

RANDWICK RACECOURSE THURST BORING

OIL/GAS | **SEWER** | STORMWATER | POWER | WATER | TELCO



LOCATION

Randwick Racecourse NSW



CLIENT

Laing O'Rourke



PIPE

DN450 RC jacking pipe



GEOLOGY

Sand



LENGTH

80 metres



TECHNIQUE

GBM & thrust boring

PROJECT OVERVIEW

As a part of the early enabling works for the new Sydney Light Rail, the existing stormwater drains had to be redirected to avoid the main construction works. Part of these works had to be installed under the Randwick Racecourse using a methodology that did not impact on the horse training and racing above. The client chose UEA's Guided Boring System to perform the works.

SCOPE OF WORKS

UEA's team installed 80 metres of DN450 S Series Class 4 RC Jacking Pipe (RCP) on a 0.5% grade beneath the Royal Randwick Racecourse using its Akkerman Guided Boring Machine (GBM) combined with its Robbins 430 Auger Boring Machine.

The client needed to ensure that the racetrack would not be affected by any ground movement such as heave or syphoning. UEA worked with Laing O'Rourke and prepared a suitable methodology to undertake the bore. The solution was based upon the geotechnical information provided, which confirmed the ground was fine to medium grained sand and had some trace silt as well as water.

CHALLENGES

Pilot Bore:

The displaceable ground was highly suited to the GBM, which was used to complete the on-grade pilot bore. It also has the advantage of causing no ground movement, as the pilot tubes have a diameter of 110mm and it displaces the ground as it progresses.

Lead Case:

With the high risk of both heave and subsidence present and the implications either of these would cause, it was imperative that UEA design the lead case correctly. It was decided to run with a splitter head on the lead pipe, avoiding the heave issue as UEA could monitor thrust pressures as the pipe progressed.

Steel Enveloper Pipe Installation:

To avoid syphoning, UEA ran the lead auger 500mm back from the end of the lead pipe, ensuring the ground would be supported while the steel pipe progressed. Whilst the case progressed with the auger 500mm back from the end of the pipe, thrust pressures were carefully monitored as any sudden increase



would indicate the auger was not clearing the case and would be at risk of heave, especially in sand ground two metres from the surface.

As the bore was grade critical, and as water was present, there was a minor risk that the GBM pilot tubes could sag, which could cause the steel pipe to drop during installation and lose grade. To avoid this, UEA relocated the Akkerman GBM to the receipt pit and connected back onto the GBM pilot tubes to pull the rods at the same rate as the auger boring machine installed the steel enveloper pipe. The pulling of the pilot tubes prevented the pilot tubes from sagging and assisted with the installation.

COMPLETION

The auger boring and methodology was a success, and the steel enveloper was installed within 10mm of the required level. The methodology worked perfectly with no impact on the racetrack whatsoever.