

# **Puhoi to Warkworth - Foundation Strengthening**

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**Client:** NZTA

**Date:** November, 2019

**Type:** Construct

**Location:** Northland

New Zealand

**Consultant:** Beca

The Puhoi to Warkworth project extends the four-lane Northern Motorway (SH1) 18.5km from the Johnstones Hill Tunnels to just north of Warkworth. It is the first stage of the Ara Tuhono - Puhoi to Wellsford project.

Freyssinet NZ were engaged as part of the strengthening works of the foundationas. The scope consisted of supply and installation, involving:

- Supply and installation of 72no. 3.15m long 50mm diameter Freyssibars together with accessories
- Supply and installation of 30no. 5.4m long 75mm diameter Freyssibar + grde 1030MPa with the following characteristics:

Limit of elasticity: 3435 kN

Breaking load: 4237 kN

- Stressing of the above up to 60 kN. The 75mm bars were acting as tie bars of abutment wingwalls during an earthquake event, thus very low stressing force was applied.

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- Corrosion protection achieved with densoclad and grouting with Freyssigrout.

Works were completed safely, on time and within budget.