

Wellington City Council Bracken Road Flats

Applying BIM retrospectively as a data collection tool for maintaining social housing.

The project

This case study demonstrates how Building Information Modelling (BIM) is being used by Wellington City Council (WCC) to cost effectively manage its property portfolio, specifically focusing on a small social housing complex – Bracken Road Flats. It shows the value of BIM for asset and facilities management. Benefits include the ability to forecast ongoing operating costs and plan maintenance to extend the life of assets. Capturing “big data” through BIM can help deliver affordable social housing and infrastructure for our communities.

As a social housing owner, WCC needs timely access to accurate building information to ensure its tenanted properties are maintained to an appropriate level. Accessing occupied properties to measure and assess their condition is difficult. Instead, WCC is using BIM as an effective data collection tool to obtain accurate measurements to populate its Asset Management and Facilities Management Information System (AMIS/FMIS) database for modelling. This is helping WCC to cost effectively, identify and schedule maintenance work required on its social housing portfolio. BIM can inform the operation of a building throughout its life cycle and help predict the whole of life costs of an asset.

“On average, approximately 29 components in a built asset comprise 80% of its value. If you can manage these electronically you can manage the asset long-term with minimum intervention. The value of a BIM model is far greater if you view it over the whole life of an asset.”

Haydn Read, Manager Strategic Asset Planning,
Wellington City Council

What is BIM?

“BIM is a digital representation of the physical and functional characteristics of a building. As such, it serves as a shared knowledge resource for information about a building, forming a reliable basis for decisions during its life cycle from inception onward.”

The National Building Information Model Standard Project Committee



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Duration

March 2014 - ongoing

This is part of an ongoing WCC data management project run by its Strategic Asset Management Planning team.

Project partners

Wellington City Council
Archaus Architects
Caduceus Architects

BIM Uses

The New Zealand BIM Handbook Appendix D defines 21 distinct BIM Uses.

For this project the primary BIM Use is:

- Asset management – electronic data transfer to an asset management database, for strategic planning and long-term asset budgeting.

It also supports other BIM Uses including:

- Record modelling for future refurbishments
- Building (preventative) maintenance scheduling
- Code validation.

Process

The original drawings of the Bracken Road Flats, produced around 1965 in 2D non-CAD format, were provided to Caduceus Architects, who were asked to draw a model based on WCC's specifications prepared with assistance from Archaus. These plans were then developed into a 3D BIM model using Autodesk's Revit software.

To meet WCC's asset management requirements, the model needed to include information on building components, such as: location (space/room names), areas of surfaces, materials and finish (the surface and surface finish are split into two separate assets, i.e., paint on plasterboard and plasterboard). These requirements were used to create a template or, in Revit terms, a "shared parameters file".

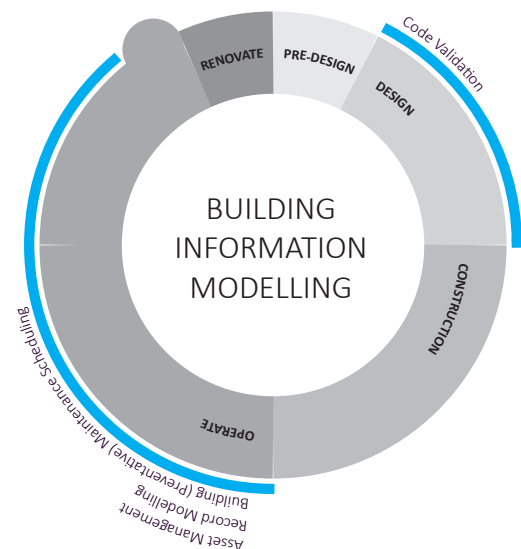
Once the draft drawing was complete, data on specific building components was extracted to Excel where it was mapped and uploaded to the WCC asset database – SPM Assets.

The result was an up to date, accurate As-Built model for asset and facilities management purposes.

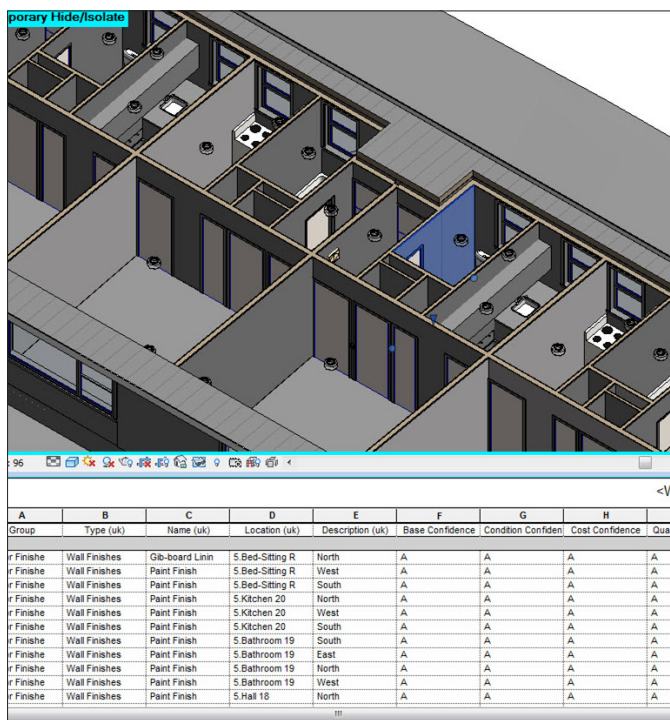
What is a BIM Use?

BIM Use – a unique task or procedure on a project which can benefit from the application and integration of BIM into that process.

The New Zealand BIM Handbook



This case study highlights the value of using BIM in the design and operate stages of the project life cycle



Challenges and constraints

Historically, BIM models have been created for architectural, engineering and construction purposes. Shifting the focus to asset and facilities management required a shift in thinking. Aligning the requirements of WCC's asset management system – what was wanted – with what the Revit software could do – was a challenge. The inclusion of WCC's specifications resulted in a database with 4000 column headers. Cross-referencing between the asset management system and Revit's standard categories took some time. However, once created, the shared parameters file from the BIM model could be imported into other models with ease.

WCC used a set of simple tools within an Excel spreadsheet to manipulate the data so it could be imported into the SPM Assets database. Either an Excel spreadsheet or SQL database could be used for this task.

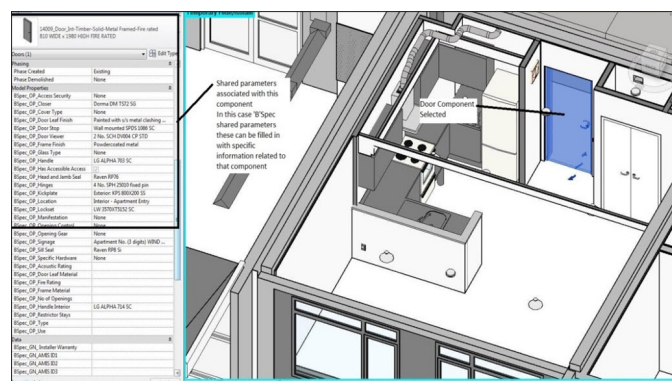
Results and benefits

The Bracken Road Flats project demonstrates an efficient method of using BIM outputs to populate asset and facilities management systems. This is particularly useful when there is little or no data available on an asset.

The desktop process can quantify a large number of assets in a very short time so scheduling, asset planning and facilities management can be done with relative ease. Quite simply, the degree of accuracy required to inform these processes would not have been achievable for WCC without BIM.

“BIM assists better decision-making.”

Haydn Read, Manager Strategic Asset Planning,
Wellington City Council



BIM has allowed WCC's maintenance planners to easily identify the location of individual building elements such as plumbing and HVAC systems for trades, prior to maintenance visits. It has also reduced the number of site visits required to rectify an issue (a Rectification Ratio [RR] can be used to measure facilities management efficiency). As the BIM model lasts for the life of a building, it also provides information for future analysis. The BIM model can be updated with current information as more data is collected over the life of the asset, e.g., information on alterations or repairs.

BIM assists better decision-making. As most data capture processes are manual, there is normally a limit to how much data is collected, due to cost restraints. BIM provides a new and exciting way to capture more information cost effectively, so WCC managers can make better informed and evidence-based decisions.

This is a small housing project with limited building services. When BIM's capability as an asset and facilities management tool is scaled up and applied to much larger buildings or extended to the many single housing units within WCC's property portfolio (some 2200 plus units), the benefits are significantly multiplied.

Estimated cost

It took approximately two days to build the BIM model for Bracken Road Flats, based on the original drawings. Populating parameters, extracting schedules and checking the output took approximately half a day, with transfer to the database adding another half day. The total cost was \$1500-\$2000 for one model of an existing building. In comparison, a manual survey of the property would cost approximately \$650-\$1000 and require more frequent site visits and visual inspections throughout the life of the asset.

The potential benefits of capturing data in BIM to assist asset and facilities management are substantial – so much so that WCC is preparing a business case for a project to retrospectively build BIM models for its entire housing and property portfolio.

Accurate 3D visualisation and the asset data suite resulting from retrospectively building a BIM model are likely to deliver significant time and cost reductions in normal AMIS/FMIS operations. As design consultants grow more familiar with the information required for AMIS/FMIS, drawing time will be reduced. Less time will also be required on site for physical surveys, resulting in additional savings.

Contact

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Further information on BIM in New Zealand

www.buildingvalue.co.nz/BIM-in-NZ

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