INNOVATION, SUSTAINABILITY + DIGITAL IN PRACTICE

ISDIP

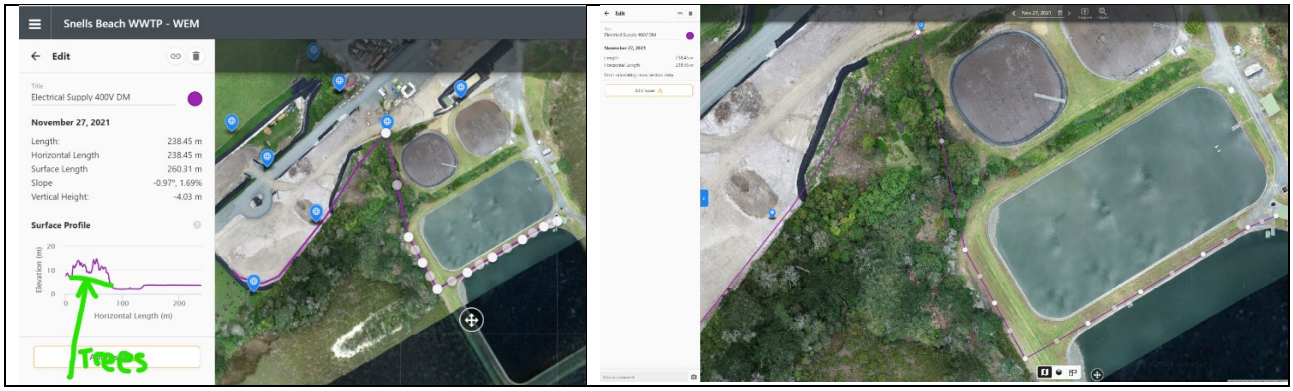
ISDIP 035	Long Haul of Large Cables
Date	February 2022
Business Unit	BPC Northern M&E
Project & Region	Snells Beach WWTP Warkworth Auckland
ISC Themes	• Using Resources • Innovation • People and Place

What Happened?

A temporary electrical supply was needed for a site facility containing 12 temporary adjoined buildings, a large covered meeting area for addressing all site staff, a kitchen and dining area, IT centre, and ablution blocks. The array of challenges regarding the electrical cable installation were clear from the first site visit:

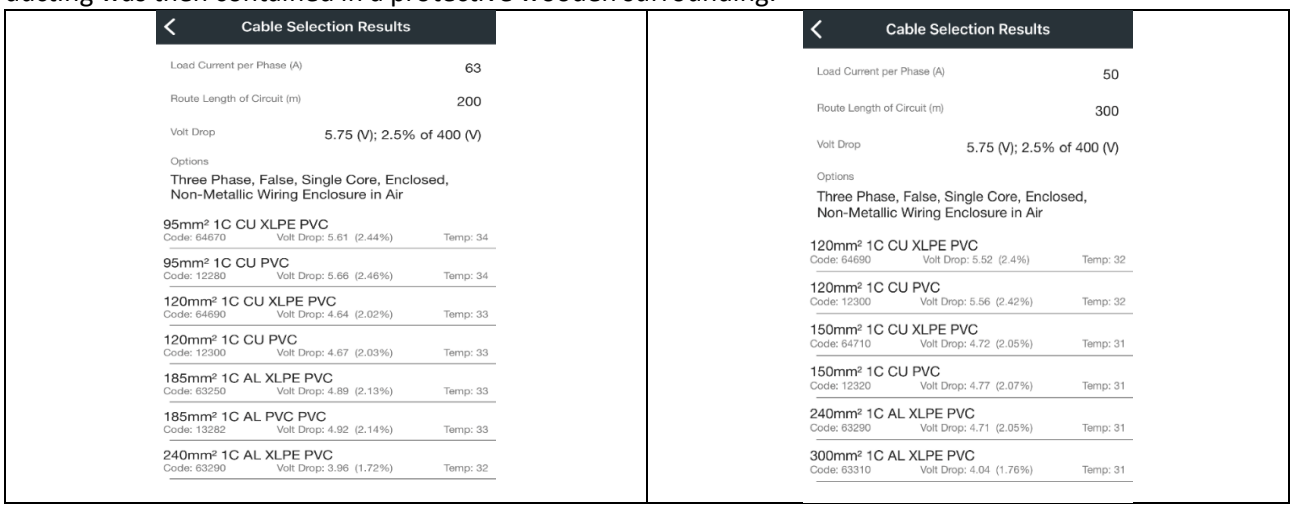
1. Distance from the supply source to buildings was over 350m
2. Size of supply required
3. Haulage calculations
4. Topography
5. Unstable ground (proximity to pond walls)
6. Access after installation
7. Marshland
8. Bushland.

To address issues 1,4,7 and 8, we used drone aerial information to identify the best cable route. This allowed us to accurately measure the distance from source to destination, calculate bend radiuses, identify soft areas and bushland to be removed, identify load points during the cable pull, and plan installation design. Drone information was also used to advise the client, and plan both safe installation methods and protection of the cabling once installed. It made it far easier to identify and mitigate potential H&S issues relating to physical hazards like site remoteness, ground conditions, and close proximity to ponds.



Drone Deploy screen grabs showing the cable pull distances

Addressing item 2, once the route and installation were designed and accepted, the cable calculations were made using a cable app. With measurements acquired and the installation method finalised, surface ducting was then contained in a protective wooden surrounding.



Cable Selection App

Addressing issue 3, once the cable size and installation design had been formalised and agreed, we used drone information and measurements – plus the cable manufacturer's cable specifications – as reference documents to approach a specialised cable haulage equipment hire company. They used this information to then calculate the forces required to achieve the pull. Recommendations followed, with equipment being supplied from stock. An eco-friendly lubricant was used to reduce stress on the cables.

Cables ready to be pulled and load scales with remote display

Addressing issue 4, it was identified from the drone footage and with liaison with WSL operations that it would be too great a risk to trench close to the pond's concrete dam walls, as this could undermine the wall and cause a breach. BPC construction and electrical teams collaborated with WSL operations around the design practicality, with the cable installation accounting for mowing strips, site access for WSL maintenance teams, cable protection, plant operation impact, and easy removal after completion of all works.

What Are We Doing Differently?

Using technology to facilitate closer collaboration between all parties and leverage the knowledge of both of our internal team resources and our supply partners. The drone information was invaluable at all steps of the installation, from design to installation, allowing us to identify hazards and problems, make measurements, and use the photos as discussion documents. Photos made it easier for all parties to visualise the issues without coming to site and then come up with great ideas to make for an easy, safe, and successful installation.

We used an eco friendly lubricant, as well as crane scales to ensure cabling and equipment were not stressed, therefore keeping our people safer by reducing the risk of incidents from equipment failure. We identified pressure points on ductwork and mitigated this with weights and tie downs, long radius bends to decrease cable stress, and identifed hazards associated with the prevailing ground conditions and environment.

Cables and conduit installed on site

More Information

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