum information requirements and format to be provided.

5.11 Training

The Supplier shall be responsible for maintaining and delivering appropriate information management and access training to all interfacing parties; working collaboratively across the delivery team, including with the Employer's staff and the supplier's own supply chain members. This shall include, but not be limited to:

a. Key parts of the BIM Execution Plan;
b. The Supplier's collaboration tool;
c. Clash detection process and reporting;
d. Model viewers;
e. CDE.

Note 19: The Supplier shall undertake a collaborative approach and facilitate workshops to promote Building Information Modelling (BIM) Level 2 process, appropriate technologies and Government Soft Landing (GSL) with both Supplier and Employer staff and or the Employers representatives.

DIO has made available the DIO BIM Manual to assist training and knowledge transfer with the supply chain.

6. Technical

This section establishes technical information requirements, including the software, information exchange contents and level of detail.

All project team members shall agree their collective strategy regarding IT systems performance. It is acknowledged that due the Employer's current IT limitations, their members of staff may be excluded from accessing many software's and files; so for this reason the team should consider ways of accommodating this best they can, especially when it comes to reviewing, sharing and issuing BIM information to the client.

This may be by providing both file and model viewing and mark-up capability in the Supplier CDE to enable Employer and TA staff to access, mark-up and apply workflow to engage and collaborate. This provision shall be confirmed in the BEP/Evaluation Criteria.

6.1 Software Platforms and Programs

The purpose of this section is to communicate software platforms and versions where these are known and where they might influence the preparation of a bid.

Note 20: As yet the Employer's software platforms are not known and as a public body, OJEU rules preclude specification and selection based on proprietary systems use. Once identified the Supplier will publish and/or share Information into the Employers CDE. Until implemented **Employer Shared and Published information deliverables shall be held in the Supplier CDE until the Employer CDE is implemented at which time, and on request, Information will be transferred to DIO.**

6.2 System Performance

The purpose of this section is to communicate to bidders any constraints in the employer's systems or specific IT requirements which may need additional resources or non-standard solutions.

The Supplier shall confirm how data and information from their authoring tools will be prepared and published so that it can be used with the software platforms outlined. The Supplier's ability to work with any specified platforms shall be made clear.

The following employer-side IT system restrictions and requirements need to be considered when developing the BEP:

a. Model size: 300Mb for 3D models and 100Mb for other documents (unless agreed by the Authority's BIM Team during project delivery);
b. Software uses: Federated 3D models in open standard IFC;
c. Access to viewers via DIO systems: to be provided in Supplier CDE without any requirement to download any additional software onto the DIO's systems;
d. Security issues: As required in the security section of this document.

6.3 Data Exchange Format

The purpose of this section is to define the formats used to deliver the Information Exchanges. Information shall be required as defined in the Information Delivery Plan, in the following formats:

a. Native – 3D discipline (un-federated) model files for all design and analysis models
b. Federated – combined 3D discipline models in IFC format;
c. COBie – COBie-UK-2012 version 2.4 to BS1192-4 & UNICLASS2015 complete with reference to the exchange files;
d. PDF files – no older than version 7.0 as a defaulting addition other open standard files as defined in the Information Delivery Plan.

Note 21: Drawings and Data should be generated from a single authored model. Drawings shall state the model ref they are generated from and note any non-derived or additional data.

6.4 Co-ordinates

This section defines requirements for a common coordinate system for all location and data.

For asset and property management the DIO use Eastings and Northings to Ordnance Survey National Grid as realised using OS Net and OSTN15 in decimal format.

Elevations to mAOD (Newlyn) as realised using OS Net and OSGM02

For projects and engineering design and construction geo-referenced local grids with a 1:1 scale factor may be required.

Building grids may also be established for the purposes of orthogonal layout of drawings and referencing. All such building grids need to be correlated to the project and ordnance survey grid with defined and accurate transformations.

The minimum requirement is spatial coordination of building grids stated as follows:

a. Intersection of grids XX and YY - [xxxxxx.xxxE and xxxxxx.xxxN];
b. Intersection of grids AA and BB - [xxxxxx.xxxE and xxxxxx.xxxN];
c. Ground floor FFL = [xxx.xxx].

Other coordinate system standards defined in the BIM Execution Plan shall include:

d. Origin rotation;
e. Offsets;
f. Datum information;
g. Units to be used.

Note 22: To ensure appropriate management of spatial coordinated of information and the ability to manage 3D in multiple grids and geo-referencing (positioning coordinates related to national and global coordinate systems) it is recommended that the supplier and TA prepare a Survey strategy which includes defined coordinate grids relevant to a project, transformations and tools to manage changing from one to the other without loss of integrity and reference to geospatial mapping and accuracy standards which support fit for purpose data capture and setting out to meet project requirements. Any use of local coordinate systems shall be agreed on a case by case basis with the TA, a qualified land surveyor.

3D Co-ordinates to be no less accurate than 10mm in any direction (x,y,z). Where this accuracy cannot be achieved, this should be clearly stated in the Post-Contract BEP.

All geophysical features and buildings shall be referenced to an orthogonal bounding box defined by two coordinate triple points – easting, northing & elevation, the bottom left and top right containing the full extent of the object and its constituent elements e.g. piles or masts. Where an insertion or local coordinate system reference point is required this shall be the bottom left of the containing bounding box.

There are also situations where a local height datum is appropriate. If used the local datum should always be referenced back to the required standards and the containing bounding box presented in the standard datum for use in COBie.

Any use of local coordinate systems shall be agreed on a case by case basis with the TA, a qualified land surveyor and referenced back to the bounding box insertion point to the required standard.

Object, model, drawing and file contextual extents will be confirmed in the Volume & Location strategy as part of the Post-Contract BEP and referenced in the agreed file name Volume and Location strategy.

7. Commercial

This section looks at the information requirements, defines purposes for data and the content of key deliverables.

7.1 BIM Execution Plans (BEP)

BEPs and Evaluation Criteria Assessment Sheets are to be provided in response to the EIR identifying the Supplier's proposals.

A Post-Contract Award BEP shall be submitted to the Employer by the Supplier within six weeks of contract award, or as otherwise agreed.

The Supplier shall respond to the EIR directly, and in addition include any further information within the BEP that the supplier deems necessary in order to outline their delivery of BIM on the project.

The Supplier shall prepare, deliver and maintain BEPs that respond to the respective EIRs and Project IDPs.

The Supplier shall review and maintain their BEP, including maintaining the MIDP, and additionally, when there is any change to their contract, they shall inform the Employer immediately of any changes to Information Deliverables as part of that change process.

7.2 Contractual Requirements

It is a contractual requirement that the Supplier provides the information/data deliverables, as per Terms and Conditions of their contract.

7.3 BIM Maturity Assessment Tool

The DIO BMAT tool will be used throughout the contract period to assess progress of both the client and supplier in achieving BIM maturity. This is a 360-degree tool and should be prepared by collaborative discussion between the client, supplier and collaborative partners, as required. Reference to the tool is included in the appendix.

Appendix A. Evaluation Criteria

When considering a compliant BEP response to this EIR the supplier shall refer to DIO's Evaluation Criteria and shall respond using the appropriate sheet. This is a mandatory requirement.

Appendix B. DIO Information Delivery Plan (IDP) Template

The Information Delivery Plan (Template) contains the following

- Information Delivery Plan – Long List Template
  To be profiled by the Projects Technical Support Provider (TSP) or Regional Delivery Team (with assistance by the FM Supplier) ahead of each stage or appointment to contractually confirm the information deliverables. This single project document develops as new suppliers are appointed and shall include deliverables required from all parties: Client, Supplier & Stakeholder
- Stage Plain Language Questions – to be met by profiled IDP deliverables
- Master Information Delivery Plan – Template
  To be profiled by the TA and each appointed supplier or stakeholder to contain all documentation: models, drawings and other documentation to meet the specified IDP Deliverables
- Pick Lists – preset and developed project reference tables
- Guidance – general and specific guidance on completion of the IDP template*.

*Further information and guidance is available in the DIO BIM Manual.

Appendix C. Information (COBie) Demand Matrix (IDM) Template

The Information Demand Matrix (IDM) is used to template the COBie information requirements for a single project stage (or operational event). This is template based on COBie UK 2012 but updated to include UNICLASS 2015 and BS1192 file name picklists for the project as developed in the IDP.

The IDM is defined from the Project IDP confirming the IDP Deliverables and MIDP documents to be delivered by all parties for a stage, and the Asset Data Requirement Library (ADRL) items appropriate for the stage and intervention scope.

This enables the information Suppliers to use a templated approach to COBie information (& data) delivery and both suppliers and the client to use the IDM to assure information pre and post-delivery, and before it is accepted for use by DIO.

The delivered IDM will include information to BS1192-4 and as defined in the EIR, IDP and ADRL for each item impacted for the exchange stage or intervention.

DIO will work with Suppliers to automate the generation of the IDM enabling the addition of the appropriate data content for delivery to DIO.

The IDM Template is a separate version-controlled document appended here*.

*Further information and guidance is available in the DIO BIM Manual.

Appendix D. DIO BIM Maturity Assessment Tool (BMAT)

The DIO has created a BMAT tool which can be used following commencement of a project to assess performance of both the client and the supplier, and progress towards BIM level 2.

Appendix E. Glossary

Full Name	Abbr.	Explanation
3D Model		A model with objects having 3D dimensional properties which are dynamic in nature.
Asset Information Model	**AIM**	Maintained BIM used to manage, maintain and operate a built asset. The purpose of the asset information model (AIM) is to be the single source of approved and validated information related to the asset(s). This includes data and geometry describing the asset(s) and the spaces and items associated with it, data about the performance of the asset(s), supporting information about the asset(s) such as specifications, operation and maintenance manuals, and health and safety information.
Asset Information Requirements	**AIR**	Based on the OIR, specific AIR might be specified as part of a contract or as an instruction to in-house teams and may use data and information from the AIM relating to the asset management activities being carried out. The AIR shall also specify data and information to be captured and fed into the AIM.
BIM Execution Plan	**BEP**	Plan prepared by the supply chain to explain how the information modelling aspects of a project will be carried out.
Classification		Systematic arrangement of headings and subheadings for aspects of construction works including the nature of assets, construction elements, systems and products.
Common Data Environment	**CDE**	Enabling the process of creation, sharing and issuing of production information so that information is managed and delivered in a consistent, lean and timely manner (see PAS1192-2) A common data environment is a single secure source of information for any given project, used to collect, manage and disseminate all relevant approved project documents for multi-disciplinary teams in a managed process.
Construction to Operation Building Information Exchange	**COBie**	Structured information for the commissioning, operation and maintenance of a project often in a neutral spreadsheet format that will be used to supply data to the Employer or operator to populate decision making tools, FM and asset management systems.

Full Name	Abbr.	Explanation
Data Verification		Check that data is in the correct format.
Data Validation		Check that the data is accurate.
Employer's Information Requirements	**EIR**	Pre-tender document setting out the information to be delivered and the standards and processes to be adopted by the Supplier as part of the project delivery process.
Federated Model		Federated Model means a model consisting of linked but distinct component models, drawings derived from the models, texts, and other data sources that do not lose their identity or integrity by being so linked, so that a change to one component model in a federated model does not create a change in another component model in that federated model.
Geospatial Data		Geospatial data, GIS data or geo-data has explicit geographic positioning information included within it, such as a road network from a GIS, or a geo-referenced satellite image. Geospatial data may include attribute data that describes the features found in the dataset.
Information (COBie) Demand Matrix	**IDM**	An Information (COBie) UK 2012 template complete with IDP, MIDP and ADRL information & data object requirements appropriate for the contract and stage or intervention event identifying which structured data about the facility, floors, spaces, zones, systems and building component should be delivered and when in accordance with the EIR.
Information Exchange		Structured collection of information at one of several pre-defined stages of a project, with defined format and fidelity (the degree of exactness with which something is copied or reproduced).
Industry Foundation Class	**IFC**	A platform neutral, open file format specification that is not controlled by a single vendor or group of vendors. Used as collaboration format for BIM. The Industry Foundation Classes (IFC) model is intended to describe construction industry data focusing on ease of interoperability between software platforms. It is a platform neutral, open file format specification which is object-based. IFC was developed by building SMART to facilitate interoperability in the architecture, engineering and construction (AEC) industry, and is a commonly used collaboration format BIM based projects
Level 0 BIM Maturity		Level 0 BIM maturity is unmanaged CAD, in 2D, with paper (or electronic paper) data exchange.

Full Name	Abbr.	Explanation
Level 1 BIM Maturity		Level 1 BIM maturity consists of managed CAD in 2D or 3D format with a collaborative tool providing a common data environment with a standardised approach to data structure and format. Commercial data will be managed by standalone finance and cost management packages with no integration.
Level 2 BIM Maturity		Level 2 BIM maturity is a series of domain and collaborative federated models, consisting of both 3D geometrical and non-graphical data, prepared by different parties during the project life-cycle within the context of a common data environment. The project participants provide defined, validated outputs via digital data transactions using proprietary information exchanges between various systems in a structured and reusable form.
Level of Development	**LOD**	Collective term used for and including 'level of model detail' (again LOD) and the 'level of information detail' (LOI) • Level of model detail = description of graphical content of models at each of the stages defined • Level of model information = description of non-graphical content of models at each of the stages defined.
Master Information Delivery Plan	**MIDP**	Project Delivery Manager level primary plan for when project information (files) are to be prepared, by whom and using what protocols and procedures, incorporating all relevant task information delivery plans. *(Also see TIDP) and meeting the individual delivery of the Project IDP*
Metadata		Metadata is data that describes other data. Meta is a prefix that in most information technology usages means "an underlying definition or description." Metadata summarizes basic information about data, which can make finding and working with instances of data easier.
Organisational Information Requirements	**OIR**	OIR data and information required to achieve the Organisation's objectives (see PAS1192-3).
Project Information Model	**PIM**	Information model developed during the design and construction phase of a project.
Project Information Plan	**PIP**	Statement relating to the Supplier's IT and human resources capability to deliver the EIR.

Full Name	Abbr.	Explanation
Plain Language Questions	**PLQ**	Large quantities of information are exchanged during a construction project and, given the potential for even more information to be exchanged through BIM, it is important for clients to identify their minimum information requirements; this can be achieved by client's developing a clear set of clear language questions to be answered at each project stage.
Publicly Available Specification	**PAS**	Sponsored fast-track standard driven by the needs of the client organizations and developed according to guidelines set out by BSI (British Standards Institute). Key stakeholders are brought together to collaboratively produce a BSI-endorsed PAS that has all the functionality of a British Standard for the purposes of creating management systems, product benchmarks and codes of practice. After two years the PAS is reviewed, and a decision is made as to whether it should be taken forward to become a formal British Standard.
Task Information Delivery Plan	**TIDP**	As MIDP, but at Delivery Team Level / Supply Chain level.
Uniclass (Unified Classification for the Construction Industry)	**Uniclass**	Uniclass (Unified Classification for the Construction Industry) Published by the Construction Project Information Committee (CPIC) this is a UK standard for classification.