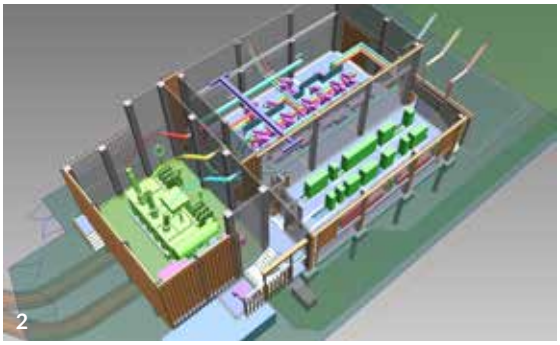

1 Wairau Rd 220kV Substation completed project taken from Wairau Road **2** Wairau Rd 220kV Substation 3D design model perspective
3 Wairau Rd 220kV Substation architectural concept for Community consulation prior to Construction

Wairau Road 220kV Grid Exit Point (GXP) Substation

Project Location: Auckland
AECOM for Transpower New Zealand Ltd
Disciplines: Whole Engineering

A key part of Transpower's North Auckland and Northland Grid Upgrade Project (NAaN), the Wairau Road 220kV Grid Exit Point (GXP) Substation upgrade provides an important supply point to Auckland, and reinforces the Northland electricity network.

Vector provided space for the new substation on land beside their existing Wairau Rd 110/33/11 kV substation, on Auckland's North Shore. Transpower commissioned AECOM to design the new substation; a complex and critical project requiring the AECOM team to develop innovative engineering solutions and techniques to ensure its success.

The Wairau Substation upgrade presented many challenging engineering problems including multiple projects and work parties on a space- and access-constrained site; installation of building piles through a complex underlying lava flow geology; integration with a live high voltage substation; a flood-prone site (including two flash floods during construction); critical timeframes; and how to get a 100 tonne transformer on site over a small bridge designed for 70 tonnes.

Work included high voltage transmission and distribution, Gas Insulated Switchgear (GIS), architectural aesthetics, fire engineering, geotechnical, acoustics, building structures including secondary response spectrum analysis, civil earthworks, flood protection, high voltage cabling, electrical magnetic fields, high voltage transients, HV network protection, control & SCADA and earthing. The design, while complex, is compact and overcame difficult site space constraints, with minimal environmental and social impacts.

Safety was paramount in both the design and construction. The use of innovative and detailed 3D modelling techniques was a powerful tool for the designers, the client, Auckland Council and the installation contractor, allowing the wider team to consider all aspects of the design, safety and installation implications.

The final outcome is aesthetically pleasing, features the most modern technology, has a reduced footprint and complements the local environment. This is a great outcome for the local community and for Transpower. Innovation and creativity necessitated this project, and then built it.

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Judging & Copyright Statement

This project is a Finalist entry in the 2016 INNOVATE NZ Awards of Excellence competition. The winners will be announced on Friday 2 September, 2016.

For more media information and high resolution images, please contact Holly Morchat
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