



DHI MARKET AREA: COAST AND MARINE

## PORTS AND TERMINALS

Consultancy for planning, design, construction and operation

Ports and marine terminals are crucial for the smooth and efficient functioning of global trade and economy. These marine infrastructures are constantly exposed to strong natural loading (waves, tides and currents). In order to be sustainable, coastal developments must work with – and not against – these loads. Moreover, with the increasing global trade as well as rising energy and transport demands, it is vital to ensure optimal operational efficiency of ports and terminals. To help overcome these challenges, we offer specialised consultancy services. These services cater to the planning, design, construction and operation of efficient and sustainable ports and marine terminals as well as other marine infrastructure.

- THE CHALLENGES**
- Meeting the increasing global need for transport
  - Optimising port and terminal design – from planning to construction
  - Coping with harsh conditions in a changing environment
  - Ensuring sustainability and cost-effectiveness of structures
  - Minimising environmental impact
  - Ensuring efficient operations and minimum maintenance

**OUR APPROACH** At DHI, we aim to help our clients achieve cost effective and sustainable development of ports, terminals and other marine infrastructure by working closely with our customers. We possess unsurpassed experience and problem solving tools with respect to design optimisation as well as Environmental Impact Assessments (EIAs) and mitigation. We have 50 years of accumulated global knowledge and experience in marine infrastructure (including ports). As such, we can help you overcome any challenge related to such projects, with respect to planning, design or operation.

**OUR SOLUTIONS** Our solutions are based on in-house front-end technologies and techniques in combination with extensive experience. Technologies include numerical modelling and physical model test facilities as well as surveying and monitoring of hydrographic, biological and chemical conditions. We have one of the world's leading laboratories for scale model testing. These help support port design optimisation on issues such as design loads and response, wave agitation and breakwater stability.

**THE ULTIMATE GOAL** OPTIMAL DESIGN, MAINTENANCE AND FUNCTIONING OF PORTS AND TERMINALS



90% of global trade is carried out by sea

International Maritime Organization

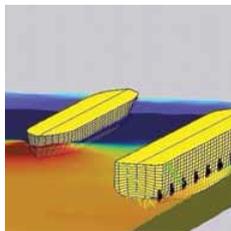
### OUR TOOLS AND SERVICES

Our consulting services contribute to achieving optimal functioning of ports and terminals. We also support project owners, developers, designers, consultants, contractors and authorities in their decision making. To meet these objectives, we offer the following services:

- Site selection and surveying
- Advanced numerical modelling with MIKE Powered by DHI software
- Dynamic mooring analysis using DHI WAMSIM software for layout optimisation and downtime analysis
- Computational Fluid Dynamics (CFD) analysis of structural loads and response
- Wave agitation and ship response modelling for downtime analysis
- Physical model testing in our in-house test facilities
- Metocean conditions – operational and design
- Wave and current impact loads on and response of structures
- Breakwater testing and optimisation
- Survey and monitoring of Metocean and environmental conditions
- Forecasting services for port operation management and navigational safety
- Siltation and maintenance dredging prediction and project optimisation
- EIAs and mitigation planning



Physical model test facilities



Numerical modelling



Surveying and monitoring



Environmental impact assessment



Sediment transport, siltation and dredging