

Design and BIM

Design disciplines have had a head start in appreciating the benefits of BIM in their phase of an asset life cycle, including improved collaboration, greater design optimisation, visualisations and process efficiencies.

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BIM FOSTERS a collaborative design process in the consultant team, enabling the sharing of design information from early stages in the project. Each consulting party can add their modelled geometry and associated information to the BIM, creating a single source of truth, enabling a greater overview of the design and improving design decisions.

Collaboration leads to efficiencies

This collaborative approach enables process efficiencies, particularly in the area of coordination. Each consulting party is responsible for their areas of expertise - for example, services engineers for calculations and circuitry of electrical items and architects for positional requirements. This allows for a single item to be placed in the model, reducing the potential for duplication and unverified model geometry.

The benefit of this is explained in an upcoming case study published on the BIMinNZ website - see www.biminanz.co.nz/casestudies.



BIM use allows improved collaboration across a project.

Design optimisation and visualisation

By working in the collaborative 3D environment and having access to up-to-date contextual modelled information, design decisions can be made with more surety. Realisation of a more functional room layout or simply where a duct can be rerouted to avoid a firewall leads to saved time and rework.

BIM enables greater visualisation of designs for both the design team and clients. Design teams are finding benefit in using

virtual reality (VR) alongside their normal design processes. This delivers improved context along with enabling coordination issues to be identified during the design phase, providing further downstream benefit on site.

For clients, the use of BIM alongside VR during the design process allows them and the facility end-users to experience the buildings in a virtual 3D environment. This provides a higher level of interaction and

understanding of the project rather than the expectation to read and understand 2D plans, sections and elevations with their potential for misinterpretation.

To focus the client's experience at this early design stage, we found it beneficial to limit the materials pallet in the model. This keeps the discussion focused on the design rather than the materiality representation.

Learnings along the way

To achieve these benefits and others throughout the life cycle of an asset, there needs to be broader understanding of BIM as not an add-on but part of the process from the start.

Define project requirements at start

The project requirements must be defined at the project outset. Are these focused on the use of BIM to gain efficiency through the design phases and during construction or the more ambitious goal of utilising the information in the BIM for asset management?

Each has implications for how the project is set up and resourced, both internally and externally. For more information on setting client requirements, see *Clients and BIM* on pages 70–71.

Set expectations early

The right consultant design team and the willingness to share and collaborate from the outset is an important aspect to the success of a BIM-enabled project. Agreeing who is responsible for modelling what, to what level, at what stage and for what purpose is as important.

This should be defined and agreed in a BIM execution plan before any modelling and sharing of information has occurred. Setting expectations early will aid in the collaboration and coordination aspects of the project.

Different team structure needed

Reviewing the internal team structure is as important as having the right consultant team. Working on a BIM-enabled project, even a project without client-agreed BIM deliverables, requires a shift in the old team structure.

No longer can you have one person responsible for plans, another for elevations, another for sections or details. Working in the 3D space, all are intertwined, derived from the same 3D geometry and information. There are now roles such as BIM coordinator, discipline BIM lead, model manager, and document controller. Understanding how best to structure your team and the requirements of these roles can be daunting. Not all projects will have all roles. For a detailed understanding of these roles, refer to *The New Zealand BIM Handbook*.

However the project team is structured, ensuring the information developed is meaningful, meets the requirements of the BIM execution plan, achieves the client's objectives and aids the collaboration process is key. ◀

Keys to success

- Clearly define the project and client's BIM goals, requirements and outputs from the outset.
- Ensure adherence to a well defined BIM execution plan.
- Procure the right consultant team for the required project deliverables.
- Identify and implement an internal project team structure to be applied practice-wide.
- Leverage a BIM philosophy to promote collaboration and coordination between consultants. ◀