

PROJECT SHEET

LE HAVRE PORT 2000 3RD PHASE
 REALIZATION OF 2 BERTHS - BERTH 11 & 12
 CONSTRUCTION AND MAINTENANCE OF PORTS

BOSKALIS

Boskalis is a leading global marine contractor and services provider. With safety as our core value, we offer a wide variety of specialist activities to the oil & gas and renewables sectors. These activities include marine installation and decommissioning, seabed intervention, marine transport and services, subsea services and marine survey. In addition, Boskalis is a global dredging contractor, provides towage and terminal services across the globe and delivers marine salvage solutions.

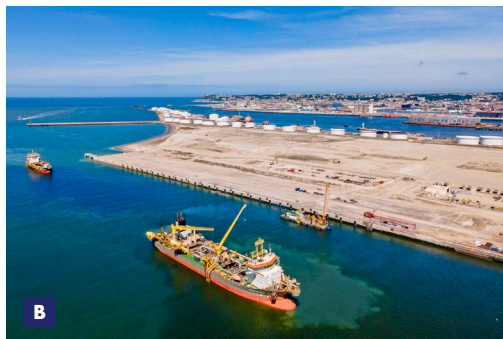
By understanding what drives our clients we are able to provide the solutions that enable them to meet their specific business goals. For this reason we are constantly looking for new ways to broaden and optimize our offering and are committed to expanding our proposition, supported by our financial strength. With our committed professionals in engineering, project management and operations, 500 specialized vessels and an unprecedented breadth of activities in 90 countries across six continents we help our clients push boundaries and create new horizons.

INTRODUCTION

In addition to the initial and 2nd phase of Port 2000 project, the Port Authorities decided in 2018 to continue with the final phase of this master plan and launched at the end of 2018 the tender for the final 2 berthing places.

As world's economy continued to grow and maritime traffic followed this growth, there was a need to continue the expansion of Le Havre port. The expansion should not only be able to coop with more cargo but also with bigger ships.

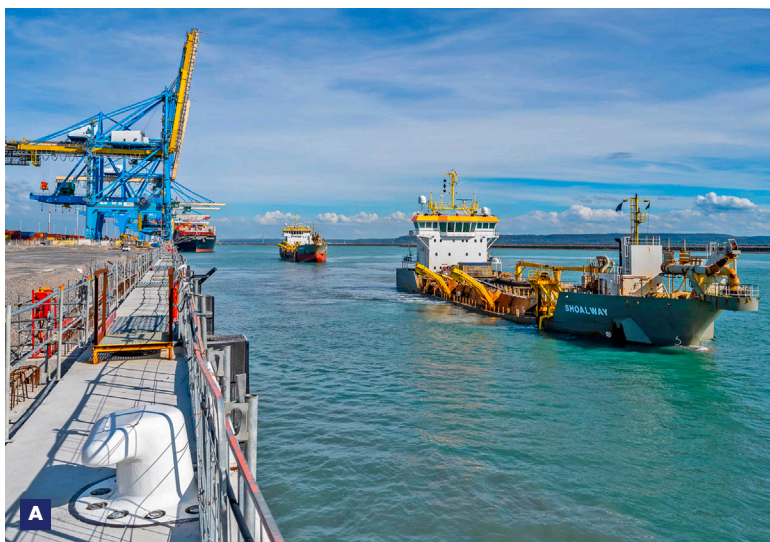
At the same time, the Port of Le Havre started the transition towards the renewable energy market with the installation of Siemens Gamesa turbine assembly plant. This new development made the movement of all container activities from the old port to Port 2000.



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FEATURES

Client	Grand Port Maritime du Havre
Location	Le Havre - France
Period	November 2019 - December 2022
Contractor	Joint Venture Soletanche Bachy - Atlantique Dragage - Bouygues TP-RF



A

In the period between completion of the 2nd phase of the works and the start of the final phase, a new generation of Ultra Large Container Ships (ULCVs > 14,500 TEU) were built. This required berthing space with a guaranteed depth of -18 CMH.

SCOPE OF THE PROJECT

The project consists of constructing 700 m of additional quay wall on top of the existing 3,500 m.

The contracting party is the joint venture Soletanche Bachy/Atlantique Dragage/Bouygues Travaux Public Region France.

The project can be divided into the following main activities:

- Deepwall construction + related civil works
- Dry excavation
- Ordnance detection
- Shore protection
- Dredging works

All works are executed by Soletanche Bachy, Bouygues TP RF and their subcontractors with the exception of the dredging works.

A TSHD Strandway and TSHD Shoalway

B TSHD Willem van Oranje, GD Medusa, TSHD Strandway

DETAILED PROJECT DESCRIPTION INCLUDING

- Start date: January 2020 for civil works; April 2021 dredging works
- Quantities of dredged material
 - 210,000 m³ coarse to very coarse material was pumped ashore
 - 2,343,000 m³ fine silty sand dumped at sea
 - 13,000 m³ contaminated sediments
 - 40,000 m² of seabed preparation for anti-scour protection

EXECUTED WORK

The main works were executed by using TSHD's. Medium size TSHD were used to create sufficient water depth (from -1 CMH till -6 CMH) before the large TSHD could take over. 90% of the dredged sediments was of bad quality and needed to be dumped at a designated dumping area offshore. 9% of the dredged sediments was of good quality and needed to be dumped ashore for re-use in a later stage. While the quaywall construction progressed, a pocket of contaminated sediments was discovered. This was treated as an additional scope for which a grab dredge with an environmental bucket was mobilized. These sediments needed to be stored in a confined, dedicated depot.

The final dredging depth varied from -17,00 CMH in the access channel till -18,00 CMH for the berth pockets. By experience, the Client learned that (un-)mooring of the container vessels would create a lot of scour in front of the quaywall hence jeopardizing the stability of the quaywall. Part of this contract was to install an "easy to maintain" anti-scour protection system. The client imposed concrete mattresses anti-scour. These concrete mattresses could only be installed in-situ and for that the seabed needed to be levelled with a high degree of precision. By using a grabdredge together with bedleveller Terra-Plana the project managed to achieve this goal.

EQUIPMENT DEPLOYED

- TSHD Shoalway
- TSHD Strandway
- TSHD Willem van Oranje
- GD Medusa
- WID Terra Plana
- Additional equipment such as multicat, survey launch, hopper barges



SPECIAL CIRCUMSTANCES

- Le Havre is known for its very coarse material which causes a high wear & tear on pumps and pipes
- Le Havre, as most of the port in the channel area, has to cope with high tide differences (up to 8 m during spring tide). A tricky business when dredging shallow area's
- Turbidity of < 100 mg/l was allowed for evacuated excess water. Concept of reclamation area was very important
- Discovery of contaminated sediments that had to be dredged in an environmental friendly way with storage in a special dedicated depot
- Levelling of 40,000 m² of seabed at -18.20 CMH with an accuracy of +/- 1.5 cm to allow for the in-situ installation of concrete anti-scour mattresses



COMPLETION DATE OF PROJECT

The initial completion date was set for May '22. But due to the COVID period, changes in scope of work and compensation for bad weather, the works were completed in December 2022.

SHE-RESULTS ON THE PROJECT

- 1 LTI's occurred
- Turbidity stayed within the contractual limits during the works
- Only 4 non-conformities had to be reported

C TSHD Strandway
D GD Medusa + SHB Wadden

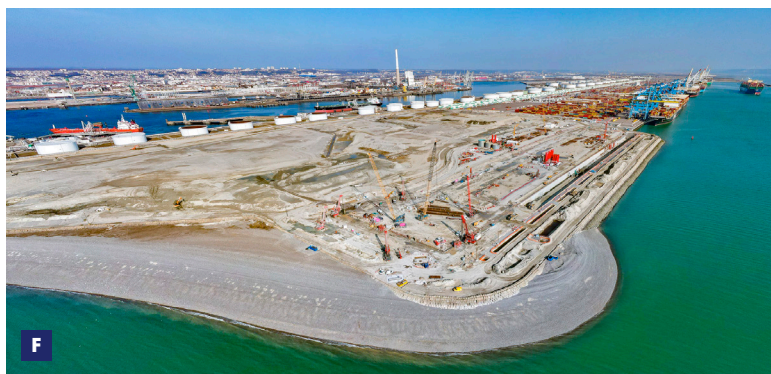


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WHICH GOALS/CHALLENGES WERE ACHIEVED?

What have we learned and where can these techniques be applied also.

- Cleaning the toe of the quay wall without damaging the new construction. A combined effort from grab dredge and TSHD's (directing the waterjet to the side of the draghead), the toe of the quay wall was cleaned.
- For stability reasons, no over-dredging was allowed in front of the quay wall. Managed to achieve the required depth while staying within the contractual limit of 50 cm. with the cutterhead
- Levelling seabed at -18.20 CMH with an accuracy of +/- 15 cm. A combined effort of bed-leveler Terra-Plana, Grab dredge Medusa and survey team made it possible to create a very flat seabed at - 18.20 CMH to allow for the in-situ installation of concrete mattresses as an anti-scour protection.



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- E** Unloading contaminated sediments
- F** Quaywall under construction

CONCLUSION

After 20 years the masterplan "Le Havre Port 2000" was completed. Together with Soletanche Bachy and Bouygues TP-RF, 4.2 km of quay wall was built, 200 ha of land was created and 17,500,000 m³ of sediments were dredged. A sustainable relation was built with the client and partners. A new container port was created allowing for the biggest container vessels in the world to discharge their cargo.