AEC (UK) BIM Protocol Project BIM Execution Plan

Implementing UK BIM Standards for the Architectural, Engineering and Construction industry.

Version 2.0   September 2012   A pro-forma and guidance document to developing a Project BIM Execution Plan.

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Contents

Execution Plan Checklist

The following headings are to be used to form the basis of a project BIM Execution Plan.

Project Information	
Project Description	☐
Project Scope	☐
Unique Project Challenges	☐
Key Project Stakeholders	☐
Key BIM Personnel	☐

Project Objectives & Goals	
Project BIM Objectives	☐
Project Stakeholders BIM Objectives	☐
Programming	☐
Level Of Development Matrix	☐
Key Performance Indicators	☐

Collaborative Working	
Project BIM Standards	☐
Project Coordinates	☐
Modelling Standards	☐

Communication & Meetings	☐
Data Exchange Protocols	☐
Model/Data Validation Protocols	☐
Model/Data Subdivision	☐
Modelling Units	☐
BIM Mock-ups	☐
Area Calculation Methodology	☐

Project Resources & IT Requirements

Stakeholders BIM Software Expertise	☐
Common Data Environments	☐
Hardware / Technology Infrastructure Requirements(all Stakeholders)	☐
Software (all Stakeholders)	☐
Project Specific BIM Content	☐

Execution Plan Guidance

Project Information

Project Description:

Briefly describe the project in terms of:

- Project Owner

- Project Name

- Project Type (School, Office Etc.,)

- Geographic Location.

Project Scope:

Briefly describe the project scope in terms of:

- Project Phasing

- Approximate Site Area

- Approximate Gross Internal Floor Area

- Contract / Delivery Type

Unique Project Challenges:

Identify any unique project conditions / challenges which may influence the approach to the project design / delivery.

For example:

- Steep sided site topography.

- Limited access route widths.

- Congested city centre location.

Key Project Stakeholders:

Record all Key Project Stakeholder details including:

- Company Role

- Company Name

- Company Contact

Key BIM personnel:

Record the Key Building Information Modelling personnel responsible for each discipline including:

- Company Name

- BIM Personnel

- Email Address

- Telephone Number

Project Objectives & Goals

Project BIM Objectives:

The BIM execution plan should document the overall Project BIM objectives. These should be discussed and agreed between all Stakeholders. The selection of these objectives will be dependent on many factors such as:

- Client Requirements

- Stakeholders Requirements

- Stakeholders Skillsets

- Project Fee Levels

It can be helpful to prioritise the Project BIM Objectives into Primary and Secondary Objectives.

Note: Project BIM Objectives will change in line with various phases of project development.

Project Stakeholder's BIM Objectives:

As well as the agreed Project BIM Objectives it is often the case that individual Stakeholders will have their own BIM Objectives running in parallel. Documenting these can help promote a better understanding of individual Stakeholders approaches to BIM.

Programming

Project BIM Objectives and Goals will change in line with the project phases. The programming of the agreed Project BIM Objectives must be taken into consideration

and agreed between all Stakeholders. Document the programming of the Project BIM Objectives within the BIM Execution Plan.

Level of Development Matrix

To assist in the exchange and delivery of collaborative BIM data it recommended that all Stakeholders collectively develop and agree a Level of Development Matrix. The purpose of this matrix is to plan and communicate the collective BIM deliverables. It should address the following items:

- Who is modelling each element?

- When each model element is being modelled.

- To what Level of Development is each element being modelled?

- Who is the responsible stakeholder for model elements at each stage?

- What is the authorised use of each model element?

Key Performance Indicators

Key Performance Indicators (KPIs) are ways to periodically assess the performance and effectiveness of the project delivery as well as individual Stakeholders. In order to quantify the performance of the project delivery it is recommended that the BIM Execution Plan incorporates some Key Performance Indicators.

For Example:

- No. of Clash Detections

- No. of Construction Clashes

- Delivery Timescales

- Costs

- Resources

Collaborative Working

Project BIM Standards

Common BIM Standards should be established and agreed between all Project Stakeholders. This can take the form of an established industry standard (such as the AEC(UK) Standards) or could be an agreed project specific standard.

Project Coordinates

Establishing agreed Project Coordinates is essential to efficient collaborative working. This should be established and documented at the soonest opportunity.

For Example:

- Geo-referenced
- Locally referenced origin point

Modelling Standards

Common modelling standards should be established between all Stakeholders. Examples of areas of consideration could include:

- Modelling Methodologies. (3D, 2.5D, Placeholders etc.)
- Level of Development.
- Level of Detail. (Revit Specific)
- Incorporation of Meta data.
- Use of Material properties.
- Use of In-Place Families (Revit Specific)

Communication & Meetings

Efficient and regular communication is essential to the running of a BIM based project. To facilitate this regular BIM project meetings are to be encouraged. The frequency of these meetings may vary as the project progresses however they are an essential part of a successful BIM project.

In addition consideration should be given to potential co-location of Project Stakeholders. This has been proven to improve Stakeholders' communication and encourage efficient collaborative working.

Data Exchange Protocols

The regular exchange of BIM data is an essential part of a successful BIM project. All Stakeholders should establish agreed Project Data Exchange Protocols. This should include the following:

- Method of Data Exchange (Shared Data Environment / Temporary Shared Area / Direct Access)

- Use of Work In Progress (WIP) data.

- Agreed format of exchanged model data.

- Model naming convention.

Model / Data Validation Protocols

All Stakeholders should have in place suitable procedures for Model Data validation for both issuing and receiving BIM data. In addition each Stakeholder should in place documentation confirming that these procedures are being followed throughout the life of the project.

For Example:

- Model Transmittal documentation.

- Model Validation documentation.

Model / Data Subdivision

BIM projects often require the segregation of data into manageable sized pieces. This can take many forms and is often unique to each project. Describe and diagram how the project model data will be subdivided.

For Example:

- Number of models for each discipline.

- Subdivision of key worksets within each model.

- Details of linked models within each sub model.

- Details of model link types (Overlay / Attachment)

Modelling Units

Common modelling units should be established and agreed between all Project Stakeholders. This becomes may take on a greater importance when working with international Stakeholders.

For Example:

- Metric / Imperial

BIM Mock-up

As part of planning BIM data exchange methodologies it may be beneficial to test the exchange workflows prior to commencing the project models. This process can help establish the most efficient ways of collaboratively exchanging information as well as reducing the risk of problems later in the process.

Area Calculation Methodology

Common agreed methods and standards for area calculations must be established between all Stakeholders.

For Example:

- Gross Internal Floor Areas

- Net Floor Areas

- Embedded Carbon

- Energy Modelling

Project Resources & IT Requirements

Stakeholder's BIM Software Expertise:

It is essential that the stakeholder's BIM software skills and experience match the required BIM deliverables. Should there be a mismatch between the required BIM deliverables and the Stakeholder's Bim skillsets agreement must be reached between all Stakeholders as to the appropriate course of action to be taken. This could include:

- Revise the agreed Project BIM Deliverables to match the project teams' BIM Software Expertise.

- Identify and agree individual Stakeholder BIM training requirements and timetable.

- Recruit the required skillsets.

- Incorporate additional skillsets from external resources such as BIM consultants.

Common Data Environments:

The exchange of information between all stakeholders is a key factor in execution of a successful BIM project. As such it is important to establish a Common Data Environment at the soonest possible opportunity. Examples of a Common Data Environment are:

- Shared network location.

- Online project portals.

- Cloud based collaboration tools.

Hardware / Technology Infrastructure Requirements:

BIM deliverables often have their own inherent hardware / technology infrastructure requirements. It is important to recognise and understand these and ensure that the required infrastructure needs can be met by the Project Stakeholders. Examples of these are:

- Suitably specified workstations

- Suitable network connectivity (Both internal and external)

- Required site based hardware (RFID readers, Total Stations, BIM access points)

Software (all Stakeholders):

Consideration should be given to the compatibility of all Stakeholders' software. Particular attention should be paid to the interoperability of BIM authoring tools. Any known compatibility issues should be acknowledged and documented. Project specific workflows may need to be developed to overcome any known compatibility issues.

Project Specific BIM Content:

Establish if project specific BIM content is available or required. This could be in the form of agreed standardised client product libraries, specific manufacturer data or bespoke project content. In the absence of pre-configured BIM content it may be prudent to allocate resources to the creation / collation of suitable content libraries. Consideration should be given to the varying requirements of the BIM content and the differing stages of a project.

BIM Uses

Below is a list of common BIM uses. Additional BIM uses can be added to the list as needed.

	BIM Uses	Primary	Secondary
☐	Building Maintenance Scheduling	☐	☐
☐	Building System Analysis (operational)	☐	☐
☐	Asset Management	☐	☐
☐	Space Planning & Tracking	☐	☐
☐	Disaster Planning	☐	☐
☐	Record Modelling	☐	☐
☐	Existing Conditions Modelling	☐	☐
☐	Engineering Analysis	☐	☐
☐	Energy Analysis	☐	☐
☐	Structural Analysis	☐	☐
☐	Lighting Analysis	☐	☐
☐	Mechanical Analysis	☐	☐
☐	Other Engineering Analysis	☐	☐
☐	Sustainability (BREEAM) Evaluation	☐	☐
☐	Code Validation	☐	☐
☐	Programming	☐	☐
☐	Cost Estimation	☐	☐
☐	Digital Fabrication	☐	☐
☐	3D Control & Planning (Digital Layouts)	☐	☐

BIM Uses

	BIM Uses	Primary	Secondary
☐	Visualisation	☐	☐
☐	Design Authoring	☐	☐
☐	Design Reviews	☐	☐
☐	Phase Planning (4D Modelling)	☐	☐
☐	3D Coordination	☐	☐
☐	Site Utilisation Planning	☐	☐
☐	Site Analysis	☐	☐
☐	Construction Systems Design (Virtual Mock-up)	☐	☐
☐		☐	☐
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