

DTSS2 TODAY

Issue 6: Nov 2021



LK2C2: Breakthrough of 3m diameter Pipe-Jacking Machine at Shaft N3 (International Business Park Road)

PROJECT PROGRESS

The Deep Tunnel Sewerage System Phase 2 (DTSS2) project has crossed the halfway mark with overall progress at 56.3% as of end Oct 2021.

Tunnelling work is expected to be completed by the first quarter of 2023, with the casting of the secondary lining currently ongoing. In Sep 2021, Penta-Ocean & Koh Brothers Joint Venture (POKB JV) marked the completion of the tunnelling works of our Industrial Tunnel.

At Tuas Water Reclamation Plant (WRP), 50% of the contracts have been awarded and are active on site. Bored piling works for the Influent Pumping Stations and Biosolids Area have been completed.

DTSS PHASE 2



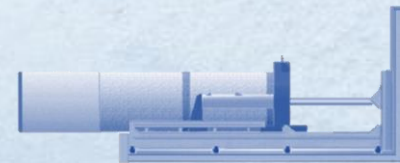
56.3%
Overall Progress



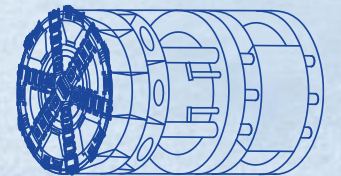
38.3 million
Total Man-hours (Overall)



Domestic Used Water
650,000m³/d
Industrial Used Water
150,000m³/d



Link Sewer
Internal Diameter:
0.3 to 3m



Tunnel Internal Diameter:
3 to 6m

CONVEYANCE

Link Sewer



34.7%

Construction Progress

3.3 km

Length Jacked

Tunnel



35.4 km

Length Tunnelled

0.8 km

Length of Corrosion Protection Lining (CPL) completed

11/19

Tunnel Boring Machine (TBM) in Operation

8/20

TBM Breakthroughs



50

Active Sites



61%

Construction Progress



28.0 million

Man-hours worked

Completion of Industrial Tunnel by Contract T-08

A walk from Jurong to Tuas Water Reclamation Plant



Marking the completion of the Industrial Tunnel with breakthrough of TBM Pioneer at Shaft V3 (Pioneer Road)
Front Row, Left to Right: Project Director Toshio Araki (POKB JV), Director Yong Wei Hin (PUB), Chief Engineer Woo Lai Lynn (PUB), Project Director Dr Ganeshan (Binnies + AECOM JV), Deputy Project Director Benson Tan (Binnies + AECOM JV).

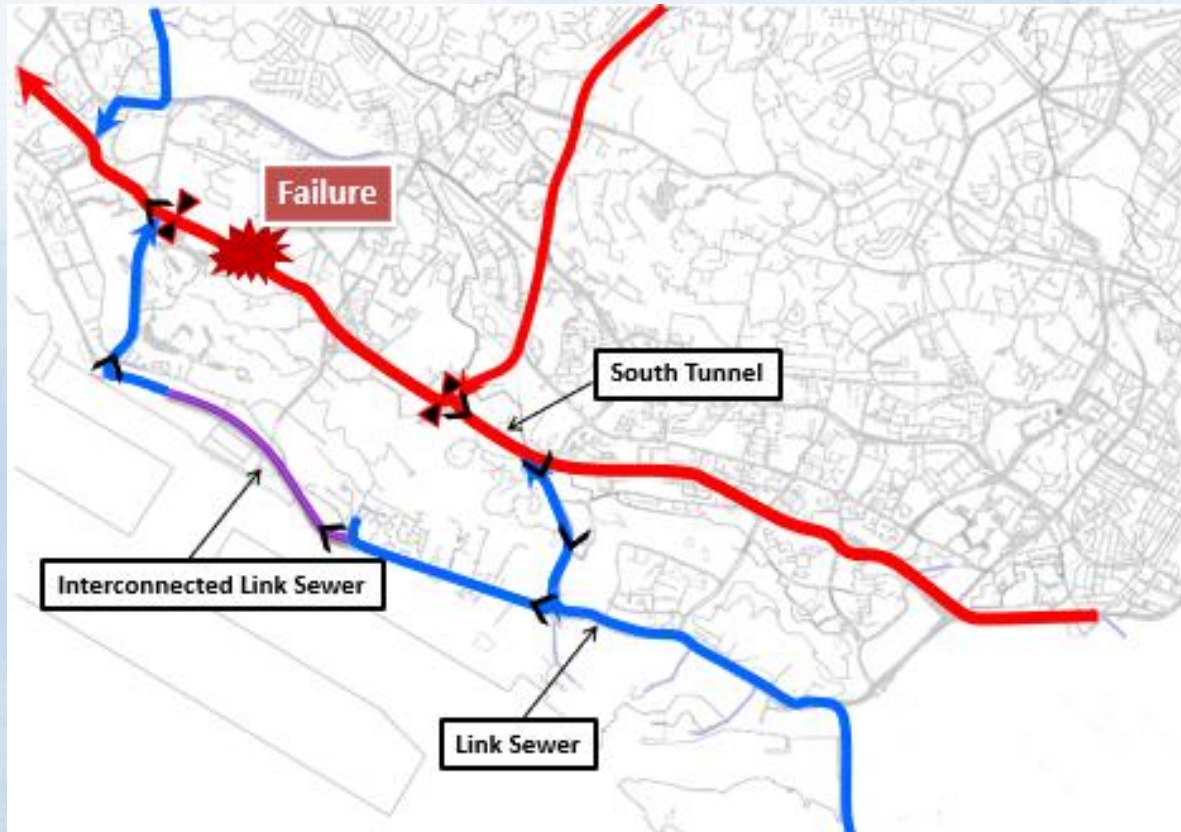
On 30 Aug 2021, POKB successfully completed the Industrial Tunnel, with an approximate length of 7km and internal diameter of 4.7m to 5.4m. This is one of the three tunnel drives in DTSS2 that encompasses subsea tunnelling.

Despite the COVID-19 restrictions that resulted in the TBM stopping under the sea for more than 3 months, POKB managed to complete the tunnelling work ahead of their planned schedule. This is a true display of the commitment and dedication of the team in working around the clock to achieve this milestone.

Upon the completion and commissioning of the Industrial Tunnel, the existing industrial used water, which is currently being channeled to Jurong Water Reclamation, will be directed into the Industrial Tunnel and conveyed to the future Tuas WRP.

Testing of Roller Gate

One of the unique features of the DTSS2 tunnel is the ability for critical sections to be isolated using large roller gates. The roller gates are co-designed by the Main Contractor, Smitech Engineering, and their specialist sub-contractors, Erhard Muhr GmbH (Muhr) and Pan Asian Flow Technology, and are manufactured by Muhr in Germany. Both companies are well-established M&E companies in the industry.



Assembly of the gate module in Dec 2020



Lifting of roller gate in Dec 2020

During a tunnel isolation event, these gates will be mobilised and assembled on-site like massive Lego blocks. The overall used water conveyance operation is maintained by channeling the used water from upstream of the isolated tunnel section to the link sewers to the DTSS2 tunnel downstream of the isolated tunnel section.

Wet testing and fit testing of the gate was successfully carried out to verify how the gate functions under full water level condition, while maintaining leakage within the allowable limits.

There are a total of 32 gate shafts across the DTSS2 tunnels. These gates are planned to work in pairs, i.e. when they are lowered into any 2 adjacent gate shafts, the section of tunnel between the 2 gate shafts will be kept dry for man entry should the need arise. Depending on the size of the tunnel to be isolated, these roller gates range from 2.5m to 6m in height.

Link Sewer Schedule 2 Team

In this issue, we learn from the team behind Link Sewer Schedule 2 - Siew Hong, Chun Jing and Lawrence share exactly what the Link Sewers are all about.



Principal Engineer Lo Siew Hong (PUB)

What role do the Link Sewers play in the overall conveyance system?

Link sewers are constructed to collect used water from existing sewers upstream, which is then transferred to the to the future Tuas Water Reclamation Plant via the South Tunnel/Industrial Tunnel.

What are some challenges that stand out?

In the early days, one of the challenges I faced is seeking land take approvals from various land owners and obtaining approval for the link sewer alignments to co-exist with other infrastructures/utilities within limited land space. The other challenge is to call a 3-in-1 tender for consultancy services to implement the link sewers across the three Schedules; this being the single largest consultancy tender I have come across.

What is some of the significant milestone achieved for Link Sewer to-date?

Since 2020, I have witnessed a couple of pipe jacking machine (PJM) breakthroughs of various sizes ranging from 800mm to 3000mm in diameter. The most recent PJM breakthrough was in Sep 2021 when we completed a 3000mm diameter sewer span under Schedule 2. This is a significant milestone as it marks the first link sewer PJM breakthrough into a Tunnel Shaft.



Senior Engineer Lawrence Lek (PUB)

How is it like working as a team under one Schedule?

Teamwork is very important because it enables us to share ideas, experiences and responsibilities. Under Schedule 2, I get to work with various team members with different backgrounds. At times conflicts might arise, but it is interesting and motivating to see how the team moves towards a common goal despite their differences and grow together.



Senior Engineer Tay Chun Jing (PUB)

TUAS WRP

Foundation and piling works are ongoing throughout the site. In parallel, Mechanical, Electrical, Instrumentation, Control and Automation (MEICA) engineering and procurement works are in progress.

Contract 3B1

Industrial Liquids Module 1 – MEICA

Contract awarded to Koh Brothers Building & Civil Engineering Contractor (Pte.) Ltd. in October 2021.

Contract 3D2

Domestic Liquids Module 2 – MEICA

Tender closed on 22 November 2021 and tender evaluation is in progress.

Contract 4A

Biosolids and Digesters

Casting of outer ring beam for 4 out of 8 Digesters has been completed

Contract 1A

Site-wide Development Works

65% of the site-wide infrastructure has been constructed.



7.1 million
Man-hours worked



9/18
Contracts awarded



12.3%
Construction progress

TUAS WRP

Contract 1A

Site-wide Development Works



An aerial view of the Pipe Jacking Machine being lowered into one of the manholes.

In Sep 2021, pipe-jacking works commenced at a depth of 38m. This pipe-jacking machine is unique as it is retractable from the shaft it was launched from, thereby de-linking with the works at the receiving shaft and enhancing productivity.

Contract 2A

Influent Pumping Stations



An aerial view of the IPS Coarse Screening and Influent Pump Station shafts.

A major milestone was achieved when bored piling works was completed on 15 Oct 2021. Shaft excavation works are on-going, with four of the five shafts under excavation today.

Contract 4A

Biosolids and Digesters



An aerial view of the Biosolids Building and Digesters.

Casting of outer ring beam for 4 out of 8 Digesters has been completed. Rebar preparation works are on-going for the raft slab (inner ring) of Digesters 2, 6 and 10.

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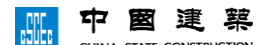
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