# BIM Project Execution Plan

Snowdon Towers (Educational Dataset)

January 26, 2026

## 1 Project Information

This BIM Execution Plan (BEP) describes the structured application of Building Information Modeling throughout the Snowdon Towers project, supporting all seven CME4121 Information Systems concepts. It outlines BIM uses, information exchanges, workflows, roles, responsibilities, quality control, and deliverables.

### 1.1 Project Details

| | |
|---|---|
| **Project Owner** | TU Delft (Educational Use) |
| **Project Name** | Snowdon Towers – BIM Educational Dataset |
| **Location** | Hamilton, Canada |
| **Delivery Method** | Design–Bid–Build |

### 1.2 Project Description

Snowdon Towers is a multi-unit residential project with separate Architectural, Structural, and MEP IFC models suitable for coordination, safety, sustainability, 4D phasing, and asset management workflows.

### 1.3 Unique BIM Characteristics

Snowdon Towers uses a federated model structure. The Architectural, Structural, and MEP models are kept separate. This makes it clear who is responsible for each part and improves coordination between disciplines (Borrmann et al., 2015). This separation allows for effective clash detection. Geometric conflicts between systems can be found automatically. It also supports 4D construction sequencing by linking the 3D model to the construction schedule. This makes dependencies between different systems easier to analyse (Sacks et al., 2025).

The dataset strongly focuses on OpenBIM interoperability. It uses IFC as a vendor-neutral standard instead of proprietary formats. This improves collaboration across different software platforms. It also supports semantic modelling and standardised information exchange (Ikerd & FORUM, 2020).

The model contains detailed geometry and embedded metadata. This makes it suitable for sustainability assessments, such as embodied carbon analysis. It can also be used for asset and facility management workflows. Spatial and equipment data can be reused for maintenance planning and visualised in operational dashboards (Sacks et al., 2025).

### 1.4 Project Phases

| Project Phase | Start | End |
|---|---|---|
| Team Formation & PoI Selection | Week 1 | Week 2 |
| BEP Development | Week 1 | Week 2 |
| Initial BIM Model Review | Week 2 | Week 4 |
| Clash Detection & 4D Simulation | Week 3 | Week 4 |
| Asset Info Management Integration | Week 4 | Week 5 |
| Sustainability Assessment | Week 5 | Week 6 |
| Safety Walkthrough | Week 6 | Week 7 |
| Final ODL Response | Week 10 | Week 10 |

Table 1: Project phases and timeline

## 2 Project Goals and BIM Uses

### 2.1 BIM Goals

| Goal | Priority | BIM Uses |
|---|---|---|
| Improve discipline coordination (A/S/MEP) | High | 3D Coordination, Clash Detection |
| Enable construction sequencing | High | 4D Modeling |
| Strengthen maintenance and asset workflows | Medium | Asset Information Management |
| Support sustainability analysis | Medium | Embodied Carbon / LCA |
| Enhance construction safety | Medium | Virtual Safety Walkthrough |
| Demonstrate IFC interoperability | High | Design Authoring / Model Exchanges |

Table 2: BIM goals, priorities, and related BIM uses.

## 3 BIM Uses

The Snowdon Towers project applies BIM Uses throughout the entire project lifecycle. These include the Planning, Design, Construction, and Operation stages. BIM acts as a shared digital information source that supports decision-making, coordination, and long-term asset performance (Sacks et al., 2025). During the planning and design stage, BIM is used as a digital prototype. The model helps to develop and test the building geometry and building systems (Sacks et al., 2025). This supports compliance with performance and regulatory requirements, such as fire safety and accessibility. Automated checks and spatial analysis are used to verify this(Borrmann et al., 2015). The project also focuses strongly on OpenBIM interoperability. Standardised formats such as IFC are used to exchange information between different disciplines. This helps maintain accuracy and consistency across teams(Sacks et al., 2025). In the construction stage, BIM is mainly used for 3D coordination and clash detection. Both hard and soft clashes between

building systems are detected automatically. This allows issues to be resolved before construction starts on site(Sacks et al., 2025).
BIM is also used for 4D construction sequencing. The 3D model is linked to the construction schedule. This improves site logistics and helps identify safety risks related to timing and space in advance(Sacks et al., 2025). In the operation stage, the model becomes an Asset Information Model. This model supports facility management activities.
Maintenance planning is based on structured data, including non-geometric information such as equipment serial numbers and warranties. This information is often exchanged using COBie(Borrmann et al., 2015; Sacks et al., 2025).
Overall, these BIM Uses ensure that Snowdon Towers is managed through a fully digital process. The digital workflow continues from early design through to operational use(Sacks et al., 2025).

### 3.1 BIM Uses by Stage

- **Plan / Design Stage:** Design Authoring; Design Review; Energy Analysis; Code Validation; Sustainability Preparation
- **Construction Stage:** 3D Coordination; Clash Detection; 4D Phase Planning; Constructability System Review
- **Operation Stage:** Asset Information Management; Maintenance Scheduling

## 4 Organisational Roles

Although all three team members will actively work with Revit, Navisworks, IFC tools, and the various platforms required across the seven CME4121 concepts, the roles below define the final accountability for each domain of the BIM workflow. This ensures clear ownership, smooth communication, and consistent quality control throughout the project.

### 4.1 Project Manager — Elke

**End responsibility:**

- Overall project coordination
- Planning and progress monitoring and alignment with deliverables
- Quality control of the BIM Execution Plan (BEP)
- Ensuring alignment between team goals and course requirements

Elke oversees the strategic planning of the BIM processes and ensures that all concept implementations (Digital Delivery, Interoperability, 4D, Asset Management, Sustainability, Safety, and Future Systems) follow a coherent workflow. While she also contributes within Revit, Navisworks, and other tools, her key responsibility lies in coordinating the work into a consistent final product.

### 4.2 BIM Manager — Hugo

**End responsibility:**

- Revit authoring and model integration

- IFC exports and OpenBIM workflows
- Model structure and Systems Breakdown Structure (SBS) creation
- Parameter enrichment and model consistency checks

Hugo ensures that the architectural, structural, and MEP components are modelled, reviewed, and exported according to the BEP. He works extensively in Revit and IFC viewers but also collaborates in Navisworks for coordination tasks. His end responsibility is the technical quality of the models and the integrity of all IFC-based information exchanges.

### 4.3 Coordination Lead — Yasin

**End responsibility:**

- Clash detection in Navisworks Manage
- 4D simulation setup and timeline setup
- Safety walkthrough model and analysis
- Issue tracking and coordination report

Yasin leads the coordination stage, conducting clash tests, producing sequence simulations, and managing safety-related model enhancements. Although he contributes to Revit model edits and IFC exports when needed, he holds final accountability for ensuring that the integrated models perform correctly during clash detection, 4D sequencing, and safety walkthroughs (Borrmann et al., 2015).

## 5 BIM Process Design

The BIM process design for Snowdon Towers serves as a formal framework to ensure that digital information is created, shared, and managed effectively throughout the project lifecycle. By defining the "how" of the project, this design optimizes multidisciplinary workflows and reduces the manual re-entering of information that often leads to errors.

**AI Disclaimer: The development and iterative refinement of the following workflows involved the use of artificial intelligence tools.*

**Identification of BIM Goals and Uses** The process design must begin by identifying specific BIM Uses that support the project's high-level objectives (Sacks et al., 2025). For Snowdon Towers, these include 3D coordination, clash detection, 4D construction phasing, and the development of an Asset Information Model (AIM) for facility management.

**BIM Process Mapping (Workflow Design)** This section defines the sequence of tasks, the actors involved, and the required software tools. Formal graphical notations are utilized to ensure the process is lean and transparent (Borrmann et al., 2015).

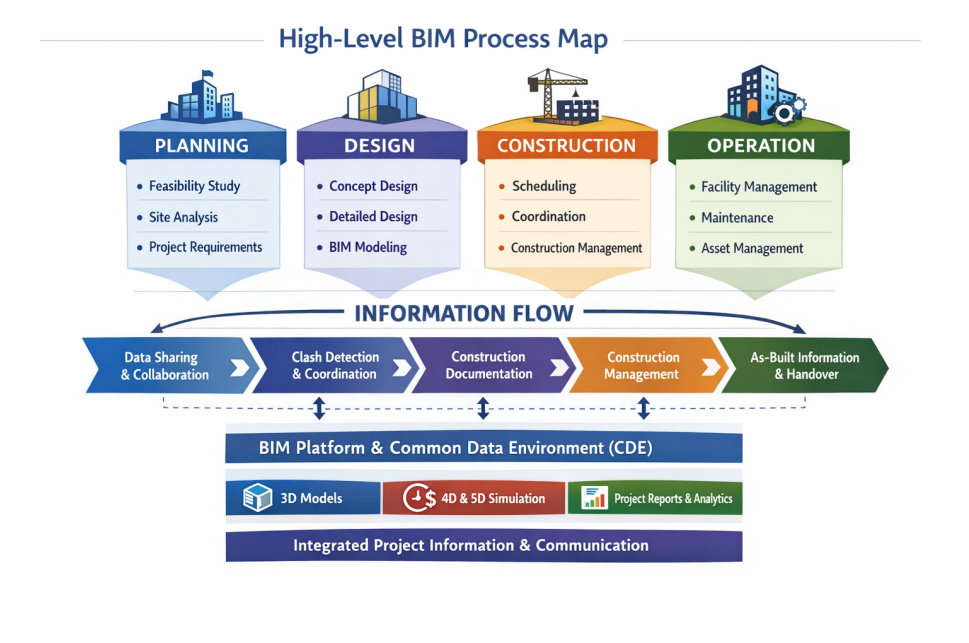


Figure 1: Process Map

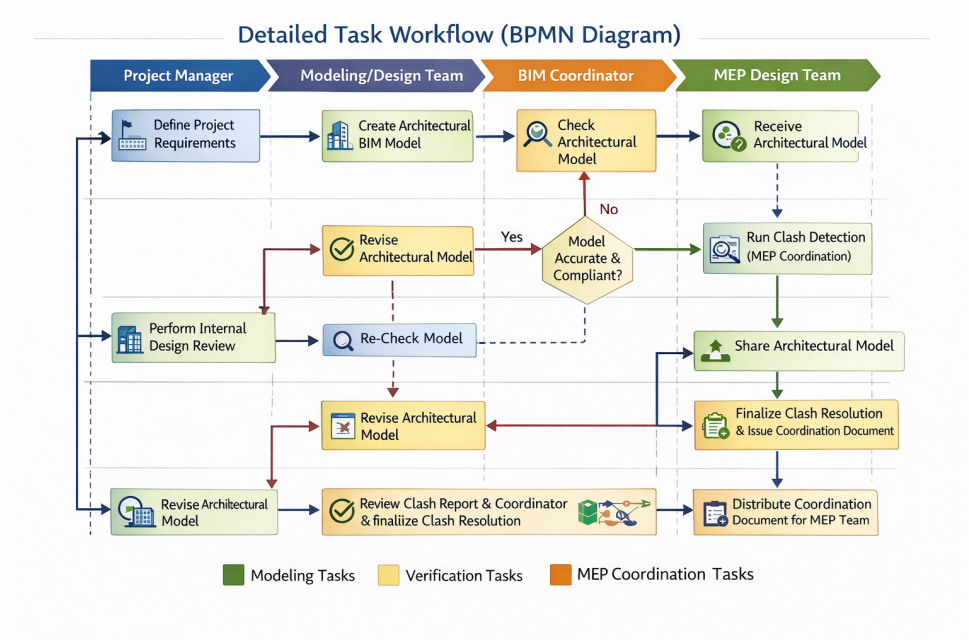


Figure 2: Task Workflow

**Information Exchange Requirements** The process must specify the technical details of information exchanges (data drops) between stakeholders. This includes defining the Level of Development (LOD) for geometry and the Level of Information (LoI) for embedded metadata, ensuring that recipients receive only the data necessary for their specific tasks (Borrmann et al., 2015).

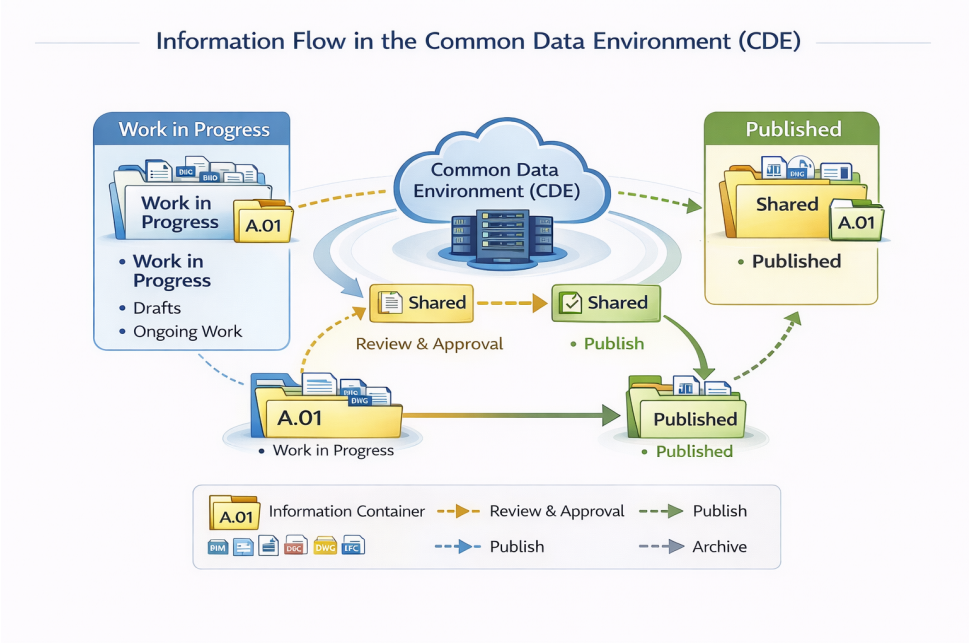


Figure 3: Information Flow

**Coordination and Collaboration Procedures** Effective coordination requires established clash detection cycles and standardized coordination schedules (Ikerd & FORUM, 2020). For Snowdon Towers, this involves using the federated model approach where sub-models are periodically merged for interdisciplinary review (Borrmann et al., 2015).

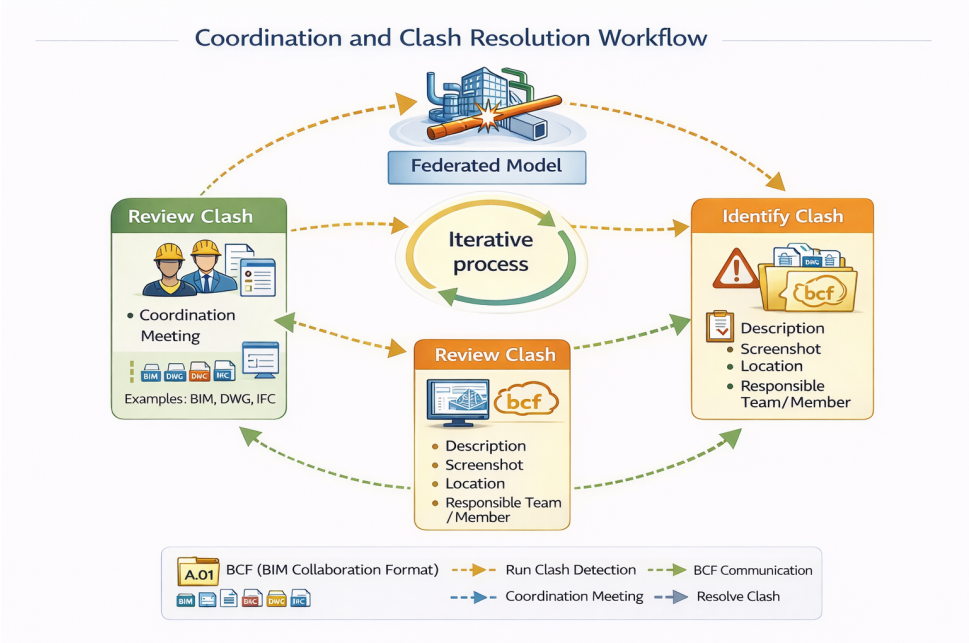


Figure 4: Clash Detection Workflow

**Quality Control and Validation** The process design must include protocols for model checking to verify that models are complete, accurate, and compliant with project standards before they are released. This ensures that the digital information remains the "single source of truth" for the duration of the project (Sacks et al., 2025).

# 6 BIM Information Exchanges

| Exchange | Sender | Receiver | Frequency | Format |
|---|---|---|---|---|
| Updated IFC Models | BIM Manager | Team | Weekly | IFC |
| Clash Detection Reports | Coordination Lead | Team | Weekly | NWD + XLSX |
| 4D Simulation Output | Coordination Lead | Team | Week 4 | MP4 |
| Sustainability Exports | Project Manager | Team | Week 5–6 | XLSX / PDF |
| Asset Data Package | BIM Manager | Team | Week 5 | Structured export |

Table 3: Planned information exchanges.

# 7 Collaboration Procedures

Effective collaboration is essential for successful BIM projects. This is especially important when working with multiple disciplines. Good coordination helps manage complex workflows(Sacks et al., 2025). In the Snowdon Towers project, communication is organised through Microsoft Teams. This platform functions as the project's online collaboration environment. It is used for centralised information sharing and real-time communication(Borrmann et al., 2015).
All BIM-related files are stored within this Common Data Environment. This includes IFC models and Navisworks coordination files. Using one shared location reduces data duplication. It also ensures that everyone works with the same, up-to-date information (Sacks et al., 2025). The platform supports version control. All changes and file updates are recorded. This is important for working in parallel and for maintaining the reliability of project information(Sacks et al., 2025).
Weekly review meetings are held to maintain alignment between team members. These meetings follow common industry practices. Progress is discussed and coordination issues are identified early (Ikerd & FORUM, 2020). These sessions utilize a standardized coordination schedule to raise issues, document solution approaches, and refine workflows (such as the user-defined seven CME4121 concepts) This aligns with the need for a structured BIM implementation approach (Ikerd & FORUM, 2020).
Overall, this iterative way of working ensures that clashes are solved digitally. This helps prevent costly errors during the actual construction phase(Borrmann et al., 2015).

## 7.1 Meeting Structure

The project follows a structured meeting schedule to streamline the BIM process:

- **BIM Kick-off (Week 1):** Define objectives, roles, tools, and planning.
- **Weekly Coordination Reviews:** IFC updates, clashes, and resolving model inconsistencies.
- **4D Review (Week 4):** Evaluates the initial construction sequencing model and identifies potential workflow improvements.

- **Sustainability Review (Week 5–6):** Data extraction and evaluation checks.
- **Safety Walk Review (Week 6–7):** Risk discussion and walkthrough outputs.

This structured approach ensures smooth information exchange, consistent model development, and clear decision-making throughout the project lifecycle.

# 8 Quality Control

| Check | Description | Responsible |
|---|---|---|
| Visual Check | Completeness, correct geometry, model scope | Project Manager |
| Clash Check | Hard/soft clashes detected and resolved | Coordination Lead |
| Standards Check | IFC export rules, naming, consistency | BIM Manager |
| Metadata Check | Required IDs and attributes present | BIM Manager |

Table 4: Quality control checks and responsibilities.

# 9 Technological Infrastructure

| BIM Use | Software (Example) |
|---|---|
| Authoring | Revit |
| Coordination | Navisworks Manage |
| 4D Simulation | Navisworks Timeliner |
| Sustainability | LCA tooling (course-aligned) |
| Asset Management | Asset information platform (course-aligned) |
| IFC Model Checking | Model checking tooling (course-aligned) |

Table 5: Software infrastructure by BIM use.

# 10 Model Structure

The Snowdon Towers project uses an object-based digital model. Each object contains geometry as well as semantic and parametric information. The project follows a federated model approach. Architectural, Structural, and MEP models are kept separate. This ensures clear responsibility and accountability(Borrmann et al., 2015). The model is organised using a hierarchical spatial structure defined by IFC. The structure follows the sequence from project level down to individual spaces. This provides a clear and standardised way to organise information (Ikerd & FORUM, 2020).

For coordination purposes, the building is divided both vertically and horizontally. Vertically, it is split into levels based on finished floor heights. Each level runs from the finished floor of one storey to the finished floor above. Horizontally, the building is divided into zones. These zones represent manageable plan areas (Ikerd & FORUM, 2020). Each BIM object combines 3D

geometry with non-graphical data. This includes material properties, performance information, and fire ratings. As a result, objects carry both visual and technical information (Borrmann et al., 2015).
Every element in the model is assigned a Globally Unique Identifier. This supports version control and change tracking across different disciplines(Sacks et al., 2025). A strict file naming convention is also applied. This includes fields such as project code, originator, volume, level, type, and role. This helps maintain consistency within the Common Data Environment (Borrmann et al., 2015).

# 11 Project Deliverables

| **Deliverable** | **Format** | **Deadline** |
|---|---|---|
| BIM Execution Plan | PDF | Week 2 |
| BIM Model + SBS | IFC | Week 3 |
| Clash Report | NWD + XLSX | Week 4 |
| 4D Simulation | MP4 | Week 4 |
| Asset Information Package | Structured export + screenshots | Week 5 |
| Sustainability Output | PDF | Week 6 |
| Safety Walkthrough | MP4 | Week 7 |
| Final ODL Response | HTML/PDF + media (MP4/PNG) | Week 10 |

Table 6: Planned deliverables and deadlines.

# 12 Delivery Strategy / Contract

As this project is an educational simulation, no contractual or legal risks apply. All BIM workflows adhere to OpenBIM principles, ensuring transparent IFC-based collaboration, and fully comply with the requirements and deliverables set by the CME4121 course.

## References

Borrmann, A., König, M., Koch, C., & Beetz, J. (2015). *Building Information Modeling*. Springer. https://doi.org/10.1007/978-3-319-92862-3

Ikerd, W., & FORUM, B. (2020, November). *BIM Project Execution Plan Guide* (Version 2.00). https://bimforum.org/wp-content/uploads/2022/06/BIMForum_BXP_2020-11.pdf

Sacks, R., Lee, G., Burdi, L., & Bolpagni, M. (2025). *BIM Handbook* (4th ed.). John Wiley Sons. https://yonsei.elsevierpure.com/en/publications/bim-handbook-a-guide-to-building-information-modeling-for-owners--2/