***[Insert LA Name]***

***[Insert LA Logo]***

***Employers Information Requirements for  
Highway Works in relation to: Building Information Modelling [BIM]***

***Standard No***

*March 2016*

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| ABBREVIATIONS | |
| AIM | Asset Information Model |
| AMS | Asset Management System |
| BEP | BIM Execution Plan |
| BIM | Building Information Modelling |
| CAFM | Computer-Aided Facilities Management |
| CDE | Common Data Environment |
| EIR | Employer Information Requirement |
| FM | Facilities Management |
| IFC | Industry Foundation Classes |
| LOD | Level of Definition |
| LOI | Level of Information |
| PEP | Project Execution Plan |
| PIM | Project Information Model |
| PLQ | Plain Language Question |
| PSCP (OR MAIN CONTACTOR) | Principal Supply Chain Partner |

**CONTENTS**

[1 Introduction 1](#_Toc447113704)

[1.1 General 1](#_Toc447113705)

[2 The Product 1](#_Toc447113706)

[3 Process 3](#_Toc447113707)

[3.1 Applicable standards 3](#_Toc447113708)

[3.2 Project specific standards 4](#_Toc447113709)

[3.3 Outline of process 5](#_Toc447113710)

[4 SECURITY 12](#_Toc447113711)

[5 ROLES AND RESPONSIBILITIES 13](#_Toc447113712)

[5.1 TRAINING 13](#_Toc447113713)

[6 PLANNING OF THE WORKS AND DATA SEGREGATION 14](#_Toc447113714)

[6.1 Coordination and Clash Detection Process 14](#_Toc447113715)

[6.2 Collaboration Process 14](#_Toc447113716)

[6.3 Health & Safety and Construction (Design and Management) Regulations 15](#_Toc447113717)

[6.4 System Performance 15](#_Toc447113718)

[6.5 Compliance Plan 15](#_Toc447113719)

[6.6 BIM Execution Plan 15](#_Toc447113720)

[Notes 16](#_Toc447113721)

1. Introduction

The intent of this document is to provide an outline definition of Employers Information Requirements (EIRs) to support the implementation of Building Information Modelling (BIM) on **[insert LA name]** projects.

Terminology relating to information flow or format relate to the terms used in PAS 1192-2:2013.

The PSCP (Or Main Contractor) shall be responsible for enabling, creating and/or delivering a project 3D models that increases in detail and approval from design to an as built status.

This document provides the Employer’s Information Requirements (as defined in PAS1192-2:2013) for the deliverables from the Building Information Modelling (BIM) processes.

It should be read in conjunction with the project information pack and other employer requirement documentation.

Nothing in this document is intended to relieve the PSCP (or Main Contractor) or its supply chain of responsibility to comply with the Clients standards including inter alia those relating to handover procedure.

The references to the Employer within this document shall be taken to mean the Client as defined in the contract.

* 1. General

This document defines the Employer’s Information Requirements for **[insert project name] project only.**

The terminology used in this document is generally the standard terminology adopted under [insert contract reference e.g. MHA framework agreement]. Terminology specific to BIM processes that are not covered under the Contract relate to terms used in PAS 1192-2:2013.

**[insert LA name]** propose to implement a BIM (Asset Information Model) strategy that requires their projects via a PSCP (or Main Contractor) to deliver Level 2 BIM maturity as a minimum standard including:

* 3D Domain Model(s) of the Highway Assets and infrastructure in both editable format and aggregated in formats for FM Viewing.
* 2D drawings based upon the 3D model(s) and fabrication and manufacturer drawings
* Asset data derived from the 3D model object attributes

1. The Product

Information about the completed Highway Asset or reconfigured spaces of the Highway Asset will constitute part of the product alongside the Highway Asset itself, other defined project information, training, spares and any other deliverables not forming part of the completed structure.

This document defines the Employer’s Information Requirements from the Highway Asset Information Model and its development through the project stages in which the PSCP (or Main Contractor) will be involved.

The information shall be provided by the constructor as defined.

Information that is required as part of the established **[insert LA name]** handover procedure shall be provided at the appropriate stage and may not be assumed to be supplanted by information embodied in the Highway Asset Information Model or outputs from it except by prior agreement with the Client.

Model elements that are created as part of the Model shall be delivered pursuant to the Client’s objective for the creation of a model element library. For this purpose, the Designer or PSCP (OR MAIN CONTACTOR) or any other party to the design of the component that may hold intellectual property rights shall grant the client unlimited license to use the design on other projects.

Formats

To support the development of a PIM and AIM at handover the information exchange formats provided by the PSCP (OR MAIN CONTACTOR) will include the following information from the same data set in commonly accessible electronic formats as the examples below.

* Excel file (.docx and or .xls) where the appropriate tables from the **Uniclass** reference system or other suitable alternative as agreed should be used.
* 2D portable format document drawings (.dwg and .pdf) cut from the native Model(s)
* The native Model(s)
* The model(s) in IFC format
* Programme files .mpp
* Text files (.doc and .pdf) for specification and all other tender docs

In the following sections the required format(s) for the delivery of information are described. It will often be the case that information will be provided in the Model and in other formats. Where this is the case the priority shall be to include the information in the Model and to supplement with documentary or other information formats.

The use and responsibility, format and frequency of shared information should be understood by all project team members.

It is a key requirement of **[insert LA name]** that asset information developed in the design and construction phases of the programme can be incorporated into the **[insert LA name]** computer aided facility management (CAFM) system) <reference LA systems> and Asset Management System (AMS). Asset data will be provided for the **[insert LA name]** Board CAFM and AMS Systems as attributes of objects in the model with the following criteria:

*NB: Only those assets types that are listed in the* ***[insert LA name]*** ***asset template sheet*** *within Appendix 1 (to be customised by the LA in concert with individual project requirements) of this document are to be fully coded as above. Other assets only need GUID and local name/description and client reference. The PSCP (Or Main Contractor) shall be responsible for exporting the data to agreed MS Excel formats for import by the* ***[insert LA name]*** *to their CAFM and 3i Studio systems.*

|  |  |
| --- | --- |
| ATTRIBUTE FIELD | DESCRIPTION |
| GUID (Globally Unique Identifier) | 3D Model Generated Code. |
| Highway Asset Name/Description | Code available from **[insert LA name]** Boards. |
| Asset Template Name | Choose the correct Asset Template Name from the **[insert LA name]** Asset Template Sheet. |
| Asset Template Code | Choose the associated code matching the name from the **[insert LA name]** Asset Template Sheet. |
| Local Name/Description | Enter with a relevant name for the asset as it could be identified on site (e.g. West AHU No1). This is the name defined in the design process. |
| Quantity | In the case of individual assets created this will be one.  In the case of "grouped" assets it will be the count of the assets. e.g. Fire Extinguishers; Fire Hose Reels; Lighting; Emergency Lighting; FCUs; Eye Bolts. These are multi selected when defined in the Models. |
| Manufacturer | The manufacturers name. |
| Model | The model or reference of the asset. |
| Serial No. | The asset serial number, this typically is added to the model late in the procurement and installation process and lends itself to being carried out via export, data entry and re-import. Where not applicable state N/A. |
| Levels | The Level of the Highway asset or Construction asset zone. |
| Position | Detailed description of location. |
| Non-graphical attributes in an agreed digital format for: | Operating instructions.  maintenance instructions.  fault finding instructions.  commissioning instructions.  working life expectancy of the asset including cost, remaining life, etc. on sub elements - Kerbs, Drainage, Bridges, Retaining walls etc.  commissioning dates and data.  health and safety file.  regular statutory tests.  Specification and maintenance – finishes and street furniture.  Asset level life cycle information Warranty information on sub elements (installed date, start and end dates).  Schedule of information on maintainable assets (site, structure, carriageway, footway, verge chainage, Road (and levels) for PPM Scheduling.  Schedule of information on maintainable systems e.g. security, access control etc., (site, structure carriageway, footway or verge, road name and levels) for PPM Scheduling.  Power supply and drainage arrangements (site and asset level).  Power consumption information.  Maintenance information on restricted access features e.g. culverts, manholes, bridge parapets etc.  Highway Structure level manufacturer information on vehicle restraint systems e.g. Parapets, safety barriers, highway safety features |

1. Process
   1. Applicable standards

In order to establish a consistent approach to collaboration, **[insert LA name]** requires the PSCP (or Main Contractor) and its associated supply chain to adopt the following standards:

* BS 1192:2007.
* BS 7000-4:1996A.
* PAS 1192-2:2013.
* PAS 1192-3:2014.
* BS 1192-4.
* PAS 1192-5.
* Government Soft Landings.
* Core Classification: Uniclass (latest format).
* IAN 182/12 Major Schemes: Enabling Handover into Operation and Maintenance

IAN 184/14 Highways Agency Data & CAD Standard  
Any relevant standards which emerge during this project are to be reviewed by the project team and adopted where beneficial to the delivery of the project.

* 1. Project specific standards

COORDINATES:

The PSCP (or Main Contractor) shall define a common coordinate system for all BIM data and adopt it consistently for all Models. As a priority the Client requires that Global Coordinates shall be used unless there is a justifiable project level reason not to do so.

Planning the Work & Data Segregation:

The PSCP (or Main Contractor) shall agree, adopt and maintain a BIM Strategy focusing on the following project-specific processes as a minimum:

* Model Management
* Zones and Areas
* Naming Conventions
* Publishing processes

Site Information:

The minimum site information as a digital default will include:

* Site Name
* Site Status
* Land Area (Ha)
* Site Grouping
* Address including Postcode
* GIA of proposed asset(s)
* Site Cross Reference
* UPRN

* 1. Outline of process

The required data drops for the insert project name are summarised in the following table and further information is provided in the following subsections.

The **Level of Model Definition (LOD)** is to be generally delivered in line with **PAS1192-2:2013 Figure 20**. The project specific LOD requirements will be identified at each stage as part of the Bidder Submission Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [INSERT LA NAME] PROJECT STAGES | DESCRIPTION | DROP | PURPOSE | LEVEL OF DETAIL |
| Mid-Way through [insert LA name] Stage 1 | After Strategic Definition | 1 | Determine strategic case and fit | 0 |
| Early in [insert LA name] Stage 2 | Early in Outline Business Case  (OBC) | 2 | Feasibility and analysis of options | 1 |
| Late in [insert LA name] Stage 2 | Late in Outline Business Case (OBC) | 3 | Identification of proposed solution | 2 |
| End of [insert LA name] Stage 3 | At end of Full Business Case (FBC) | 4 | Design freeze and price agreement | 3 |
| End of [insert LA name] Stage 4 | At end of implementation / construction stage and prior to handover | 5 | Practical completion – populate O&M manual(s) and Client’s CAFM systems | 6 |

**[insert LA name]** **Drop 3**

Information to be delivered prior to the end of PAS 1192 – Stage (2) Concept

(to be edited in concert with individual project requirements)

**(RIBA POW13 – Stage 2)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Drop 3 | Description | Model | 2D PDF Drawings | 2D DWG Drawings | Digital Documentation | Level of detail |
| Overall Form & Content |  |  |  |  |  |  |
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| Design Strategies |  |  |  |  |  |  |
| Road Safety Audit |  |  |  |  |  |  |
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| Performance |  |  |  |  |  |  |
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| Asset |  |  |  |  |  |  |
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| Construction process proposals |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Site access |  |  |  |  |  |  |
| Site set-up |  |  |  |  |  |  |
| **Health and Safety** |  |  |  |  |  |  |
| Project overview | Summary of project proposal supplemented by drawings as necessary |  |  |  |  | 2 |
| Description of works | Outline methodology for design / delivery of the works |  |  |  |  | 2 |
| Project site specific risks for Constructor’s design; | Summary of project Proposals. Supplemented by drawings as necessary |  |  |  |  | 2 |
| Constructor design team details; | Summary of project Proposals. Supplemented by drawings as necessary |  |  |  |  | 2 |
| Safe systems of work and person responsible for their coordination; | Summary of project Proposals. Supplemented by drawings as necessary |  |  |  |  | 2 |
| Site compound location and arrangements (refer to other section if included elsewhere); | Summary of project Proposals. Supplemented by drawings as necessary |  |  |  |  | 2 |
| Traffic management plan identifying access arrangements (refer to other section if included elsewhere); | Summary of project Proposals. Supplemented by drawings as necessary |  |  |  |  | 2 |
| Construction plant or equipment to be used in project. | Summary of project Proposals. Supplemented by drawings as necessary |  |  |  |  | 2 |
| BIM execution plan | Provide outline BIM execution plan to demonstrate how project will comply with PAS1192:2 |  |  |  |  |  |
| Model co-ordination | Demonstrate how Model(s) will be co-ordinated. |  |  |  |  |  |
| Other (specify) |  |  |  |  |  |  |
| Other (specify) |  |  |  |  |  |  |
| Other (specify) |  |  |  |  |  |  |

**[insert LA name]** **Drop 4**

Information to be delivered prior to the end of

PAS 1192 stage (4) Definition

(to be edited in concert with individual project requirements)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| [insert LA name] Drop 4 | Description | Model | 2D PDF Drawings | 2D DWG Drawings | Digital Documentation | Level of detail |
| **Overall form and content** |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Site and context | Relationship to adjacent assets and external uses/circulation. Proposed levels. |  |  |  |  | 3 |
| Surveys | The outcome of all surveys undertaken |  |  |  |  | 3 |
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| **Design strategies** |  |  |  |  |  |  |
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| **Performance** |  |  |  |  |  |  |
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| **Elements, Materials Components** |  |  |  |  |  |  |
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|  |  |  |  |  |  | 3 |

**[insert LA name] Drop 5**

**Information to be delivered prior to the end PAS1192 Stage (5) Build and Commission**

**(to be edited in concert with individual project requirements)**

**PAS 1192 Stage (5) Build and Commission** the Board’s requirements for information submitted by the PSCP (OR MAIN CONTACTOR) as part of its Operating and Maintenance Information shall constitute Data Drop 5.

If demolitions or removal of existing equipment are necessary as an enabler for the contract, then a separate data drop 5 shall be provided at the end of such demolitions or removals to allow updating of the Board’s CAFM system.

If enabling works or sectional completions are to be employed then a Data Drop 5 will be provided at the completion of each section.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| [insert LA name] Drop 5  Handover + Closeout: O&M Information | Description | Model | 2D PDF Drawings | 2D DWG Drawings | Digital Documentation | Level of detail |
| **Overall form and content** |  |  |  |  |  |  |
| Space planning | Confirmed zoning. Confirmed scale of spaces and of the asset as a whole as constructed. Confirmed adjacencies and circulation pattern |  |  |  |  | 6 |
| Site and context | Relationship to adjacent assets and external uses/circulation. Constructed levels. |  |  |  |  | 6 |
| External form and appearance | Confirmed construction |  |  |  |  | 6 |
| Asset and site sections | Relationship to adjacent assets and external uses/circulation as constructed. Levels as constructed. |  |  |  |  | 6 |
| Internal layouts | Internal layout of all spaces as constructed |  |  |  |  | 6 |
| **Design Strategies** |  |  |  |  |  |  |
| Space planning | Confirmed zoning. Confirmed scale of spaces and of the asset as a whole as constructed. Confirmed adjacencies and circulation pattern |  |  |  |  | 6 |
| Site and context | Relationship to adjacent assets and external uses/circulation. Constructed levels. |  |  |  |  | 6 |
| External form and appearance | Confirmed construction |  |  |  |  | 6 |
| Asset and site sections | Relationship to adjacent assets and external uses/circulation as constructed. Levels as constructed. |  |  |  |  | 6 |
| Internal layouts | Internal layout of all spaces as constructed |  |  |  |  | 6 |
| **Performance** |  |  |  |  |  |  |
| Design Performance Analysis (technical compliance including asset compliance certificates | Record of analysis, calculation output, updated Model and drawings |  |  |  |  | 6 |
| Structural Analysis | Record of analysis, calculation output (If requested by the TA), updated Model and drawings |  |  |  |  | 6 |
| Thermal Simulation  (Asset thermal movement ) | Record of analysis, calculation output, updated Model and drawings |  |  |  |  | 6 |
| Sustainability Analysis | Record of analysis, calculation output, updated Model and drawings |  |  |  |  | 6 |
| Acoustic analysis | Record of analysis, calculation output, updated Model and drawings |  |  |  |  | 6 |
| 4D Programming Analysis | To be agreed with the PSCP (OR MAIN CONTACTOR) | ? |  |  |  | 6 |
| 5D Cost Analysis | To be agreed with the PSCP (OR MAIN CONTACTOR) | ? |  |  |  | 6 |
| Services Commissioning | Record of design requirements used for commissioning (design flow rates etc,) and certification that these were achieved within acceptable limits. | ? |  |  |  | 6 |
| **Elements, materials components** |  |  |  |  |  |  |
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| **External Landscaping** |  |  |  |  |  |  |
|  | Soft landscaping and planting |  |  |  |  | 6 |
|  | Walls, fencing and gates |  |  |  |  | 6 |
|  | Roads and car parks |  |  |  |  | 6 |
|  | Paths and paved areas |  |  |  |  | 6 |
|  | External fittings and furniture |  |  |  |  | 6 |
|  | Ancillary assets |  |  |  |  | 6 |
| **Health and Safety** |  |  |  |  |  |  |
| Completed operation and maintenance manuals in the timescale dictated by [insert LA name] handover procedures | Documentation supplemented with drawings. Model to be updated where necessary. |  |  |  |  | 6 |
| Record of any residual risks for Constructor’s design; | Documentation supplemented with drawings. Model to be updated where necessary. |  |  |  |  | 6 |
| Safe systems of work for future maintenance (refer to Maintenance Strategy if included therein) | Confirmed project Proposals. Supplemented by drawings as necessary |  |  |  |  | 6 |
| **Local Authority Approval Documents** |  |  |  |  |  |  |
| Other (specify) |  |  |  |  |  |  |
| Other (specify) |  |  |  |  |  |  |
| Other (specify) |  |  |  |  |  |  |

With regard to the Model(s), these shall be supplied in the native format used by the PSCP (OR MAIN CONTACTOR) and in a format suitable for viewing on the client’s IT system. At data drop 5 the Models shall be supplied in a format capable of being read and edited on the client’s IT system.

Drop 5 will include the Asset Data as prescribed in Appendix 1 - [insert LA name] asset template sheet and 2.6.2 of this document.

1. SECURITY

Specific [insert LA name] Security Requirements are defined here:

PSCP (or Main Contractor), consultants and agency staff providing services to [Insert LA name] may use their own computing facilities to deliver services with the following conditions:

These computing facilities must be their 'tools of trade', i.e. separate from personal computing facilities used by themselves or their families etc. for leisure or other personal uses; and must employ best practice security controls such as up to date anti-virus control, personal firewall, access control, disk encryption and up to date software patches.

Use of these computing facilities should be limited to activities involving [Insert LA name] data such as producing reports, reviewing documents, sending and receiving emails, and should not involve storing and processing large volumes of [Insert LA name] data, for example database extracts.

Disc encryption must be in accordance with [Insert LA name] requirements.

Where the computer connects to a remote network e.g. the contractor's company network, then an encrypted link must be used.

No data will be stored in ‘the cloud’ or stored outside the UK or transferred via non-secure FTP.

No emails containing protectively marked or personal data, or any other type of sensitive information should be sent un-encrypted over the Internet.

Any removable media used to transport data outside of secure assets must be encrypted. Once no longer required these devices should be securely disposed of. CD/DVDs and floppy disks should be cut into 4 pieces and disposed of as normal waste.

Computer hard disk drives should be securely erased before disposal or recycling if it has held any personal or protectively marked data. [Insert LA name] Information Assurance Branch should be consulted on the procedure to be followed.

In compliance with the Data Protection Act, any personal data must be deleted when no longer required and must not be used for any other purposes that what it was collected for. It must not be retained beyond the duration of engagement with the [Insert LA name]

Where there is a need to provide access to large volumes of personal or protectively marked data only [Insert LA name] computing facilities must be used. Removable media provided by [Insert LA name] must be returned to the [Insert LA name] after use.

Paper records containing sensitive or personal data should be stored, transported and disposed of securely. Sensitive waste paper should be collected separately from normal waste, and stored securely pending destruction by shredding or burning. As with electronic records, particular care should be taken when moving bulk paper records.

Any file, including files, when uploaded to a [Insert LA name] digital common data environment are deemed to be secure to the standard required by [Insert LA name].

1. ROLES AND RESPONSIBILITIES

The PSCP (or Main Contractor) will assign these responsibilities as defined in PAS1192-2 within their BEP. This should include:

* Project Delivery Manager (PDM)
* Information Manager (IM)
* Lead Designer (LD)
* Task Team Manager (TTM)

The Board will participate in the BIM process, for example: EIR drafting, receipt of data drop information, CAFM FM provider engagement and Stakeholder / end-user engagement.

The roles themselves are addressed in specific appointments.

Details of activities under taken by the [Insert LA name]:

***Guidance 1****: Roles associated with the management of information on BIM-enabled projects are described in outline in PAS 1192-2:2013.*

***Guidance 2****: An outline scope of service for the role of Information Management has been published by CIC.*

***Guidance 3****: All of the roles described in PAS 1192-2:2013 are expected to be undertaken within the scope of existing appointments.*

***Guidance 4****: Any drafting of roles and responsibilities in the EIRs should be aligned with drafting published in appointment documentation and employer’s requirements / specifications.*

***Guidance 5****: Detailed of how any BIM-specific roles will be delivered and coordinated should be included in the BIM Execution Plan (BEP).*

* 1. TRAINING

The [Insert LA name] Board will require training as follows [insert project specific training requirements – for example]:

* Maintenance / updating of the Asset Management dataset
* The principles / process of BIM federation
* Navigation around BIMs using freely available software

Training should be delivered periodically throughout the design and construction period as required. Responsibility for training rests with the PSCP (or Main Contractor).

1. PLANNING OF THE WORKS AND DATA SEGREGATION

The PSCP (OR MAIN CONTACTOR) should organise the Project Information Model to ensure that managed access to its content is available. The CDE should be managed in accordance with BS1192 and PAS1192-2. The PSCP (OR MAIN CONTACTOR) is also required to manage model area, volume and zoning strategies. All models and data should hold consistent reference to blocks, zones, Highway Structures, Carriageways, Footways, Drainage and Statutory Undertakers Equipment, Street lighting, etc. and spaces as a means of identity space reference should be managed through a formal change control process. For documents and files there should be a single naming convention which is adopted project wide with all information managed in accordance with the processes described in PAS1192-2, PAS1192-3, BS1192 and BS1192-4.

* 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

* Naming Conventions

Definition of the requirement for a single project convention – preferably based on a departmental standard agreed with the Board.

Fully documented procedures are required in the BEP.

* 1. Coordination and Clash Detection Process

The purpose of this section is to define the required co- ordination process, together with requirements for quality control.

Provide details of the following within the BEP on coordination, clash prevention and detection process in line with PAS1192-2:

* Details of the clash detection process including:
  + Software
  + Process overview
  + Responsibilities
  + Outputs
* Technical query workflow
* Tolerance strategy
* Clash resolution process
  1. Collaboration Process

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

Provide details of the collaboration process sufficient to demonstrate competence and capability. It is expected that full details of the process will be included within the completed BIM Execution plan and 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. Health & Safety and Construction (Design and Management) Regulations

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.

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.

* Schedule of work stages (PAS 1192 Work Breakdown Structures)
* 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. 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 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
  1. Compliance Plan

The purpose of this section is to enable the PSCP (or Main Contractor) to communicate how the integrity of the model and other data sources will be maintained.

Details of client-specified model and data compliance requirements, including references to standards and to compliance software that is used by the employer.

The PSCP (or Main Contractor) 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)
  1. BIM Execution Plan

The PSCP (or Main Contractor) shall prepare, deliver and maintain a BIM Execution Plan (BEP) for the project that responds to this Employer Information Requirements.

The PSCP (or Main Contractor) shall review their BEP regularly and additionally when there is any change to their contract.

The BEP should also address BIM Capacity and Experience. Responses will need to describe how mature an organisation is, and what capabilities are held; this should include the following detail:

* BIM experience - organisational and personnel
* BIM capabilities
* Out-sourced roles

Notes

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