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Dear Swansea Council,

Following your instructions to deliver a 'state of the art' infant school in Swansea as a joint venture with the Welsh Government, we understand the project must comply with the 21st Century Schools Programme and therefore meet BIM Maturity Level 2. As the appointed Quantity Surveyors within your design team, we write to you outlining the BIM maturity requirements for this project. The main objectives of this letter are to highlight how the design team will incorporate the appropriate international standards throughout the project.

BIM Maturity Level 2

From early 2016 it is required for suppliers tendering for government projects to be working to BIM Maturity Level 2 (BSI, 2022). As this project is a centrally procured government project it is mandatory that we meet these requirements. To achieve this standard of BIM throughout the project we must comply with the ISO 19650 series and PAS 1192 (Operam, 2022). Securing Level 2 BIM on the project allows information from designing to construction and throughout the buildings lifetime to be sufficiently shared and secure between all parties. In accordance with BIM guidance, all relevant teams including end users such as management and maintenance should be part of the process as early as possible. This creates a smoother handover on completion of construction and encourages the continuous use of BIM Maturity Level 2 for the duration of the building's life cycle (The CAD Room, 2017).

Sharing Information

Sharing information is vital when practicing BIM Level 2, this includes making sure all shared documents are secure and fully understandable to the whole team. Revit and Revizto will be used throughout the project. Revit will sufficiently store information on a controlled and secure platform, allowing for individuals from the team to work with a live



document and to track and manage group activity. As mentioned, sharing data under BIM Level 2 is covered in the BS EN ISO 19650-5:2020, covering security considerations for the designers and client (UK BIM Framework, 2022). Revit has been chosen as it is well understood and used by all team members, enabling all the team to access and understand the project as efficiently as possible. Revizto works hand in hand with Revit, unifying BIM projects making them accessible to the team and it also provides data in both 2D and 3D (Revizto, 2022). Using Revizto will contribute to compliance with both BS EN ISO 19650-2 and BS EN ISO 19650-3:2020. Applying BIM Level 2 to a project also means the implementation of Construction Operations Building Information Exchange (COBie). COBie is a data format that improves connectivity between the building, the equipment and maintenance required (BIM+, 2017). Exporting important data for the designers, contractors, and any maintenance companies supports efficient working. COBie organises and calibrates information sufficiently and effortlessly assists with operations and asset management systems. Codes of practice for COBie are illustrated in BS 1192-4:2014 (BIM Wiki, 2021).

Coordination

When working at BIM Level 2 we must utilise the process of common data environment (CDE). CDE is used with BIM to collect, manage, and collaborate project information. Updating information related to the project is vital when working to achieve BIM Level 2 maturity. CDE allows for this aspect of coordination between all parties involved, encouraging best practice and good collaboration (Carey, 2020). Coordination between all parties is important when considering clash avoidance. Making use of early engagement with BIM, CDE and open work-in-progress (OWIP) will enable a more efficient workforce. Training and experience with BIM will be essential from all involved parties (Akponeware & Adamu, 2017). Due to the caliber of work required for the project, the continuous use of a sharing network better assists the design team and yourselves, the client, understand stage by stage from modelling, construction, and end use maintenance.

Management

Having a data rich model, by use of BIM, CDE and OWIP requires a strong management system. Using these processes and software following their international standards will only work as well as the appointed team. Without the appropriate management the benefits of working at BIM Level 2 are not fully realised. Productive management results in efficient risk management, quality assurance, increase in productivity and reduced cost but overall improve safety of the completed project (Symetri, 2022). All team members will be capable of the required skills. Additionally, we will look to obtain accreditations for all parties as an Informed Professional or Certificated Practitioner by compliance with BIM ISO 19650-2:2018 (Graitec, 2022). A BIM Execution Plan (BEP) has been proposed and attached as confirmation of our commitment to achieving BIM Maturity Level 2.

Sincerely,

Morgan Lewis (2005946)

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Project BIM Execution Plan (BEP)

Project Number: 5010

Project Name: Ysgol Bae Abertawe

Project Client: Swansea City Council

Consultancy: QuantSwansea Ltd

Lead Consultant: Morgan Lewis

BIM Execution Plan Overview

The intent of this BEP is to provide a framework that will allow all participating parties to deploy building information modelling (BIM) technology and best practices on this project. This plan allocates the roles and responsibilities of each party, the detail and scope of information to be shared, relevant business processes and supporting software (UC San Diego, 2022). Using BEP throughout the project advocates to International Standards for BIM Maturity Level 2. The plan will need to be updated and assessed as a live document for the duration of the project.

This BEP is in accordance BS EN ISO 19560.

Information required by EIR

In accordance with ISO 19650 this project will comply with information required by the Exchange Information requirements (EIR). The EIR is detailed information that will be delivered and exchanged between various teams during a project. Appointed by the leading parties, EIR allows the design team to interact efficiently over project information from the design concept to handover. This BEP will cover the requirements of EIR by discussing plan of works, clash detection the collaboration process between parties.

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Section 1: Project Information

1.1 Project Details

Client Name	Swansea City Council
Project Title	5010
Project Number	Ysgol Bae Abertawe
Project Description (EIR)	1 form entry infant school for 99 pupils, with provisions for 48 PT Nursery
Project Design Start	March 2022
Project Start Date	September 2022
Project Estimated End Date	September 2023
Site Location	Appendix 1.
Survey Points	192364.7N, 265976.9E

1.2 Employer's Details

Consultants	
Employer's Name	QuantSwansea Ltd
Employer's Address	17 Swansea Street, Swansea, SA1 1UD
Lead Consultant	Morgan Lewis
Employer's Contract Type / Procurement Route	Design and Build
Contractors	
Lead Contractor	J Mill Construction
Contractors Address	Unit B, Church Street, Llansamlet SA6 7HB
Project Manager	Joseph Mill
Date Appointed	1.12.2021

Section 2: Management

2.1 Roles and Responsibilities

Responsibility	Name	Company	Contact
Design Team			
Design Architect	Sarah Lowe	BuildingOne	Sarahlowe@buildingone.co.uk
Structural Engineer	Mike Phillips	BuildingOne	mikephillips@buildingone.co.uk
Quantity Surveyor	Morgan Lewis	QuantSwansea Ltd	morgan@qswansealtd.com
BIM Manager	Helen Davies	QuantSwansea Ltd	helen@qswansealtd.com
Contractor	Joseph Mill	J Mill Construction	jmill@jmillconstruction.co.uk
Construction & End Use			
Plumbing	Sam Rees	Plumb&Co	Samr@plumbandco.co.uk
Electrical	Ifan Pugh	All Things Electrical	Ifan.pugh@ate.co.uk
Facilities Manager	Rachel Magee	SW Facilities Management	r.magee@swfm.co.uk

2.2 BIM Use Worksheet

BIM Use	Value to Project (H/M/L)	Responsible Party	Capability (H/M/L)	Proceed with use (Y/N)
Pre-Planning	M	Design Team	H	Y
Modelling	H	Design Team	H	Y
Costing	H	Design Team	H	Y
End Visualisation	M	Design Team & Client	M	Y

2.3 Project Milestones

The project will aim to sufficiently provide BIM and CDE updates to all parties at milestone points. More detail on each individual milestones is to be agreed upon by stakeholders and to be sufficiently reported on using BIM, CDE and COBie.



2.4 Project Processing

Company	Solution	Network	Database	File	Comments
BuildingOne	Revit		Model	RVT	
QuantSwansea Ltd	Revit		Model	RVT	
QuantSwansea Ltd	Excel		Costing	Exl	
J Mill Construction	RVT		Model	RVT	
Design Team	Revizto				At handover

2.5 Clash Detection/Avoidance

As a requirement of BS EN ISO 19650-Part 2.

Clash Rendition Viewer	Version
Solibri	V9.5

2.6 Matrix of responsibilities

			Plan of work			
Model Authoring	Format	Exchange Format	1 Preparation & Brief	2 Concept Design	3 Developed Design	4 Technical Design
Space Planning	RVT	RVT / IFC / NWC	TBC			
Site, Urban Design Context	RVT/ DWG					
Architectural Model	RVT/ DWG	RVT / IFC / NWC				
Structural Model	RVT	RVT / IFC / NWC				
HVAC Design Model	RVT	RVT / IFC / NWC				
Building Services	RVT	RVT / IFC / NWC				
Lighting Model	RVT	RVT / IFC / NWC				
Electrical Model	RVT	RVT / IFC / NWC				
Hydraulics Model	RVT	RVT / IFC / NWC				

Interior Layouts	RVT	RVT / IFC / NWC	
Fabrication Model	RVT	RVT / IFC / NWC	
Structural Steel Model	RVT	RVT / IFC / NWC	

This project is currently at Concept stage and the matrix of responsibility is to be updated per ISO 19650-1 clause 5.4 and ISO 19650-2 clause 5.1.2. (PIR).

2.7 CDE

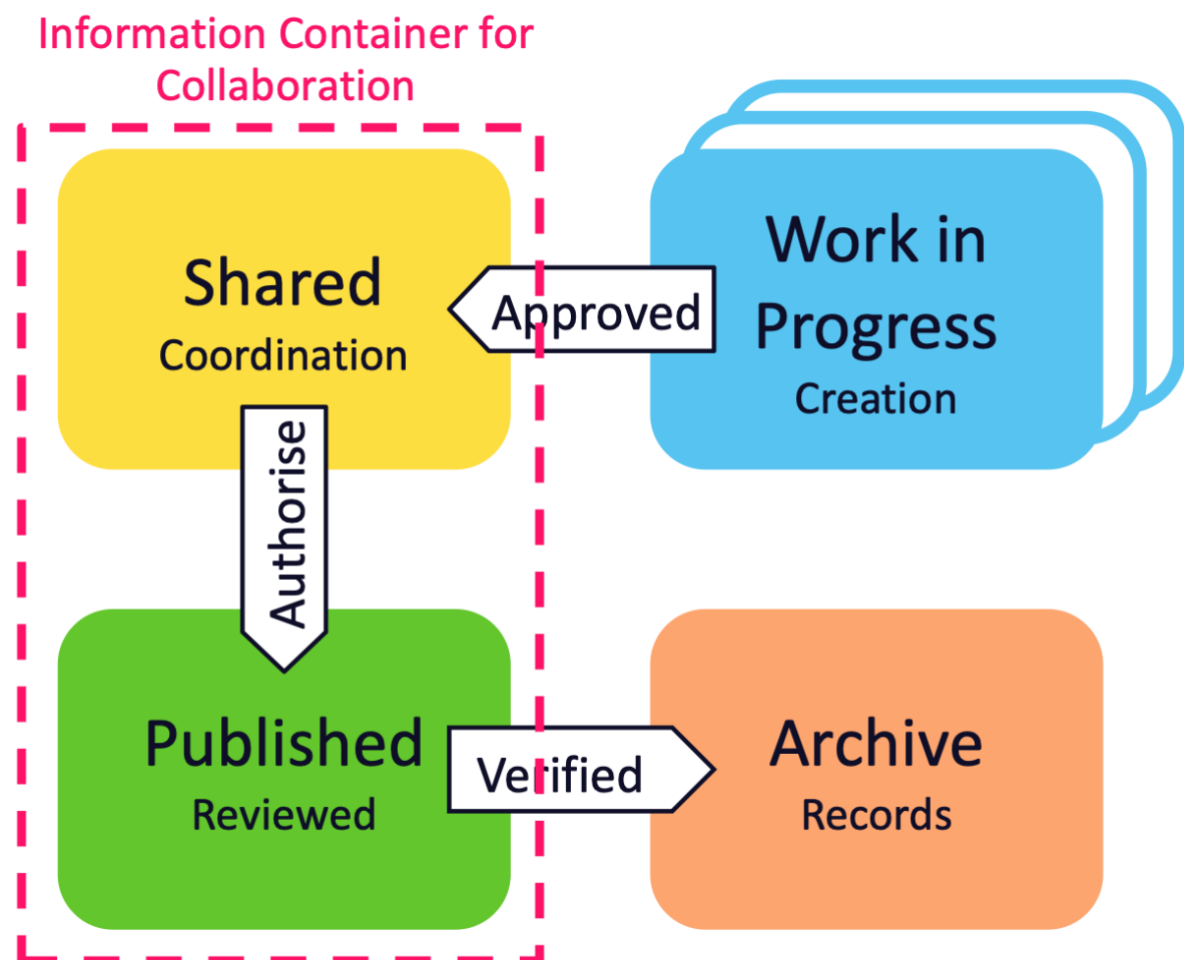


Figure 1: CDE Diagram (HDB et al., 20211)

Work in Progress (WIP)

At WIP work is stored as unapproved information. This work is to be processed through a check, review and approval stage prior to any works being shared.

Shared

Once approved, the information can be shared with other organisations for further development. Following any changes or modifications, the completed design requires authorisation by the client prior to any publishing stages.

Published

This documentation has been fully approved and confirmed by the design team and client. This section holds other information on the project such as production information or tendering documentations.

Archive

Archive is the final stage of the CDE, where documentation is finally stored. This includes the full project history, transactions, and change orders.

(SFT, 2022)

Section 3: Objectives, Planning, and Documentation

Key delivery documentation includes Project Implementation Plan, and Task Information Delivery Plan, Master Information Plans.

3.1 Objectives

The objective of the implementation of BIM Level 2 into this project are to:

- * Implement an efficient and productive workforce
- * Having a working minimum standard for all parties
- * Increase the knowledge and understanding of BIM and CDE
- * Meet the full expectations of the client
- * Create a continuously collaborative team
- * Create safety during construction by introducing clash-detection and early risk management
- * To reduce, or not exceed the projects timeframe
- * Improve overall control over the projects budget and quality
- * Effectively produce more accurate design documentation

3.2 Goals

The main goals set to achieve on this project are:

- * To complete the project working at BIM Maturity Level 2
- * Stay within the allocated timeframe for the clients
- * Not exceed to project budget
- * Work collaboratively

Section 4: Standards, Methods, and Procedures

4.1 Volume Strategy

Section 4.2 and 4.3 cover all required standards, annexes, and conventions for this project. These cover the volume strategy that will be used on this project.

4.2 BIM Standards

The project will follow all the below International Standards and Local Annexes.

Information Management

- ISO 19650 Series
- Collaborative production of architectural, engineering and construction information. Organization and digitization of information about buildings and civil engineering works, including building information modeling (BIM).

National Annex

- ISO 19650 Series
- UK AnnexMethod of assignment for level of information needed

Document Management

- ISO 7200
- All exchanged information containers shall comply with ISO 7200 by including, as a minimum, all of the specified mandatory data fields in title blocks and document headers

Naming Conventions

- ISO 19650 Part 1
- The agreed convention for the naming of information container identification

Management of Assets

- ISO 55000 Series
- Guidance on the factors to be considered by an organization when managing its assets

Facilities Maintenance

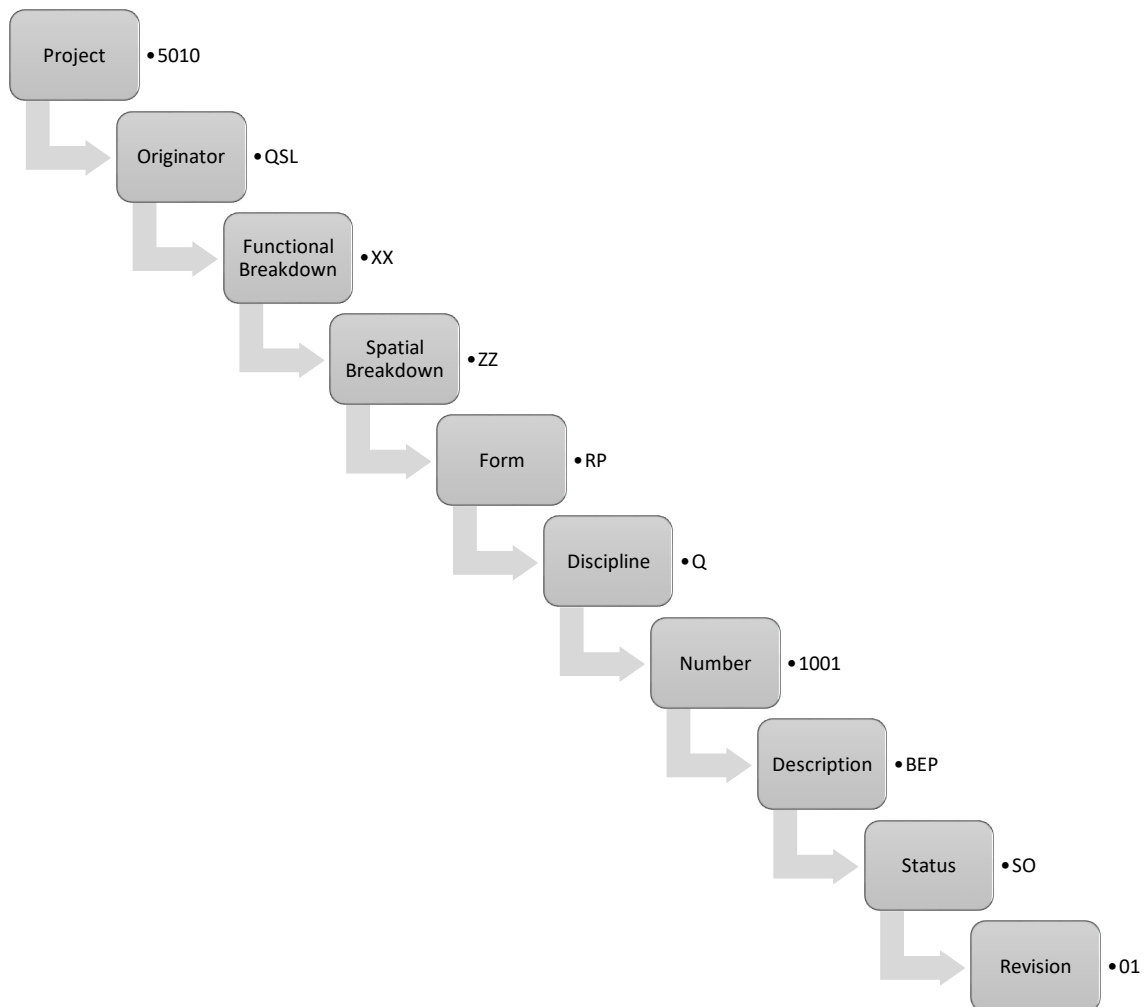
- BS 8210
- Detailed guidance on facilities maintenance management and code of practice

Briefing for design and construction

- BS 8536
- Recommendations for the briefing for design and construction to ensure that the design takes account of the expected performance of the asset/facility in use over its planned operational life.

4.3 Naming Conventions

ISO 19650 specifies naming conventions to be used when sharing and exchanging information. The structure is as follows.



The naming convention for this project in full format:

5010-QSL-XX-ZZ-RP-Q-1001-BEP-SO-01.file format

4.3.1 Project

A single common project identifier that is distinct from any organisation or job role number. Usually supplied by either the client or appointed team leader.

4.3.1 Originator

The company or organisation producing the data. Between 3-6 characters should be agreed upon by all participating parties prior to project commencement.

4.3.3 Functional Breakdown

Zones are only required on certain aspects of individual projects. Ensure this convention is required at the appropriate point prior to use. Zones can be dedicated to roles and are used as volume systems.

4.3.4 Spatial Breakdown / Level

Two characters referring to the level which the data is referring to. Suggested conventions are:

- ZZ – Multi Level
- XX – No Level
- GF – Ground Floor
- 01 – First Floor
- 02 – Second Floor
- Etc.

Below ground floor levels prefix 'B'.

4.3.5 Form

The form of data being shared.

Files	AF	Animation File
	CM	Combined Model
	DR	2D drawing
	M2	2D Model
	M3	3D Model
	MR	Model Rendering
	VS	Visualisation
Documentation	BQ	Bill of Quantities
	CA	Calculations
	CO	Correspondence
	CP	Cost Plan
	DB	Database
	FN	File Note
	HS	Health & Safety
	IE	Information Exchange
	MI	Minutes/Action Notes
	MS	Method Statement
	PP	Presentation
	PR	Programme
	RD	Room Data Sheet
	RI	Request for Information
	RP	Report
	SA	Schedule of Accommodation
	SP	Specification
	SH	Schedule
	BEP	BIM Execution Plan

4.3.6 Discipline

One character reference to the job role.

Role	A	Architect
	B	Building Surveyor
	C	Civil Engineer
	D	Drainage Engineer
	E	Electrical Engineer
	F	Facilities Manager
	G	Geographical Surveyor
	H	Heating & Ventilation Designer
	I	Interior Designer
	K	Client
	L	Landscape Architect
	M	Mechanical Engineer
	P	Public Health Engineer
	Q	Quantity Surveyor
	S	Structural Engineer
	T	Planner
	W	Contractor
	X	Subcontractor
	Y	Specialist Designer
	X	General

4.3.7 Number

A 4-digit code including 1 digit Drawing Code and 3 latter digits.

Drawing Codes:

- 0 General
- 1 Substructure
- 2 Superstructure
- 3 Openings
- 4 Finished
- 5 Piped & Ducted services
- 6 Electrical
- 7 Fixtures & Fittings
- 8 Loose Furniture
- 9 External Works

4.3.8 Description

An agreed description from 6 to 8 characters for the document. Avoid long, unwieldy descriptions.

4.3.9 Status

A code defining the current state of the document.

Status	Description	Graphical	Non – Graphical	Document
Work in Progress (WIP)				
SO	Initial Status of WIP	Y	Y	Y
Shared				
S01	Suitable for co-ordination	Y	Y	Y
S02	Suitable for information	Y	Y	Y
S03	Suitable for review	N	Y	
S04	Suitable for approval	N	Y	
Published				
A01, A02, A03	Approved	Y	Y	N
B01, B02, B03	Partial sign off	Y	Y	N

4.3.10 Revision

Numeric code to denote the version of the document. Using a numeric code allows for all version to supersede any files instead of allocated dates.

Numeric 01, 02, 03, 04 etc.

Section 5: IT Solutions

This section will deter the IT solutions to comply with BS EN ISO 19650:2-2018.

5.1 Software Version

This project will consist of agree software and their version to achieve BIM Maturity Level 2. The agreed software and versions will need to be agreed upon by all parties before the start of the project. Versions of the chosen software must be available to all parties.

Company	Data	Software	Version	Format
BuildingOne	Model	Revit	2021	RVT
BuildingOne	Model	Solibri	V9.5	IFC
QuantSwansea Ltd	Model	Revit	2021	RVT
QuantSwansea Ltd	Model	Excel	2021	Exl
Plumb&Co	Model	Revit	2021	RVT
All Things Electrical	Model	AutoCAD	2020	DWG
SW Facilities Management	Model	Revit	2021	RVT
SW Facilities Management	Model	AutoCAD	2020	DWG

5.2 Exchange formats

To sufficiently exchange files and documents the below formats are agreed as below.

	RVT	NWC	IFC	PDF	DWG	Excel
Modelling	Y		Y			
Drawings	Y		Y	Y	Y	
Final Drawings				Y	Y	
Schedules				Y		
Spreadsheets				Y		Y

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Appendices

Appendix 1.

