RANDWICK RACECOURSE

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

LOCATION	Randwick Racecourse NSW	**GEOLOGY**	Sand
CLIENT	Laing O'Rourke	**LENGTH**	80 metres
PIPE	DN450 RC Jacking Pipe	**TECHNIQUE**	GBM/thrust boring

PROJECT OVERVIEW

UEA completed an 80 metre bore for Laing O' Rourke. The 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.

TECHNICAL DETAILS

The client needed to ensure that the race track would not be affected by any ground movement such as heave or syphoning, both of which can incur when undertaking a large bore within two metres from the surface. 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.

Pilot Bore: The displaceable ground was highly suited to the GBM, which was used to complete the on grade pilot bore. The GBM is capable of undertaking 150 metre pilot bores where it can guarantee grade accuracy of +/- 25mm. 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 for the ATC, it was imperative UEA design the lead case correctly. UEA 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. The splitter head is connected to the GBM installed pilot tubes via a bearing swivel fitted at the head of splitter.

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.

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. The auger boring and methodology was a success and the steel enveloper was installed within 10mm of accuracy.

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