Case Study

INSTRUMENTING SYDNEY WESTERN HARBOUR TUNNEL ROUTE

BACKGROUND

To relieve traffic pressure on the existing Harbour Bridge and Tunnel, the NSW Government sought expressions of interest to build a second tunnel to the Western side of the harbour in July 2020.

In June 2021, NSW 2021-2022 budget allocated $6.3 billion over the next four years for the Western Harbor link to go ahead.

In Dec 2021the geotechnical investigation was awarded to GHD and SMEC.

HMA Geotechnical was selected to provide the instruments and installation equipment for boreholes in nine locations.

Site work commenced mid-February 2022

Figure 1 – Sydney Harbour Bridge

OBJECTIVE

- Supply and install 32 Vibrating Wire piezometers in nine boreholes up to 135m depth
- Install nine Loggers
- Activate loggers and fit Gatic covers.
- Ensure loggers were accessible on the online web portal.

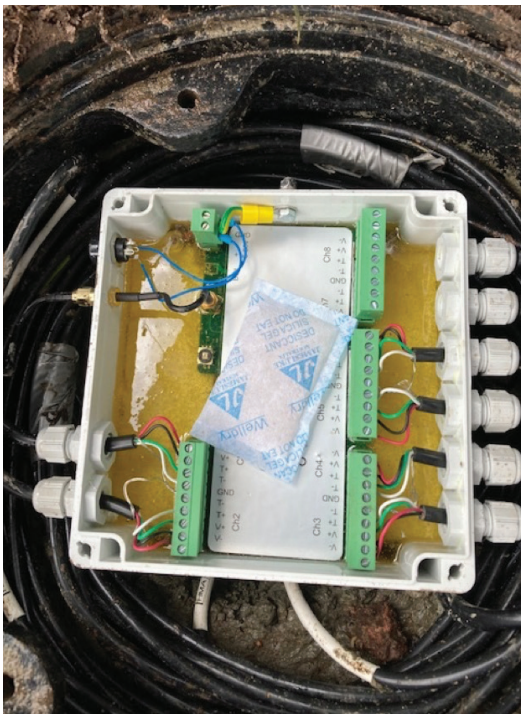

Figure 2 – Client supplied Loggers

CHALLENGES

- Restricted access.
- Limited working hours due to local curfew.
- Working in poor weather conditions.
- Working with unfamiliar logging equipment.
- Working near public access

SOLUTION AND OUTCOME

HMA Geotechnical's winch truck was the best option for installing the vibrating wire instrument strings.

The winch truck was developed by HMA Geotechnical to deliver instruments and grout line up to 1000m and be self-contained when grouting.

By adapting the trucks configuration, operation within the narrow confines was made possible.

Figure 3 – HMA Winch Truck at Bay Rd Waverton

HMA Geotechnical worked at nine locations along the route of the tunnel.

- Birchwood Rd Balmain
- Louisa Rd Balmain
- Punch Park Balmain
- Waverton Park Waverton
- Bay Rd Waverton
- Balls Head Rd Waverton x 2
- St Leonards Park North Sydney
- Falcon St North Sydney

HMA Technicians installed the nine grouted instrument strings and the loggers in the most difficult weather conditions.

The collar pipes were cut down below ground level to allow the gatic cover to sit flush with the surface.

The flush mounted antenna was installed on the gatic lid to allow communication with the online web portal.

The ground around the collar and gatic cover was made good with concrete and topped off with either cold asphalt or soil.

Figure 4 – Completed instrument strings

A bluetooth connection via an IPhone app allowed the configuration of the logger and activation of the GPS locator and Web Portal. All fine tuning of the data could be achieved remotely i.e., Uploading calibration coefficients and zero readings.

At the end of this case study is an example of data collected by the client's web portal.

HMA Geotechnical completed all site work by early April 2022 and their technicians returned to Melbourne.

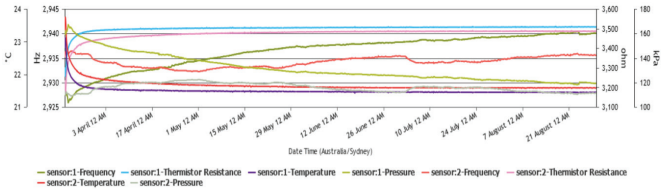

Figure 5 – Output from client's web portal

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