



**Education for zero
energy Buildings using
Building Information
Modelling**

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Learning Unit 6



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BIM MODEL USES DURING CONSTRUCTION

EQF	6	Target	Project manager Consultants Designers Site engineers Construction managers Site supervisors Specialists in green building Quantity surveyors
Description			

The following learning unit focuses on the uses that BIM models provide for optimization during construction and a digital twin design. In an innovative way, solutions for clashes between different disciplines and engineering calculations via a BIM model, will be explained. Likewise, special emphasis will be placed on an active work methodology aimed at anticipating and solving problems.

Objectives

- Implement and design a digital twin of the building.
- Optimize the BIM model and create models with zero clashes.
- Implement an active working methodology in the use of BIM for constructive design.
- Generate structure and systems calculations from the BIM model.
- Audit the BIM model project provided by the client (Clash detection, technical issues, LOD)

Generic competence

- Spatial vision skills and knowledge of graphic representation techniques through computer-aided design applications.
- Cognitive and practical skills to perform tasks related to the process of designing energy saving buildings.
- Proactive, anticipatory and change-oriented behaviour.
- Ability to apply construction procedures, methodology and planning techniques.
- Discipline following the project's workflow.
- Define the property of the models.



Specific competence

- Interpret and interrogate a design model for constructability purposes.
- Utilise the model and technologies to assist with value engineering testing and validation procedures.
- Utilise the design model to issue expected materials and construction methodologies for trade tendering / pricing.
- Map Design meetings that match the BIM and project deliverables and include live model review processes and mark-up procedures.
- Quality checking procedures for design standards and compliance within BIM.
- Compare 2D plans / drawings (contractual precedence) to BIM model through a diligence checking.
- Demonstrate the impact that a work breakdown structure has on the clash coordination and segregation checking for constructability.
- Design a federation map for model aggregation processes and techniques within the BIM Management Plan.
- Illustrate the use of information modelling in design teams and management of information modelling within the nZEB design.
- Define workflow of change orders and cycle of approvals.
- Define the LOI (Level of Information) that is to be achieved in construction phase (this link with EIR of the client).

Recommended learning methodology

Methodology

The recommended methodology for the course would be Design Thinking. A methodology that considers innovation as a holistic approach, where students through technology and their own interests or training needs converge through an action plan designed by themselves. It is based on finding the most original solution to a real problem given by the



teacher, and for which the students will have to analyse the situation, establish hypotheses, and foresee possible impacts of the action.

In addition, another recommended methodology would be Problem Based Learning, is based on group learning that uses real problems as a stimulus to develop skills in problem solving and acquire specific knowledge.

Method

The recommended teaching methods should be based on problem solving and collaborative work.

Recommended assessment methodology

The recommended assessment methodology would be the realization of a portfolio with the resolution of practical cases made in the course and individual reflective exercises.
