

Highbrook Lines Realignment

Project: Highbrook Lines Realignment

Client: Transpower NZ Ltd

Location: Highbrook, South Auckland

Contract Value: \$6,000,000

The project involved the deviation of the OTA-PEN C, 220kV, double circuit transmission line from lattice steel structures, tower 4 to tower 12, a distance of 2.50km, on to steel monotubes. Also the erection of four steel monopoles at each line cable termination (near the existing towers 4 and 12 as part of the undergrounding for the OTA-PEN A & B, 110kV).

The line deviation and undergrounding was commissioned by the property developers of the old Ra Ora Horse Stud property to enable commercialisation of the land into a modern business park. With the overhead conductors removed the potential for development was greatly enhanced.

Transpower purchased steel monopoles manufactured in China from an Australian supplier. The nine poles for the 220kV section ranged in height from 35 to 50m and the eight for the 110kV terminations were 25m high. The design was undertaken by a NZ engineering consultancy and was always going to be a challenge during construction with very acute turnoff angles on the line route.

The 220kV line teams erected massive steel poles weighing from 10 to 50 tonne using up to 300 tonne capacity all terrain crane. The huge poles had bases from 2.4 to 3.8m in diameter and each pole carried six "Goat" conductors and one earthwire and one OPGW fibre cable. Due to the deflection in the poles each and every span was sagged separately using dynamic tension stringing techniques.

There were many challenges, such as having to hold 52 conductors simultaneously using over 200 tonne of concrete anchors, developing a live line procedure to enable erection of one pole between one live and one dead circuit on an existing in service 220kV line, working in and around roading and building contractors and over a four lane motorway used by Auckland commuters.

Highbrook developers now have a world class business park free of overhead transmission lines ready for their clients, within 15 minutes travel of the Auckland CBD.



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