

# DARLING ISLAND, SYDNEY

FREYSSIMIX JET GROUTING FOR CONSTRUCTION OF HORIZONTAL BORE, INSTALLATION NEW SEWER LINE



**Client:** Multiplex Limited

**Specialist Contractor:** Menard Bachy Pty Ltd

## THE PROJECT

As part of the redevelopment of the Sydney Harbour Foreshore in Pyrmont (Sydney), new residential units have been constructed at the site of the old casino on Darling Island. Sydney Water needed to install 250m of new sewer line to the new development from the existing service. The new line passed through 190m of 'tidal-fill' material not suitable for the 375mm to 440mm diameter bores proposed (micro-tunnelling). It was thus necessary to improve this fill material using Freyssimix Jet Grout Columns (FJGC) to allow Sydney Water Board to perform a continuous bore successfully over the 190m distance. Ground improvement and hydraulic cut-off was also required to allow the construction of 4No manholes and 2No Send Shafts for the commencement of the bores.

## MENARD BACHY'S ROLE

A ground improvement solution was required to allow the successful completion of the bore and the installation of the sewer line.

The Freyssimix technology provided the following main benefits to the client:

- It provided a homogeneous, relatively firm, soil mass for efficient penetration with the trenchless horizontal drill.
- It provided a suitable foundation system for the pipe structure
- It drastically reduced water ingress during the works

- and, the FJGC can be drilled effectively through underground obstructions formed by masonry, sandstone blocks, mass concrete and some timber profiles as well as allowing constructions works to be carried out around existing/'live' services.

Along the bore alignment a series of short Freyssimix columns (1.5m in length) were installed in the fill material. A strip was formed which consisted of 1m diameter Freyssimix columns installed at 0.6m centres thus creating a continuous Freyssimix wall over the required distance. Every 3m along the 'strip' a column was installed all the way to rock (max 12m) to provide the permanent support for the pipe.

Freyssimix columns were also installed at 0.8m diameter at 0.6m centres from bedrock to existing ground level at all manhole and send shaft locations to provide structural support and hydraulic cut-off. Soil mixing was achieved by jet grouting with target column strengths of 1 to 5 MPa and a soil displacement in the order of 40% - 45%.

The job was successfully completed on a budget considerable lower than any other solution presented to the client. And the sewer line was installed and operational soon after grouting works were completed.

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