

HOBAS® Jacking Pipes Down Under HOBAS® Pipes Jacked at Ports Cape Lambert and Victoria Harbour, AUS

The Pilbara Region in north-western Australia was first inhabited by the ancestors of today's Aboriginal people some 50,000 years ago. Since 2012, HOBAS Jacking Pipes D_e 2250 are playing an important role as stormwater drainage lines for the emerging mining industry. To the South, in Melbourne, HOBAS also scored with high-quality Jacking Pipes D_e 427: Here, a HOBAS Sewer System was installed by means of jacking.

In the 1950's, it was discovered that the Pilbara area is home to one of the world's largest iron ore deposits. Since then it has been an integral contributor to the Australian economy with the help of mining companies such as Rio Tinto. With most of the ore being exported today, a rail infrastructure and large ports have been built to accommodate the ore transportation. One of the largest of these ports is Rio Tinto's Cape Lambert. Trains travel in from Rio Tinto mines throughout the region, carrying around 80 million tonnes of iron ore per year into Cape Lambert for processing and ship loading.

Cape Lambert is currently undergoing an upgrade, which will see its capacity more than double by mid 2015. At the project's completion, an estimated 200 million tonnes of iron ore will be exported per year from this port. An integral part of the upgrade project was the extension of the "Sam's Creek" drainage lines, which run under the existing rail lines allowing the release of stormwater during the wet season. The rail lines needed to stay in constant operation throughout the construction works in order to ensure the continual loading of ships. Stopping the productivity was not an option, making trenchless installation the only choice.

The designer of the new drainage culvert Sinclair Knight Merz planned two rows of 2100 mm internal diameter pipes with approximately 100 meters length each. HOBAS Jacking Pipes with an outside diameter of 2250 mm and a stiffness of SN 32000 were specified for this purpose. With the soil being hard and rocky, the initially calculated jacking force added up to 7850 kN. Thanks to the smooth outer surface of HOBAS Jacking Pipes, the actually applied jacking forces were much lower than expected. The substantially smaller outside diameter as compared to an alternative concrete pipe had the additional benefit of allowing increased ground cover beneath the rail line, reducing both risk and installation time. Furthermore, the lead-time for HOBAS was substantially shorter than that of locally supplied concrete pipe, and given the tight timeframe for the project, HOBAS proved to be the best solution.

The installation set a new record in terms of the largest diameter HOBAS Jacking Pipe ever installed in Australia, and it paved the way for similar projects in the ever-growing mining industry in Australia. The Rio Tinto drainage system was also used as an opportunity for creating cultural awareness: Local artists were invited to paint the HOBAS Pipes in the artistic style of the traditional landowners. The imagery is supposed to bring good fortune to the land and HOBAS Pipes have become truly part of the local landscape.

Year of construction

2012

Construction time

6 months

Total length of pipe

308 m

Pipe specifications

D_e 2250, PN 1, SN 32000

Client

Rio Tinto

Designer

Sinclair Knight Mertz

Contractor

NRW, Tunnel Boring

Australia

Advantages

Low jacking forces,

small inner/outer

diameter ratio



Year of construction

2012 - 2013

Construction time

2 months

Total length of pipe

150 m

Pipe specifications

D_e 427, PN 1, SN 100000

Client

City West Water

Designer

GHD

Contractor

Abigroup,

Edge Underground

Advantages

**Almost non-absorbing
outer surface, low
coefficient of friction,
small inner/outer
diameter ratio**

In another recent project, a HOBAS Sewer Pipeline was jacked for a new residential development right in the heart of Melbourne. The Victoria Harbour project was realized just meters away from the iconic and environmentally sensitive Yarra River. Having been polluted by contaminated stormwater for years before the government implemented an effective treatment system, the banks of the Yarra River still contain contaminated soil. Since this soil is quite expensive to dispose of, this was a critical point when it came to the choice of a suitable pipe and installation method.

The general ground conditions were also quite problematic: Silty clay and wet sand required a non-porous pipe with a low coefficient of friction to ensure the jacking loads would not build up in case the sticky ground clamps around the pipe. The design engineers and installation contractors evaluated all alternatives and eventually opted for HOBAS Jacking Pipes D_e 427 SN 100000 with stainless steel couplings: Featuring the largest possible inner diameter in relation to their outer diameter, HOBAS Jacking Pipes kept the excavated soil to a minimum and were also optimal for the difficult soil thanks to their smooth and almost non-absorbing outer surface.

Most of the 270 m long pipeline was installed in sections up to 7 m deep with a thrust force of approximately 80 kN, the longest drive was 76 m. Surprisingly enough, the tunnelling contractor encountered an unexpected obstacle during the jacking process: a large timber pile suddenly showed up along the alignment of the jacking track, and there was no other option than to jack the HOBAS Pipes straight through the middle of it. The sewer has been successfully completed, on time and within budget. The builders can now carry on with erecting the highly sought after, multi storey apartments that will deliver some of the most beautiful harbour views in Melbourne.

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