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27TH December 2023

For the Attention of: David John
On behalf of Neath Port Talbot Council

The Quays,
Brunel Way,
Neath,
SA11 2GG

Subject: Understanding and Implementation of Building Information Modelling Maturity for Ysgol Yr Afan

Dear Mr John,

I hope this letter finds you well. We appreciate the opportunity to work on the Ysgol Yr Afan project which will consist of a 1 form entry infant school for 90 pupils with provision for a 48 pupil PT nurse and are committed to ensuring the successful implementation of Building Information Modelling (BIM) to enhance the overall project outcomes. This letter's aim is to outline our understanding of the BIM requirements for this project and in general, and also detailing how information will be shared, coordinated, and managed from the project phase into the operational and handover stages of the project.

A cooperative team is put together early on in a BIM project. In order to guarantee that the design information produced is coordinated and will be most helpful to those involved in the construction and operation stages, it agrees on the procedures and information structures. Those who will be participating later in the project (manufacturers, the client's FM team, etc.) can be of great assistance in getting things started, this is all explained in the ISO 19650 which is where the BIM process is defined for those all over the world so that everyone no matter where you are, are working to the same standards.

In BIM there are something called BIM maturity levels consisting of 4 different levels but to begin with I will explain the explanation of BIM. Building information modelling is a collaborative approach to work supported by digital technologies that make it possible to design, produce, and maintain physical built assets more effectively over the course of their full existence. Greater efficiency can be realised due to considerable pre-planning during the design and construction phases, delivering comprehensive information at handover point, there are then something called BIM Maturity levels which define the technological progress achieved in the AEC sector according to the degree of collaboration and information shared between different stakeholders who are all involved in the same project. (Lorek, S, 2022)

These levels consist of 4 different levels beginning with level 0 and going up to level 3, Level 0 consists of low collaboration and makes use of paper based 2D CAD drafting techniques, this level of integration utilises paper or electronic prints with the main goal to generate production information, this low level of BIM Maturity is rarely used in the modern-day construction industry, and any projects with this level of maturity would not get considered if they were applying for government tenders as they have to achieve

BIM level 2 to be considered (UNITED BIM, 2019). You do not want to be on this level with this project and that is why I am writing you this letter to inform you of the procedures that should be put in place for this building so that you are well equipped to be using BIM for the lifecycle of this project.

Level 1 involves 2D drafting and 3D CAD (Computer aided design), with both playing a big role as 2D is used for the generating of statutory documentation for approval and production information while 3D CAD is used for conceptual works for the projects which would be very useful in this project as it would allow you and the team at Ysgol Yr Afan to see the school before it is even built so you can make design changes or structural changes before work is started on site. This level is still not where you want to be though as there is still no collaboration between different stakeholders as everyone is working on their own document and not a shared document. (Eischet, O, 2023)

Moving on to level 2 which is where BIM starts to become very useful as it promotes collaborative working by making sure every stakeholder has their own 3D CAD model, this would be the maintenance team, the building contractors and even the staff at the school itself. (United BIM, 2019)

While every stakeholder has their own document to work on the information changed on the document is shared through a common file format, this allows us at Beynon Consultancy to combine all external data to create a federated BIM Model, commonly known as a BIM execution plan.

A BIM Execution plan can be very useful for this project as it is a resource that outlines how stakeholders in the project will achieve desired project outcomes, it includes details such as roles and responsibilities, project timeline and the deliverables that will be produced. (Eischet, O, 2023)

The final level is 3, which is commonly known as 'open BIM' which enables deeper collaboration between stakeholders through a shared model stored in a central spot where it can be accessible easily by everyone involved where all participants can work on the same model which will be updated once all changes have been made, although this level isn't very popular at the moment many firms across the UK are thinking of transitioning to it from Level 2. (United BIM, 2019)

How will BIM maturity work in your instance? To meet the BIM requirements for Ysgol Yr Afan, we will adhere to international standards, specifically focusing on the ISO 19650 series which provides guidelines for the organization and digitization of information about buildings and civil engineering works. Additionally, we will utilize a BIM Execution Plan (BEP) to define the processes, roles, and responsibilities to ensure the successful delivery of the project which.

Information Sharing:

Information sharing will be facilitated through a collaborative platform that allows real-time access to project data. Our team will employ a Common Data Environment (CDE), ensuring that all stakeholders have access to accurate and up-to-date information. The CDE will follow ISO 19650-2 standards, establishing a clear framework for information exchange.

Coordination:

BIM enables enhanced coordination among project disciplines. Our team will utilize clash detection tools and 3D modelling to identify and resolve potential conflicts early in the design phase. This proactive approach minimizes the risk of issues during construction, leading to improved project efficiency and reduced costs.

Information Management:

A robust information management system will be implemented throughout the project lifecycle. This includes version control, audit trails, and a structured data management approach, ensuring that historical project data is preserved for future reference. ISO 19650-1 will guide our information management processes, promoting consistency and reliability.

Operational Stage:

Our commitment to BIM extends beyond project completion into the operational stage. We will deliver a comprehensive digital asset that includes relevant information for facility management. This transition aligns with ISO 19650-3, addressing the information management requirements during the operational phase.

Level of Detail (LOD) and Level of Information (LOI) Format:

Understanding the client's information needs is crucial for successful BIM implementation. The Level of Detail (LOD) and Level of Information (LOI) framework provides a structured approach to defining and communicating these requirements throughout the project lifecycle. The definition of Level of development refers to the level of detail and reliability of information within BIM elements at different stages of the project, whilst level of information describes the information content of a BIM object at a specific time in the project such as dimensions, material specification or cost of a building element. (Baldwin, M, 2017))

Now I will discuss level of detail and level of information in RIBA Stages Stage 1 is the Preparation and Brief, during this stage, the Level of development is typically low, focusing on conceptual representations. The Level of information is primarily qualitative, outlining the general requirements and project objectives.

The second stage is Concept Design, in this level, level of detail progresses to a more detailed level, with a focus on the overall project concept. The Level of information becomes more quantitative, specifying key performance indicators and functional requirements.

This stage being the third is Developed Design in this stage Level of detail further advances, providing a detailed representation of the design. The Level of information specifies specific product and performance information, aligning with detailed design requirements, next we have Stage 4 which is technical Design in this stage Level of development reaches a highly detailed level, incorporating precise product and material information. The level of information becomes comprehensive, detailing all aspects of performance, maintenance, and operational requirements.

At Stage 5 Construction begins this meaning that the Level of detail is at its peak, providing a construction-ready model. The Level of information is exhaustive, covering all necessary information for construction, including sequencing, installation, and quality standards, this is where the level of information has truly been used to its maximum as a construction model is made. Following on from this stage we have stage 6 which is Handover and Close Out in this stage of the process Level of detail remains high, capturing as-built conditions whilst the level of information transitions into an operational focus, detailing information necessary for facility management.

The final stage is stage 6, this is when the model is in use and Level of detail is maintained at an as-built level, supporting ongoing facility management, at this stage the level of information continues to evolve based on the client's changing operational needs, this meaning it changes whenever the client decides they would like something added to the model or something taken out making it easier to use in the future for maintenance of the building.

Examples of Level of detail and Level of information:

An example of Level of detail could be At Stage 3 which is Developed Design, in this stage the Level of development might include a 3D model with detailed architectural and structural elements, whereas at Stage 5 being Construction, Level of detail would extend to include MEP systems, clash detection, and construction sequencing, therefore signalling to the client is there are any issues with the model and build.

An Example of Level of information could certainly be at Stage 2, Concept Design, in this stage Level of information may focus on qualitative requirements, such as spatial relationships and overall project goals. In contrast, at Stage 4, Technical Design, Level of information would detail specific product and performance requirements for each building component.

We understand the significance of extending BIM benefits into the operational stage of this project. Therefore, our strategy includes a robust information lifecycle management plan. This plan will address data handover procedures, training for facility management teams, and the ongoing use of BIM data for maintenance, operations, and future renovations.

Let us conclude by saying that we are thrilled to have the chance to help the Ysgol Yr Afan project succeed in the terms of BIM Maturity. For the project to be successful in terms of efficiency, teamwork, and long-term operational efficacy, Building Information Modelling must be included. Your dedication to following BIM maturity levels in particularly concentrating on the ISO 19650 series lays the groundwork for an efficient and cooperative strategy between all stakeholders involved in the project.

We have delineated the sequence of events leading up to BIM maturity levels, stressing the significance of reaching a minimum of BIM Level 2, which fosters cooperative efforts among all parties involved. Real-time access to project data is made possible through the implementation of a Common Data Environment (CDE) that complies with ISO 19650 requirements to ensure smooth information sharing.

A thorough information lifecycle management plan is part of our approach, and it addresses data transfer, training, and continuous usage of BIM data for operations, maintenance, and upcoming upgrades. We are sure that our strategy will make a big difference in the Ysgol Yr Afan project's viability and success.

Beyond the project's completion, we remain committed to complying with ISO 19650 during the operational phase. Our goal is to provide a comprehensive digital asset that will provide pertinent data to help facility management.

We look forward to further discussing these plans and working collaboratively to achieve the successful implementation of BIM for Ysgol Yr Afan. Please do not hesitate to reach out if you have any questions or require additional information.

If you would like to research further into this topic then the building information modelling process and associated data is explained well and defined within ISO 19650 which as I explained earlier is the international standard for BIM.

Thank you for entrusting us with this important project.

Sincerely,

Jac Beynon
Design Manager
Beynon Consultancy Limited
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