



Services | BIM Management - Design Phase

BIM Management is a project-specific role, independent from the design and construction teams.

The core focus of this role is to work closely with the design team to lead the coordination process, support a digitally-led Safety in Design process, and track the progress of the project team, providing transparency and accountability to make sure that the client's project BIM requirements and associated deliverables are met

Design BIM Management services provided

BIM Requirements Workshop

Prior to design commencing, a BIM requirements workshop will be facilitated to allow key project stakeholders to map out the short, medium, and long-term goals of the project and how BIM will be leveraged to support the delivery of these. During this workshop we will collaboratively define the key project goals, and how the different uses of BIM can be implemented to support these outcomes.

BIM management programme

We will produce a BIM management programme to detail key BIM management activities and the frequency at which they will be undertaken, milestones and approval gateways during design, construction, and handover. It will be aligned with the overall programme and will feed into the BEP.

Project BIM Execution Plan

The outcomes of the BIM requirements workshop will feed into the development of the project BIM Execution Plan (BEP) which will set out the detailed methodology and all the associated inputs and outputs to enable the project to be executed.

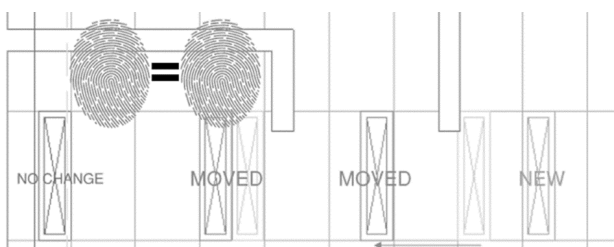
The Project BEP will include the Design Phase BEP, and the Construction BEP requirements, and will be updated at the beginning of each design phase and before construction commences to capture any changes that have been made.

Common Data Environment (CDE)

Following the development of the BIM Execution Plan, a common data environment (CDE) will be established by the BIM manager, this will act as a single source of model-based information for the project. The CDE will function as a digital hub within which project stakeholders can collect, manage, and disseminate all relevant approved BIM data in a managed environment. Information includes building information models, drawings, reports, and other project-related information.

Element Sharing within models

Element sharing is a method of coordinating digital objects such as services between consultants through creating specific digital fingerprints for all elements. It is ideally suited to elements that require engineering design, but the dimensioned set out is by another consultant (i.e. Architect). We will support our client with management of Element Sharing process. The intended outcome is a high level of coordination between the services and architecture models, leading to less issues during construction, less RFIs, and less variations.



Example of element sharing and "digital fingerprints"

Production of Federated Models

We will produce a Federated Model (an aggregation of constituent discipline models produced by a series of model authors) of the project and verify that what's been modelled follows the requirements defined in the BIM Execution Plan. This will be an iterative activity that is undertaken at different frequencies during the design phases in-line with the project programme.

This model will be presented to the project team and published for their review. Publication will be timed to coincide with the project's design team and stakeholder meetings.

Virtual Coordination and Issue Resolution

We will facilitate regular model review meetings, progress and compliance reports. This will provide all stakeholders with complete visibility of the project. The process will address issues rather than just 'clash' numbers. All issues will be assigned a hierarchy of importance and be designated a specific service or organisation for resolution. Progress reports will communicate how many issues are being resolved, created, or ignored.

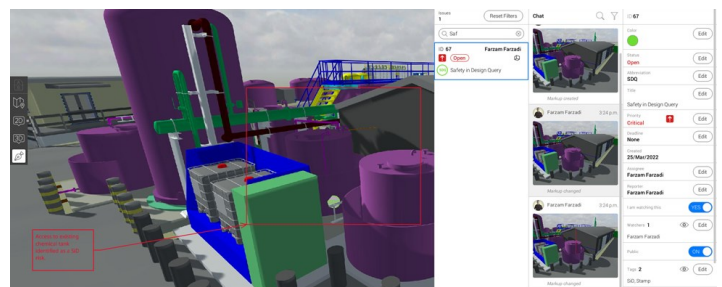
BIM coordination workshops or meetings will be structured to make sure issues are highlighted and a relevant project stakeholder is accountable for the resolution of each issue. These will be held in addition to the standard Design Coordination meetings

BIM Audit and Compliance Reports

BIM compliance reports will be produced during the design phase of the project and will identify and communicate model-based issues against the requirements documented in the BIM Execution Plan. It is not expected that each model will be fully compliant from the beginning, but that it will improve as the models develop throughout design.

Safety in Design and HAZOP review support

The application of technology can improve safety management and risk mitigation during design We can facilitate and lead the implementation of visual collaboration tools during Safety in Design (SiD) and HAZOP workshops. We supports the design teams to identify, categorise, minimise, and mitigate H&S risks through digital collaboration and coordination platforms.



Example of SiD being undertaken using digital collaboration platform



Project Example | BIM Management - Design Phase

Wellington Metro Upgrade Programme Digital Engineering

Client | KiwiRail

Project Duration | 2019 - 2021

Project Role | Development of Project Digital Engineering strategy • of Digital Engineering Management • Digital Engineering Specification Development



Project Description

Digital Engineering was identified by KiwiRail as a mechanism to continuously improve efficiency and collaboration across multiple concurrent and consecutive capital projects. The first program of works that Digital Engineering was implemented on was the Wellington Metro Upgrade Programme (WMUP).

Our role on the WMUP programme included leading the development, implementation and management of Digital Engineering processes aligned to ISO19650 on the Porirua Area Capacity Enhancement (PACE) project, the development of a sub-surface utility modelling standards and the digitisation of sub-surface utilities at 6 substation sites and the development of asset data requirements and an object classification system aligned to Uniclass 2015.

We worked with KiwiRail to establish procedures for the hosting of 3D models as part of the tender process and the procurement of contractors using only the 3D model, the development of visualisations to support stakeholder engagement and the update of their Digital Engineering Framework to align with newly developed processes.

Delivering this project included undertaking the following activities:

- Extensive client engagement to clearly understand and define requirements
- Digital Engineering strategy development and implementation at a project level
- Identification of specific Digital Engineering use cases for pilot implementation and subsequent capital projects
- Support capability development and upskilling with client's supply-chain (Rail engineering providers)

- Information management process development aligned to ISO19650
- Development of Digital Engineering specifications and standards
- Development of asset data requirements and model object classification requirements
- Construction contractor procurement support
- Development of high-resolution visualisations to support stakeholder engagement
- Development of Digital Engineering processes used to update the KiwiRail Digital Engineering Framework

Approach

Our approach was to engage with the client to define the requirements of the programme and identify any gaps in their Digital Engineering Framework, this allowed us to develop requirements with a focus on continuous improvement of the clients Digital Engineering Framework in mind.

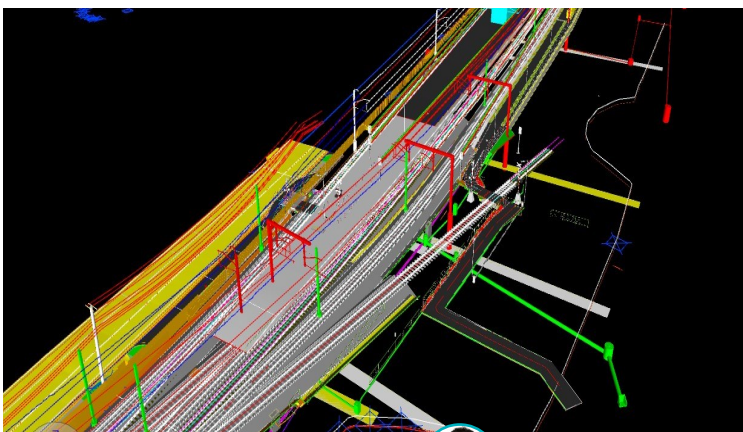
During the implementation phase we developed procedures for model coordination, software interoperability, asset data and object classification, information management in accordance with ISO19650 and sub-surface utility modelling requirements.

Lessons learned throughout the programme were captured and implemented in the Digital Engineering Framework.

Benefits Realised

- Meaningful model coordination workflows for rail resulting in improved design coordination
- A significant cultural-shift in the supply-chain, with buy in and support of Digital Engineering processes
- A revised Digital Engineering Framework that is founded on tried and tested solutions
- Valuable clearance test checks for early service strike avoidance

Additional Information: [PACE Case Study](#)



Project Example | BIM Management - Design Phase

Auckland International Airport Terminal Integration Enabling

Client | Auckland International Airport Ltd

Project Duration | 2021 - Present [Expected Completion 2026]

Project Role | Design BIM Management



Project Description

A critical step in enabling the delivery of Auckland Airports combined domestic and international terminal the Terminal Integration Enabling Programme (TIEP) is a ~\$1bn development that will provide new baggage processing, renewed, and relocated plant, and additional floor plate for the development of the Domestic Processor.

We have led the development and implementation of the BIM processes to support digital coordination with the existing facility, coordination across multiple design disciplines, and coordination with third parties including the Domestic Processor design team and the transport hub design team.

Delivering this project included undertaking the following activities:

- Development of project BIM Execution Plan in line with Auckland Airport's Asset Information Delivery Manual
- Inter-disciplinary BIM coordination for TIEP during design, including coordination against the 48 existing 3D building models
- Interfacing with 120 linked models
- Establishing coordination process with the Domestic Processor project, to identify and resolve potential interface issues
- Integration and coordination with baggage handling models

- 4D construction sequencing
- Model audit and compliance reporting (Model quality assurance)
- Establishment and ongoing management of the project Common Data Environment
- Assisting with facilitating the Safety in Design process using Revizto
- As built model review and asset data reporting during construction
- Establishing coordination rules which identify where design elements or parts of the existing building will be removed during future stages of the upgrade programme

Approach

Upon commencement, the BIM Team worked with the project management and design discipline leads to establish the BIM process to enable collaboration across the entire Terminal Enabling Integration Programme.

Model coordination was undertaken fortnightly during the design period, with regular BIM meetings used to discuss issues found and any specific BIM issues, such as software interoperability with the baggage handling models. Fortnightly meetings were held with the client BIM team, and the BIM Leads for the other AIAL work packages to support alignment between the different phases of the project, and share lessons learnt between the teams.

The BIM process was reviewed at each project milestone, and improvements were made where identified to streamline the processes.

This project was successfully audited as part of Beca's annual external ISO19650-2 surveillance audits in 2022.

Currently Stage 1 of the project is in construction, and the role of the team is to undertake monthly as built model and asset data reviews, and reporting against Auckland International Airports asset data and as built BIM requirements specification.

Benefits Realised

- Identification and resolution of over 12,000 coordination issues during design, resulting in a reduction of Requests for Information (RFI) during construction
- The BIM management process enabled the early coordination of specialist contractor elements, such as a baggage handling and seismic restraints
- Highly coordinated design models enabled model based quantity take offs by the QS team throughout the design process

Additional Information:

[Beca Digital Solutions Webinar - Leading data-driven transformation in major infrastructure programmes](#)

