

Stephenson&Turner

Customer Success Story

Autodesk® Revit® Architecture
Autodesk® Revit® MEP

Revit Architecture and Revit MEP helped to bring the consultant team together to deliver the project in a timely manner on a tight budget. They are very powerful building information modeling (BIM) design tools and in high demand. In fact, for many large commercial and government projects, you can't even sit at the table unless you use BIM.

—Anthony van Kan
CAD Manager
Stephenson&Turner

Minimum impact design.

New Zealand's first environmentally certified government building is designed with Autodesk BIM Solutions.



Cafeteria. Image courtesy of Paul McCredie.

Project Summary

Established in 1920, Stephenson&Turner (S&T) is a team-oriented, multidisciplinary architecture and engineering practice specializing in the creation of inspirational, environmentally sustainable solutions for clients in New Zealand, Australia, and other Asia-Pacific countries. The firm's diverse portfolio spans numerous industries, including commercial and residential construction, hospitality, transportation, and healthcare. S&T designers also have extensive experience working for government clients on a variety of facilities, including prisons, universities, and office and research complexes. To help ensure design effectiveness and environmental sustainability, S&T practices close collaboration among the disciplines from the earliest project stages—when design decisions have the greatest impact on sustainability and cost. That's why the firm recently adopted a building information modeling (BIM) process supported by Autodesk® Revit® Architecture and Autodesk® Revit® MEP software. "BIM is a natural extension of our 'total building' approach," says Michael Warwick, a lighting and sustainable design consultant for S&T. "It greatly enhances our ability to work in an integrated fashion."

The Challenge

Since adopting Autodesk BIM solutions, S&T has completed numerous projects, including an award-winning multipurpose building at the Ministry of Agriculture and Forestry's (MAF) National Centre for Biosecurity and Infectious Disease (NCBID), located near Wellington, New Zealand. Designed to be the centerpiece of the NCBID campus, this one-story building consolidates all administrative and support functions in a single location, separating them from the facility's laboratories. The completed building includes a formal reception area and administrative offices, as well as several meeting rooms and a cafeteria that staff can combine to form a large, multipurpose emergency response center.

MAF wanted to emphasize the building's relationship to the natural environment, requiring S&T to incorporate natural building materials and harmonize the building's layout with three large tōtara trees on the site. After reviewing the program requirements, S&T encouraged MAF to pursue 5-Star Green Star sustainable design certification, which corresponds to the USGBC LEED Gold™ standard.

Autodesk®

With assistance from Autodesk BIM solutions, S&T surpassed the energy efficiency goals for 5-Star Green Star certification.

The Solution

Initially, the design team formulated a sustainable design strategy that included high-performance insulation, passive solar construction, and a sophisticated natural and mechanical ventilation system. During preliminary design, S&T created a model of the architectural and building systems. S&T then leveraged intelligent information in the building model to assist in visualizing and simulating the building's appearance and performance.

"BIM is instrumental in helping the clients—who are often unaccustomed to interpreting 2D information—to visualize projects in 3D and actively participate in optimizing building layouts and finalizing designs," says Murray Robertson, the project architect from S&T. "Using Revit Architecture we rearranged rooms virtually, which helped us make better decisions in design and minimize change orders during construction. That was very important."

Equally important was the use of Revit MEP to adhering to a passive solar strategy that required maintaining artificial lighting levels at or below 400 lux. "We used Revit MEP to perform an ongoing lighting analysis," says Warwick. "Whenever we made a change to the building dimensions, the software automatically updated the lighting information."

S&T used Revit MEP to design a mixed-mode building that used two separate mechanical systems to

naturally ventilate the building. The first distributed air from an underground pipe network throughout half of the building; the second distributed it from above. "On that half, the building lacked an overhead slab, so we built a platform where we could stack the air handling units," says Warwick. S&T used Revit MEP to design the complex layers of overlapping duct work and create easy-to-understand 3D cut-away views for use in construction.

S&T exported information from the Revit model to a 3rd-party analysis applications. "Being able to export from Revit software to analysis applications helped us further analyze performance and optimize the design," says Warwick.

The Result

S&T completed the building in a timely manner and on a tight budget with BIM. The sustainable design strategies it pursued helped S&T remove the need for expensive climate control systems and surpass the rigorous standards of the 5-Star Green Star rating—a first for a government-developed building in New Zealand.

"We had to achieve an energy efficiency of fewer than 120 watts per square meter per annum," says Warwick. S&T predicts that it will achieve 39 watts—one third the maximum allowable total. "The BIM process with Revit Architecture and Revit MEP definitely played a part in that success."



MAF Building interior. Image courtesy of Paul McCredie.

For more information, visit www.autodesk.com/revitarchitecture and www.autodesk.com/revit-mep.



The National Centre for Biosecurity and Infectious Disease. Image courtesy of Paul McCredie.

The MAF Building has been tested and confirmed as one of the most energy efficient buildings in New Zealand. The BIM process with Revit Architecture and Revit MEP definitely played a part in that success.

—Murray Robertson
Project Architect
Stephenson&Turner