

ALPHINGTON TRUNK SEWER



CLIENT

Lend Lease Engineering

LOCATION

Alphington, Melbourne, VIC

TYPE OF CONTRACT

Construct Only

VALUE

\$10 million - \$15 million

CONSTRUCTION PERIOD

Jun 2014 - Aug 2015

OVERVIEW

The Alphington Trunk Sewer Replacement, which services some 85,000 homes, was a major upgrade of essential sewerage infrastructure in the area for the existing old brick sewer which was deteriorated significantly due to a century of use. The replacement section of sewer integrates with the existing sewer operated by Melbourne Water and the reticulation system operated by Yarra Valley Water.

Rob Carr Pty Ltd was engaged by Lend Lease Engineering to undertake the construction of approximately 1km of pipeline via Microtunnelling over 4 separate drives. Drive lengths varied between 80m for the DN700 line and 587m for the DN1500 line. To facilitate the TBM launch and reception as well as construction of detailed complex concrete maintenance structures (DN5000) and detailed connections to existing assets, Rob Carr constructed access shafts to depths of up to 16m and 9m in diameter.

Varying methodologies were used to construct the access shafts with consideration given to ground type, strength and location within the environmentally sensitive park zone. Underpinned caissons were the preferred choice for the deep shafts in the confined locations with traditional methods used for the shallower shafts. The most challenging aspect of this particular project was the construction of a single 587m drive using DN1500 reinforced concrete jacking pipe, which was installed on a curved alignment to facilitate the installation of the pipeline within critical stakeholder boundaries. A second 272m drive was also installed on a curved alignment to complete the DN1500 section of the work. This 2nd drive was also constructed through existing infrastructure at key points, which necessitated the diversion of major sewage flows during this time. Rob Carr Pty Ltd used its TCS 1500 Iseki TBM to successfully construct the two curved drives on the major section of the work, which was custom built to suit the 300 MPa native rock found throughout portions of the alignment.

PROJECT SCOPE

- DN1500 RCP Microtunnel consisting of 1 single drive of 587m and a 2nd single drive of 272m both on curved alignment
- DN1300 GRP Microtunnel, single drive 80m on straight alignment
- DN700 RCP Microtunnel, single drive 120m on curved alignment
- 16m deep x 9m ID launch shaft constructed by caisson using underpinned precast segment method
- 12m deep x 6m ID reception shaft constructed by caisson using underpinned precast segment method
- DN3200 and DN5000 cast in situ reinforced concrete manhole structures to 12m and 16m deep
- Multiple live connections during night shift

PROJECT HIGHLIGHTS



Variable ground conditions from running water-charged sands to 300MPa rock.



Welding was undertaken inside 600m long pipe under confined space conditions.



Curved alignment undertaken, with 1/1000 grade fall requirement was successfully achieved.



Intricate staging and coordination required for the delivery of the project, due to the clients interfacing works.



\$500k savings resulting from reduction in trenchless excavation disposal costs.



Tight site footprint, dewatering was reduced, while large volume of existing materials was re-used on site to reduce environmental impact of the works.



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Top: Initial Launch of Iseki TCS1500 | **Bottom Left:** Iseki TCS1500 received at reception shaft | **Bottom Right:** Construction of DN5000 in situ concrete manhole