

work, dredging about 3.7 million m³ of material from the sea floor and pumping it ashore. This not only brought the new harbour basin to its required depth, but the material was reused in the reclamation area.

The reclamation work also consists of two parts. For the part nearest the coastline, the presence of a relatively soft sand and silt layer in the subsoil had to be taken into account. To pressurise this layer and induce settlement, a 2-7 m-thick overburden is applied. It is thickest where an important interchange will be built above. For the part lying nearest the water, no overburden is necessary but vibro-compaction to densify the applied sand is scheduled.

Next phase

DPC visited in April and *Fernão de Magalhães* was scheduled for dredging and reclamation work until May. As you read this, the second phase of rock work – completing the breakwater sections using some 900,000 tonnes of rock – should be happening. Jan De Nul/Sodraco's activities on this project are scheduled to run until September.

After that, it will be up to the other joint venture partners to complete the superstructure of the breakwater and the dry infrastructure of the project, including re-handling the sand overburden in the reclamation area and levelling it at approximately 10 m above chart datum.

The completion and final delivery of the entire project is scheduled for January 2021. ■

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Calais Port 2015, hopper barges *Geelvinck* ...



... and *Nijptangh* at work

Quiet optimism in maintenance sector

Ports and terminals tell *DPC* whether they are seeing a recovery from the recent downturn, new markets to exploit, returning confidence, and new investment

Tony Slinn, dredging correspondent

For Port of Hamburg, the downturn looks to be over, a representative explained to *DPC*.

“In 2016 Hamburg achieved a turnaround in seaborne cargo throughput, which reached a total of 138.2 million tonnes in the general and bulk cargo segments – an increase of 0.3%.

“Container throughput picked up during the second half, achieving a 1% advance over 12 months to 8.9 million teu. And for 2017, the marketing organisation reckons to have seaborne cargo throughput at last year's level.”

The port is investing. “Modernisation and optimisation of such infrastructure as bridges, streets, and our rail connection, including the new Kattwyk railway bridge, are all current projects.”

It also completed the Vorhafen harbour basin entrance redesign in March 2017, offering more manoeuvring space, faster berth assignment, and improved navigational safety.

As for new market sectors, Hamburg is already ahead in establishing LNG. “Ships calling the port can access low-emission power during their stay via the LNG hybrid barge *Hummel*,” the representative noted.

“Another example of forward-looking development is the recent ideas competition for the Steinwerder-Süd port sector. Hamburg Port Authority is planning to develop this central 42 ha area in a future-oriented way and has already worked out possible site and usage ideas based on first feasibility analysis.

“Looking ahead, and apart from developing the Steinwerder-Süd area,” the representative concluded, “important tasks include implementing the navigation channel adjustment [dredging] on the Lower and Outer Elbe to optimise port accessibility, plus the western expansion of Eurogate container terminal”.

Santos

At South America's largest port, Santos in Brazil, a representative explained to *DPC* that 2016 was a major turning point. “We estimate that about 122 million tonnes of gross cargo was handled at the 55 port terminals in Santos – a new record.

“And during the first quarter of 2017, we've seen an increase of 0.5% compared with 2016. The port complex moved 27.9 million tonnes of gross cargo in those three months.”

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In terms of containers, Santos also expects recovery. “After two years of economic recession, the Brazilian economy is growing again,” the representative said. “Projections indicate a growth of 1.8% – 3.6 million teu – in relation to 2016.”

The port is investing too. “We are looking to complete transport infrastructure upgrades – internal railways, waterways, and road access to the port. Companies in the port are also investing about USD928 million in terminals.

“The goal is make Santos the hub port of the South Atlantic Ocean,” the representative concluded.

Supplier views

For spreader supplier Bromma, events that created uncertainty in the container handling and shipping sector, such as the formation of major shipping alliances, have had varying effects on the equipment market.

“Investments are held or postponed,” marketing manager Therese Westerudd told DPC. “Equipment is not replaced and in some cases not even maintained to normal standards, though that differs a lot from country to country and even from terminal to terminal.

“What it does, however, is to create an accumulated need for spare parts, refurbishment, and upgrades when business picks up again. And although Bromma saw a slowdown in order intake at the end of 2016, we now see increased activity, something that is confirmed by other market players.

“Our short-term challenge is to thoroughly support

our customers,” Westerudd concluded. “This includes a discussion about how to best utilise and maintain equipment purchased 10–15 years ago, and to work with them to plan for replacement in an optimal way.”

For fender specialist Trelleborg it is all about the future and the opportunities available through smart technologies, process automation, and the capture, analysis, and effective use of Big Data.

Richard Hepworth, president of Trelleborg’s marine systems operation, explained, “We’re calling on the views of global port, terminal, and shipping stakeholders. We’ve explored the evolution of digital technologies in ports and we’re examining stakeholder perspectives on whether we’re really doing enough to embrace automation and Big Data, or whether the marine industry is being typically conservative.”

In doing that, Trelleborg has launched an interactive report entitled *Preparing for the port of the future*, which discusses the future of shipping through an interview with futurist Gerd Leonhard. The aim is to understand the state of play in ports and terminals, assess how digitally mature the industry is now, how far it is from the Port of the Future vision, and the progress required to make that vision a reality.

“We’re at a crossroads in our evolution,” Hepworth concluded. “We can ill afford to continue to ignore the advances of technology.” ■

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Building new infrastructure in Hamburg