The CLAW All Wales BIM Toolkit

Employers Information Requirements

A comprehensive suite of documents and tools to explain and enable deployment of a BIM enabled approach in line with standards and protocols, and to achieve Welsh Government adoption date of March 2016.

The Toolkit is devised to support officers and members articulate the BIM business case and efficient deployment and procurement practice of BIM enabled projects.

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CONSTRUCTING EXCELLENCE IN WALES
Consortiwm Awdurdodau Lleol Cymru
Consortium of Local Authorities in Wales
CLAW
Hyrwyddo Eiddo'r Sector Cyhoeddus
Promoting Public Sector Property

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Purpose

This guide has been prepared following a series of CLAW workshops to introduce Building Information Modelling (BIM) to CLAW and prepare an All Wales BIM Toolkit. This is part of a suite of documents which support cross authority client competency and consistency to deliver BIM in line with Welsh Government aspirations. It is a base from which each authority can develop their own local and project specific variations. The documentation has been drawn together as the output from a series of workshops contributed to by various CLAW members and does not represent advice or the opinion of any single party.

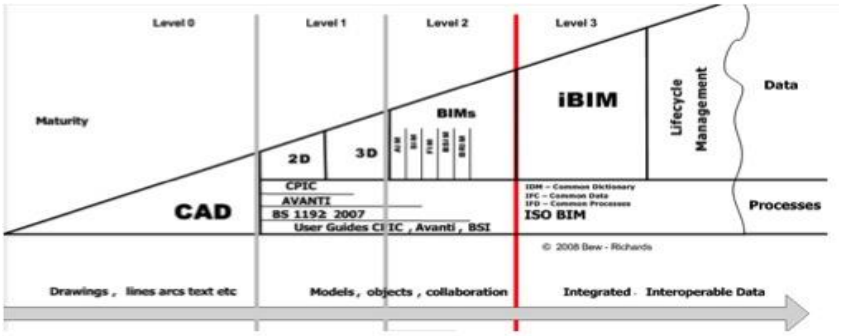
This guide and the attached documents will enable CLAW Members to create a project specific Employer's Information Requirements document as part of the Toolkit.

Introduction

An Employers Information Requirements (EIR) document is a key part of the BIM Level 2 Document set as defined by the UK BIM Task Group. See the Toolkit Glossary for definitions. BIM Level 2 is designed to have the minimum impact on current contract forms but even with this approach defining BIM Employer's Information Requirements needs to be carried out for each project.

The project constraints and variables driving the creation of an EIR are multi-dimensional: client, stakeholder & supply chain BIM competency, project type: new build, refurbishment, roads & highways and asset maintenance, plus the form of contract and the scope of the particular works, all impact on information requirements.

This complexity is distilled into this simple to follow guide which will enable the creation of a project specific EIR.



'BIM will be adopted to level 2 by 2016 on all Welsh Government funded projects, with Welsh Government department projects achieving level 2 by 2015.'

Llywodraeth Cymru
Welsh Government

EIR Development Process

An Employers Information Requirements (EIR) is a key contractual addendum document in any asset improvement, replacement or new build project where any form of Building Information Modelling (BIM) or digital information is being requested by the client (Employer). This should be prepared specifically for each project as a pre-appointment and/or pre-contract document.

An EIR is an Employer's confirmation of exactly what information, at what stages and in what format is needed under the contract from supply partners to enable the client and the project stakeholders to make informed decisions. The process starts before professional advisors or contractors are appointed.

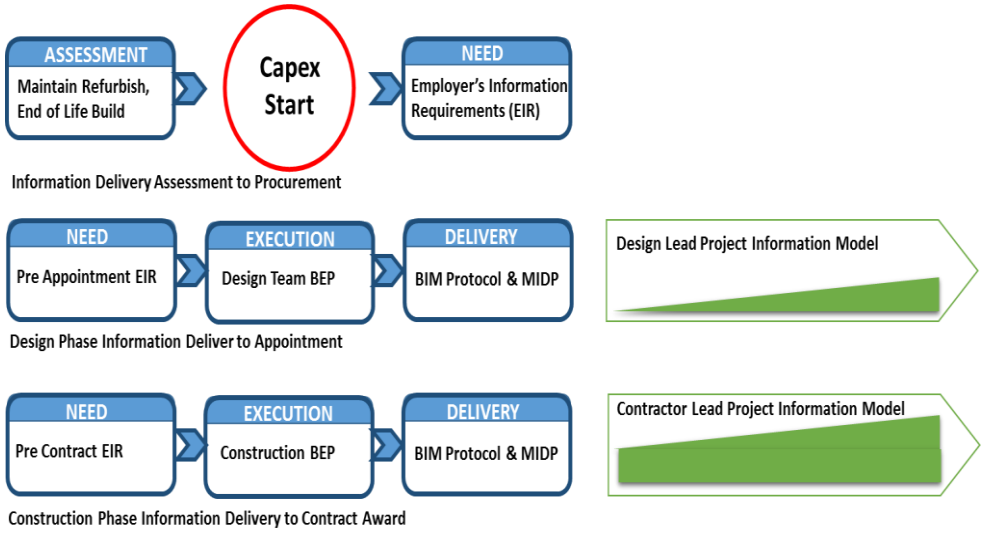


Table 1: EIR Production Process (after PAS1192-2)

An EIR is created by the Employer at the earliest opportunity as a pre appointment or pre contract document and before the appointment of design or construction suppliers. In preparing an EIR the Employer should confirm the project stakeholders and their information requirements at each projects stage and including handover and in the case of Soft Landings the performance requirements of the delivered project and methods of assessing these during operation.

The Employer should also confirm the information he or the stakeholders will make available to the project, and any pre project searches or investigations he needs. The EIR should contain a proposed Production and Delivery Table (PDT) confirming the desired information packages at each plan of work stage with level of information detail required.

As part of any appointment or invitation to tender process the potential suppliers will respond to the EIR with a BIM Execution Plan (BEP) which will contain an updated PDT. This will in turn be bound into both the appointment EIR and accompanying BIM Protocol as a contract appointment addendum. The appointment EIR, BIM Protocol and PDT should be back to back across all collaborative suppliers at appointment. Any change (eg at appointment of constructor) needs the process to be refreshed again equally across all parties.

If the contract is traditional, with distinct appointments of design team and subsequently construction team, then the design stage EIR will need to be refreshed with the benefit of the developed design, as the pre contract EIR which will in turn be updated/refreshed with the construction BIM Protocol at main contract award. Again the full project team need to be party to a back to back EIR and BIMP and appendices. This is particularly relevant to the (PDT) which confirms who is delivering what information and in what format and level of detail at each Plan of Work (PoW) stage. It may be that the scope of services provided by each party envisaged pre-appointment will be varied at award and for two stage contract that pre contract varied post main contract award.

This should be recognised in the BIM Protocol with the various appointments and contracts having appropriate fee stages, novation's and assignments.

Note 1: The PDT becomes the MIDP – Master Information Delivery Plan, and Responsibility Matrix at different stages of the project appointment and dependent on its scope and content.

Note 2: See the companion Claw Procurement Guide.

EIR Content

An EIR should contain the following sections:

Technical	Management	Commercial
○ Software Platforms ○ Data Exchange Format ○ Co-ordinates ○ Level of Detail ○ Training	○ Standards ○ Roles and Responsibilities ○ Planning the Work and Data Segregation ○ Security ○ Coordination and Clash Detection Process ○ Collaboration Process ○ Health and Safety and Construction Design Management ○ Systems Performance ○ Compliance Plan ○ Delivery Strategy for Asset Information	○ Data drops and project deliverables ○ Clients Strategic Purpose ○ Defined BIM/Project Deliverables ○ BIM-specific competence assessment

Table 2: EIR Contents

In preparing an EIR this guide should be read in conjunction with and as a commentary to the BIM Task Group BIM Employer's Information Requirements Core Content & Guidance Notes, which should form the basis of your project EIR. An editable copy of this document is appended to this document which may be used as a template for a project EIR.

Project Team BIM Capability

Until BIM is fully embedded in all parties processes as 'business as usual' BIM capability will need consideration in any Project EIR. To procure with BIM the requirements, set out in Table 3, is needed and can be used to inform capability.

Note 3: See the companion Claw Procurement Guide.

Requirement	Mechanism
1. Capability to deliver	PAS 91 Pre-Qualification Questionnaire (PQQ) and Invitation To Tender (ITT)
2. Defined Information Requirements	Employer's Information Requirements (EIR)
3. Right to use data	BIM Protocol
4. Agreed model outputs	Protocol Appendix 1
5. Defined process for delivery	Information Manager
6. Agreed data exchange	Protocol Appendix 2

Table 3: BIM Procurement Requirements

PAS 91 contains a number of important BIM related questions to assess the supplier/supply chains capabilities and this should be considered as part of any PQQ/ITT exercise. It is however likely (initially at least) that most suppliers will not be precluded solely for a lack of full Level 2 BIM capability.

Note 4: The position on Level 2 capability may be hardened with time and dependent of UK Central Government/ Welsh Government' project funding position post 2016.

Note 5: Please see "PAS1192-2 page viii. Fundamental Principles for BIM Level 2 Information Modelling" as a guide to Level 2 BIM requirements and also Table 4 below.

A client may be able to define, validate and accept all information requirements digitally. A project EIR should recognise this as well as the supply chain Level 2 BIM capability.

Table 4 enables projects and project supply chains to be assessed based on the level of BIM capability or working practices being employed and can inform the scope position of a project EIR. Any capability less than Full BIM – full Level 2 BIM as defined in PAS1192-2, and the clients capability to accept, validate and use digital information as defined in PAS1192-3, and above the minimum level of BIM Ready, see below, can be accommodated by classifying the project and its EIR as BIM Adopter. At this level the client and EIR should challenge but over specify information requirements.

KPI	BIM Team Capability Working Practices	BIM Ready	BIM Adopter	Full BIM
B0	No BIM - Not assessed or no working practices B1-B9			
B1	Electronic File Based Information Publishing (Agreed Formats)	✔	✔	✔
B2	Discipline Based Model Authoring & Visualisation		✔	✔
B3	Collaborative Working (Full Design Team)(PAS1192-2)		✔	✔
B4	Collaborative Working (Full Construction Team)(PAS1192-2)		✔	✔
B5	Construction (Planning, Costing & Environmental) (4D, 5D, 6D)		✔	✔

B6	User, Operator, Maintainer Engagement (GSL) (7D)		✔	✔
B7	Employer Engagement (EIR, BIM Protocol, COBie)		✔	✔
B8	BIM Procurement (PAS91, Framework & Project Contract)			✔
B9	Structured Information Exchange & Validation (PAS1192-3)			✔

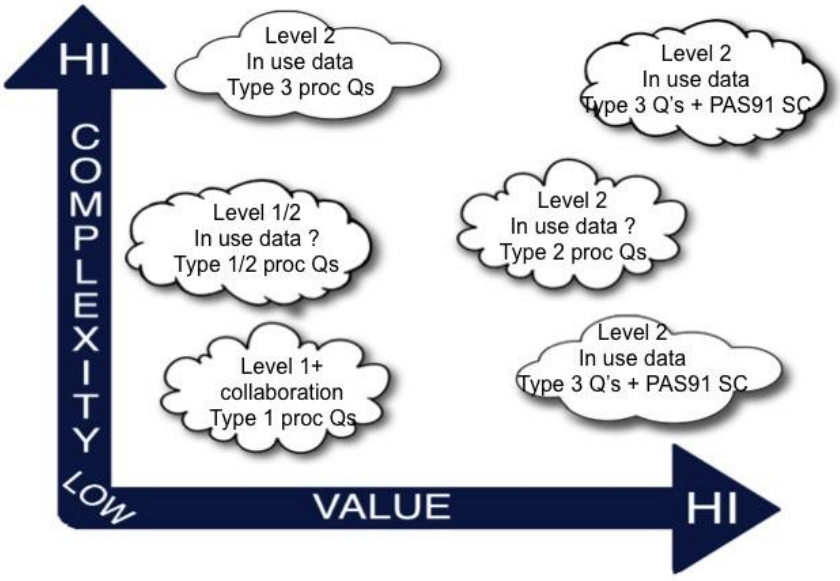
Table 4: Level 2 BIM KPI Working Practices Assessment & EIR Scope Position

The below diagram shows how the value and complexity of a project influence the BIM level required of providers. High value and complex projects demand higher BIM competency in clients and suppliers – so more testing procurement questions are used and an expectation of BIM in tiers 2 and 3 of supply chain is expected. This cascades BIM capability to local SME suppliers.

Low value and low complexity projects may be delivered to lesser sophisticated BIM requirements (this may only be for a short period of time and the client and supply competency matures) therefor less testing questions can be used in procurement. This enables inclusion of local and SME suppliers and affords them time to change and adapt to the “normality” of BIM as its adoption matures.

Some low value and low complexity projects and adaptions may never require BIM and this should be recognised and communicated to the market through supplier days.
This joined up approach builds competency and capacity in principality providers while reducing the risk of exclusion from the adoption of BIM as mandated.

The diagram helps officers in the selection process of levels of BIM and communicates the inclusive approach to non-technical officers and stakeholders. The document refers to procurement questions which form part of the procurement section of the toolkit.



Maturing Standards

As with the project team capability, Level 2 BIM standards are still maturing with some still to be published and some construction sectors needing to catch up.

To determine the full scope of information required at each Plan of Work (PoW) stage in the PDT, it is useful to build a set of Plain Language Questions - see PAS1192-2. These questions should be formulated to inform the key Client Decision at each PoW Gate.

These questions should be used to test both the information requirements, information completeness, level of information detail and readiness to pass each PoW gate. PLQ are not, however, typically included in an EIR.

Ultimately the level of information detail to be specified in the EIR to inform the PLQ will be contained in a digital information Demand Matrix which will be used to validate and verify presented information and documents at each stage. The use of a Demand Matrix to validate submitted information is also maturing and is unlikely to be commonly used until software automation tools are available.

Guidance on PLQ and supporting levels of information and automated validation is still maturing.

PAS1192-3 defines Organisational Information Requirements as a set of asset stakeholder questions across the end to end asset lifecycle and Asset Information Requirements the subset of these for each particular asset related contract. For a capital project the PLQ are the equivalent to the Asset Information Requirements.

The Technology Strategy Board competition for "A digital tool for building information modelling" of February 2014 aims to get industry to fill in the gaps here but won't be delivered until 2015. Before this information is typically specified generically in the PDT using PAS1192-2 Table 20 as a guide.

Similarly the ability for all stakeholders to interact and view 3D visualisation is an important benefit of BIM. Whilst Industry Foundation Classes (ifc) as a visualisation format is mature for the building sector, it is as yet to be fully defined for use in infrastructure and other non-building projects. 3D pdf may be an alternate visualisation format and one or both formats

should be specified in an EIR for visualisations.

The structured data exchange standard – COBie, is also yet to mature in similar areas. IFC's for Infrastructure will likely not be mature for some years and COBie will be standardised in the up-coming BS1192-4 due to be published in 2014, hopefully including infrastructure scope.

The type of project as well as the project team BIM capability will therefore all have a strong bearing on the scope and format of the project EIR and information requirements specified. Do not specify a format the supply chain will be unlikely to able to provide or that will exclude candidates at ITT.

The EIR and BIM specific requirements will adapt and change over time, the current specifications are not perfect and the platform providers are developing their solutions in real time to ease the adotpion and use. It is essential that clients support the development by giving clear requirements that are not product specific, so the suppliers will invest in development that suits the clients requirements, systems and capability. Inconsistent EIR's from clients make for additional avoidable cost – the claw approach harvests savings in time and cost and is an efficient approach to a developing technology.

EIR Scope Position

Digital information is fundamental to any level of BIM and there is an opportunity to embrace this by adopting digital information as a minimum transmittal standard on all projects. This 'BIM Ready' approach will enable even the smallest SME designer, sub-contractor or supplier to start their BIM journey and with the client enjoying at least some of the benefits of BIM working.

The table below summarises the three BIM Project Scope Positions that will assist in drafting an EIR

Project Scope Position	Description
BIM Ready	Base position for all projects and where a 3D BIM model is not required or not appropriate and for all in-use supply & install or planned or reactive maintenance contracts. This position enables the client to build BIM readiness across his asset estate by collecting integrated structured data and digital information. All information is published electronically as documents and data in COBie or negotiated format.
BIM Adopter	Interim position with project team developing its BIM skills. It is recognised here that all team members may not be fully Level 2 BIM capable and that formal BIM appointments are not practical. L2 BIM KPI should be assessed prior to project start with an expressed improvement plan in place. For UK Government funded projects this position is transitional and only applicable to projects initiated prior to 2016.
Full BIM	This is the full 'business as usual' BIM capability position with full project team collaborating and sharing to Level 2 BIM standards. End to end collaborative managed 3D BIM is the formal contractual position for all project team members.

Table 5: BIM Project Scope Position

This can now be incorporated into a simple guidance table to inform your project EIR drafting.

Project Type	Project Scope	Plan of Work	Visualisation Format	Data Format
New Building or Extension to Existing Building, Refurbishment or Upgrade exc Minor Works	BIM Adopter or Full BIM	RIBA 2013	Discipline Industry Foundation Class (IFC)	COBie
Existing Building. Refurbishment or Upgrade inc Minor Works	BIM Ready	RIBA 2013 or as appropriate	Pdf drawings & documents	COBie
Infrastructure Roads, Rail, Public Realm, Environment, Flood or Sea Defence. New Asset or Asset Replacement exc Minor Works	BIM Adopter or Full BIM	CIC 2012 APM	Native Discipline or Negotiated	Open Geospatial Consortium (OGC) or Negotiated
Infrastructure Roads, Rail, Public Realm, Environment, Flood or Sea Defence. Asset Refurbishment or Upgrade inc Minor Works	BIM Ready	CIC 2012 APM or as appropriate	Pdf drawings & documents	OGC or Negotiated

Table 6: Project Type, Scope & Plan of Work based Visualisation and Date Exchange Formats

Use the Project Scope position to define the scope of the Project EIR and information requirements.

Production and Delivery Table Production

The RIBA have created a very useful BIM Toolbox spreadsheet tool to assist in the development of the Production and Delivery Table (PDT). This is buildings based but can easily be modified to suite other sectors.

If your project is to use Government Soft Landings, a GSL Champion should be appointed. Liaise with the GSL Champion in integrating GSL into your EIR. This includes engaging with operations and maintenance team, determining the GSL PLQ and information requirements and the post-handover performance requirements and evaluation criteria.
Refer to the BIM Task Group website for GSL guides.

The EIR should include reference to normal good design management practice. BS1192:2007 and its guidance publications should be used to assist.

Where your project falls within the OJEU criteria you should specify open non-proprietary standards for all information exchange**.** This should in all but the rarest of cases or when a suitable format is not available, be the case anyway.

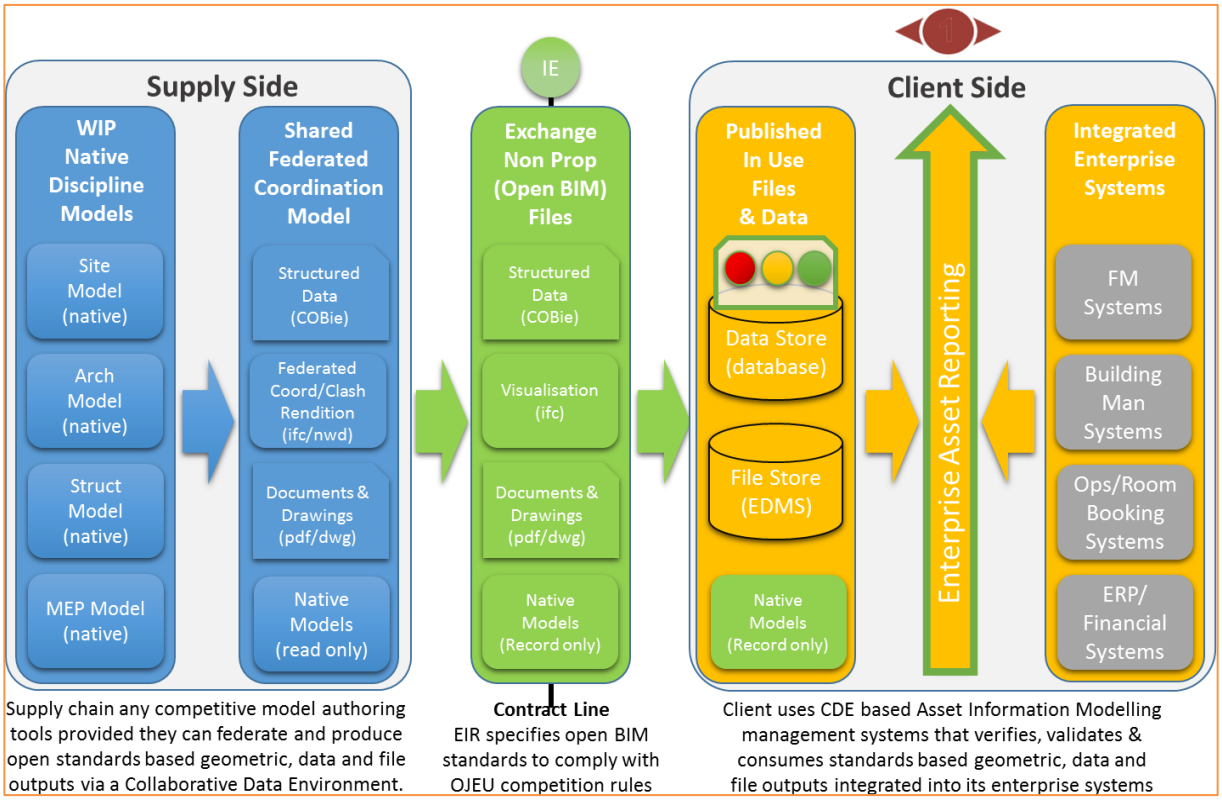
Information and Exchange Packaging

The EIR will specify the information to be exchanged, as a file package, between the supply chain and client at each PoW stage. BIM Level 2 information exchanges are file based.

Whilst the supply chain can use any agreed modelling authoring system, the exchange files should, where possible, also support open non-proprietary standards that can be accessed by the client and stakeholders alike. It must not be assumed that the client or the project stakeholders have either the software licences or skills to view and interact with the model files in their native authored format. The native design files should be included as part of any information exchange package typically for record purposes.
By adopting open standards a client can utilise common tools and systems, adopt a common checking, validation and integration methodologies and utilise the PAS1192-3 concept of an estate wide Clients Asset Information Model.

The table below shows the information flow between the project supply chain – design team and construction team, via defined PoW information exchanges to the client under PAS1192-2 and PAS1192-3.

Diagram 1: Whole Life BIM Information Management



Exchanged packaging should therefore be specified in the EIR as:

Structured Data: in COBie spreadsheet format.
3D Visualisations: in ifc or 3D pdf format.
Documents & Drawings: in pdf or dwg format (cut from the models).
Native (Discipline) 3D Models: in native model authoring format
Native analysis files: as appropriate or again in 3D pdf

Record photographs may also be needed in which case the format should be specified and if date/time and geo coding is required.

Structured COBie data is key to both smooth and eventually automated information transfer and the automated checking and validation of the exchanged information. Whilst the use of COBie as the structured data exchange format is maturing clients should persevere in its use. There is no open or sustainable alternative format for buildings and its extension into infrastructure is also developing.

The power of COBie is not only in its ability to transfer information in a standard accessible and easily automated format, but in the ability to use COBie to specify exactly the information, field by field, to be provided via the Demand Matrix. As stated earlier this is maturing, with a number of UK software providers proposing extensions to validate exchanges via COBie and a Demand Matrix in 2014.

Where IFC objects are not available say for infrastructure, COBie can be linked to and supplemented by OGC CityGML, LandXM, AGS for Geotechnical Surveys, and other industry standard formats suitable for the information being exchanged. These should be used but linked in the documents section of the COBie file. These can also be used to specify areas, regions, extents and zones.

The COBie file should reference all information exchange package files as an issue sheet as a minimum and then be used to validate the transmitted files are present and valid.
The recent outcome of the second Building Smart COBie Test concluded that poor design management and incomplete poorly defined models were the prime cause of difficulty in generating COBie and poor client side information.

Models for federation should have contained information fully defined and classified including

Classification all model elements to be classified to Uniclass2 (or an equivalent standard)
Room Space and Floor Naming a naming strategy must be applied
Origin – must be consistent and global across all models

3D Visualisation files should be exchanged in an acceptable neutral and if possible open standards format - as either ifc files, which can be viewed by free or low cost and intuitive ifc viewer software, or 3D pdf files - which again can be viewed and interacted using free pdf viewers. The latter is a more general format but sometimes more difficult to author. Typically ifc is used for building and 3D pdf for infrastructure projects.

EIR Compilers Guide

Use the following questions to prepare yourself and draft your project Employers Information Requirements:

1. What is the BIM capability of the Project Team – include designers, constructor, FM & client?
2. If GSL, also build in the GSL PLQ from Task Group website to identify the post operation performance and the evaluation process questions into the PLQ?
3. Determine the Plain Language Questions (PLQ) at each stage to inform the information required in your EIR?
4. Is Government Soft Landings being employed and what is the post-handover review period?
5. What is the (digital) plan of work and key decision gates/stages to deliver the project?
6. Are the project and post-handover stakeholders identified and are they engaged?
7. Draft the pre-appointment Production and Delivery Table (PDT) to meet the PLQ and Project Team capabilities across each plan of work stage? Use the RIBA BIM Toolkit for all project types – search 'RIBA BIM Toolkit'.
8. Draft the pre-appointment EIR using BIM Task Group 'EIR Core Content and Guidance Notes' and the CLAW EIR guide (this document). The project EIR should be based on your office BIM standards, BS1192:2007, PAS1192-2:2013 and PAS1192-3:2014. All but BS1192:2007 are currently free to download from the BSI website.
9. Draft the pre-appointment EIR using BIM Task Group 'EIR Core Content and Guidance Notes' and the CLAW EIR guide (this document). The project EIR should be based on your office BIM standards, BS1192:2007, PAS1192-2:2013 and PAS1192-3:2014. All but BS1192:2007 are currently free to download from the BSI website.
10. If the project falls within OJEU criteria make sure you specify open non- proprietary document format standards not to exclude any capable candidate. Where these are not sufficient use 'negotiated or agreed suitable post appointment format'.
11. Be prepared to update the EIR and associated BIM Protocol and appendices as the project progresses. The EIR and BIM Protocol at both design team and construction team appointments should be back to back and common between all parties.

Example Employer's Information Requirements

Contents

1.1 Technical	1.2 Management	1.3 Commercial
○ Software Platforms ○ Data Exchange Format ○ Co-ordinates ○ Level of Detail ○ Training	○ Standards ○ Roles and Responsibilities ○ Planning the Work and Data Segregation ○ Security ○ Coordination and Clash Detection Process ○ Collaboration Process ○ Health and Safety and Construction Design Management ○ Systems Performance ○ Compliance Plan ○ Delivery Strategy for ○ Asset Information	○ Data drops and project deliverables ○ Clients Strategic Purpose ○ Defined BIM/Project Deliverables ○ BIM-specific competence assessment

1.0.1. General

1.0.1. This Employer's Information Requirements (EIR) document is included in the tender documents for the procurement of both a Design Team and the Constructor. The EIR has been edited to confirm the project-specific requirements for each of the sections. All EIR content requires review and confirmation before each issue to ensure that there are no project specific issues which need to be taken into account.

1.0.2. EIRs are an important element of Project BIM Implementation as they are used to set out clearly to the bidder what models are required and what the purposes of the models will be. These requirements will be written into the BIM Protocol and implemented through the BIM Execution Plan.
In accordance with PAS 1192-2, the Design Team and Constructor should each include an outline BIM Execution Plan (BEP) in their proposal. In addition to information requested as part of the tender process, a comprehensive initial BEP will include the following content:

- the Project Implementation Plan
- project goals for collaboration and information modelling;
- major project milestones consistent with the project programme; and
- project Information Model Delivery Strategy

1.0.3. A compliant BEP will demonstrate how the requirements outlined in the EIRs will be met.

1.0.4. The EIR is a key document with regards to communicating information requirements as well as establishing information management requirements. This EIR will act as a good basis from which to review the contents of the tenderer's BIM Execution Planning, confirming its completeness.

1.1 Technical

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

Reference	Item	Requirement
1.1.1	Software Platforms	Platforms and versions used across the programme of projects include the following: • Collaboration – the Design Lead and then Constructor Lead will provide the collaboration environment and give the Employer reasonable access for the life of the project until 3 months after practical completion • Facilities maintenance – Information Exchanges will generate the input into the Employer's Asset Information Model environment. The proposed systems and access proposals should be made clear in the bidder response BIM Execution Plan (BEP). Details of information exchange requirements are set out in 1.1.2, data exchange format. Designers and Constructors should configure their attribute data in their models to align with the data exchange format. The BEP should set out how this will be achieved.
1.1.2	Data Exchange Format	Information Exchanges will be made prior to completion of each plan of work stage. Information is required in the following formats: • Native discipline based 3D model files product specific for all design and analysis models • 3D discipline based model visualisation in IFC format extracted from native files • COBie – COBie-UK-2012 version 2.4 extracted from native files • PDF files – no older than version 7.0 • 2D Drawing files in dwg format cut from the submitted models All exchanged files should be named as BS1192:2007 and linked in the COBie Documents section and with Authors in the Contacts section to enable package validation at each exchange. All models and extracted information and files should be coordinated see PAS1192-2

1.1.3	Co-ordinates	Please confirm the spatial coordination proposals in the submitted BEP • Intersection of grids in global coordinates Easting and Northing • Finished Ground Floor Level (FFL) Other coordination standards defined in the BEP should include: • Origin rotation • Offsets • Datum information • Units to be used • Space Naming – all spaced should be named consistently in all discipline models • Please liaise with the Employer on space and other naming conventions to apply • Classification system will be UNICLASS2 It is imperative that all submitted information is coordinated and consistently names, positioned and classified. Please confirm proposals in the BEP.
1.1.4	Level of Detail	• The plan of work used shall be RIBA 2013 Stage 0 - 7 • Level of model definition: PAS1192-2 Figure 20 for models at each work stage • Alignment of Information Exchanges at completion of each work stage • Please see Production and Delivery Table below
1.1.5	Training	The responsibility for provision and training of the Employer in the use of any other electronic or software modelling and analysis tools other than in the formats specified rests with the consultant/constructor.

Production and Delivery Table

	Stage 1		Stage 2		Stage 3		Stage 4		Stage 5		Stage 6	
	Model Originator	Level of Detail	Model Originator	Level of Detail	Model Originator	Level of Detail	Model Originator	Level of Detail	Model Originator	Level of Detail	Model Originator	Level of Detail
Overall form and content												
Space planning	Architect	1	Architect	2	Contractor	2	Contractor	3	Contractor	3	Contractor	6
Site and context	Architect	1	Architect	2	Contractor	2	Contractor	3	Contractor	3	Contractor	6
Surveys							Contractor	3	Contractor	3		
External form and appearance			Architect	2	Contractor	2	Contractor	3	Contractor	3	Contractor	6
Building and site sections					Contractor	2	Contractor	3	Contractor	3	Contractor	6
Internal layouts					Contractor	2	Contractor	3	Contractor	3	Contractor	6
Design strategies												
Fire			Architect	2	Contractor	2	Contractor	3	Contractor	3	Contractor	6
Physical security			Architect	2	Contractor	2	Contractor	3	Contractor	3	Contractor	6
Disabled access			Architect	2	Contractor	2	Contractor	3	Contractor	3	Contractor	6
Maintenance access			Architect	2	Contractor	2	Contractor	3	Contractor	3	Contractor	6
BREEAM					Contractor	2	Contractor	3	Contractor	3	Contractor	6
Performance												

Building	Architect	1	Architect	2	Contractor	2	Contractor	3	Contractor	3		
Structural	Architect	1	Str Eng	2	Contractor	2	Contractor	3	Contractor	3		
MEP systems	Architect	1	MEP Eng	2	Contractor	2	Contractor	3	Contractor	3		
Regulation compliance analysis							Contractor	3	Contractor	3	Contractor	6
Thermal Simulation							Contractor	3	Contractor	3	Contractor	6
Sustainability Analysis							Contractor	3	Contractor	3	Contractor	6
Acoustic analysis							Contractor	3	Contractor	3	Contractor	6
4D Programming Analysis 5D Cost Analysis												
Services Commissioning							Contractor	3	Contractor	3	Contractor	6
Elements, materials components												
Building			Architect	2	Contractor	2	Contractor	3	Contractor	3	Contractor	6
Specifications			MEP Eng	2	Contractor	2	Contractor	3	Contractor	3	Contractor	6
MEP systems					Contractor	2	Contractor	3	Contractor	3	Contractor	6
Construction proposals												
Phasing							Contractor	3	Contractor	3		
Site access							Contractor	3	Contractor	3		

Site set-up												Contractor	3			Contractor	3		
Health and safety																			
Design												Contractor	3			Contractor	3		
Construction												Contractor	3			Contractor	3		
Operation												Contractor	3			Contractor	3	Contractor	6

1.2 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.

Reference	Item	Requirement
1.2.1	Standards	The core documents and standards that are to be used on this project are: • PAS1192:2 • PAS1192-3 • Supported by BS1192:2007 • COBie-UK-2012 Adoption of other standards related to Building Information Modelling are encouraged if specifically relevant (this list is not exhaustive): • *BS7000 series - Design Management Systems* • *BS8534:2011 - Construction Procurement policies* • *BS10012 - Data Protection* • *PAS 55-1:2008 - Asset Management*
1.2.2	Roles and Responsibilities	References to contract documentation which defines the responsibility and scope of appointments associated with roles including: • Client's Technical Adviser (TA): xxx yyyyyy • Project Delivery Manager (PDM): xxx yyyyyy • Information Manager: xxx yyyyyy

		• Lead Designer: xxx yyyyyy • Task Team Manager: xxx yyyyyy

1.2.3	Planning the Work and Data Segregation	Information should be managed in accordance with the processes described in PAS1192-2, PAS1192-3 and BS 1192 (2007)
		• Model Management
		  ○ The expectation is that this will be co-ordinated by the Information Manager
		• Volumes, Zones and Areas
		  ○ Requirements in connection with the definitions of zones and the management of adjacency within the model
		  ○ Requirements in connection with the definition of the project volume structure
		• Naming Conventions
		  ○ Definition of the requirement for a single project convention – preferably based on a departmental standard, such as the generic example below:
		• Publishing processes
		  ○ Details for procedures required. The expectation is that publication processes will be in accordance with the standards of the defined common data environment
		Fully documented procedures are required in the BIM Execution plan

1.2.4	Security	No specific security provision however the BEP should confirm policy arrangements.

1.2.5	Coordination and Clash Detection	Please provide details of the following project management processes in the BEP:
		• Details of the clash detection process including:
		  ○ Software
		  ○ Process overview
		  ○ Responsibilities
		  ○ Outputs
		• Technical query workflow

		• Tolerance strategy • Clash resolution process
1.2.6	Collaboration Process	Please provide details of the collaboration process sufficient to demonstrate competence and capability in the BEP. This should include details of: • Form of sharing • Extent of model i.e. reduced LoD • Frequency of collaboration and information exchange • Details of model review workshops and other collaborative working practices
1.2.7	Health and Safety/ Construction Design Management	Please provide details of how BIM enabled processes will be used to manage the employer's and supplier's H&S/CDM obligations, sufficient to demonstrate competence and capability in the BEP. • Schedule of work stages (RIBA 2013) • Overview of key H&S deliverables against each work stage • Confirmation on how deliverables should be stored • Requirements for disaster planning • Approach to design authoring
1.2.8	Systems Performance	All information exchange via supplier collaboration system. Please provide details of all volume, model and other size limitations in the BEP. All models and files subject to an individual size limit of 500Mb.
1.2.9	Compliance Plan	Please provide proposals for model and data compliance detailed in the BEP, which should refer to: • Quality assurance/control procedure • Associated software • Level of assurance

		• Period of aftercare (the number of years that the model should be managed for)
1.2.10	Delivery Strategy for Asset Information	All asset information should be delivered in the formats above with data in COBie 2012 format and PAS1192-3.

1.3 Commercial

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

Ref	Item	Requirement
1.3.1	Data Drops and project deliverables	All information exchanges align with the Plan of Work Stages – RIBA 2013
1.3.2	Client's Strategic Purposes	It is expected that the primary use of the data will be for the following purposes: P01 Registration / P06 Assessment and re-use P02 Use and utilisation / P07 Impacts P03 Operations / P08 Business case P04 Maintenance and repair / P09 Security and surveillance P05 Replacement / P10 Regulation and Compliance
1.3.3	Defined BIM/Project deliverables	This section is to include detail of specific BIM/Project deliverables eg fully rendered animated model renditions; fly/walk through through visualisations; 4D programme models; solar impact analysis models. The specific requirements, stages and level of detail/definition should be clearly stated.

1.3.4	BIM-specific competence assessment	This section details the information that a bidder should be required to provide as part of a bid submission. The scope of information described in 1.3.3 should be referred to in instructions to tenderers.
A	BIM Capability and Experience	BEP should include the following detail: • BIM experience - organisational and personnel • BIM capabilities • Out-sourced roles
B	Evidence of BIM Execution Planning	BEP should include the following detail: • BIM Execution Plans • Lessons learnt
C	Confirmation of BIM Toolset	BEP should include the detail on procedures aligned with core project stages as follows:: • BS1192 (2007) • PAS1192-2 (2013) • COBie UK 2012 • Other bespoke processes
D	Details of BIM Workload and Resourcing	BEP should include the following detail: • Resource matrix with level, number, utilisation • Outsourcing details or services etc.
E	Principal Supply Chain	BEP should include the following detail: • Key supply chain partners • Expected outputs • Assessment process

EIR Core Content and Guidance Notes

1.0 Employer's Information Requirements

This Specimen Employer's Information Requirements (EIR) document is designed to be included in the tender documents for the procurement of both a Design Team and the Constructor. The content can be incorporated into other tender documents. The EIR will require editing to confirm project-specific requirements for each of the sections. Standard responses have been included and in many cases these can be adopted without amendment. However, all EIR content will require review and confirmation before issue to ensure that there are no project specific issues which need to be taken into account.

Guidance written into the EIRs should be deleted prior to formal issue,

EIRs are an important element of Project BIM Implementation as they are used to set out clearly to the bidder what models are required and what the purposes of the models will be. These requirements will be written into the BIM Protocol and implemented through the BIM Execution Plan.

In accordance with PAS 1192-2, the Design Team and Constructor should each include an outline BIM Execution Plan (BEP) in their proposal. In addition to information requested as part of the tender process, a comprehensive initial BEP will include the following content:

- the Project Implementation Plan
- project goals for collaboration and information modelling;

- major project milestones consistent with the project programme; and
- project Information Model deliverable strategy

A compliant BEP will demonstrate how the requirements outlined in the EIRs will be met.

The EIR is a key document with regards to communicating information requirements as well as establishing information management requirements. The EIR will act as a good basis from which to review the contents of the tenderer's BIM Execution Planning, confirming its completeness.

The core content and guidance is split into the following sections:

Technical	Management	Commercial
○ Software Platforms ○ Data Exchange Format ○ Co-ordinates ○ Level of Detail ○ Training	○ Standards ○ Roles and Responsibilities ○ Planning the Work and Data Segregation ○ Security ○ Coordination and Clash Detection Process ○ Collaboration Process ○ Health and Safety and Construction Design Management ○ Systems Performance ○ Compliance Plan ○ Delivery Strategy for Asset Information	○ Data drops and project deliverables ○ Clients Strategic Purpose ○ Defined BIM/Project Deliverables ○ BIM-specific competence assessment

Adaptations to the EIRs will be required to align with the requirements of the employer. Areas where adjustments are likely to be required include:

- Type of asset. This document was prepared on the assumption that the asset is a building – this will not be the case for all employers;
- Project stages. Data drops and associated information requirements are to be mapped against the project stages of a particular employer;;
- Information requirements. Data drops are to be aligned against the needs of the project – e.g. new-build vs. on-going asset management;
- Procurement strategy. Data drops are to be aligned with the procurement strategy adopted by the employer (e.g. Cost-led, Integrated Insurance, two-stage open book)
- IT requirements. Collaboration tools and other employer-specific requirements are to be specified. For example, any collaboration site provided by the employer;
- Detailed alignment of documents. Terminology for information, stages, documents and roles described in the EIRs should match that used in specific appointment documents;
- Detailed technical information requirements. Space object properties are likely to vary by employer and asset type.

Section 2 outlines the additions to other tender documents for a Constructor tender issue

1.2 Technical

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

Reference	Item	Description	Response
1.1.1	Software Platforms	Define the platform for the Building Information Model as well as other software platforms to be used The purpose of this section is to communicate software platforms and versions where these are known and where they might influence	**This EIR should include:** Platforms and versions used by the employer across the programme of projects include the following: • Collaboration – XXX • Facilities maintenance – XXX The ability of the bidder to work with these platforms should be made clear in the response. Details of information exchange requirements are set out in 1.1.2, data exchange format. Designers and Constructors should configure their attribute data in their models to align with the data exchange format. The BEP should set out how this will be achieved *Guidance: In accordance with an open approach to software solutions, the EIRs should not dictate a software solution to the supply chain. However, depending on the stage of the project, the Employer will be able to state the versions and platforms used to prepare data drops that the bidder will receive. The employer will also be able to define the versions and platforms used for employer collaboration and facilities management.*

		the preparation of a bid. Section 1.1.1 also defines content required in the BEP	*When appointing a design team or integrated project team, only collaboration, information exchange and FM versions and platforms should be described in the EIRs:* *Design development by the Consultant team may include the following disciplines (as required). Where design models are provided by the Employer as a data drop, The platforms/versions used to produce the design deliverables should be stated within the BEP. This information is incorporated into the contract using the BIM Protocol:* • *Architecture* • *Structures* • *MEP* • *Model Coordination* • *Collaboration* *The Constructor design development may include the following (as required). Platforms and versions should be stated in the BEP. Again, the Client should not be prescriptive regarding the software used for design or analysis:* • *Building Physics* • *Environmental* • *Acoustic* • *Daylight analysis* • *Fire* *Planning (4D) and Cost (5D)*

Reference	**Item**	**Description**	**Response**
1.1.2	Data Exchange Format	The purpose of this section is to define the formats used to deliver data at data drops	**This EIR should include:** For each of the data drops, information will be required in the following formats: • Native – 3D model files product specific for all design and analysis models • COBie – COBie-UK-2012 version 2.4 • PDF files – no older than version 7.0 *Guidance: Government Employer Requirements mandate information in a COBie format (a relative of IFC). The Construction-Operations Building Information Exchange (COBie) format facilitates the delivery of asset information during planning, design, construction, and commissioning for delivery to facility owners and operators.* *The version reference for COBie and PDF files can be stated* *Under the BIM Protocol, a project member undertakes to generate data provided in all three formats from the same data set.* *There is no specific contractual provision to deal with discrepancies, but it can be anticipated that if discrepancies were discovered, then a submission will be returned. The return of the submission is unlikely to be accepted as the cause of a variation/compensation event.*
1.1.3	Co-ordinates	The purpose of this section is to encourage the	**This EIR should include:** The minimum requirement is spatial coordination stated as follows**:**

		adoption a common coordinate system for all BIM data with consistent adoption for all models. Defines requirements for the common coordinate system for all BIM data. Details modifications to imported DWG/DGN co-ordinates.	**e.g:** • Intersection of grids XX and YY - xxxxxx.xxxE and xxxxxx.xxxN • Intersection of grids AA and BB - xxxxxx.xxxE and xxxxxx.xxxN • Ground floor FFL = xxx.xxx Other coordination standards defined in the EIRs/BIM Execution Plan should include: • Origin rotation • Offsets • Datum information • Units to be used

Reference	Item	Description	Response
1.1.4	Level of Detail	The purpose of this section is to define requirements for information submissions/data drops at project stages. This information is used to populate the Model Production and Delivery Table included in the CIC BIM Protocol (MPDT). The MPDT defines the scope of the models for the purposes of the contract. It is important that the	**EIR provided to define the Level of Detail should include the following detail** **Details of information requirements** • A schedule of work stages (APM is the preferred option but RIBA/ICE/bespoke can be used) • Expected Level of Detail for models at each work stage • Alignment of data drops to the work stages • Definitions of the levels of detail. E.g. Definitions published in PAS 1192-2 *Extract from Appendix 1, CIC BIM Protocol – Definition of Level of Detail and Project Stages* **Levels of Detail and the Model Production and Delivery Table** The Levels of Detail are as follows: LOD 1 _____ LOD 2 _____ LOD 3 _____ LOD 4 _____ LOD 5 _____ LOD 6 _____ LOD 7 _____ The Stages are as follows: STAGE 1 _____ STAGE 2 _____ STAGE 3 _____ STAGE 4 _____ STAGE 5 _____ STAGE 6 _____ STAGE 7 _____ *This is a framework for a Model Production and Delivery Table. The parties may choose any other appropriate format and attach it to this Appendix.* *An editable version of the BIM Protocol Appendices are provided on the BIM Task Group Website:* **www.bimtaskgroup.org** *Details of individual models and other deliverables aligned to work stages and data drops are captured at section 1.3.1.* *Guidance: A worked example of a simple MPDT is set out overleaf. This has been taken from Appendix 1 of the CIC BIM Protocol. All models that are expected to be*

		MPDT is comprehensive and is regularly updated. The MPDT also defines for the purposes of the contract the levels of detail used for the various phases of the project.	*used to produce Project Outputs should be detailed in this table. If a model is not described in the table, it will not be covered by the provisions of the BIM Protocol. Details of the models themselves should be recorded at section 1.3.1 of the EIR.* *Under the BIM Protocol, the responsibility for the maintenance of the MPDT sits with the employer. It is envisaged that the table will be managed by a party appointed by the employer.* *Accurate recording of the Level of Detail is important. Originators will typically be required to complete models strictly to the level of detail required at a particular stage. Similarly information users will typically be required to only rely on information completed to the contractually defined level of detail.* *In advance of the publication of definitive UK definitions of Levels of Detail for models, assemblies and components, employers can use existing generic definitions such as that included within PAS 1192-2 as a reference point.*

Extract from CIC BIM protocol appendix 1.
Model Production and Delivery table

Specimen Production and Delivery Table for CIC BIM Protocol

	Drop 1 Stage 1		Drop 2a Stage 2		Drop 2b Stage 2		Drop 3 Stage 3		Drop 4 Stage 6	
	Model Originator	Level of Detail	Model Originator	Level of Detail	Model Originator	Level of Detail	Model Originator	Level of Detail	Model Originator	Level of Detail
Overall form and content										
Space planning	Architect	1	Architect	2	Contractor	2	Contractor	3	Contractor	6
Site and context	Architect	1	Architect	2	Contractor	2	Contractor	3	Contractor	6
Surveys							Contractor	3		
External form and appearance			Architect	2	Contractor	2	Contractor	3	Contractor	6
Building and site sections					Contractor	2	Contractor	3	Contractor	6
Internal layouts					Contractor	2	Contractor	3	Contractor	6
Design strategies										
Fire			Architect	2	Contractor	2	Contractor	3	Contractor	6
Physical security			Architect	2	Contractor	2	Contractor	3	Contractor	6
Disabled access			Architect	2	Contractor	2	Contractor	3	Contractor	6
Maintenance access			Architect	2	Contractor	2	Contractor	3	Contractor	6
BREEAM					Contractor	2	Contractor	3	Contractor	6
Performance										
Building	Architect	1	Architect	2	Contractor	2	Contractor	3		
Structural	Architect	1	Str Eng	2	Contractor	2	Contractor	3		
MEP systems	Architect	1	MEP Eng	2	Contractor	2	Contractor	3		
Regulation compliance analysis							Contractor	3	Contractor	6
Thermal Simulation							Contractor	3	Contractor	6
Sustainability Analysis							Contractor	3	Contractor	6
Acoustic analysis							Contractor	3	Contractor	6
4D Programming Analysis										
5D Cost Analysis										
Services Commissioning							Contractor	3	Contractor	6
Elements, materials components										
Building			Architect	2	Contractor	2	Contractor	3	Contractor	6
Specifications			MEP Eng	2	Contractor	2	Contractor	3	Contractor	6
MEP systems					Contractor	2	Contractor	3	Contractor	6
Construction proposals										
Phasing							Contractor	3		
Site access							Contractor	3		
Site set-up							Contractor	3		
Health and safety										
Design							Contractor	3		
Construction							Contractor	3		
Operation							Contractor	3	Contractor	6

LOD definitions (from PAS 1192)

1 Brief
2 Concept
3 Developed Design
4 Production
5 Installation
6 As constructed
7 In use

Stage definitions (from APM)

0 Strategy
1 Brief
2 Concept
3 Definition
4 Design (production information)
5 Build & Commission
6 Handover & Closeout
7 Operation and end of life

Model Originators identified by name

Reference	Item	Description	Response
1.1.5	Training	The purpose of this section is to provide bidders with details of training that will be provided in connection with project systems, or training requirements which the bidder will be required to deliver as part of their appointment/contract.	**This EIR should include:** Details of training for specified client specific applications that will be used on the project. This should refer to item 1.1.1. Details of any additional training requirements for the client team *Guidance: The EIRs should communicate clearly that the responsibility for training associated with other modelling and analysis tools rests with the consultant/constructor.*

1.3 1.2 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.

Reference	Item	Description	Response
1.2.1	Standards	The purpose of this section is to define the BIM Standards that are incorporated into the Information Requirements, Appendix 2 of the CIC BIM Protocol.	**This EIR should include:** Definitions of the core documents and standards that are to be mandated on the project: e.g.: • PAS1192:2 • Supported by BS1192:2007 • COBie-UK-2012 *Guidance: Use of these standards can be incorporated into the contract via the CIC BIM protocol* *Adoption of other standards related to Building Information Modelling can be encouraged if specifically relevant (this list is not exhaustive):* • *BS7000 series - Design Management Systems* • *BS8534:2011 - Construction Procurement policies* • *BS10012 - Data Protection* • *PAS 55-1:2008 - Asset Management*

Reference	Item	Description	Response
1.2.2	Roles and Responsibilities	The purpose of this section is to bring to the attention of the project team the allocation of roles associated with the management of the model and project information. The roles themselves are addressed in specific appointments and ERs. PAS 1192-2 provides a useful cross-tabulated summary of the	**This section should include:** References to existing documentation (XXXX) which define the responsibility and scope of appointments associated with roles including: • Client's Technical Adviser (TA) • Project Delivery Manager (PDM) • Information Manager • Lead Designer • Task Team Manager Details of activities under taken by the employer: The following roles in connection with BIM will be taken on directly by the employer: • To be detailed as required *Guidance: Roles associated with the management of information on BIM-enabled projects are described in outline in PAS 1192-2.* *An outline scope of service for the role of Information Management has been published by CIC.* *All of the roles described in PAS 1192-2 are expected to be undertaken within the scope of existing appointments.*

		roles as they apply across Project Team Members	*Any drafting of roles and responsibilities in the EIRs should be aligned with drafting published in appointment documentation and employer's requirements/specifications.* *Detailed of how any BIM-specific roles will be delivered and coordinated should be included in the BIM Execution Plan.*

Reference	Item	Description	Response

1.2.3	Planning the Work and Data Segregation	The purpose of this section is to set out requirements for the bidder's proposals for the management of the modelling process	**This EIR should include:**
			
			A statement that information should be managed in accordance with the processes described in PAS1192-2 and BS 1192 (2007)
			
			Where the employer has specific requirements for work management, the requirement and request for proposals should be identified in the EIRs
			Examples of requirements include:
			• Model Management
			  ○ Details for procedures required. The expectation is that this will be co-ordinated by the Information Manager
			• Volumes, Zones and Areas
			  ○ Requirements in connection with the definitions of zones and the management of adjacency within the model
			  ○ Requirements in connection with the definition of the project volume structure

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Naming Conventions

Definition of the requirement for a single project convention – preferably based on a departmental standard, such as the generic example below:

<table>
<tr><th>description</th><th>PROJECT NUMBER</th><th>PHASE/ZONE</th><th>ORIGINATOR</th><th>DISCIPLINE</th><th>PACKAGE</th><th>LEVEL</th><th>OUTPUT TYPE</th><th>NUMBER</th></tr>
<tr><td>no. of characters</td><td>XXXXX</td><td>XX</td><td>XXX</td><td>X</td><td>XX</td><td>XX</td><td>XX</td><td>XXX</td></tr>
<tr><td>notes</td><td></td><td>2 Char</td><td>3 Char</td><td>1 Char</td><td>2 Char</td><td>2 Char</td><td>2 Char</td><td>3 Char</td></tr>
<tr><td></td><td></td><td></td><td>Company Name</td><td></td><td>Alphabetical/ numcerical code</td><td></td><td>Alphabetical</td><td>Numerical, begining 001</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>according to discipline</td><td></td><td></td><td></td></tr>
</table>

there are no Client specific requirements but definition of a convention should be clearly addressed in the plan

Publishing processes

Details for procedures required. The expectation is that publication processes will be in accordance with the standards of the defined common data environment

Fully documented procedures are required in the BIM Execution plan
</td>
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<tr>
<td>1.2.4</td>
<td>Security</td>
<td>The purpose of this section is to communicate client specific security measures required in order to secure the data</td>
<td>
This EIR should include:
Details of the security standards that apply to information used on the project. For example:
Any file when uploaded to the collaboration site or other electronic document management system, is to be secure to the standard required by the employer.
For this project, security is defined in accordance with business impact levels defined in the HMG Security Policy Framework as follows:

IL1 – not protectively marked
IL2 - protect
IL3 - restricted
IL4 - confidential

</td>
</tr>
</table>

			Guidance: The bid submission should demonstrate the supplier's compliance with mandated security systems. The completed BIM Execution Plan will set out compliance processes and the means by which compliance is monitored and managed.

Reference	Item	Description	Response

1.2.5	Coordination and Clash Detection	The purpose of this section is to define the required co-ordination process, together with requirements for quality control?	**This EIR should include:**
			Requests for details of the following project management processes:
			• Details of the clash detection process including:
			  ○ Software
			  ○ Process overview
			  ○ Responsibilities
			  ○ Outputs
			• Technical query workflow
			• Tolerance strategy
			• Clash resolution process
			Guidance: Agreed processes will be defined in the completed BIM Execution Plan

1.2.6	Collaboration Process	The purpose of this section is to define how, where and when project information will be shared	**This EIR should include:** Details of the collaboration process sufficient to demonstrate competence and capability at tender. It is expected that full details of the process will be included within the completed BIM Execution plan. Details of the process received at tender should include details of:

			• Form of sharing • Extent of model i.e. reduced LoD • Frequency of collaboration and information exchange • Details of model review workshops and other collaborative working practices *Guidance: Agreed processes will be defined in the completed BIM Execution Plan*

Reference	Item	Description	Response
1.2.7	Health and Safety/ Construction Design Management	The purpose of this section is to enable the employer to define how BIM-based working will support H&S/CDM monitoring aligned with the work stages. Data and records capture processes also need to be documented.	**This EIR should include:** Details of how BIM enabled processes will be used to manage the employer's and supplier's H&S/CDM obligations, sufficient to demonstrate competence and capability at tender. • Schedule of work stages (APM/RIBA/ICE/bespoke WBS) • Overview of key H&S deliverables against each work stage • Confirmation on how deliverables should be stored • Requirements for disaster planning • Approach to design authoring *Guidance: for example, against data drops the following could be specified:* *Drop 2a* • *Pre-construction information (PCI) document (collated and issued by CDMC using client team information, sent out with tender documents)* • *Outline risk assessments from design team members (included in PCI)*

			Drop 2b
			• *The contractor is to provide an outline but project specific construction phase health and safety plan (maximum five pages), Including but not limited to:*
			  ○ *Project overview / description of works;*
			  ○ *Project's site specific risks for contractor's design;*
			  ○ *Contractor design team details;*
			  ○ *Safe systems of work and person responsible for their coordination;*
			  ○ *Site compound location and arrangements (e.g. stacking of site huts;*
			  ○ *Traffic management plan identifying access arrangements (refer to other section if included elsewhere); and*
			  ○ *Construction plant or equipment to be used in project.*
			Drop 3
			• *Contractor is to provide project construction phase health and safety plan on their appointment at least two weeks before agreed start on site date.*
			• *Contractor is to supply relevant information to update F10*
			Drop 4
			• *Contractor is to*
			  ○ *Collate information for operation and maintenance manuals throughout the construction period*
			  ○ *Provide completed operation and maintenance manuals in the timescale dictated by handover procedures (starting six weeks before completion)*
			  ○ *Provide information in accordance with prescribed format*
			  ○ *Provide the CDM coordinator with relevant information.*
			Drop 5 (post occupation)

			• *Contractor is to*
			  ○ *ensure that all relevant documents including commissioning certificates and record drawings have been provided and indexed within the building manual.*
			  ○ *upload the Building Manuals onto XXX and provide 1 electronic and 1 hard copy to the Establishment.*

Reference	Item	Description	Response
1.2.8	Systems 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 EIR should include:** The following employer-side IT system restrictions and requirements need to be taken into account when developing the BIM Execution Plan: • Model size • Software uses • Access to free viewers • Security issues *Guidance: The above should be populated with appropriate requirements and constraints, indicating where any specific detail is required in a contractor's interim BIM Execution plan as part of a bid submission.*
1.2.9	Compliance Plan	The purpose of this section is to	**The EIR should include:** Details of client-specified model and data compliance requirements, including

		enable the supplier to communicate how the integrity of the model and other data sources will be maintained	references to standards and to compliance software that is used by the employer. It is expected that the suppliers proposals for model and data compliance will be detailed within the BIM Execution plan, which should refer to: • Quality assurance/control procedure • Associated software • Level of assurance • Period of aftercare (the number of years that the model should be managed for) *Guidance: The above should be populated with appropriate requirements, indicating where any specific detail is required in a contractor's interim BIM Execution plan as part of a bid submission. If aftercare is required, the period for which it is required should be stated.*
1.2.10	Delivery Strategy for Asset Information	This section defines the information exchange standard for asset information and enables the employer to obtain proposals with regards to asset information delivery into the	**The EIR should include:** Confirmation of the information exchange format and reference to requirements for the Asset Information Model (AIM) The asset information should be delivered in the COBie 2012 format as prescribed in the data drop detail, and in accordance with requirements described in the Asset Information Model Text describing AIM delivery strategy should be populated with appropriate requirements and constraints, indicating where any specific detail is required in a contractor's interim BIM Execution plan as part of a bid submission In addition, proposals should be included in the interim BIM Execution plan setting out proposals for how best to deliver information into the following defined facilities

		employer's FM environment?	maintenance environment: • XXX *Guidance: Define the details of systems/databases/information formats in use so that the contractor can demonstrate compliance with information management requirements*

1.4 Commercial

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

<table>
<tr><th>Ref</th><th>Item</th><th>Description</th><th>Response</th></tr>
<tr><td>1.3.1</td><td>Data Drops and project deliverables</td><td>The purpose of this section is to communicate the content of data drops and how data drops are aligned to work stages. Section 1.3.1 will also explain how data drops relate to the selected procurement process, as well as the purpose and key contents.
This part of the EIR must be complete when issued to bidders for design or constructor tenders</td><td>The EIR should include:
Details of the information requirements:
Schedule of work stages (APM/RIBA/ICE/bespoke WBS)
Alignment of data drops to the work stages
Key purposes of data drops
Specific information requirements from the data drops, defined as responses to the ‘English Language Requirements’
E.g.<table><tr><th>Stage</th><th>Description</th><th>Drop</th><th>Purpose</th></tr><tr><td>Stage 1</td><td>fees for Option Appraisal</td><td>-</td><td></td></tr><tr><td>Stage 2</td><td>Option Appraisal</td><td>1</td><td>Approved Outline Business Case</td></tr><tr><td>Stage 3</td><td>Feasibility Study</td><td>-</td><td></td></tr><tr><td>Stage 4</td><td>Project Brief / Tender Model</td><td>2a</td><td>Tender package</td></tr><tr><td>Stage 5a</td><td>Initial Project Proposals Proposals (IPP)</td><td>2b</td><td>Appoint Constructor</td></tr><tr><td>Stage 5b</td><td>Developed Constructor Proposals (DPP)
Agreed Maximum Price (AMP)</td><td>3</td><td>Agree maximum price (submit DPP for evaluation)</td></tr><tr><td>Stage 6</td><td>Construction</td><td>-</td><td></td></tr><tr><td>Stage 7</td><td>Completion</td><td>4</td><td>Practical completion / certificate A</td></tr></table>Guidance: The data required to populate the data drops will vary at each stage in accordance with the ‘Plain Language Questions’ that need to be supported by the data drops. These address the performance requirements which a project is required to meet to comply with the brief and wider regulatory requirements. The project team is</td></tr>
</table>

required to provide information in the model to demonstrate compliance with questions associated with the data drops.

An extract from a typical tabular format which is compatible with the CIC BIM Protocol and that can be used to communicate information requirement, content, formats and data originator is set out below:

Stage 4: tender requirements **Heading**	**Description**	**BIM model***	**2D PDF drawings**	**2D DWG drawings**	**COBie-UK-2012**	**Documentation**	**Who?**
Overall form and content							
Space planning	Overall zoning. Approximate scale of spaces and of the building as a whole. Required adjacencies and circulation pattern	✓			✓		Client's design team

In addition to models, drawings and analysis reports, the data drops will potentially also include some or all of the following project outputs. These should also be described in the data drop schedule:

Cost Model/estimate/contract sum analysis	*Phasing analysis*
Floor area/accommodation schedules	*Approvals schedule*
Elemental Project Planning Model	*Site / Welfare Planning*
Construction Sequencing Model	*Temporary/Enabling Works/Logistics*

A comprehensive data drop schedule will help to ensure that information requirements

<table>
<tr><td></td><td></td><td></td><td>are clearly communicated to the project team/contractor.</td></tr>
<tr><td>1.3.2</td><td>Client's Strategic Purposes</td><td>The purpose of this section is to describe the expected purposes of the information provided using the COBie data exchange format. The CIC BIM Protocol does not specifically state the purposes for which models will be used. Setting out proposed purposes in the EIRs informs the scope of the licences defined in the Protocol</td><td>The EIR should include:
It is expected that the primary use of the data will be for the following purposes:
<table>
<tr><td>P01 Registration</td><td>P06 Assessment and re-use</td></tr>
<tr><td>P02 Use and utilisation</td><td>P07 Impacts</td></tr>
<tr><td>P03 Operations</td><td>P08 Business case</td></tr>
<tr><td>P04 Maintenance and repair</td><td>P09 Security and surveillance</td></tr>
<tr><td>P05 Replacement</td><td>P10 Regulation and Compliance</td></tr>
</table>
Guidance: In circumstances where the employer intends to use elements of the model for a wider set of purposes (e.g. use of elements of design on more than one project); the additional use should be stated, together with the wording of the proposed licence.</td></tr>
<tr><td colspan="4">1.3.3 BIM-specific competence assessment – this section details the information that a bidder should be required to provide as part of a bid submission. The scope of information described in 1.3.3 should be referred to in instructions to tenderers.</td></tr>
<tr><th>Ref</th><th>Item</th><th>Description</th><th>Response</th></tr>
<tr><td>A</td><td>BIM Capability and</td><td>Responses will describe how mature an organisation is,</td><td>The competence assessment should include:
Tenderers should include the following detail:</td></tr>
</table>

	Experience	and what capabilities are held	• BIM experience - organisational and personnel • BIM capabilities • Out-sourced roles *Guidance: The information requested in this section is detailed further in the Project Implementation Plan described in PAS 1192-2*
B	Evidence of BIM Execution Planning	Responses will include examples of BIM execution planning	**The competence assessment should include:** Tenderers should include the following detail: • BIM Execution Plans • Lessons learnt *Guidance: The content of the BIM Execution Plan at tender and start on site stages are described in PAS 1192-2*
C	Confirmation of BIM Toolset	Responses will describe the processes and procedures that make up the bidder's BIM and information management toolkit	**The competence assessment should include:** Tenderers should include the detail on procedures aligned with core project stages as follows:: • BS1192 (2007) • PAS1192-2 (2013) • COBie UK 2012 • Other bespoke processes
D	Details of BIM Workload and Resourcing	Responses will describe the resources (and what levels) that are available to the	**The competence assessment should include:** Tenderers should include the following detail: • Resource matrix with level, number, utilisation • Outsourcing details or services etc.

		project	*Guidance: The content of the assessment is described as the supplier BIM assessment form described in PAS 1192-2*
E	Principal Supply Chain	Responses will describe the supply chain's ability to link into the process and how will this be assessed	**This should/could include:** Tenderers should include the following detail: • Key supply chain partners • Expected outputs • Assessment process

2.0 Changes to other tender documents

The intention with the BIM Strategy designed to achieve BIM maturity Level 02 generally, is that changes to existing processes should be minimal. To this end, the insertions into the existing tender documents are also minimal.

The following are the questions or comments that have been used in early adopter projects.

Based on experience from the 'Early Adopter Projects' the recommendation of the BIM Task Group is that the tender questionnaire should separate out the BIM Information processing from the asset design and specification for evaluation. These questions should never overlap.

The following general changes to tender documentation are recommended:

2.1 PQQ brief

Commentary is to be added to the brief clearly stating expectations with respect to the application of BIM on a project:

> In addition, the Constructor is to note that this scheme will br executed using Building Information Modelling (BIM) in line with the Government Construction Client Group BIM Working Party Strategy Paper. The Constructor must be capable of delivering this scheme while providing information in the requisite format. The standards, format and content are outlined in the document 'Employer's Information Requirements' included in the tender information. The tender return assessment will include a review of the BIM submission, as outlined in the Tender Evaluation Plan and Tender Questionnaire.

2.2 Project Execution Plan

Commentary should be added describing the procedure for uploading models to collaborative environments:

> Native models are to be uploaded to the client's collaboration environment using the same procedure as for drawings with regard to file reference, issue sheets etc. Models naming conventions are included in the Client BIM Requirements document.
>
> The issue sheet should include the software used to generate the model, plus the version.

2.3 Tender Questionnaire:

The following are exemplar questions which could be added to the Tender Questionnaire to address specific BIM issues:

Q #	Question	Guidance notes (where applicable)	Format requirements	Weighting (%)
1	**Design proposals and Building Information Models as required by the design brief**			
1.1	Provide the Building Information Model(s) as listed in, and required by, the Project Brief and the Employer's Information Requirements, for each element of the project.	The Bidder shall submit models and COBie files which are compliant with the Employer's Information Requirements for the project. The models and COBie files will be compared against those issued for tender to establish: i. The fidelity of the information i.e. that the attributes and data contained within the tender models have been retained ii. That the origin points, orientation, levels and units have been maintained iii. The degree to which the models and COBie file have been developed iv. That the COBie file is compliant with the COBie specification listed in the EIR's	Native models and COBie file	x%
1.2	Provide a narrative on the BIM design and development process (rationale)	The narrative should describe how the Building Information Models have been developed from tender issue to tender return, giving a clear description of: i. What new elements, systems and components have been introduced	To be defined by the Employer	x%

Q #	Question	Guidance notes (where applicable)	Format requirements	Weighting (%)
		ii. For existing elements and components, what additional attributes have been added or populated iii. What additional models have been provided as part of the tender submission e.g. acoustic and day lighting models to demonstrate how the technical solution has been developed. iv. Where the information that appears in the COBie file is attributed to the models v. The order of precedence of the model files if data relating to a space or object appears in more than one model file vi. How the models have been aggregated and coordinated vii. Whether any external reference documents are linked to the model viii. The tools or workflows that have been used to create and aggregate the COBie file from the models		
1.3	Provide a short narrative on how the Bidder Proposes to utilise BIM in the Design, Construction and Management of this project. Give examples of projects where you have previously utilised BIM in this	Your answer should consider the following elements i. Design Delivery ii. Design Management, Coordination and Optimisation	To be defined by the Employer	x%

Q #	Question	Guidance notes (where applicable)	Format requirements	Weighting (%)
	manner	iii. Standard Design Elements iv. Design for Offsite Manufacture v. Costing (5D) vi. Planning (4D) vii. Collaborative and Common Data Environments viii. Supplier Management ix. Commissioning x. Operations & Maintenance xi. Health & Safety		
1.4	Provide the headings for your standard BIM execution plan	The headings and rationale should be explained to give an understanding of the underlying processes and tools that the BIM execution plan will establish, and how the template for the execution plan has been developed.	To be defined by the Employer	x%
1.5	List the key BIM tools you use, with examples of projects where these have been implemented.	This should include tools / software used for: i. Authoring ii. Aggregation and coordination iii. Analysis iv. COBie extraction and aggregation	To be defined by the Employer	x%

2	Capacity			
2.1	How many BIM trained users do you have and how do you plan to resource this project with staff capable of delivering BIMs and datasets?	This is relevant to the Office from which the work is managed and its relevant personnel. If BIM activities are to take place in a different office, please clarify.	To be defined by the Employer .	x%
2.2	List your tier 1 main subcontractors and confirm how many BIM trained users they have and how they will resource this project with staff capable of delivering BIMs and datasets? How will you evaluate their capability?	If BIM activities are to take place in a different office, please clarify.	To be defined by the Employer	x%

Tender Evaluation plan

Text should be added describing the process by which Building Information Models will be submitted during the tender process.

'BIMs are to be returned in their native format on a CD, which should also include the model issue sheet (to include the software type and version used to create the model) and the COBie file'

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