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ANALYTICAL APPRAISAL OF BIM STRATEGY FOR CAERPHILLY COUNCIL

Project Title: Ysgol Y Twyn

UPRN: 5016

Prepared for: Caerphilly County Borough Council

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1. Introduction

CymruBIM Integrated Design Group Ltd. has been hired by Caerphilly County Borough Council as the principal consultant for the construction of Ysgol Y Twyn, a one form entry infant school featuring a community hall, the Caerphilly Story Gallery, and a 48 seat part time daycare. The project must comply with the Sustainable Communities for Learning Programme of the Welsh Government, which requires lifecycle focused asset information and strong digital delivery (Welsh Government, 2022). Therefore, whole life thinking, structured information management, and BIM maturity are crucial.

This analytical appraisal sets out CymruBIM's BIM strategy for the Ysgol Y Twyn project, explaining how we intend to apply ISO 19650 processes, LOIN principles, federated modelling and CAFM integration across the different stages of delivery. The aim is to show Caerphilly Council and the Welsh Government that the project will be managed in a structured and transparent way. While the overall approach aligns with recognised good practice in the UK BIM Framework (2023), the focus here is on what these ideas mean for this particular school and its associated community facilities.

2. Holistic BIM Approach for Ysgol Y Twyn

CymruBIM's approach centres on making sure that the people, processes and digital tools involved in the project all connect properly throughout the building's lifecycle. In practical terms, this means clarifying who is responsible for producing and checking information, deciding how models and documents will be shared, and making sure the technology chosen genuinely supports these tasks. The intention is not simply to follow theory but to create a workflow that helps the Council and future FM staff use the digital information easily once the building is handed over. This reflects ideas promoted in Digital Built Britain (2018) and the operational focus in BS 8536-1 (BSI, 2015), but adapted to suit the scale and needs of Ysgol Y Twyn.

The first step in CymruBIM's methodology is to make sure that every project stakeholder has distinct roles within an information management structure that is in line with ISO 19650 (BSI, 2019a). Under defined digital procedures and approval paths, the project team which includes architects, engineers, FM specialists, and council stakeholders will collaborate. A safe foundation for information transmission is provided by the technological platform, which includes coordination environments like Navisworks and Solibri, BIM authoring tools like Revit and Tekla, and the Asite CDE. Crucially, the BIM strategy's main goal is to support an asset that is transparent, future proof, and provides long term sustainability, operational efficiency, and value all of which are in line with the concepts of whole life asset management (Wilkinson & Alarcon, 2019).

3. BIM Maturity Strategy

As a development of the previous UK BIM Level 2 mandate, the Ysgol Y Twyn project must reach a BIM maturity level in line with ISO 19650. All Sustainable Communities for Learning initiatives are expected by the Welsh Government to follow organised digital workflows, which include the creation of structured asset data like COBie, the usage of a CDE, and

federated modelling techniques (BSI, 2015b). Both Caerphilly Council and the Welsh Government are reassured by these criteria, which guarantee that information is generated, distributed, and verified in a consistent and transparent manner (Welsh Government, 2022).

To meet the expectations of the Sustainable Communities for Learning Programme, the project must operate at a level of BIM maturity consistent with ISO 19650. In practice, this means making sure that each discipline produces models that follow shared standards, that information moves through an organised CDE workflow, and that the asset data is complete enough for the Council to use later. Modelling will begin with discipline specific Revit or Tekla files, which will then be brought together for spatial coordination. This process although on a much smaller scale than major schemes follows the same principles used on projects like Crossrail, where regular digital coordination helped reduce clashes and delays (Crossrail Ltd, 2020). The same logic applies here, catching problems early should make the build more predictable.

The approach then shifts to integrated BIM, where asset lifecycle data is organised using COBie fields and matched with ISO 19650-3 specifications for the asset's operational phase (BSI, 2020). If Caerphilly Council decides to use enhanced monitoring and optimisation in the future, CymruBIM offers a route towards a Digital Twin ready environment that goes beyond technical design and construction. The National Digital Twin Programme's (NDTP, 2020) national digital twin concepts are in line with this.

4. Level of Information Needed (LOIN)

A key idea that guarantees information provided at every step of the project is appropriate, intentional, and in line with decision making needs is the Level of Information Need (BSI, 2021). I have seen this myself when models become overloaded with unnecessary detail. Establishing an appropriate LOIN guarantees that each component of Ysgol Y Twyn, where the nursery, infant school, community hall, and gallery must operate both jointly and independently, has the geometric detail, data attributes, and documentation required for design, coordination, and long term operation (DfE, 2021).

The idea behind LOIN is to avoid producing unnecessary detail and instead focus on the information that is genuinely needed at each stage. From my experience, models can easily become overloaded if this isn't controlled, which makes coordination harder rather than easier. By defining LOIN for areas such as the nursery HVAC, the community hall doors or the gallery lighting, the team can agree early on what level of geometry and data is sufficient for design and what must be included at handover for FM purposes. This follows the structure in BS EN 17412-1 (BSI, 2021) and helps ensure the FM team receives information they can actually use.

5. Key Standards Embedded in the Project

The foundation of CymruBIM's methodology is adherence to a number of national and international standards. The ISO 19650 series, which outlines information management procedures across the asset lifetime, is essential to the plan (BSI, 2019a; 2019b; 2020). This guarantees that all information is controlled by transparent procedures for exchange,

approvals, and quality control. Because infant schools are security sensitive, ISO 19650-5 is essential in ensuring that digital information does not jeopardise protection (BSI, 2020b).

The standards that guide the project particularly the ISO 19650 suite, BS 8536-1 and COBie provide a framework for managing information consistently. However, the real benefit for this project is that these standards give the Council confidence that information will be traceable and structured, which should make later approval stages smoother. Uniclass 2015 also helps by keeping classifications consistent across drawings, models and schedules (NBS, 2023). Using these standards isn't just about compliance it should make the process clearer for everyone involved, especially during handover.

6. Common Data Environment (CDE) Strategy

The primary platform for organising and verifying all project data will be the Asite Common Data Environment. Information will move via organised phases in accordance with ISO 19650, starting with Work in Progress sections where each discipline creates and improves model data. When information is prepared, it will be sent to the Shared area for interdisciplinary coordination before being verified and approved for client release in the Published area. All data will be kept in an archive location for future reference and auditability (UK BIM Framework, 2023).

The Asite CDE will be used to manage all project files, with information moving from Work in Progress to Shared and then to Published once it has been checked. One of the practical advantages of using Asite is that it can automatically highlight missing data or incorrect naming, which reduces the chance of errors slipping through. Issues such as inconsistent metadata or files saved in the wrong location are common in early stages, so having these checks in place should make coordination meetings more efficient and avoid confusion later on.

7. Coordination and Collaboration Strategy

Early and ongoing coordination is highly valued by CymruBIM in order to minimise rework and program delays. Every week, federated models will be examined, and conflicts will be found and assigned using organised issue tracking procedures. This strategy is based on learning from big projects like Crossrail, although our project is much smaller, the principles still apply. (Crossrail Ltd, 2020).

Regular coordination is essential, especially because several buildings on the site need to operate independently but still share some infrastructure. Weekly reviews of the federated model will help catch issues early, and tools like Navisworks and Solibri will support this. Although the project is far smaller than schemes like Crossrail, the principle is the same, identifying clashes before construction reduces risk and avoids unnecessary rework (Crossrail Ltd, 2020). VR sessions should also help engage teachers and community groups by letting them see how the spaces will function in practice.

8. Whole Life Digital Strategy and CAFM Integration

Making sure that buildings function effectively for the duration of their operational lives is a fundamental requirement of the Sustainable Communities for Learning Programme (Welsh Government, 2022). CymruBIM will create a thorough digital asset register organised using COBie to facilitate this. All maintainable assets, such as HVAC units, lighting, fire suppression systems, teaching equipment, and specific gallery systems, will have detailed information in this registry. Important information that is in line with ISO 19650-3 (BSI, 2020) will contain manufacturer details, warranty expiration dates, maintenance schedules, and asset performance characteristics.

For long term use, the Council needs asset information that works smoothly with its CAFM system. To achieve this, the project team will populate COBie fields as the design develops and carry out early checks to confirm that the data format matches the Council's system. In my experience, the biggest challenge is ensuring that each supplier provides information in a consistent way, so setting expectations early should help avoid gaps at handover. QR tagged assets will also make it easier for FM staff to identify equipment on site and access the relevant maintenance details.

9. Sustainability and Digital Performance Monitoring

Sustainability modelling using IESVE will help identify potential issues such as overheating, ventilation shortfalls or high energy demand. This is particularly important for the nursery, where larger glazing areas could increase heat gain in summer. These findings will feed back into design changes, for example adjusting shading or ventilation strategies. After the building is occupied, environmental sensors linked to the CAFM system will allow the Council to monitor how spaces are actually performing rather than relying solely on predicted data. This supports the Soft Landings approach outlined in BS 8536-1 (BSI, 2015).

Environmental sensors, such as temperature, humidity, CO2 levels, and energy consumption, will be connected to the CAFM system after occupancy. This helps the project adjust to actual operational needs by facilitating ongoing development and supporting the soft landings aftercare period (BSI, 2015). Occupancy based analytics will be especially helpful for the community hall and gallery, as it will enable the Council to modify maintenance, lighting, and heating schedules according to actual usage patterns (NDTP, 2020). This facilitates each building function's effective, independent operation.

10. Governance and Information Management Roles

Ysgol Y Twyn's governance structure is based on the ISO 19650 role framework (BSI, 2019a). As the appointing party, Caerphilly Council sets the Exchange Information Requirements (EIR) and authorises important project deliverables. As the primary appointed party, CymruBIM is in charge of overseeing the CDE, guaranteeing overall information governance, and coordinating information creation across all task teams. As task teams, the architectural, structural, and MEP consultants each generate models and data unique to their respective disciplines. The information manager makes ensuring that model validation, metadata requirements, and naming conventions are followed. Lastly, to guarantee that operational requirements are satisfied right away, the FM adviser from Cymru Asset Operations Consulting supervises CAFM and asset handover preparation.

11. Information Delivery Plan

An Information Delivery Plan (IDP) in line with ISO 19650-2 will be implemented by CymruBIM (BSI, 2019b). The IDP will concentrate on creating the BEP, creating preliminary federated models, and carrying out preliminary sustainability evaluations during the concept stage. The project will proceed towards fully coordinated models, initial COBie datasets, and improved design risk assessments at the spatial coordination stage. In the technical design stage, advanced COBie outputs are prepared, comprehensive CDE validation is carried out, and precise discipline models are finalised.

Weekly model updates, digital site diaries, and scan to BIM verification are the main ways that information is delivered throughout construction to make sure that as built circumstances correspond with the design intent. A comprehensive digital asset register, an as built federated model, and O&M documentation that complies with COBie requirements will be provided by the project team at handover. In order to assess and maximise building performance, the operational stage includes CAFM onboarding and Soft Landings assessments at three, six and twelve months (BSI, 2015).

12. Digital Risk Management

To protect data security, quality, and operational readiness, CymruBIM uses a proactive digital risk management approach. Automated model validation addresses one of the most frequent causes of digital rework by preventing incomplete or below level data from entering the coordination environment (UK BIM Framework, 2023). By implementing ISO 19650-5 procedures, security risks are reduced and the school's sensitive digital data is sufficiently safeguarded (BSI, 2020b). Frequent clash detection and issue tracking methods, based on effective strategies employed in projects like Crossrail, are used to control coordination concerns (Crossrail Ltd, 2020). While focused training sessions guarantee that all project participants maintain the necessary digital competency, early COBie testing reduces the risks related to CAFM incompatibility.

13. Added Value Delivered by CymruBIM

Caerphilly Council benefits greatly from the BIM concept put forth by CymruBIM. Better coordination and information quality lower construction risk, decrease rework, and increase program certainty. The school and community facilities can be run effectively and maintained predictably thanks to the integration of sustainability models, lifetime asset data, and CAFM. Accurate zoning, asset tagging, and occupancy based analytics increase the capacity to run the gallery, community hall, and baby school individually. Additionally, the approach guarantees complete compliance with Welsh Government funding requirements, offering a transparent, auditable record of information management and whole life value.

14. Conclusion

Overall, the BIM strategy presented aims to support both the design and the long term operation of Ysgol Y Twyn by applying ISO 19650 processes, LOIN, coordinated modelling

and CAFM integration in a practical way. The intention is to give Caerphilly Council confidence in the project's delivery and also make the building easier to maintain once it is in use. By focusing on clear information management and early coordination, the project should run more smoothly and provide reliable digital information for future FM teams.

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