Project Name

P22-02

Project Code - P22-XX-XX-SP-K-BEP

Pre - Contract BIM Execution Plan (BEP)

Approval Record

By:	xx	**Date:**	xx
Apr:	xx	**Date:**	xx

Revision Record

Rev	Date	Revision Details	Rev by
xx	xx	xx	xx

Created in collaboration by

Endorsed by

BIM Execution Plan Overview

This Pre Contract BIM Execution Plan (BEP) template has been prepared by the PSCP to enable the NHS Trusts to specify their Building Information Modelling (BIM) requirements in line with PAS1192-2:2013 and associated standards. It is a response to the EIR ref [Project_Code-P22-XX-XX-SP-K-EIR_P1.1_S2] ***[insert correct ref]***

This document shall be read in conjunction with the:

- P22 BIM Client Guide
- Organisational Information Requirements (OIR)
- Model Production Delivery Table (MPDT)
- Asset Information Requirements (AIR)
- Government Soft Landings requirements (GSL)

Document Ownership

This document should be compiled and completed by the [project team as a collaborative submission], reviewed with all key project stakeholders.

This document requires the completion of the Model Production Delivery Table (Appendix 1) and the Asset Information Requirements (Appendix 2), which are to be developed and completed with the assistance and input from the Design Team, FM Team, Clinicians and other key stakeholders with an interest in or benefiting from the implementation of BIM on the scheme after handover.

Appendix 1 (MPDT) and Appendix 2 (AIR) hold blank templates for development and completion as described above. Please refer to the P22 Client BIM Implementation Kit for worked examples of the same. These tables need to be made project specific. The MPDT is to be developed and completed for all BIM projects. AIR is to be completed and developed where data for support of FM (or other BIM uses) is required on the project.

Document Authority

Once completed, this document will define the requirements of different stakeholders that will become part of the project delivery team at different stages of the development of project. In first instance, the requirements made within this document are to be reviewed by the Client appointed consultants and included in their appointments.

The document should be returned as part of the Contractors tender information. At such stage, this document shall be agreed by all the representatives of the project team, with the authority of their contracting organisation to accept this document as the Pre Contract BIM Execution Plan (BEP) as referenced in the Terms of Engagement or subcontracts. This acceptance also confirms that the relevant supply chains personnel have read and understood its requirements.

Contents

1 General Project Information

Table 1: Project Information	
INSERT IMAGE HERE	
Client Name	
Project Name	
Site Name	
Building Name	
Building Description	
Site Description	
Project Address	
Type of asset	
Form of Contract	
Project Number	
Design Start:	
Site Construction Start:	
Site Completion / Handover:	
Project EIRs:	
Project Description:	
Project Deliverables as defined in the EIR and COBie project templates (see the CIPx Protocol)	
Project Design Management Plan:	
Project Management Plan:	
Procurement Route:	
Phasing:	
Approximate Value:	
Approximate Gross Internal Floor Area:	
CIC BIM Protocol in use	CIC/BIM Protocol Second Edition 2018

Table 2: Project Stakeholders

Discipline	Role Code	Organisation	Originator Code	Key Contact
Architect & Lead Designer	A	Insert Company Name	XYZ	Insert Name – Refer to Project Directory
Building Surveyor	B	Insert Company Name	XYZ	Insert Name – Refer to Project Directory
Civil Engineer	C	Insert Company Name	XYZ	Insert Name – Refer to Project Directory
Drainage, Highways Engineer	D	Insert Company Name	XYZ	Insert Name – Refer to Project Directory
Electrical Engineer	E	Insert Company Name	XYZ	Insert Name – Refer to Project Directory
Facilities Manager	F	Insert Company Name	XYZ	Insert Name – Refer to Project Directory
Geographical and Land Surveyor	G	Insert Company Name	XYZ	Insert Name – Refer to Project Directory
Heating and Ventilation Designer	H	Insert Company Name	XYZ	Insert Name – Refer to Project Directory
Interior Designer	I	Insert Company Name	XYZ	Insert Name – Refer to Project Directory
Client/Employer		Insert Company Name	XYZ	Insert Name – Refer to Project Directory
Landscape Architect	L	Insert Company Name	XYZ	Insert Name – Refer to Project Directory
Mechanical Engineer	M	Insert Company Name	XYZ	Insert Name – Refer to Project Directory
Public Health Engineer	P	Insert Company Name	XYZ	Insert Name – Refer to Project Directory
Quantity Surveyor	Q	Insert Company Name	XYZ	Insert Name – Refer to Project Directory
Structural Engineer	S	Insert Company Name	XYZ	Insert Name – Refer to Project Directory
Town and Country Planner	T	Insert Company Name	XYZ	Insert Name – Refer to Project Directory

Contractor	W	Insert Company Name	XYZ	Insert Name – Refer to Project Directory
Sub-Contractor 01	X1	Insert Company Name	XYZ	Insert Name – Refer to Project Directory
Specialist Designer	Y1	Insert Company Name	XYZ	Insert Name – Refer to Project Directory
General (non-disciplinary)	Z	Insert Company Name	XYZ	Insert Name – Refer to Project Directory

Expand as necessary.

Note: Role codes are as identified in BS1192:2007+A2:2016. The role code and originator codes identified above will form part of the naming conventions. Any changes to these codes must be agreed with the project team.

Table 3: Project Milestones

RIBA Plan of Work 2013	Period	Project Milestone	BIM Deliverable
0 | Strategic Definition	*Insert Period*	*Insert Milestone*	*Insert Description of BIM Deliverable*
1 | Preparation and Brief	*Insert Period*	*Insert Milestone*	*Insert Description of BIM Deliverable*
2 | Concept Design	*Insert Period*	*Insert Milestone*	*Insert Description of BIM Deliverable*
3 | Developed Design	*Insert Period*	*Insert Milestone*	*Insert Description of BIM Deliverable*
4 | Technical Design	*Insert Period*	*Insert Milestone*	*Insert Description of BIM Deliverable*
5 | Construction	*Insert Period*	*Insert Milestone*	*Insert Description of BIM Deliverable*
6 | Handover and Closeout	*Insert Period*	*Insert Milestone*	*Insert Description of BIM Deliverable*
7 | In Use	*Insert Period*	*Insert Milestone*	*Insert Description of BIM Deliverable*

2 BIM PROCUREMENT AND EMPLOYER ENGAGEMENT

2.1 Document Purpose

This Pre Contract BEP is a response to the NHS Trust Employer's Information Requirements (EIR's) and as such provides details on how the deliverables stated in the EIR's are to be achieved each team member's responsibility and allocation of said deliverables according to discipline and specialism. Upon contract appointment this document will be updated to a Post Contract BIM Execution plan and should be updated to include additional details on how each deliverable will be met.

2.2 Document Structure

NHS TRUST has defined their Information Requirements using the following:

- Project code-P22–XX-XX-SP-K-EIR-001 Employer's Information Requirements (EIRs)
- Project code-P22–XX-XX-SP-K-OIR-001 Organisational Information Requirements (OIRs)
- Project code-P22–XX-XX-SP-K-AIR-001 Asset Information Requirements (AIRs)

The EIRs, OIRs and AIRs set out all information deliverables (models, documents and data) including traditional project documents, surveys, reports and appraisals.

This document Project code-P22–XX-XX-SP-K-BEP-001 BIM Execution Plan (BEP) is a response to the above.

2.3 Response to EIR

This BEP is a response to the EIR and includes the following sections in line with PAS1192-2:2013:

- BIM Delivery & Response to the EIRs
- Management processes
- Planning & Documentation processes
- Standard Method and Procedure (SMP)

2.4 BIM Vision and Objectives

BIM as a concept is 'the adoption of information rich Building Information Modelling (BIM) technologies, process and collaborative behaviours that will unlock new more efficient ways of working at all stages of the project life-cycle'. The Government Construction Strategy has mandated the implementation of BIM to Level 2 maturity for Government Departments by 2016.

To drive a more effective solution to collating the O&Ms, generating Asset Registers, create commissioning schedules, populate data to a Computer Aided Facilities Management (CAFM) systems etc. and working with a collaborative approach driven through Soft Landings.

NHS Trust has set out their BIM Vision and Objectives to enable:

Vison and Objective	Delivery Mechanism	Responsibility
Visualisation & Stakeholder engagement	Through 3D modelling and collaboration	Design Team/ Employer
Improved design coordination	Through coordination and clash detection utilising 3D models	Design Team/ Contractor
Cost & risk reduction	Via informed information available through 3D models and information	Design Team/ Contractor
Space and facilities management,	Via handover of digital asset information	Employer
Asset management	Utilising data within CAFM tools for PPM	Employer
Task management	Via informed data driven decisions.	Employer

Plan preventative maintenance	Via CAFM tools with easy access to information	Employer/ FM Provider
Efficiently execute reactive maintenance	By having better access to reliable information	Employer/ FM Provider
Standardise services and streamline processes	Utilising information to make better decision quickly and efficiently	Employer/ FM Provider
Improve long-term planning of service requirements against budgets to ensure alignment with core business needs	Utilising information to make better decision quickly and efficiently	Employer/ FM Provider

NHS Trust has set out the benefits of BIM as follows:

Benefits	Delivery Mechanism	Responsibility
Every maintainable asset listed, per space, per building of each type and instance	Via COBie data set	Design Team/ Contractor/ Suppliers
All Product specific maintenance and warranty information fed into the CAFM system	Via either COBie data set or upload template	FM Team
Full PPM and Lifecycle capability	Efficient CAFM database provided by FM	FM Team
Knowledge of specific equipment per room for replacements	Via COBie data set or CAFM System	Design Team/ Contractor/ Suppliers/ FM Team
Avoidance of additional site visits to ascertain equipment required	Via PPM Schedules within CAFM System	FM Team
Spares management	Via PPM Schedules within CAFM System	FM Team
Barcode tagging per asset for tracking and management	Bar code management system	Contractor
Structured data to enable the population of the CAFM software	Via either COBie data set or upload template	Design Team/ Contractor/ Suppliers

3 INFORMATION MANAGEMENT

3.1 Levels of Definition

Level of Definition is used to determine both the level of geometry detail (LOD), and level of associated information (LOI) for any given model element at an agreed project work stage. Defining LOD and LOI informs suppliers of the degree of information reliability when using the model.

Further guidelines on Level of Definition are available at **https://toolkit.thenbs.com/definitions**.

The project Level of Definition requirements, delivery work stages, and model originators are as outlined in the Model Production and Delivery Table (MPDT) and post contract Master Information Delivery Plan (MIDP)

The project information requirements are as outlined in the Asset Information Requirements (AIR) appended to this document. The LOI requirement for each asset element will be delivered using the COBie UK – 2012 (Construction Operations Building information exchange) schema in accordance with BS 1192-4:2014.

3.2 Training Requirements

The purpose of this section is to provide the supplier details of training to be provided in connection with project systems, or training requirements to be delivered by the supplier as part of their appointment/ contract.

Training for access and operation of the Employer's CDE shall be provided by the Employer to suppliers as required. Employer security or induction requirements will be highlighted to the suppliers on a project specific basis.

Training and education needs of the project delivery team involved in the production, analysis and review of the Project Information Model are recorded here in the BIM Execution Plan (BEP). Unless noted below as a specific Employer training requirement(s), project delivery training will remain the responsibility of the relevant supplier members.

Training Requirement	Organisation Providing Training	Training Requirements	Completed
Client Common Data Environment	Client	All persons accessing the client Common Data Environment	
Contractor Common Data Environment	Contractor	All Persons accessing the Contractors Common Data Environment	
Site BIM Induction	Contractor	All site operative who interact with model and data requirements	
**Extend as required to include details of all training requirements for successful project delivery.*			

3.3 Planning of Work and Data Segregation

The purpose of this section is to set out management and modelling process requirements for the supplier.

Data segregation planning and information management responsibilities shall be in accordance with the processes described inside of PAS1192-2:2013+A1, clause 5.3 A) 3) and BS1192:2007+A2:2016. The following are required as a minimum and shall be documented inside the project BIM Execution Plan:

Pre Contract BIM Execution Plan (BEP)

Model management

Insert any specific model management requirements here

Volumes zones and areas

Insert details of Volumes, Zones and Areas here

Naming Conventions

Insert details of any specific naming conventions here.

Note: Naming conventions should follow BS1192:2007+A2:2016 for Files and Layers (provide examples)

Annotations, Dimensions , Abbreviations & Symbols

Each discipline should provide the Design Manager and the Lead Designer with a full list to be used on the project. This list should be published to all members of the project team to ensure consistency of the document graphical presentation and shall be consistent throughout the project. Also see BS8541 Parts 1, 2, 3 and 4. As identified in 4.1 Applicable standards.

Dimensions should be derived automatically from the underlying CAD coordinates by using the 'associative dimensioning' function of CAD systems. Dimensions should not be entered as 'text' as they are purely graphic characters having no relationship with the underlying CAD coordinates and will cause the relative positions of elements in a drawing to be compromised.

Type of Information	Millimetres	Metres	Degrees	Radians	Clockwise	Counter Clockwise
Survey		•	•			
Civils		•	•			
Models	•		•			
Drawings	•		•			

Publishing Processes

Insert specific publishing process here or refer to separate guidance document.

The Employer expects all suppliers to work in a collaborative manner utilising intelligent 3D geometry models. Supplier's 3D model will be the originating source for drawing production. Object standards shall align with BS 8541:1,3,4 and BS 8541-2 for project 2D symbols.

Technical limitations of production hardware and software systems should be identified and recorded in the BEP during the initial planning of work and data segregation phase.

Technical Limitations

Insert any specific technical limitations and mitigating factors here.

3.4 Co-ordination and Clash Detection

Project quality and de-risking through model and information co-ordination is a key employer's objective and requirement. The purpose of this section is to define the project coordination process including quality control requirements.

The project clash detection and avoidance process is detailed herein this BEP as follows.

Software Utilisation	
Federation	*Insert details and outputs of federation software including year of release and version.*
Review	*Insert details of how task teams and client team interact with federated model and review issues.*

Lead Consultant	Task Team A (Arch)	Task team B (###)	Employer	Contractor
Issues Models to CDE	Undertakes internal clash detection and coordination prior to issue	Undertakes internal clash detection and coordination prior to issue	Receives Models via CDE	Issues Models to CDE for CDP elements
Receives Models via CDE	Issues Models to CDE	Issues Models to CDE	Reviews federated model from CDE	Receives Models via CDE
Federates Models provided by Task Teams (inc sub contractors)	Reviews federated model from CDE	Reviews federated model from CDE	Reviews coordination report	Reviews federated model from CDE
Reviews federated model from CDE	Reviews coordination report	Reviews coordination report		Reviews coordination report
Undertakes Visual Issue detection utilising federated model	Undertakes Visual Issue detection utilising federated model	Undertakes Visual Issue detection utilising federated model		Undertakes Visual Issue detection utilising federated model
Undertakes clash detection utilising specialist software to agreed workflow	Brings any issues to Coordination meeting	Brings any issues to Coordination meeting		Contributes and prioritises issues to Coordination meetings
Issues Coordination report	Reviews report and BIM Issues prior to BIM coordination meeting	Reviews report and BIM Issues prior to BIM coordination meeting		Reviews report and BIM Issues prior to BIM coordination meeting
Issues BCF file of BIM issues	Comments on issues at BIM coordination meeting	Comments on issues at BIM coordination meeting		Comments on issues at BIM coordination meeting
Attends and leads BIM Coordination Meeting	Adjust models based on project team feedback	Adjust models based on project team feedback		Makes adjustments to models based on project team feedback
Assigns Owners to Issues				Monitors the design review process to ensure review is reflective of the design management plan and appropriate construction timeline.
Closes out issues with task team approval				

Records issue management at BIM Coordination Meeting				
Creates saved views of issues discovered and saved views of floor plans, sections and elevations plus other views as directed by the Design Manager to enable model review.				

Output	Owner	Content	Frequency
Coordination Report	Lead Designer	Geometry Issue review	2 weekly
BIM Review	Contractor	Full audit review of protocols, process, data delivery and management.	Monthly
*BCF File**	Lead designer	Geometry and Issue Management	2 Weekly (Mandated) Ad hoc as required by task teams
*NWD File**	Lead Designer	Federated Model	2 Weekly (Mandated) Ad hoc as required by task teams
*SMC File**	Lead Designer	Federated Model	2 Weekly (Mandated) Ad hoc as required by task teams
Electronic Notification, PDF Report	Contractor	Error notification issued via collaborative platform supported by PDF report	2 Weekly reports supported by online notifications as coordination and information is collected
*Complete as required or delete			

Technical Query Workflow	
Inset workflow diagram to illustrate technical query workflow	

Tolerance Strategy	
Inset workflow diagram to illustrate tolerance strategy	

Clash Resolution Process	
Inset workflow diagram to illustrate clash resolution process	

Delivery will be undertaken through regular sharing of model data as outlined in the BEP in the form of native files and other agreed exchange formats. Prior to sharing all data shall be checked, approved and validated as 'Issued for coordination" in the CDE in line with the BS1197:2007+A2:2016 and PAS1192-2:2013+A1 status codes.

Model federation, coordination and reporting responsibilities shall align with information exchange activities and roles outlined in PAS1192-2:2013+A1, Table 2.

3.5 Collaboration Process

This section defines how, when and where project information will be shared.

All processes follow BS1192:2007+A2:2016 & PAS 1192-2:2013+A1, utilising the described four Common Data Environment (CDE) phases; Work In Progress, Shared, Published and Archive during all project work stages.

Item	Link
CDE Tool	*Insert web link to CDE tool*
CDE Administration	*Insert Name and contact details of CDE administrator*
CDE Help	*Insert details of CDE help process or web link*

The project CDE set up and management shall align with activities, roles and responsibilities as outlined in PAS1192-2:2013+A1,Table 2.

Frequency and formats of information exchanges
Insert details of frequency and formats of information exchanges

Format and extent of model sharing at every stage of the project
Insert details of frequency and extent of model sharing at every stage of the project

Frequency and details of model review workshops and other collaborative working practices				
Meeting Type	**Description**	**Frequency**	**Participants**	**Location/Time**
BIM Strategy Meetings	BIM Strategy Meetings to establish project aims and ambitions.	Project Inception	All Key BIM Personnel	**< Complete>**
BIM Kick-off Meeting	This meeting will confirm the herein BIM Execution Plan (BEP) It will define the full scope of packages and agree appropriate fees to plan model progression to meet procurement schedules	Once	All Key BIM Personnel	**< Complete>**
BIM to FM Strategy	To define the scope for the FM requirements and establish the link from BIM to CAFM	Pre-or Post-Contract to be agreed	Design Team, Project Information Manager, FM/Client	**< Complete>**
BIM Audits	To monitor and report on the BIM progress of the project	Monthly	All Key BIM Personnel	**< Complete>**
BIM Coordination Meetings	3D and data coordination of federated BIM including a review of BIM Issue Log and resolution priority.	Every 2 Weeks	All Key BIM Personnel	**< Complete>**
Geometry Validation Meetings	To ensure validation of the As Built Vs Virtual Model	At set milestones	All Key BIM Personnel	**< Complete>**

Data Drop (Information Exchange) meetings	To align with information exchange dates to ensure successful handover of information	At Set Milestones	All Key BIM Personnel	**< Complete>**
PIM to AIM Handover	To discuss, agree and formalise digital handover requirements	Once (Align with agreed information exchange)	All Key BIM Personnel	**< Complete>**
Additional Meetings as project requires				**< Complete>**
Note: Meetings can be combined, however there should be a clear distinction between topics to ensure meeting achieves goals.				

Frequency and details of design / employer team reviews using the federated model/ data
Insert frequency and details of design / employer team reviews using federated model/ data

3.6 Health & Safety and Construction Design Management

The Employer expects the BIM process to support the project Health & Safety and CDM monitoring aligned to the project work stages. This includes the utilisation of BIM to identify and reduce H&S hazards/ risks in design, construction and operational phases through early identification and mitigation. Residual hazards/ risks should be communicated through the CDE and where possible within the model environment.

Schedule of work stages and overview of key H&S deliverables against each stage
Insert schedule of work stage and overview of key H&S deliverables against each stage

Confirmation of how information shall be stored and shared
Insert details of how information shall be stored and shared

Requirements for disaster planning
Insert details of disaster planning requirements

Approach to design authoring and model interrogation
Insert details of approach to design authoring and model interrogation

The model development and structured delivery of information should enable the following uses under CDM2015:

BIM uses under CDM2015	Delivery Mechanism	Responsibility
Design to construction coordination	3D native and Federated models providing regular design review and look ahead.	Design Team
Site logistics and site safety, plant and pedestrian segregation, traffic and delivery management	Temporary works modelling to deliver design review and look ahead	Contractor

4D simulation with programme and logistics	4D time/ Programme Visuals	Contractor
Pre-fabrication	Off Site manufacture	Contractor
Installation management checklists – mobile devices	Automated checklist for site installation	Contractor/ Sub Contractor
BIM virtual animation to fly through and around site, indicating all H&S issues on site during site inductions	Animation file	Contractor
Visual method statements	3D visuals to support method statement	Contractor/ Sub Contractor
Access to the BIM model by all subcontractors and visitors on site	Shared Federated model in hosted platform space	Facilitated by Contractor
Completion of the H&S File and asset information for soft landings, training etc.	Supported by model delivery	Contractor
[UPDATE AS APPLICABLE]		

3.7 Security

This section details the process set out for monitoring, managing and complying with the Employers security mandate, including adherence to any standard or processes for data sharing.

All supply chain organisations are required to adopt the security requirements as detailed in the project BIM execution plan.

The following security standards should be followed in respect of the proposed BIM project, defined in accordance with the business impact levels as prescribed in the HMG Security Policy Framework

Security Status	Description	Requirement
IL1	Not Protectively Marked	*Insert Requirement*
IL2	Protect	*Insert Requirement*
IL3	Restricted	*Insert Requirement*
IL4	Confidential	*Insert Requirement*

- All project information must be shared via the project CDE
- The use of CDs, USB drives is not permitted
- The use of other online document exchange tools is not permitted
- Project documents must not be shared via email
- All CDE users must have their own user name and password – please contact the project administrator
- The project team have confirmed their company security standards as part of the BIM Capability Assessment.

3.8 Delivery of Information Requirements

This section defines the information exchange standard for the information deliverables, and enables the employer to obtain proposals in relation to asset information delivery for the FM environment.

The information exchange format and requirements for the Asset Information Model are prescribed in the Asset Information Requirements (AIR's) document Project code-P22-XX-XX-SP-K-AIR-001. Asset information requirements and handover format shall be in accordance with BS 1192-4:2014, delivered at work stage exchange points noted herein.

Insert proposed methodology and process for best delivery of the Employers required asset information and associated Master Information Delivery Plan post contract award.

Task Information Delivery Plan (TIDP)

A task information delivery plan (TIDP) for each task within the project should be prepared by all task team authors identifying their information deliverables and not limited to models and drawings. This is to align with milestone dates and project Programme. When completed by all team members the TIDPs should be published on the CDE and updated regularly to reflect the information deliverables on the project. The template is provided to align with the MIDP and allow cutting and pasting of information.

<Provide reference to TIDP here>

Master Information Delivery Plan (MIDP)

The master information delivery plan (MIDP) will be developed by PSCP's from the separate TIDPs produced for each task within the project aligned with the project programme. This detailed, co-ordinated MIDP must be developed and agreed with the project team. When completed the MIDP should be published in the CDE as a project plan. The MIDP should list all the information deliverables for the project, including but not limited to models, data, drawings or renditions, specifications, equipment schedules, room data sheets, and shall be managed via change control. If unsure please seek advice from ICL BIM Core Team.

<Provide reference to MIDP here>

Model authors should ensure that the model will be modelled and edited as per construction sequence it may be further used downstream for 4D and 5D purposes for which this is critical. It is also critical that the model represents how the project is to be estimated and constructed. Elements must be modelled as they will be constructed and/or delivered (i.e. in an as-built state), not in an analytical state. Elements should never overlap. If elements overlap they will cause clashes (false positives) and generate false quantities during take-off. We have solutions for identifying and eradicating any clashes but all stakeholders should aim to avoid creating clashes from the outset to streamline the design process. Please note the following good practice points.

- Elements are to be modelled and classified correctly i.e. a roof is a roof not a floor.
- Elements are to be replaced not deleted and re inserted to maintain GUID/ BATID
- Architectural spaces are to be complete and accurate to match client/ CAFM requirements.

3.9 System Performance

This section communicates any constraints in the Employer's systems or specific IT requirements, which may need additional resources or non-standard solutions.

Model size – no size limitation but practically **100Mb** max refer to section 3.3 for Volumes and Zone requirements to manage model size and delivery.

Software Uses – It is essential native file formats delivered can be openly shared, and software platform systems can export to IFC (2x3) for information extraction, verification, archive and free model viewing purposes. Inherent model data must be extractable in a format exchangeable with Microsoft Excel for information exchange purposes.

Security issues – as noted in 3.7 herein.

3.10 Compliance Plan

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

All published information exchanges will be validated to COBie UK -2012 in accordance with BS 1192-4:2014 guidance and recommendations, and to the delivery requirements as outlined in the Asset Information Requirements appendix documentation.

The methodology for model delivery and data compliance procedures including references to standards and compliance software is outlined in the tables below.

Quality assurance/ control procedures (Verification/ Validation of Geometry and Data)
Insert details of Quality assurance/ control procedures (Verification/ Validation of Geometry and Data) *Note: This section should include detail of pre/ post construction surveys to ensure as constructed asset reflects the virtual asset including details of any rectification workflows. Details of any existing legacy data use should also be provided.*

Associated software
Insert details of associated software

Period of Aftercare the number of years the model should be managed for (IF APPLICABLE)
Insert details of aftercare (if applicable)

Security requirement assurances
Insert details of security requirement assurances.

Change Control
Insert details of change control process

Legacy Data Use
Insert details and control mechanisms for use of legacy data, if none state n/a

The Employer / Employers Information Manager shall be granted access to the project CDE to enable regular compliance monitoring and audits.

Compliance Plan for Project Delivery Manager	**Compliance Plan for Information Manager**	**Compliance Plan for Lead Designer**	**Compliance Plan for Task Team Managers**	**Compliance Plan for BIM Implementation Manager**
Comply with the requirements of the BEP (this document)	Comply with the requirements of the BEP (this document)	Comply with the requirements of the BEP (this document)	Comply with the requirements of the BEP (this document)	Comply with the requirements of the BEP (this document)
Host meetings scheduled in section 3.5.	Validation of model Information utilising manual and automated means.	Generate federated model for coordination review process (all models are to be aligned with agreed	Issue information in agreed formats to the CDE at the agreed frequency.	Develop and maintain Post Contract BEP (this document)

		coordinates detailed in section 3.11)		
Produce MIDP	Communication of model issues via collaboration platform	Complete coordination review as detailed in section 3.4	Derive 2D drawings from models	Conduct BIM Audit checks against the BEP (this document) at agreed frequency.
Manage change control process and regularly audit and review	Monitor and report on information uploaded to the CDE and ensure it aligns with MIDP	Attend and respond to issues discussed at the relevant meetings scheduled refer to section 3.5.	Develop models in accordance with TIDP MIDP to the agreed LOD LOI	Attend and respond to issues discussed at the relevant meetings scheduled refer to section 3.5.
	Attend and respond to issues discussed at the relevant meetings scheduled refer to section 3.5.		Self-audit all documentation prior to issue to CDE	
			Carry out internal clash detection/ data validation prior to issue to CDE	
			Attend and respond to issues discussed at the relevant meetings scheduled refer to section 3.5.	
			Produce TIDP	

3.11 Levels & Coordinates

This section defines the requirements for the common coordinate system for all BIM data, with consistent adoption on all project models.

The following is a minimum spatial coordination requirement:

- Intersections of grids XX and YY – xxxxxx.xxxE and xxxxxx.xxxN
- Intersections of grids AA and BB – xxxxxx.xxxE and xxxxxx.xxxN
- Ground Floor FFL = xxx.xxx
- Origin rotation = 000.000deg
- Offsets = xxx.xxx
- Datum Information = xxx.xxx

3.12 Software Platforms

This section defines the platforms for the Building Information Modelling as well as other software platforms to be used.

Platforms and versions used by the Design/Construction Team on this project are outlined in the below table:

Table 2: Software formats	
Method of Data Exchange:	NHS Trust CDE
Format of 3D Graphical Data Exchange:	*.IFC (2x3), native and .NWC (20xx) (all required)*
Format of 2D Graphical Data Exchange:	*PDF, DWG*
Documentation	*PDF, DOC*
Non Graphical Asset Data	*IFC (2x3), XLSX (COBie UK 2012)*
(extend as required)	

Suppliers with asset data deliverables should align their model attributes consistent with the data exchange format outlined in BS 1192-4:2014.

Model data compilation to COBie.
Insert details of Model data compilation to COBie

4 COMMERCIAL MANAGEMENT

4.1 Information Exchange

This section communicates the timing and content of information exchanges between the Project Team / Supplier and the Employer and how information exchanges are aligned to work stages. Information may flow both ways.

The NHS Trust work to the RIBA Plan of Work 2013. At a project level, the frequency of required information exchanges will be defined in further detail within the project AIR & MIDP. Whilst information can be shared at any time during the course of a stage, formal published information deliverables should be exchanged prior to the end of a stage to advise the decision gateways, as indicated by the project MIDP.

Information deliverables required at each information exchange will be as defined by the project MIDP. In general, those information deliverables range from files that may consist of any of the following:

- COBie as a transmittal sheet (project directory, facility, docs and component tabs as a minimum).
- Native and PDF documents (reports, schedules)
- 3D Models – in their native discipline (un-federated) and in open standard IFC format.
- Drawings – cut from the models, and other documents, in PDF and DWG format
- Structured data – manual input or from models, in BS1192-4: 2014 format, all exchanged as files and referenced in the COBie transmittal sheet, to be issued in both IFC and XLS format.

COBie-BS1192-4:2014 excel sheet data structure shall be used as the default exchange format for all project related information whether 3D modelling is involved or otherwise. For all mandated projects the expectation shall be for the following COBie-BS1192-4 tabs to be completed as a minimum:

Insert project specific Information Exchange requirements here in line with the Project AIR

4.2 Strategic Information Purposes

The Project Information Model (PIM) and Asset Information Model (AIM) will be used for the following purposes:

Stage 0 – 2 Definition & Brief	Stage 3 – 4 Design	Stage 5 Construct	Stage 6 Handover	Stage 7 Operation
Site evaluation				
Feasibility Study				
Visualisation	Visualisation	Visualisation		
Stakeholder engagement	Stakeholder engagement		Stakeholder engagement	
	Design Authoring			
	Coordination			
	Structural Analysis			
	Lighting Analysis			
	Energy Analysis			

	Sustainability Assessment			
	Statutory Compliance			
	Site Logistics (4D)	Site Logistics (4D)		
	H&S Planning	H&S Planning		
Cost Management	Cost (QTO)	Cost (QTO)		
CDM2015	CDM2015	CDM2015	CDM2015	CDM2015
		Off Site manufacture		
			As-Built Asset data	
			Soft Landings	Soft Landings
			Planned Maintenance Scheduling	Planned Maintenance Scheduling
Lifecycle Analysis	Lifecycle Analysis	Lifecycle Analysis	Lifecycle Analysis	Lifecycle Analysis
				Asset Management
				Facilities Management
				Space Management
				Post Occupancy Evaluation (POE)

4.3 Responsibilities Matrix

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 assignation of roles is noted below, derived from PAS1192-2:2013 7.5 Table 2. The Information Management role is additionally defined in CIC/INF MAN/S 2013. The roles are not new appointments, rather roles that are applied to named individuals working on the project to assign task ownership. These roles may be transferred and migrate to different individuals as the project progresses.

The following roles will be applied to the project in line with PAS1192-2:2013.

Role		Activities PAS1192_2 Table 2	Authorities PAS1192-2 Table 2	Carried out by
Employer Representative / PIM (receiver) (refer also to BS8536-1)	*Name and Organisation – Refer to Project Directory*	• Define the EIRs, OIRs and AIRs, including structured data requirements (COBie) • Define the IDP, including PLQs • Establish the Employer AIM CDE and/or CAFM • Authorise information from Shared to Published • Ensure information exchanges from PIM to AIM • Accept / reject information exchanges to AIM • Validation of AIM information • Enable data integration to the employer AIM CDE • Ensure information exchanges to the Employer CAFM • Validation of CAFM information		EMP PIM
Project Delivery Manager (PDM)	*Name and Organisation – Refer to Project Directory*	• Assure delivery of information exchanges • Confirm suppliers ability to deliver information requirements	• Accept / reject information exchanges within the common data environment	TBC
Project Information Manager (PIM)	*Name and Organisation – Refer to Project Directory*	• Enable reliable information exchange through the CDE • Maintain and receive information into the Information Model • Enable integration and co-ordination of information within Information Model • Configure information for Project Outputs • Populate the information exchange format for the Information Model	• Accept / reject information exchanges within the common data environment • No design responsibility or right to issue instructions	TBC

Lead Designer	*Name and Organisation – Refer to Project Directory*	• Co-ordinated delivery of all design information • Manage information development and information approvals • Confirm design deliverables • Overall lead for configuration management	• Confirm status and approve information for issue within the CDE • Approve design changes proposed to resolve clashes	LD
Task Team Manager(s) (TTM)	*Arch - Name and Organisation – Refer to Project Directory* *Struct - Name and Organisation – Refer to Project Directory* *MEP - Name and Organisation – Refer to Project Directory*	• Production of design outputs related to a discipline specific, package based or time-based task • Approval of Task Team Information prior to Sharing to the CDE	• Issue approved information within the CDE	TTM(s)
Task Information Manager(s) (TIM)	*Arch - Name and Organisation – Refer to Project Directory* *Struct - Name and Organisation – Refer to Project Directory* *MEP - Name and Organisation – Refer to Project Directory*	• Direct the production of task information in compliance with standards and methods • Direct the production of task information using agreed systems	Confirm that information is suitable for issue within the CDE	TIM(s)
Information Author(s)	*Arch - Name and Organisation – Refer to Project Directory* *Struct - Name and Organisation – Refer to Project Directory* *MEP - Name and Organisation – Refer to Project Directory*	• Develop constituent parts of the information model in connection with specific tasks • Production of project outputs		Information Author(s)
Interface Manager(s)	*Arch - Name and Organisation – Refer to Project Directory* *Struct - Name and Organisation – Refer to Project Directory* *MEP - Name and Organisation – Refer to Project Directory*	• Manage spatial co-ordination on behalf of a task team • Propose resolutions to co-ordination clashes	Propose resolutions to clashes	Interface Manager(s)
Information Originator	*Arch - Name and Organisation – Refer to Project Directory*	• Develop constituent parts of the information model in connection	Ownership of model information	Information

	Struct - Name and Organisation – Refer to Project Directory *MEP - Name and Organisation – Refer to Project Directory*	• with specific tasks • Production of project outputs		Originator

4.4 Applicable Standards

The purpose of this section is to define the BIM Standards and protocols that are incorporated into the Information Requirements on the project. The following standards will be applied to the project.

Industry Standards	Applicable
BS1192:2007	☐
PAS1192-2:2013	☐
PAS1192-3:2014 Lifecycle	☐
BS1192-4:2014: COBie	☐
PAS1192-5:2015 Security	☐
PAS1192-6:2018 Health and Safety	
BS8536-1:2015 Facilities Management	☐
BS8541-1, 2, 3, 4, 5, 6 Library management	☐
BS7000-4:2013 Design Management	☐
Uniclass 2015 Classification*	☐
RIBA Plan of Works 2013	☐
BIM Toolkit (DPoW), including Level of Definition*	☐
CIC BIM Protocol 2ND Edition 2018	☐
Other – State here	☐
* Under development (date stamped tables will be issued and are to be adhered to by all model authors)	

Corporate Standards	Applicable
Process EIR, OIR, AIR	☐
Asset Tagging	☐
Room Naming/ Numbering	☐
Room Data Sheets	☐
O&M Manuals	☐

CDE Standards including folder structure to align with PAS1192-2	☐
Zoning for CAFM	☐
Bar Coding	☐
Level Standards	☐
System Naming	☐

4.5 Schedule of Contract Delivery Changes

The purpose of this section is to outline any changes to the standard roles, responsibilities and competences set out in the contract.

Confirm that all BIM requirements, roles and responsibilities are included in appointment scope of services and the Supply Chain BIM deliverables will be included in applicable Subcontractor orders.

Provide any clarity required on changes to standard roles, responsibilities and competences.

Provide any additional information regarding changes to CIC BIM protocol and IP Changes requested by Insurers and full descriptions of amendments and reasons.

5 COMPETENCE ASSESSMENT

5.1 Project Implementation Plan (PIP)

Supply Chain Capability Summary
Insert Supply Chain Capability Summary (PAS 6.3.2)

Supplier Building Information Management Assessment Forms
Insert Supplier Building Information Management Assessment Forms (PAS1192-2 6.3.2a)

Supplier Information Technology Assessment Forms
Insert Supplier Information Technology Assessment Forms (PAS1192-2 6.3.2b)

Supplier Resource Assessment Forms
Insert Supplier Resource Assessment Forms (PAS1192-2 6.3.2c)

5.2 Capability Assessments

The Supplier should confirm that the project team have been assessed in line with the following:

- PAS1192-2:2013
- CPix BIM Capability Assessment
- CPix IT Questionnaire

Insert supplier confirmation and evidence as applicable.

6 Appendices

7 Glossary of Abbreviations and Terms

BEP	BIM Execution Plan
BIM	Building Information Modelling
BSRIA	Building Services Research and Information Association
BWM	BIM workgroup meeting
CIC	Construction Industry Council
CDE	Common Data Environment
EIR	Employer Information Requirement
IFC	Industry Foundation Class
LOD	Level of Detail
LOI	Level of Information
MPDT	Model Production Delivery Table
NBS	National Building Specification
WIP	Work In Progress
4D	3D representation of an asset with the element of time included to enable simulations.
5D	3D representation of an asset with the element of time and cost included to enable simulations, commercial management and earned value tracking to take place.
BEP	Plan prepared by the suppliers, facilitated by the Employer or the Employer's BIM representative to explain how the information modelling aspects of a project will be carried out
BIM	Process of designing, constructing or operating a building or infrastructure asset using electronic object-oriented information
CIC Scope of Services	Multi-disciplinary scope of services published by the Construction Industry Council (CIC) for use by members of the project team on major projects
COBie	Construction Operation Building information exchange. Structured facility information for the commissioning, operation and maintenance of a project often in a neutral spread sheet format that will be used to supply data to the employer or operator to populate decision-making tools, facilities management and asset management systems
CDE	Common data environment - Single source of information for any given project, used to collect, manage and disseminate all relevant approved project documents for multi-disciplinary teams in a managed process. This is commonly a cloud based SaaS solution synchronised with party servers to host the information model
Data	Information stored but not yet interpreted or analysed
Design intent model	Initial version of the project information model (PIM) developed by the design suppliers
Document	Information for use in the briefing, design, construction, operation, maintenance or decommissioning of a construction project, including but not limited to correspondence, drawings, schedules, specifications, calculations, spread sheets
Drawing	Static, printed, graphical representation of part or all have a project or asset
Employer	Individual or organization named in an appointment or building contract as the employer

EIR	Employer's information requirements - Pre-tender document setting out the information to be delivered, and the standards and processes to be adopted by the supplier as part of the project delivery process
Federated model	A federated model is an assembly of distinct models or design disciplines, to create a single complete model of the building. Eg Architectural, Structural and Mechanical models may be viewed in a single 'federated' model.
Graphical data	Data conveyed using shape and arrangement in space
Level of Definition	Collective term used for and including "level of model detail" and the "level of model information"
MIDP	Master information delivery plan - Primary plan for when project information is to be prepared, by whom and using what protocols and procedures, incorporating all relevant task information delivery plans
Pre-contract BEP	The pre-contract BEP is to demonstrate the supplier's proposed approach, capability, capacity and competence to meet the EIR. It is utilised prior to the appointment of any stakeholder.
Post-contract BEP	The post-contract BEP is the document defining standard methods and procedures adopted during the contract in order to meet the objectives and requirements set forth in the EIR. It is utilised following the appointment of project stakeholders and in particular the main contractor.
PIP	Project implementation plan - Statement relating to the suppliers' IT and human resources capability to deliver the EIR
SMP	Standard method and procedure - Set of standard methods and procedures covering the way information is named, expressed and referenced.
Volume	Manageable spatial subdivision of a project, defined by the project team as a subdivision of the overall project that allows more than one person to work on the project models simultaneously and consistent with the analysis and design process