



CASE STUDY: Middleton Substation 66kV upgrade

The Middleton area has become a significant commercial hub for Christchurch over recent decades, housing a variety of businesses, from light commercial to heavy industry. In 2007 network operator Orion initiated a major upgrade to meet increased demand.

UNDERGROUND

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PROJECT SCOPE

Connetics was engaged to upgrade the Middleton substation from 33kV to 66kV. The scope of work also included the installation of two new 66kV cable feeds to the Middleton Substation over a 400 metre route from an overhead transmission line. The project required an extensive compliance regime, close monitoring of safety and security, and highly specialised cable laying and handling methods.

OUR RESPONSE

Major infrastructure projects of this nature are rare. Only three such upgrades had been carried out in Christchurch in the previous 25 years, and Connetics was one of few companies with the necessary capacity and technical expertise to undertake the work. The project required us to work closely with the three authorities involved: grid operator Transpower, Orion, and rail network owner Ontrack to meet technical and safety requirements.

CHALLENGES

Although the distance between transmission lines and the substation was not large, the route was challenging. A large trench - up to 2.5 metres deep in places - was required to house the cable system, and this had to be shored up for much of its length. Crossing railway lines posed an additional challenge.



The cable manufacturer specified continuous monitoring requiring dedicated equipment to be in place during cable-hauling.

SOLUTIONS

Connetics developed a detailed methodology for all aspects of cable handling and laying.

Using experienced work crews and in particular a highly experienced leading hand, Connetics ensured that the construction of the trench and backfill of the specialised concrete and thermal material was completed to specifications. Testing was carried out during the cable lay to ensure compliance.

Pipe ramming technology was used to lay the cable through a 45-metre stretch under railway

lines. Above ground, Connetics maintained the security and safety of the project by ensuring the site was secured each night, and that public access was restricted.

RESULTS

Despite the complexity and challenges of this major upgrade, Connetics successfully managed all aspects of the project, completing it within three months, very close to timeline. The company's experience and expertise ensured it delivered the 66kV upgrade, fully compliant with the strict specifications of the cable manufacturer and network operator.

"The expertise Connetics hold in high voltage underground cable works contributed to the project's success.

Connetics provided experienced cable installation and jointing staff to undertake this project."

Nic Wong
Orion New Zealand Limited