

PEZZIMENTI TUNNELBORE



Specialising in: **Highly Accurate, Laser-Guided Microtunnels**

Sydney Uni

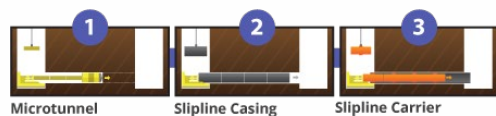


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METHOD FOR MICROTUNNEL 1

Freebore and Pipejack



OUTCOME

Pipe in a Pipe



LENGTH

221m
TOTAL



DIAMETERS

Ø550
Ø630



GROUND

Shale &
Fill



CARRIER PIPES

GRP



OUTER CASING

Steel



The designer (Warren Smith and Partners) had the challenge of getting the sewer from a new development within Sydney University to an old oviform sewer traversing nearby.

Various options were considered and faced the challenge of depth (8m deep) around existing infrastructure and services.

Early in the concept phase, Warren Smith and Partners approached Pezzimenti to look at the possibility of boring below the Sydney Uni Oval # 1 which they use as their Cricket and AFL oval. Under no circumstances could this oval be dug up with games being played every weekend.

Client / Head Contractor

Diona

Designer: Warren Smith & Partners

Location

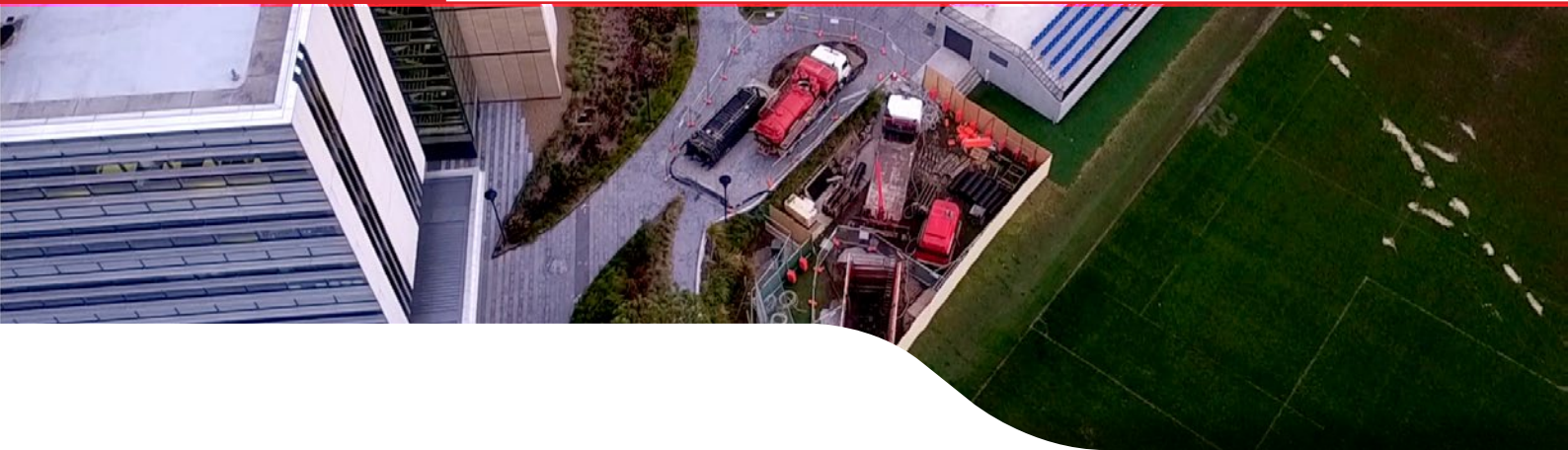
Sydney University

Length

221m Total
201m + 20m microtunnels

Categories

Intercept Bore
Sewer



Geotech Investigation

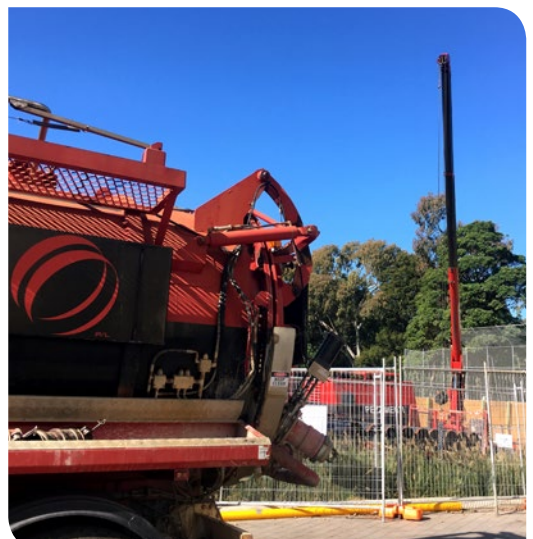
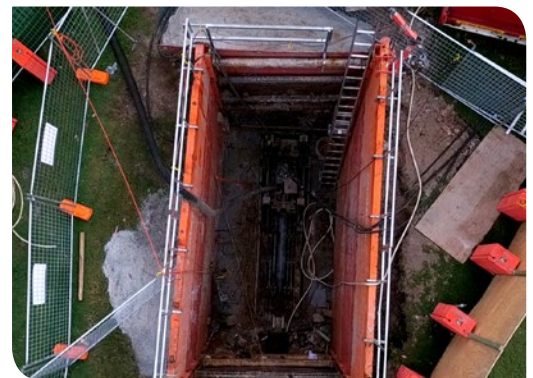
A geotech investigation was undertaken to determine the likely ground the bore would pass through - this is critical in determining firstly possibility and then methodology. The study showed shale throughout most of the bore becoming clay and then the possibility of some fill at the end.

Given the ground conditions, it was decided to free bore (no sleeve) from the shale end to a point whereby the bore would no longer stand up in the clay.

The shaft was 8m deep and had to be expanded to fit a scaffold access (Lend Lease requirement) and a sideline drop junction - so essentially it was about twice as big as a normal shaft in a reasonably tight area. Both Pezzimenti's crane truck and a large excavator were used for crange as access to the shaft was difficult. All spoil was to be removed off site which meant Pezzimenti had to run two bins to a registered tip. With space being a premium, Pezzimenti managed to setup the power pack, crane truck, vacuum and two bins at the shaft.

The shale posed no problem in boring but it did need to come out wet as the ground conditions were quite damp. Also - boring negative (downhill) meant whatever moisture the bore made, it would drain to the face. The bore continued into the clay strata. As there was suspected fill at the other end, a free bore could not continue the full 200m as the fill was not self supporting.

A low point in the above ground profile (3m deep) was selected to finish the first of the intercept bore - this was right at the edge of the main Oval just before the ground started to rise. The rods were retracted and steel sleeve inserted into the bore to protect it from collapse. When the second (receive/send) shaft was dug, fill with considerable voids within was found. Therefore, pipejacking was required to meet the intercept. That being the case, an intermediate shaft where the two bores met was required so that the head could be removed at that point. This was only able to be opened early in the week so that it may be backfilled and turfed come game day.





Debris Encountered

The bore progressed through fill with all sort of building rubbish including tin, bolts, nuts and even a horseshoe found blocking the vacuum at the shaft. The main risk here is hard material amongst soft material not breaking up and either blocking the vacuum or making a large disturbance at the face causing overcut. By luck or good management (actually both), the second bore was successful and met up with the original. The head was removed and the sleeve pushed through to meet the original sleeve. The carrier main was inserted and the bore successfully grouted. Additional grout was required as it seemed to escape outside the sleeve and into the voids within the fill.

With no area to dispose of additional grout, it was decided to fill as much as possible from the bottom end (as calculated) then come back and top it up from the top end at a later date.

Tunnelling directly into a manhole

The connection to the oviform was designed to bore straight into an existing 100 year old manhole - 10m below the the channel - as flow could not be stopped for an extended period. The same shaft as the original bore was used (as this is the location of the connecting manhole).

After going through a few possibilities with the designer and client (Diona), it was decided to bore directly into this manhole. However, it was unknown whether reo was in the structure - if so then special cutters would be required.

The carrier main was a 450GRP pipe so a connection of at least 600mm was required. Pezzimenti bored up to the manhole with a 630mm head, pulled back, inserted steel sleeve then installed the special cutters to break through the manhole. The carrier main was then installed and grouted up for a successful connection.



PEZZIMENTI TUNNELBORE



For all inquiries – including Job Inspections,
Quotations and Project Feasibilities –
please don't hesitate to contact Pezzimenti
Tunnelbore. We are confident we'll hit the
mark on your next microtunneling project.

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