

DTSS2 TODAY

Issue 3: March 2020



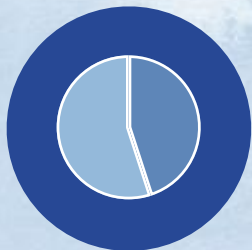
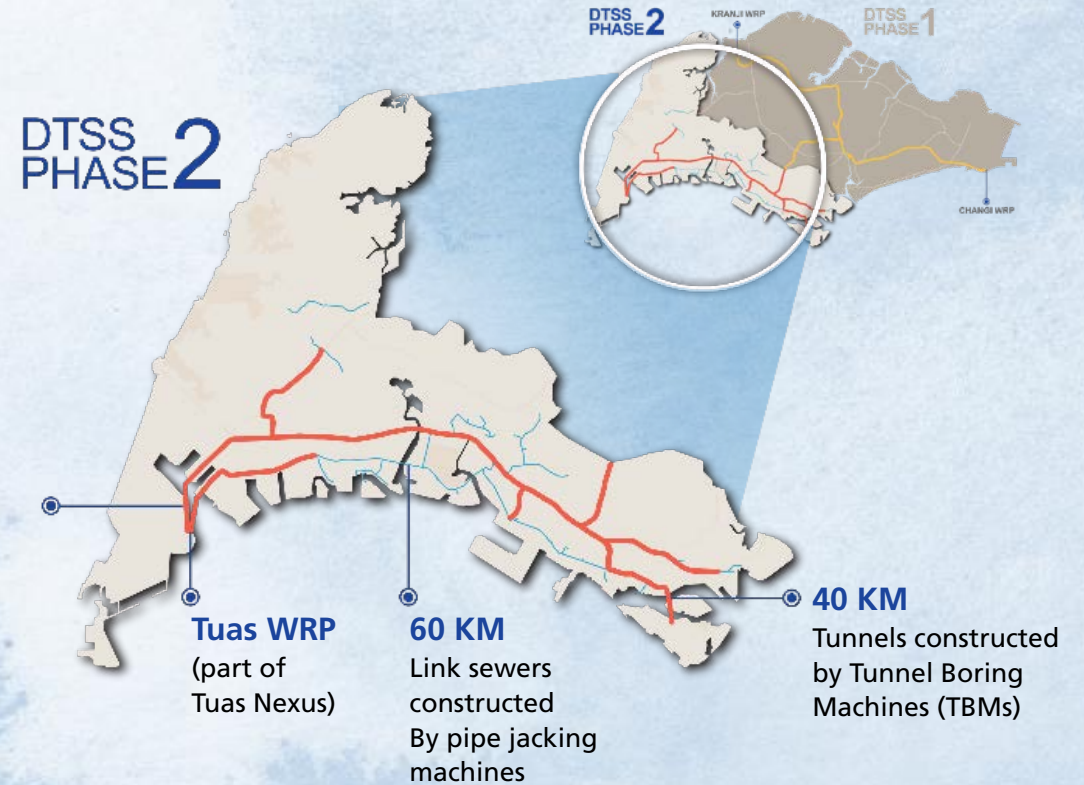
Photo: TBM Jurong Hill

PROJECT PROGRESS

The Deep Tunnel Sewerage System Phase 2 (DTSS2) project is picking up speed. 9 tunnel boring machines (TBMs) are in operation today and 3.6 kilometers of tunneling works have been completed.

At Tuas Water Reclamation Plant (TWRP), guide wall construction has commenced for the shaft diaphragm walls of the Influent Pumping Stations and site development works are also progressively being carried out.

With the flurry of activities on site, DTSS2 has crossed the 10 million safe work hours milestone; a significant achievement for the whole project where safety is paramount.



34.74%*
Overall Progress



17.4 million
Total Man-hours Worked



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



Link sewer
internal diameter
0.3 to 3.0m



Tunnel internal
diameter:
3.0 to 6.0m

* Reduction in progress due to re-baseline of programme with the repackaging from 11 to 18 contracts for Tuas WRP

** Information accurate as of 29 Feb 2020



DTSS2 Project Safety Leadership Forum Members

DTSS2 PARTNERS COMMITTED TO HIGH HEALTH, ENVIRONMENTAL AND SAFETY STANDARDS



DTSS2 is presently the largest project in PUB, with an estimated of 3,000 workers active onsite. I am heartened to learn that, as of today, we have racked up more than 12.5 million accident-free man-hours. This would most certainly be impossible without the collective effort of every one of our partners involved in the project.

DTSS2's safety mission is to strive for high safety standards, surpassing what are industry norms. Safety has and will always remain a priority. And we have, from project start, developed and put in place a comprehensive safety management plan to make this an everyday reality.

As we celebrate, let us be mindful that these are still early days. DTSS2 will require 100 million man-hours before it is complete. We have a long way to go, and I urge everyone to keep up the good work.



Mr Ng Joo Hee,
Chief Executive of PUB, Singapore's National Water Agency

CONVEYANCE



13.3 MILLION
MAN-HOURS WORKED

LINK SEWER CONTRACTS

12 Contracts



11/12

Contract Awarded



13%

Construction Progress

TUNNEL CONTRACTS

5 Design & Build Contracts



9/19

TBMs in Operation



46/50

Active Sites



3.94km

Length Tunnelled



34.5%

Construction Progress

*Information accurate as of 29 Feb 2020

OUR TUNNEL BORING MACHINES

Since Q3 2019, seven more TBMs have been launched across various DTSS2 sites. There are now nine TBMs in operation. Another 9 TBMs will be launched progressively this year while the final TBM will be launched in early 2021. These 19 TBMs will construct a total of 50 kilometres of tunnels by 2022.



Final checks on TBM Spooner before initial drive



TBM Pioneer – cutter-head assembly



Lowering of TBM Jurong Hill



TBM Yuan Ching – Site acceptance test



TBM West Coast's factory acceptance test in China



TBM Buroh being prepared for launch



TBM Benoi assembly

TUAS WRP

Contract 4A

Biosolids and Digesters

Tender closed on 14 November 2019 and tender evaluation is in progress

Contract 3C

Domestic Liquids Modules –
Civil and Building Services Works

Tender closed on 12 March 2020.

Contract 1A

Site Development Works

McConnell Dowell is progressively setting up permanent site-wide facilities. A sentry post equipped with facial recognition access control system has also been set-up to streamline the access to the site.

Contract 2A

Influent Pumping Stations

KB-CH JV has completed its soil investigation works around the five shaft locations in December 2019.

The start of 2020 has seen the installation of three test piles and the commencement of guide wall construction for the shaft diaphragm walls.



1.86 MILLION
MAN-HOURS WORKED

*Information accurate as of 29 Feb 2020

TWRP WINS BIG WITH THREE GLOBAL AWARDS



Tuas Water Reclamation Plant (TWRP) was crowned Project of the Year under the Water and Wastewater Plant category at the **Bentley System's Year in Infrastructure 2019 Awards** and Project of the Year under the water category at the **IChemE Global Awards**.

NEA's Integrated Waste Management Facility (IWMF) and PUB's TWRP, jointly known as Tuas Nexus was also awarded the Most Innovative Water-Energy-Nexus Project at the **International Desalination Association (IDA) World Congress 2019**. Tuas Nexus also received the Minister's Special Commendation Award at the **Ministry of Environment and Water Resources (MEWR) Excellence Day 2020**, for pioneering a new way in which public agencies work together to create better value for Singapore.



PASSION FOR ENGINEERING

Meet **Tiong Sen**, an Engineer working on Tuas Water Reclamation Plant. He is involved in the design and construction of the Influent Pumping Stations (Contract 2A) and work closely with consultants to execute projects with BIM.

As an engineer by training and practice, how would you describe your experience doing away with the typical 2D drawings?

I like adopting new technologies and methodology to improve the way we work. As such, I welcome the idea of doing away with the typical 2D drawings. Working on the 3D model allows us to better appreciate the scope and complexity of the works. The immersive experience of the 3D model provides the ability to walk through the model as though we are moving through a physical plant. This enables experienced plant operators to quickly identify potential improvement areas on operation and maintenance aspects of the design.



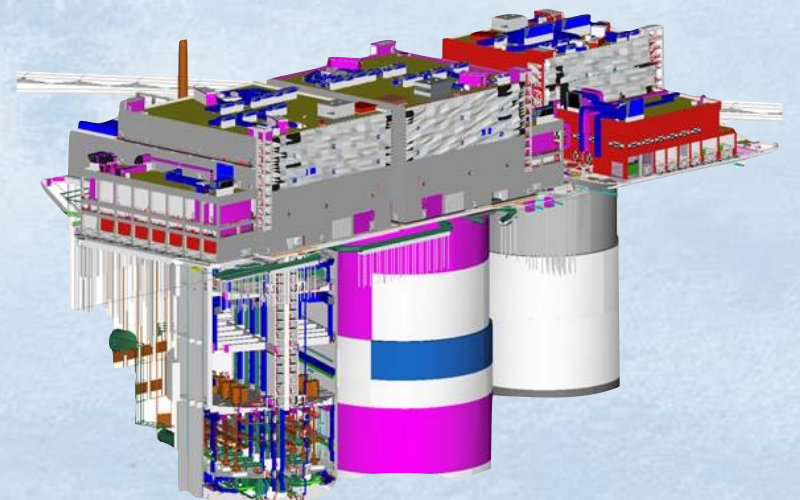
BIM is more than a tool or software, it is a process of collecting and sharing good data.

Give us a word to describe your feeling upon winning the Bentley's Year in Infrastructure 2019 Award in the Water and Wastewater Treatment category.

Rewarding. When I started on this project 4 years ago, the model was still in the early stages of development. It was mainly simple geometry to define the spatial requirement of the project. As the project progressed, the level of detail increased. Today, we are working on a model that looks like an actual plant with the civil structures, architecture, mechanical, electrical and instrumentation incorporated. I am glad that we are the first in Singapore to adopt a model-based tender by issuing a complete Virtual Design Model. As the tender process is rather short compared to the time taken for the design, we hope the model will be able to convey the design intent and the project complexity to the tenderers.

Now that you have got your hands on BIM at work, how is this skill applicable to your daily life?

The BIM philosophy is to share and make use of both graphical and non-graphical data at each stage of a project, improving project quality and efficiency, while facilitating efficient and sustainable designs. The quality of data will result in the effectiveness of the model. This is similar to our daily life where we are constantly receiving and exchanging information, creating a mental model in our mind. This mental model helps us to make informed decisions.



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