

CASE STUDY

STAR AWARD FINALIST - CATENARY SUPPORT SYSTEM

PROJECT TYPE

Transmission Line Construction
Design

SERVICES

Overhead Line Design, Structural
Design, Verifications and Peer
Reviews & Drafting

ASSET OWNER

Transpower New Zealand Ltd

WORKS SUBCONTRACTED

All works completed in-house



CHALLENGE

Replacing end-of-life conductor through dense urban Auckland — crossing motorways, schools, live LV assets, and residential properties in a way that had never been attempted at this scale.

The northern sections of two Transpower transmission lines running through Ōtara, Auckland required conductor replacement, a routine task made extraordinarily complex by the urban development that had grown up around and beneath the lines since the 1950s. Multiple high-importance motorways with no tolerance for full road closures, smaller roads, schools, live LV crossings, and residential and commercial properties all lay within the stringing corridor. At the outset, Transpower questioned whether the risks were manageable at all.

SOLUTION

Groundline deployed Catenary Support Systems across continuous long stringing runs — far beyond their typical application — and developed a bespoke structural analysis tool to manage the resulting tower loads and enable rapid design changes during construction.

CSS provided the protective coverage needed to safely replace conductor over property, roads, and live assets, but its standard use is limited to one or two spans protecting one or two obstacles. The constraints of this project demanded full-span protection across much longer continuous stringing runs, imposing greater loads on the existing lattice towers. Groundline developed a specific methodology and iterative loading analysis tool to manage these loads and accommodate the complex structural behaviour of the existing towers. The tool was deliberately designed to allow rapid reconfiguration when construction changes arose, and they did, with the tool enabling Groundline's field engineers to respond to contractor requests in real time. Close daily communication with construction contractor Omexom throughout the works was central to keeping the project moving safely and efficiently.

IMPACT

Delivered under budget and on programme, with public safety maintained throughout — and recognised as a finalist in Transpower's STAR Awards for Safety by Design.

The innovative application of CSS at scale, combined with Groundline's on-site engineering presence and the bespoke analysis tool, allowed a project Transpower had considered potentially undeliverable to be completed safely, on time, and within budget. Disruption to motorways, local roads, schools, and utility assets was minimised throughout. Transpower recognised the quality of the design and delivery approach with a STAR Award nomination in the Safety by Design category, an acknowledgement of the engineering thinking that made a genuinely difficult project possible.

