



Otago Harbour Crossing Project Submarine Cable Installation



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Introduction – Project Video



Cable Selection Process and Learning



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Finding the right cable for the job

Our key requirements for the submarine cable were:

- Current Capacity – two options - 300Amps and 400Amps
- 11kV
- 1.85km – Continuous length

One the biggest challenges was finding a submarine cable that could meet the requirements above and provided a good value option for the 746 Customers they power.

Finding the balance between network requirements and installation methodology was tricky – capacity vs weight vs full length. This required close collaboration between the installation contractor, Aurora Energy Engineers and the cable manufacture.



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Cable Procurement - RFP

Submarine cables are not something that are purchased very often at Aurora Energy. We decided to prepare a requirements document and sent this out to the cable manufactures.

The responses from the cable manufactures was quite interesting.

- Due to the relatively short length of cable, many respondents provided cables that were very sophisticated and appeared to be left over from large international orders, these had much higher current capacities and voltages.
- Nexans NZ realised that the cable being offered by the international divisions might not have been fit for purpose and provided an alternative option. This was a submarine cable that was used by many distribution companies in Scandinavia, this met our requirements and had good price point.



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Cable and Spares purchased

Manufacture: Nexans Yanggu China

Cable: 3C 185 mm² AL 6.3511 kV TR-XLPE SCRNL LLDPE SWA HDPE

Length: Two x 1850m – one drum each

Capacity: 300 – 350Amps

Spares:

Submarine Cable: 400m

Submarine Joint Kits: Eight



Installation Considerations and Learning



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Working with our Stakeholders

One of the largest challenges with installing a submarine cable in a harbour environment is identifying all the stakeholders, the success of the project is heavily linked to understanding the stakeholders needs, excellent communication and support.

- Operational Stakeholders
- District & Regional Council and Iwi Stakeholders
- Environmental Stakeholders
- Local Community Groups



Ōtākou Runaka - Project Blessing



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Pre-lay Considerations

- Finding the most suitable route from the Networks perspective
- Discussing the proposed route with the Operational Stakeholders
- Agree on the proposed route
- Investigate the route by completing a detailed seabed survey using divers. Including understanding the topography to determine the cable length and installation methodology.



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Consenting & Environmental

Understanding the both the Regional and District Council consenting requirements is key, more importantly how the installation methodology aligns at the intersection of the two councils requirements.

The Otago Regional Council allows the installation of submarine cables on the seabed surface, although all practical steps shall be taken to bury the cable for 20m past the low mean tide line



Understanding what wildlife is in the area early is key.

The District Council does not allow for machinery to be used on a beach without resource consent.



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Finding the right Vessel for the job



Self propelled Barge - Patiki

The depth profile of the cable route was very challenging at High Tide the maximum depth was 25m through the shipping lane and an had a minimum depth of 2m across the sand flats. At low tide these sand flats are clear of the water.

Otago Harbour experiences very fast moving tides and we needed to have the ability to hold our position and anchor quickly if required.



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Loading the Cable – Failing Fast

We started off using quite an elaborate system to load the cables onto the barge however this was not successful.

Due to the cable size and weight the running gear started to damage the cable sheath

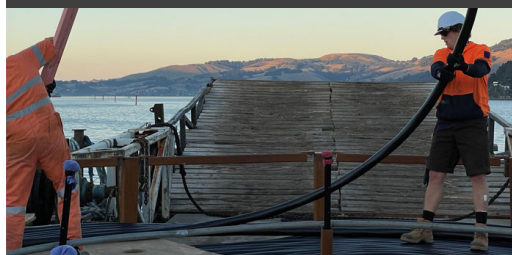
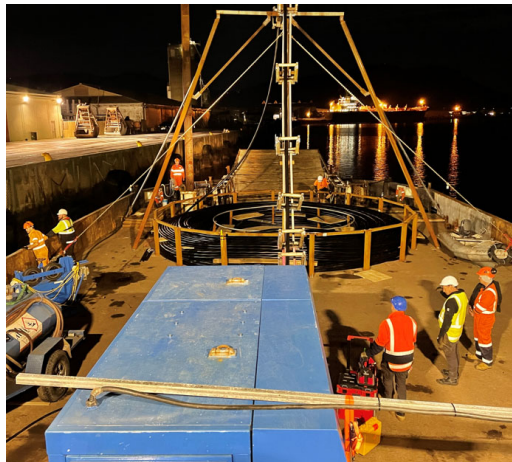


We needed to find another option.

We ended up shifting the position of the barge and reversed the direction of the cable laying equipment to load the cable.

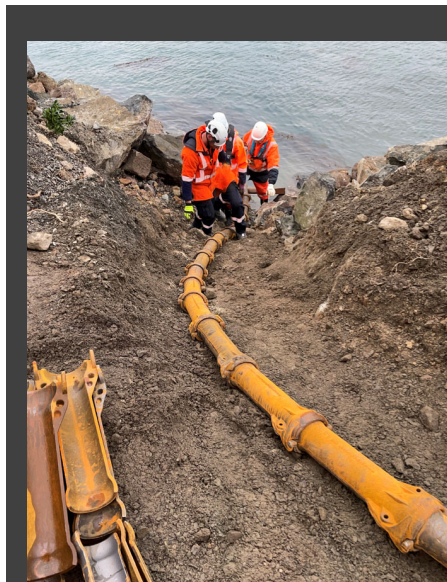
This was successful...and cheaper!





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Pictures of cable loading



ProtectorShells – Port Chalmers



Ducting down the bank at Portobello



Anchor Block for Ducting at Portobello

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Bringing the cables onshore





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Lay Day



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Post Lay Inspections

Following the installation of the submarine cables we have completed two dive surveys.

- The first was immediately following the installation to ensure correct placement.
- The second was 6months post lay to ensure that the cable was settling well into its new environment.

The cable is settling well, however there are a few low level suspensions that we will monitor.



Questions?



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