



## CASE STUDY: STATE HIGHWAY 20 MANUKAU EXTENSION

The State Highway 20 Manukau Extension is a \$210 million construction project for the New Zealand Transport Agency, involving the construction of 4.5 kilometres of a new four-lane motorway to improve access to Auckland International Airport and Manukau City.

### PROJECT SCOPE

This major construction project required the relocation of three 33kV pressurised oil-filled cables forming part of Vector Electricity's subtransmission network. Northpower was contracted by Vector to cut and relocate the cables, installing new stop joints and new sections of solid XLPE cables under the new roadways.

The project also included the relocation of associated 11kV and 400V cables from Wiri Station Road to run through a newly-constructed motorway bridge. The installation of new oil tanks at Vector's Wiri zone substation and Transpower's Wiri substation were required.

Due to the needs of the wider construction project, Northpower had to work in stages over a two-month period to complete the task.

### CHALLENGES

Work took place across a 140-acre site, with large numbers of personnel and heavy machinery present at all times. On-site safety was an issue requiring careful management, as was safety working with exposed cables at the Transpower site.

### FACTS AND FIGURES

- 4,500 metres of cable laid
- 4243 man hours worked
- 1200 litres of cable oil used



Due to the size and weight of the oil-filled cables, relocation over a 50-metre distance was not an easy matter, with the cables being swung into position by hand.

Ongoing liaison with all parties had to be maintained at all times, ensuring Vector, Transpower, the main construction contractor Leighton Works and all other on-site contractors were kept informed.

### SOLUTIONS

Before starting the project, Northpower brought in specialised equipment to work with the pressurised oil-filled cables and procured materials to link to the new Vector oil tanks

located at the Wiri substation. Skilled and experienced staff were drafted in and a 10-man team was on hand to move the cables, ensuring that all the tasks were completed without injuries to personnel or damage to the cables. The Northpower team held on-site safety briefings with all workers explaining to them the risks and warning them of the need to stay away from the Northpower electrical site.

Experienced Northpower staff were paired with those with less experienced to ensure safety was not compromised and that all work was done to the highest standard.

### RESULTS

As with all relocation projects there were numerous challenges and issues which required prompt and cost effective solutions involving voltages from 400V to 33kV. By planning ahead Northpower was able to exceed the terms of the contract and completed all work to a high standard, on time and on budget and without affecting the integrity of the subtransmission and distribution networks. This was achieved while at the same time meeting the wider construction needs and deadlines.