

APPENDIX GA36b

LEVEL 5 ASSESSMENT SPECIFICATION

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Submission method:	All written assessments, where practical and possible, must be submitted via Turnitin unless otherwise instructed by the Lecturer. (Please DO NOT put this assessment specification into Turnitin or it will match many similarities with other students' submissions.) Alternative submission method (if applicable): Late submission of the assessment will result in a late penalty mark. Penalties for late submission: Up to one week late, maximum mark of 40%. Over one week late, 0%. Only the Extenuating Circumstances Panel may approve a change to submission dates.		
Academic honesty / referencing:	Academic honesty is required. In the main body of your submission you must give credit to authors on whose research and ideas your work is based. Append to your submission a reference list that indicates the books, articles, etc. that you have used, cited or quoted in order to complete this assessment.		

BIM Execution Plan (BEP)

N7177 – Swansea Waterfront Innovation Quarter phase 1

BIMXtra

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1 Introduction

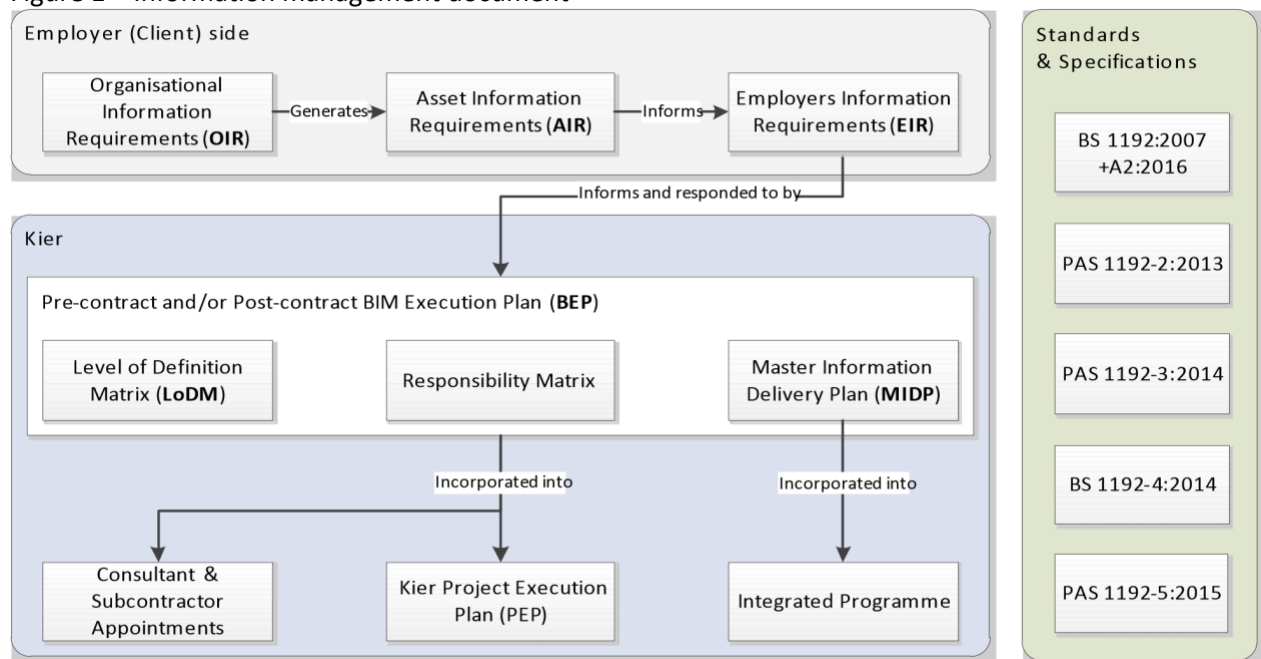
Building information modelling (BIM) is a process for creating and managing information on a construction project across the project lifecycle. BIM will enable clients to have better tools for asset management & enables complete and accurate design information for an effective construction process.

The BIM Execution plan (BEP) covers BIM processes for all plan of work stages during the contracted phases of the project and responds to the following:

- Employers' information requirements (EIR)
- All relevant specifications from pre-contract. BEP if one is in circulation
- The underlying principles of 1192 series of standards and specification

The relationship between the project documents relevant to the BIM process is illustrated in Figure 1.

Figure 1 – Information management document



- All project BIM Models shall comply with this document and associated appendances
- It is assumed that the reader has a good understanding of all technical terminology used in this document
- This is an evolving document and has to be kept updated with changes during the duration of the project
- Amendments shall be agreed by the project team, authorised by the project information manager and summarised on page 2 'Amendment record' (Class Notes 2021)

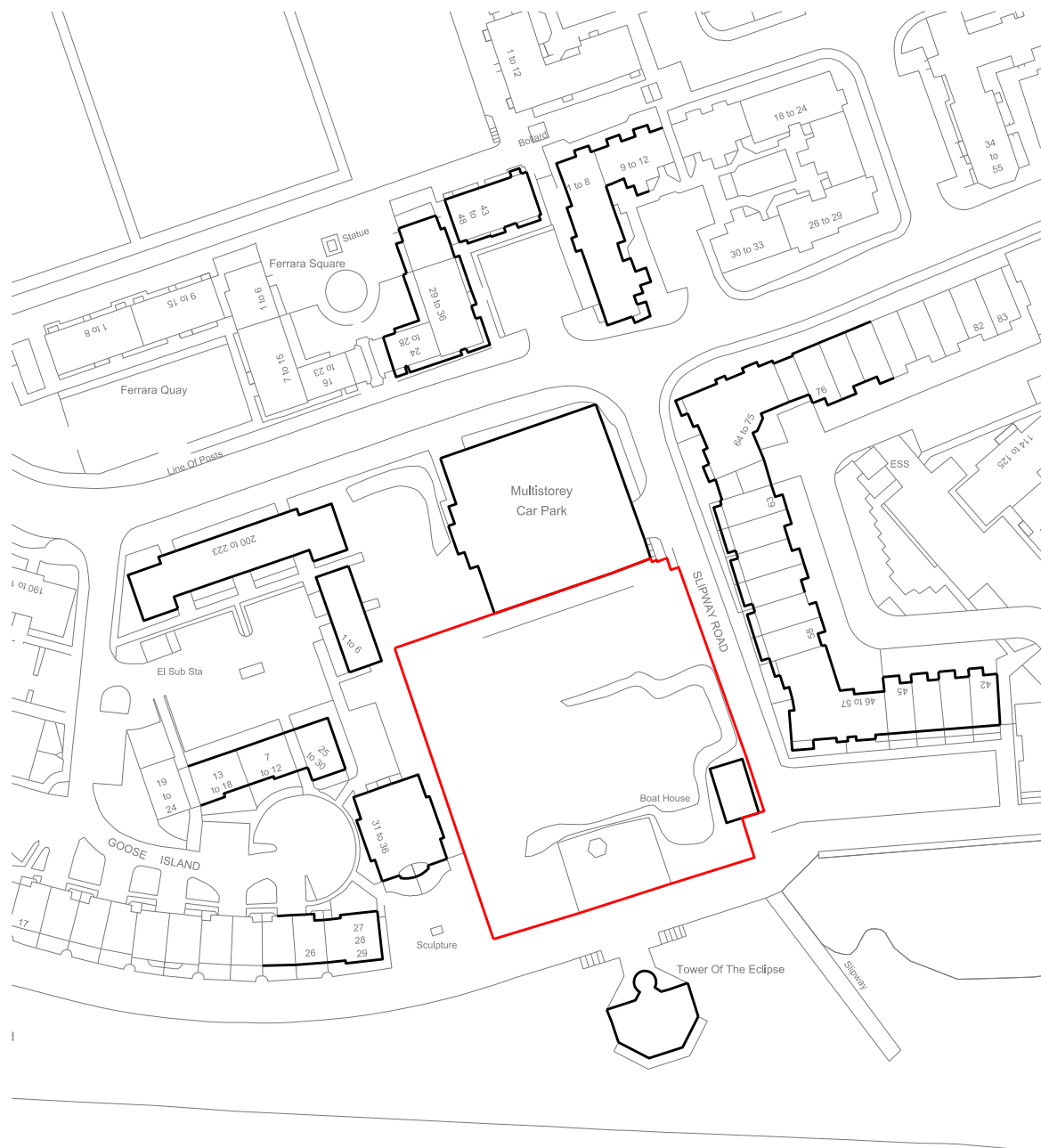
BIM makes it possible for anyone to access information for any purpose by bringing together all the information about every component of a building and making it accessible in one place. By using BIM, the risk of mistake or discrepancies is reduced, and abortive costs minimized.

1.1Project Information

Table 1 – Project Information

Project	
Project Number	5010
Project Name	Ysgol Bae Abertawe
Project Client	Swansea Council
Project Description	1 form entry infant school for 90 pupils
Site Location	Plans Attached

Figure 2 – Site Location



2 Management

Each collaborating Stakeholder performing their roles correctly as outlined in this section is key to the success of BIM.

2.1 Client

Employers Information Requirements (EIR) should be advised at the outset. The client should support the project team in achieving the BIM objectives and be kept informed of the BIM process.

2.2 Client Representative

Authorising information at the identified stage is down to the clients representative. This information stage is known as the client decision point.

2.3 Facilities (Asset) Manager

If required, the client shall appoint a facilities asset manager to provide clarity and feedback where an AIM deliverable is identified as a requirement. If a facilities manager is not available, they may nominate someone in a similar capacity.

2.4 Main Contractor

The roles of Project information manager and project delivery manager shall be carried out by the main contractor (AWL Construction)

2.5 Consultant Task Teams

Individual consultants design responsibility does not reduce or are replaced by BIM processes. They will adhere to the specifications in this document and shall discharge their duties as per the AWL Construction appointment document. They are collectively responsible for the PIM during their contracted phase.

2.6 Subcontractor and Specialist Designer and Task Team

The roles and responsibilities for subcontractors and specialist designers are the same as that of consultants.

2.7 Other Stakeholders

Requirements for software/database for handover will be investigated by AWL Construction whilst liaising with AWL FM and QFM.

2.8 Roles, Responsibilities and Authorities

There is an explicit project management team structure consisting of defined and agreed roles and responsibilities for the people involved in the project and a means for effective communication between them. All projects have primary stakeholders:

- Business – sponsors who endorse the objectives and ensures that the business investment provides value for money
- Users – who after the project is completed, will use the products to enable the organization to gain the expected benefits
- Suppliers – who provide the resources and expertise required by the project.

All three stakeholders interest need to be represented effectively in the project management team. The defined project management team structure unites the various parties in the common aims of the project for all those involved. A defined project management team structure provides direction on roles and responsibilities. Typical responsibilities and authorities for information management roles should be reviewed and familiarised by the entire project team.

Project Information Manager and Project Delivery Manager

AWL Construction leads BIM implementation and information management upon contractor involvement to the project. AWL Construction team individuals are assigned to fulfil these roles. AWL Construction will administer the Common Data Environment (CDE), ensure stakeholder compliance of Standard Method and Procedure (SMP) and manage Information Exchange deliverables.

Task Team Managers, Task Information Managers, Interface Managers and Information Authors

Task Teams (Consultants, Subcontractors and Specialist Designers) identified as stakeholders in the BIM process shall assign individuals to fulfil the Task Team roles for their contracted phase of the project. (Class Notes)

3.0 Planning & Documentation

3.1 Planning of Work

The Planning of work shall follow the stages as defined within the Royal Institute of British Architects (RIBA) Plan of Work 2013.

The model shall consist of multiple linked Building Information Models.

The following strategies shall be considered to manage the models effectively:

- • Each model shall contain no more than one building
- • Each model shall contain information solely produced by the originating design consultant and/or discipline
- • If required models shall be segregated to reduce file size, agreed maximum 150MB

Models shall be managed in accordance with BS 1192:2007+A2:2016 and PAS 1192-2:2013.

Project information shall be shared, managed and published within a CDE, refer to Section 2.5. For a security minded approach the CDE shall be organised to ensure managed access to content in accordance with PAS 1192-5:2015.

The design and construction of the school will be inspiring to create a vibrant facility for the pupils. The schedule of accommodation shall be in accordance with BB99.

3.2 Supply Chain Capability

Project stakeholder's management includes the processes required to identify the people, groups or organizations that could impact or be impacted by the project, to analyse stakeholders' expectations and their impact on the project, and to develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution. (PMBOK 503) An assessment for competency and capability is required to be carried out by all identified stakeholders, prior to starting their work in this contracted phase of the project.

- Subcontractors, consultants & specialist designers shall be sent a BIM capability assessment to complete and return.
- If any of the subcontractors, consultants & specialist designers do not pass the BIM capability assessment, a replacement may be contacted to replace them.
- All results will be saved and kept on record.

3.3 Levels of Definition

The level of definition refers to the combined accuracy of level of detail and level of information. It applies to the production of all design/construction information generally.

Table 2 - LoDM

UK LOD	US LOD	DESCRIPTION	CONTENT
1		Brief	A model communicating the performance requirements and site constraints. Building models would be block models only
2	LOD 100	Concept	Conceptual or massing model including basic areas and volumes, orientation and cost. In the RIBA Plan of Work, this is equivalent to stage 2
3	LOD 200	Developed design	A design development model, "generalized systems with approximate quantities, size, shape, location and orientation." Equivalent to RIBA stage 3
4	LOD 300	Production	Equivalent to RIBA stage 4. Production, or pre-construction, "design intent" model representing the end of the design stages. Modelled elements are accurate and coordinated, suitable for cost estimation and regulatory compliance checks.
5	LOD 400	Installation	Model suitable for fabrication and assembly, with accurate model of the construction requirements and specific components, including specialist sub-contract geometry and data.
6	LOD 500	As Built	An "as built" model showing the project as it has been constructed. The model and associated data is suitable for maintenance and operations of the facility.
7		In Use	Asset Information Model used for ongoing operations, maintenance and performance monitoring

3.4 Task Information Delivery Plan (TIDP)

Task team managers are responsible for compiling their own TIDP, which will assist in the compiling and development of the MIDP. Taking into consideration any sequencing requirements for the production information, each task shall have a corresponding milestone that aligns to the overall design and construction of the programme. Each Task shall also detail the responsibility of each supplier's information and show how responsibility for the preparation of project documents transfer from one team to another. (SFT)

3.5 Master Information Delivery Plan (MIDP)

The MIDP will be developed by AWL Construction project delivery manager, whilst collaborating with task team managers. The Project delivery manager will use the MIDP to assist him in the delivery of project information during the project.

The MIDP is a collation of Individual Task Information Delivery Plans (TIDP), prepared by other team members, and includes details of when project information is to be prepared, who is responsible for producing the information as what protocols and procedures for each stage shall be followed. PAS1192-2 advises that following contract award an induction meeting should be set up to develop the MIDP with reference to the team member's TIDPs. The completed MIDP will form part of the post contract-award BIM Execution plan. (SFT)

4.0 Standards, Methods & Procedures

4.1 Units & Measures

All Drawings must be appropriately scaled at A1 size. All measurements will be in MM and clearly visible on drawings. Area and volume shall be described in M2 & M3. Any angles will be displayed in degree format.

4.2 File Naming Convention

File naming conventions will be done by following protocol for naming files that are shared or published in the common data environment as per BS1192:2007+A2:2016 of practice. Each Filed name should be clear to both authors and recipients so there is a need to separate each field.

Figure 3 – Naming Convention

name :	
project	originator volume level type role number
ABCDE - BBA - 00 - XX - DR - A - 0000	
status :	suitability description :
S2	SUITABLE FOR INFORMATION
revision :	revision description :
P01	PRELIMINARY

The naming convention for files is broken down into the following fields:

Table 3: Summary of Naming Convention

Field	Obligation	Description
Project	Required	Code for project
Originator	Required	Code for organisation creating information.
Volume or system	Required	Code for system reference.
Levels and location	Required	Code to locate info (Floor 1 etc)
Type	Required	Code for type of file Cost Plan, method statement etc)
Role	Required	Code for role of organisation (A - Architect etc)
Classification	Optional	Code to reference asset (Uniclass or equivalent)
Number	Required	Sequential file number
Suitability	Meta-data	Code for status of data (WIP, Shared, published etc)
Revision	Meta- data	Code for revision of data.

Table 4: Summary of Levels & Locations

<u>Levels & Locations</u>	
ZZ	Multiple Levels
XX	No Level Applicable
GF	Ground Floor
00	Base Level of Building or linear Asset
<u>Floor Levels</u>	
01	Floor 1
02	Floor 2, etc

<u>Mezzanine Levels</u>	
M1	Mezzanine above Level 1
M2	Mezzanine above Level 2
<u>Below Ground Floors</u>	
B1	Floor -1
B2	Floor -2

Table 5: Summary codes for document types

<u>Codes for Drawings & Models</u>	
AF	Animation File
CM	Combined Model
CR	Specific for the clash process
DR	2d Drawing
M2	2D Model file
M3	3D Model file
MR	Model rendition file for other renditions (thermal analysis)
VS	Visualisation
<u>Codes for Documents</u>	
BQ	Bills 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 Statements
PP	Presentation
RD	Programme
RI	Request for information
RP	Report
SA	Schedule of accomodation
SH	Schedule
SN	Snagging List
SP	Specification
SU	Survey

Table 6: Codes for Roles & Discipline

<u>Codes for disciplines & roles</u>	
A	Architect
B	Building Surveyor
C	Civil Engineer
D	Drainage, Highways Engineer
E	Electrical Engineer
F	Facilities Manager
G	Geographical and Land Surveyor
H	Heating & Ventilation Designer
I	Interior Designer
K	Client
L	Landscape Architect
M	Mechancial Engineer
P	Public Health Engineer
Q	Quantity Surveyor
S	Structural Engineer

T	Town and County Planner
W	Contractor
X	Sub-Contractor
Y	Specialist Designer
Z	General

Table 7: Summary of codes for suitability

Status	Description	Graphical	Non- Graphical	Document
<u>Work in Progress</u>				
SO	Initial Status of WIP	Yes	Yes	Yes
<u>Shared (Non-Contractual)</u>				
S1	Suitable for co-ordination	Yes	Yes	Yes
S2	Suitable for Information	Yes	Yes	Yes
S3	Suitable for review	No	Yes	Yes
S4	Suitable for approval	No	Yes	Yes
<u>WIP to Publish</u>				
D1	Suitable for costing	Yes	Yes	Yes
D2	Suitable for tender	Yes	Yes	Yes
D3	Suitable for design	Yes	Yes	Yes
D4	Suitable for manufacture	Yes	Yes	Yes
<u>Published Docs</u>				
A1,A2,A3	Approved/Accepted	Yes	Yes	No

B1,B2,B3	Partial sign off	Yes	Yes	No
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All project documentation should follow naming protocols as per BS 1192:2007+A2:2016 to comply with Level 1 BIM maturity, which is a fundamental requirement to achieve Level 2 BIM maturity.

4.3 Component Naming Specific Requirements

Any specific requirements for the structure of component names are to be detailed here (BS 8541, Uniclass 2015,

4.4 Room Numbering & Naming

All Drawings should be completed with Room names, area, measurements. A logical naming and numbering system must be used in lieu with information provided by the client. There will also be legends, tags and annotations on drawings.

4.3 Drawing Sheets

Drawing sheets will be distributed throughout to the relevant recipients in PDF format. Drawings produced from Autodesk Revit software can be uploaded to BIMXtra either in .dwfx format as WIP prints (via batch export by using the BIMXtra add-in to Revit) or uploaded individually upon formal revision issue. Drawing sheets will be in DPF and in A1 size for printing. They will be able to be printed on A3 or A4 but must not be worked off for scale

5.0 IT Solutions

5.1 Software

Vectorworks, & Revit will be used for compiling and sharing documents. Microsoft projects will be used to programme works.

5.2 Revit

The following documents will be carried out on Revit:

Architectural Model with Architectural drawings:

- Site location plan
- Existing site plan and demolition
- Works plan
- Proposed General arrangement floor plan.
- Proposed Principal elevations
- Proposed Long and Short Section
- Proposed Materials Take off schedule
- Proposed Visualisations

Structural Model with Structural Drawings:

- Foundations Plan
- Primary Structure Plan
- Structural Visualisation

5.3 Vectorworks

Vectorworks will be used if different floor levels are being carried out by different people in different offices. A floor level will be given out with a datum point to work from. This will all be used to compile a finished building from remote locations.

5.4 Microsoft Projects

Microsoft projects will be used to programme works and track progress throughout the project.

Bibliography

A guide to the project management body of knowledge - 2017 - PMBOK Guide - Sixth edition - Page 503

Class Notes

Managing successful projects with Prince 2

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Scottish future trust - 2021 - <https://bimportal.scottishfuturestrust.org.uk/level2/stage/4/task/38/master-information-delivery-plan>

Scottish Future Trust - 2021 - <https://bimportal.scottishfuturestrust.org.uk/level1/stage/8/task/47>

The CAD Room - 2021 - <https://www.thecadroom.com/bim-compliance-ready-bim-level-2/>

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Thank you, for giving us the opportunity to work with yourselves on the construction of the new state of the art infant school in Swansea.

We will be using BIM to control and manage this project. BIM level 2 is compulsory for this project. To do this we will be responding to the clients Employers Information requirements (EIR) by producing BIM Execution Plan (BEP), a Master Information Delivery Plan (MIPD) and a Task Information Delivery Plan (TIDP). These plans will provide a scheme for project deliverables, the schedule of works and roles and responsibilities for every stage of the project.

Common Data Environment (CDE) is a shared workspace where everyone involved in the project can store and manage all of the data relating to the project. This single storage point will be used to help you manage the whole project development process and so will also include a structured approval process. BIM Level 2 also includes a standard called BS 1192-4 which covers all of the security considerations for safely sharing project data which relates to the project and the client. There will be controls in place to ensure information is being shared in a secure way. There will be controlled access to information stored in the Common Data Environment and it will track and manage activity.

The following standards will be followed for the management, coordination and sharing of information throughout the lifecycle of the project.

- PAS 1192-2:2013 - Specification for information management for the capital/delivery phase of construction projects using building information modelling
- PAS 1192-3:2014 - Specification for information management for the operational phase of assets using building information modelling
- BS 1192-4:2014 - Collaborative production of information. Fulfilling employer's information exchange requirements using COBie-Code of practice
- CDM 2015 - The Construction (Design and Management) Regulations 2015
- CIC/BIM Pro:2013 - Building Information Model (BIM) Protocol, 1st Edition 2013
- CIC/INF/MAN/S:2013 - Outline Scope of Services for the role of Information
- BS ISO 12006-2:2015 - Building construction – Organisation of information about construction works - Part 2 Framework for classification
- BS ISO 12006-3:2007 - Building construction – organisation of information about construction works - Part 3 Framework for object-oriented information
- BS ISO 55000:2014 - Asset management – Overview, principles and terminology
- BS 8536-1:2015 - Briefing for design and construction. Code of practice for facilities management (Buildings infrastructure)

Looking forward to working with you.

Regards

AWLloyd

Anthony Williams-Lloyd

Director