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Power through residential & industrial Albany for VECTOR Ltd

Background

Due to an increase in electricity demand, Vector required to link an existing Transpower circuit at the Bass Road Substation in Albany, to Vectors existing 33kV Substation in Sunset Road, Sunnynook ó a total distance of 6.1 km.

Public expectations required the full length of the cable route to be underground. Although the end result of this project was to benefit the community, the council and general public would tolerate little inconvenience.

Tender

The contract called for a total of four ducts to be installed. One duct for each phase and a 110mm diameter duct for a communications cable. In order to reduce the overall bundle size, Smythe contractors opted for a non-standard power duct size of 140mm. This decreased the duct material cost and reduced the required tunnel diameter. This design innovation gave Smythe Contractors the edge at tendering. The advantage however was short term as the 140-diameter duct has now been adopted by other power authorities.

Along with the acceptance of using the slightly undersized continuous ducting for the 33kV power cabling, it was proposed that the three ducts and the single 110mm communications duct be installed into a single 350mm diameter borehole in õquad-foiõ arrangement.



Mike Smythe taking delivery of an additional drill for the project, bringing the total number of four drills on site.



Launching the 4-way power/communication ducts into the drilled hole.



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Breaking new ground every day

er busy road
and industr

To reduce construction impact on the public, trenchless technology was utilised where possible. The ground conditions and the intensity of existing underground services, especially at intersections led to traditional open cut excavation in some places.

Existing underground services location

By far the biggest hurdle on the project was locating existing underground services. For a relatively new area of Auckland the quality of records of underground services was poor.

The ambiguous nature of many power plans made it necessary to cut into existing live power ducts to determine their content. Cables were encountered that were not marked on any plan and some existing services were installed through existing buried council services. A complete lack of quality control for existing underground services installation and location in this area became quickly apparent. Due to this we were forced to utilise ground penetrating radar.

Traffic Management

Traffic management is a large component in civil works within public roadways. In many cases in an effort for councils to standardise traffic management systems they have adopted Transits code of practice and strictly apply it.

Over the course of this contract a large volume of traffic management hardware was stolen. Unattended brightly coloured cones and road signs are an easy target for thieves. One cone was placed at the very top of a nearby 50m high Norfolk Pine tree. Although this feat deserves some credit, that cone was on the road for a reason and by removing it the public was placed in danger.

Hazard control

Hazard control plays a big part in the project. All hazards need to be controlled in some way. Working amongst the public calls for extra vigilance.

Summary

Given the difficult ground conditions and poor existing underground services plans, the project was completed to a high standard. The reinstated roadway, road-verge, footpaths, traffic islands, gardens and parks in most cases were an improvement on existing quality.

The end result was a success for the client and there is now very little above ground evidence that this major project ever took place.



Intensity of existing underground services



4-way duct installation
drawn into drilled tunnel



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Excavation and shoring of the
cable joint pits

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