MOTT MACDONALD

Ports

Streamlining transport and boosting trade

Helping you navigate from berth to gate

The world's ports are at the heart of a dynamic and interdependent network of global trade and freight transportation. Managing their challenges effectively requires a comprehensive and innovative approach to problem-solving.

What if you could rely on an award-winning, employee-owned consulting engineering firm with strong technical specialisations in marine, ports, coastal, rail, energy, buildings and transportation infrastructure? All backed by industry-leading digital, environmental, social and sustainability capabilities. With Mott MacDonald you can.

Our teams have first-hand experience and extensive local knowledge of port facilities, marine infrastructure, and coastal environments.

Mott MacDonald provided planning, design, procurement and implementation support throughout expansion of DP World's Puerto Caucedo terminal in the Dominican Republic.

Our capabilities

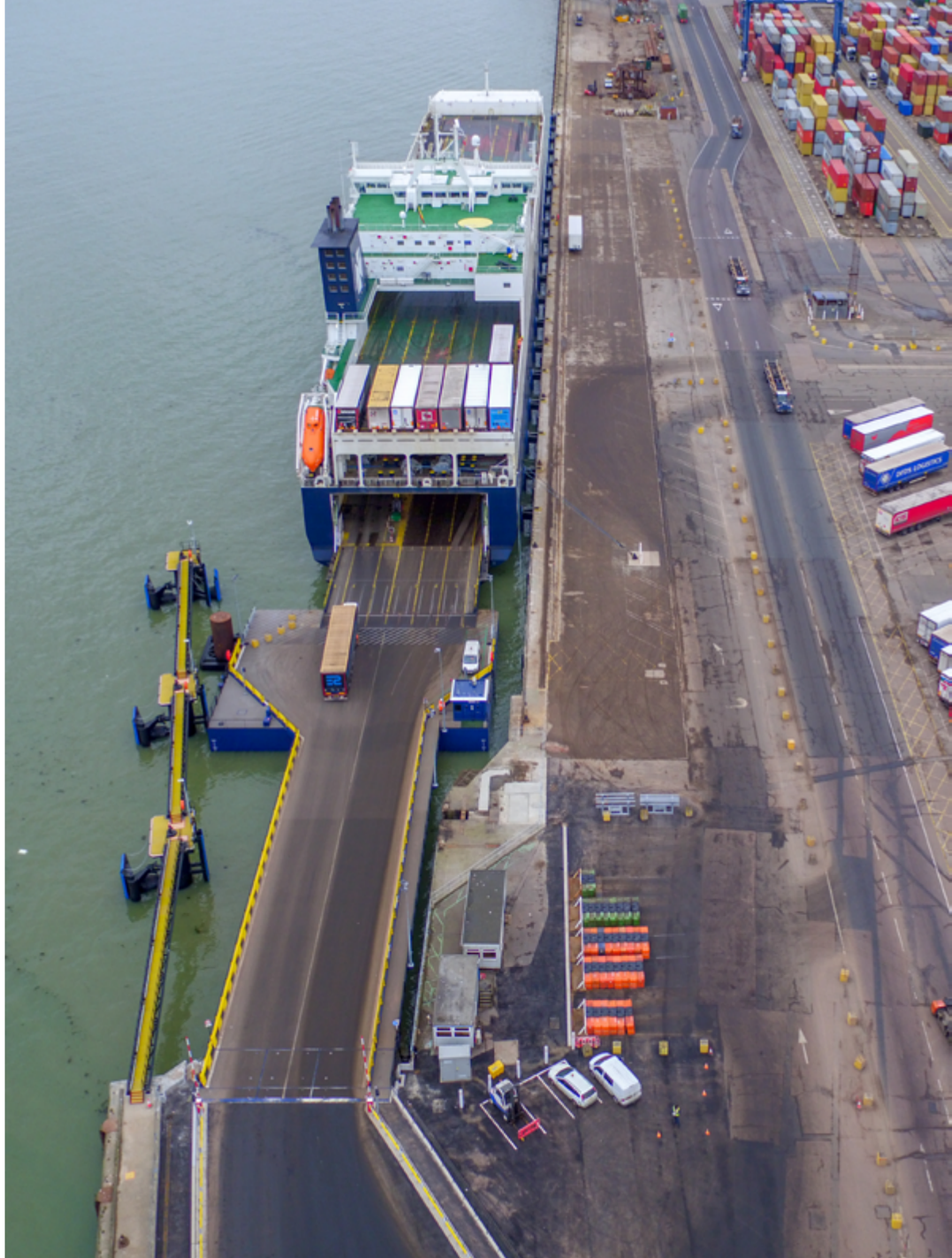
Mott MacDonald has been fortunate to work on major port infrastructure projects around the world.

Mott MacDonald's port capabilities address all aspects of container, roll-on/roll-off (Ro-Ro) and cruise terminals; commodity bulk and breakbulk facilities and small craft harbour projects.

We undertake port planning and marine structural and civil engineering projects from berth to gate. We also provide strong functional expertise in environmental planning and coastal engineering, including permitting, breakwaters, dredging, and dredge material placement and reuse, land use planning, reclamation, brownfield development and material handling engineering.

Mott MacDonald has led the way in developing alternative project delivery approaches for our clients. We can work within design-build arrangements and public-private partnerships, as well as asset management strategies - all critical in today's climate of capital shortfalls.

Our approach focuses on the most important drivers of economic and technical solutions, as well as how to optimally configure these factors before real project investments begin.



We provided design, procurement and project implementation support throughout works to upgrade berths 3 and 4 at the Dooley Terminal in Felixstowe.

Delivering solutions for ports

We provide a range of services across all maritime sectors.

Our services include:
- Master planning
- Design
- Procurement and implementation
- Planning and permitting
- Asset management
- Project/programme management
- Digital and decarbonisation strategies

Our sectors include:
- Containers
- Dry bulk
- Liquid bulk and oil and gas
- Passenger and freight
- Marinas and waterways
- Shipyards and naval bases
- Cruise

Our long history with Felixstowe Dock & Railway Company at the UK's largest container terminal was extended by a key role in delivery of the Berth 9 Yard Extension project.

Our initial work on the master plan for the Port of St Helier in Jersey now moves forward with our appointment to support the Ports of Jersey through a six-to-seven year implementation programme.

Asset management and due diligence

From masterplan to implementation

Project
Port of St Helier – Port Master Plan and Implementation Programme

Location
Jersey, Channel Islands

Client
Ports of Jersey

Expertise
Port masterplanning, demand forecasting, option appraisal, economic appraisal, stakeholder consultations, numerical modelling, navigation simulations, dredging assessments, EIA, planning and permitting, sustainability assessments, procurement strategy

Opportunity

The Port of St Helier in Jersey in the Channel Islands is typical of many older ‘city centre’ ports that have expanded from an original core function to accommodate changing requirements in often demanding circumstances. Mott MacDonald was initially appointed by the Ports of Jersey to peer review its existing port master plan.

Solution

We made certain recommendations and were extended to complete a new port master plan which provided a comprehensive and commercially focused identification and appraisal of modernisation enhancements to the port. Through this extension Mott MacDonald produced a long-term 25-year harbour master plan study to define and clarify the port’s own strategic planning for the short, medium and long-term developments.

Outcome

These enhancements focused on technically and economically sound solutions which could be provided in compliance with environmental and legislative boundaries and delivered with minimal disruption of ongoing port operations, critical for a life-line facility such as at St Helier. We have now been appointed to support the Ports of Jersey through a six-to-seven year implementation programme. Identified projects will be turned into reality in a sequence optimised to minimise disruption and maximise commercial conditions. Together, we will deliver a port refocused on meeting its commercial and social obligations to its customers and island community.

Port planning and operations

Expanding capacity in Australia

Project
Port Botany Expansion

Location
Sydney, Australia

Client
Hutchison Port Holdings

Expertise
Design, contract administration, supervision

Opportunity

Australia's second largest container port, Port Botany in Sydney, also handles bulk liquid imports such as petroleum and natural gas. The Port Botany Expansion Project, one of the biggest port projects in decades, will add a third container terminal.

Solution

Mott MacDonald revised the master plan, redesigned about 30% of the works, and now serves as the superintendent's representative for contract administration and full-site supervision.

Approximately 7.8M cubic metres will be dredged to create shipping channels and berth boxes. Five new shipping berths will accommodate container ships carrying up to 8000 twenty-foot equivalent units (TEUs).

Outcome

Port Botany currently generates $1.1bn per year in economic activity. The ongoing project is expected to create more than 2000 direct and indirect jobs, and the expanded terminal is forecast to generate 9000 direct and indirect jobs by 2025.

9000

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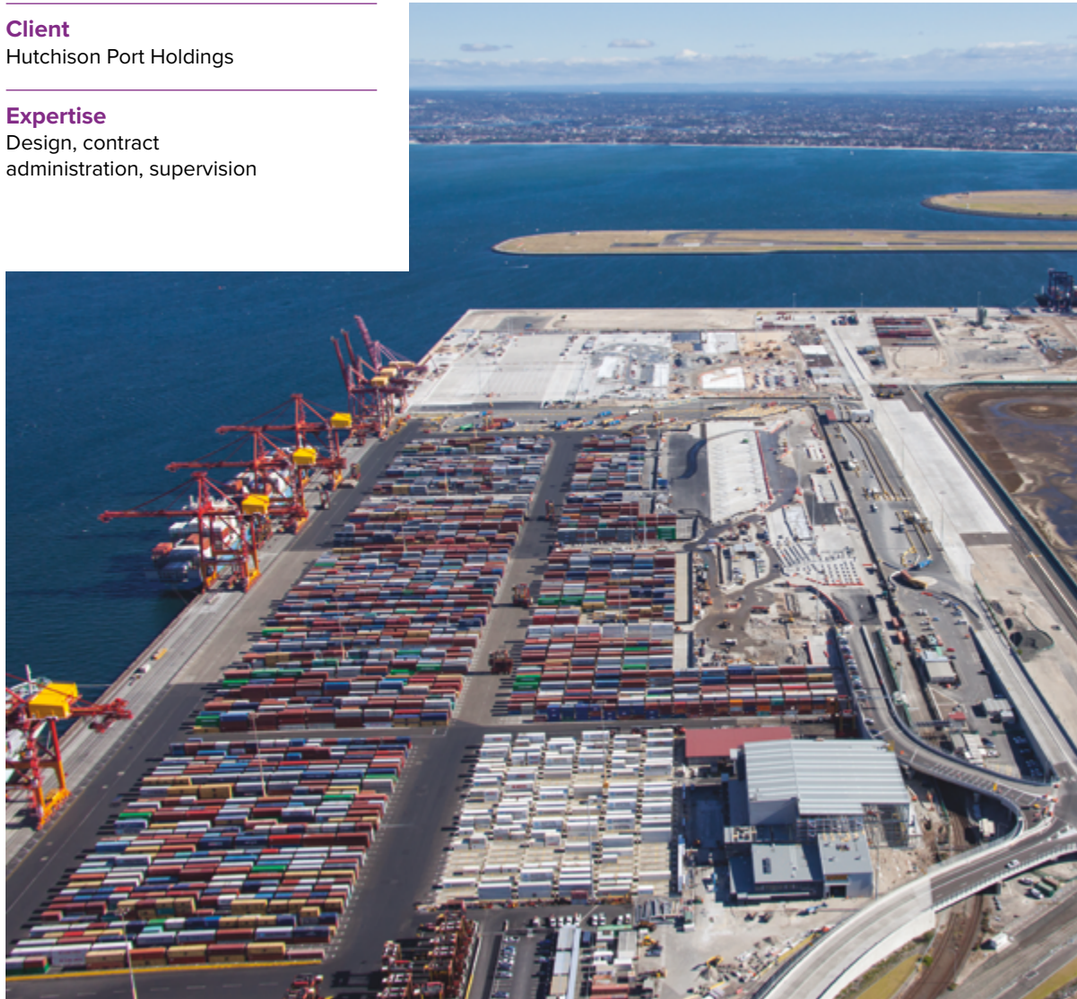


Port Botany currently generates $1.1bn per year in economic activity.

Credit: Sydney International Container Terminals PTY Ltd

Project
Neptune Terminals

Location
Vancouver, BC

Client
Neptune Terminals Limited

Expertise
Rail engineering, project management, construction management, contract administration, project controls

Dry bulk terminals

Boosting Canada's mineral exports

Opportunity

The province of Saskatchewan meets 35% of the demand for globally traded potash. Much of this mineral fertiliser passes through Neptune Terminals, one of the largest multiproduct bulk terminals in North America.

Solution

Neptune Terminals retained HMM, a joint venture of Mott MacDonald and Hatch, for a CDN$49.3M project to increase potash export capacity and reduce operational costs.

We provided rail engineering, project management, construction management, contract administration and project controls services and document control.

Outcome

After the construction of two tunnels and a new roadway, and upgrades to a surge bin and conveyer system, Neptune Terminals' annual potash capacity grew about 30%, to 11.5M metric tonnes.

Much of Canada's potash exports passes through Neptune Terminals in Vancouver.

30%

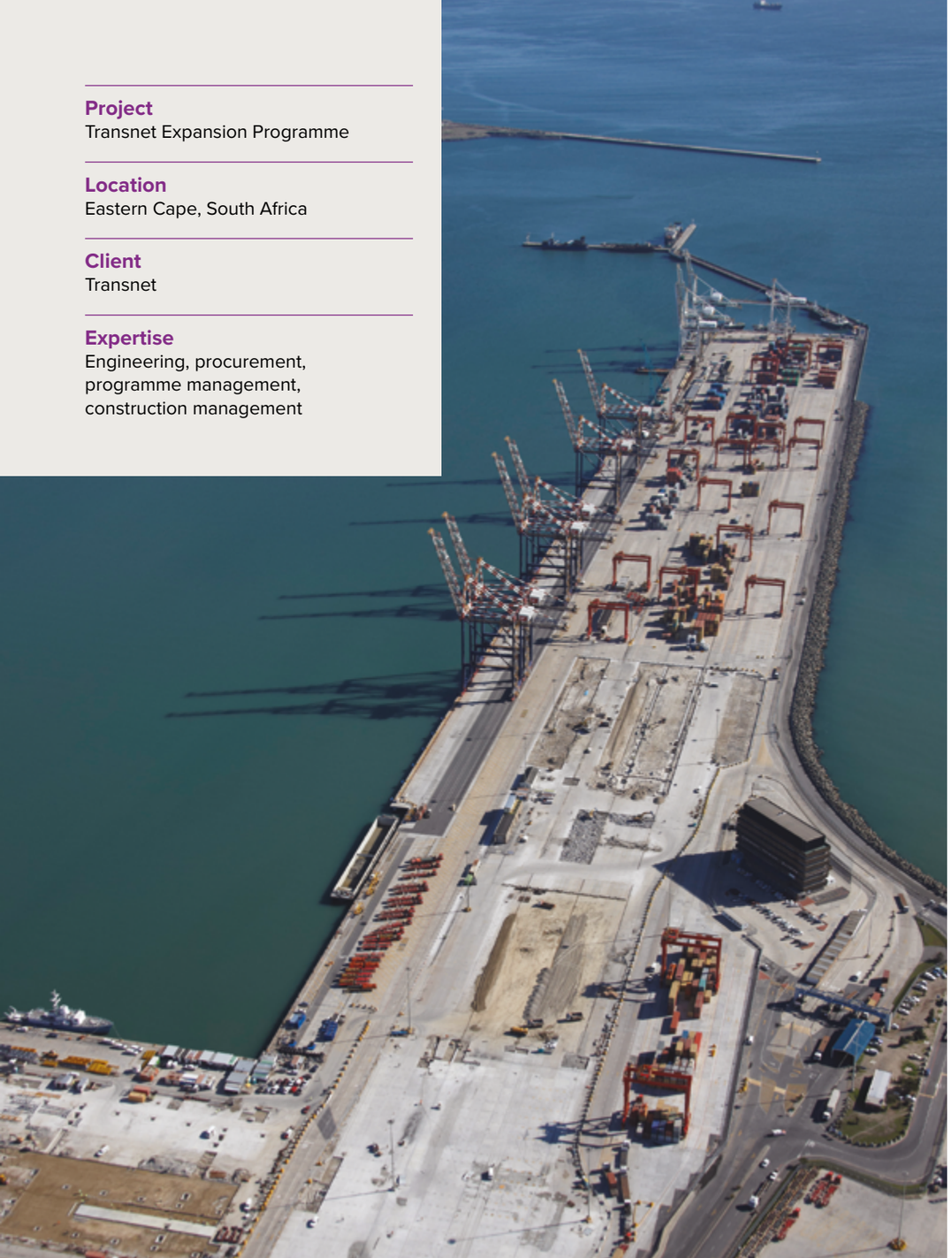
approximate growth in Neptune Terminals' annual capacity

Project
Transnet Expansion Programme

Location
Eastern Cape, South Africa

Client
Transnet

Expertise
Engineering, procurement, programme management, construction management



Cape Town was one of seven major ports in South Africa upgraded as part of the Transnet Expansion Programme.

The Transnet Expansion Programme increases handling and storage capacity for many types of freight.

Container terminals

Upgrading seven South African ports

Opportunity

South Africa is a gateway to trade across Sub-Saharan Africa. Increases in manufacturing, exports, consumption, and living standards have made South Africa's container ports the target for massive investment.

Solution

We helped our client upgrade seven major ports while providing the long-term capacity needed to expand the country's import and export capacity. The Transnet Expansion Programme required managing costs while implementing best-in-class planning, engineering, procurement, construction management and port logistics.

Outcome

Projects conducted under the programme won multiple awards. Benefits include improved navigation, deeper and longer berths and increased handling and storage capacity for containerised, Ro-Ro, bulk and liquid freight.

Two million barrels of fuel can be stored at the Isla Melones terminal. Photo courtesy of Intercoastal Marine.

Liquid bulk terminals

Profiting from a bigger Panama Canal

Project
Isla Melones marine terminal

Location
Isla Melones, Panama

Client
Melones Oil Terminal Inc.

Expertise
Conceptual engineering, environmental analysis, alternative layouts, design-build criteria

Opportunity

As the volume of shipping through the Panama Canal continues to increase, the need for bunkering fuel grows with it. About 14.8km from the Pacific end of the canal, Isla Melones was identified as a promising location for a marine fuel terminal.

Solution

Mott MacDonald provided a conceptual engineering design for the creation of an efficient, cost-effective and constructible marine terminal on the island. We analysed local currents, winds and wave heights under normal conditions and during storms, then developed alternative layouts and design-build criteria for bidding.

Outcome

The Isla Melones marine terminal now offers 16 tanks with a storage capacity of more than 2M barrels. A T-shaped pier allows up to four barges, or one tanker and two barges, to load simultaneously.

The terminal has achieved outstanding loading rates of up to 17,500 barrels per hour for vessels, and 3500 barrels per hour for barges.

17,500
barrels loaded per hour capacity

Cruise

Supporting tourism while protecting the environment

Opportunity

The volatile and competitive cruise industry requires efficient and attractive terminals. Ferry terminals are a vital link in a community's transport infrastructure.

For Falmouth Port in Jamaica, this required building a pier for next-generation cruise liners while protecting the sensitive environment of a coral-ringed lagoon.

Solution

Our role covered all phases of the development, from feasibility and planning and preliminary design, through construction supervision and environmental monitoring.

Outcome

Computer modelling was used to simulate steering a ship into port, making it possible to maximise manoeuvrability without the need for additional dredging.

As part of the project, coral and beds of sea grass were relocated and protected to minimise the impact on sea life.

6600

passenger capacity with new pier

Project
Falmouth Cruise Terminal

Location
Falmouth, Jamaica

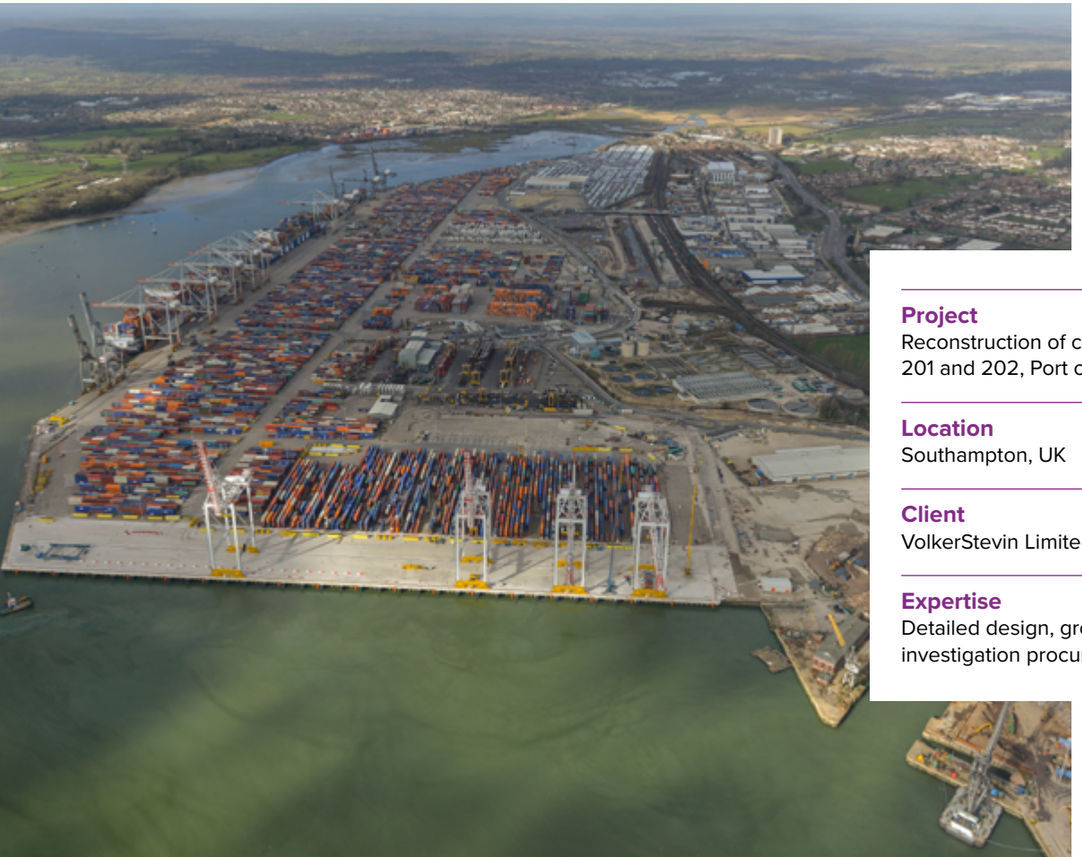
Client
Port Authority of Jamaica

Expertise
Planning, preliminary design, computer modelling, construction supervision, environmental monitoring

Falmouth Cruise Terminal's new pier was designed and constructed with environmental sensitivity.

Marine structural

Innovative solutions



Project
Reconstruction of container berths 201 and 202, Port of Southampton

Location
Southampton, UK

Client
VolkerStevin Limited

Expertise
Detailed design, ground investigation procurement

At the Port of Southampton we provided detailed design for Volker Stevin of berths 201 and 202, along with 4ha of heavy duty pavement, storm drainage and other utilities.

Opportunity

We were engaged by VolkerStevin as its designer for the reconstruction of two berths at the Port of Southampton. The project comprised the construction of:

- 550m of land backed quay
- Deepening of the berth pocket to either -16m or -17m chart datum (CD)
- Foundations for new ship-to-shore gantry cranes
- New heavy duty paving
- Associated new utilities and services for a 9ha container yard

Solution

The existing wall comprised a buried piled reinforced concrete relieving platform, and detailed records of the berths' construction were available.

We were able to model the full history of the existing wall and augment this with the proposed deepening solution incorporating the ageing process of the existing structure.

The deepened quay retained the existing structure with a new combi-wall of large diameter steel tubes and U-shape infill piles driven seaward of the existing piles. The tubular piles were anchored back to a continuous sheet pile anchor wall.

All works were carried out in the dry from the existing quay, and allowed the berth to be deepened from 12m to 17m below CD.

Outcome

This detailed modelling of the re-constructed wall challenged the tender documents' idea that the wall could not be utilised in the re-constructed quay solution. In doing so, we realised the benefit of the existing relieving platform, which being buried for 50 years was thought to be in excellent condition.

This was proven through condition surveys of its structural elements when exposed during the construction process.

The main efficiencies gained were in reducing the structural requirement of the main tubular steel combi-piles to such an extent that pile wall thickness was typically governed by driveability rather than structural capacity. The proposed solution also created savings for the anchorage system of pre-stressed tie rods and steel sheet pile anchor wall.

51,000

cubic metres of sandy material was dredged to create a new habitat and protective bar

Marine environmental and permitting

Restoring fragile wetlands

Project
West Bay Bird Island

Location
Galveston County, Texas

Client
Texas General Land Office

Expertise
Geomorphology, numerical modelling, shoreline protection design

West Bay Bird Island is home to reddish egrets, great egrets, Forster's terns, black skimmers, roseate spoonbills, and tricolored herons.

Opportunity

Leased and managed by the Audubon Society, West Bay Bird Island in Texas supports a rookery of birds, including reddish egrets, great egrets, Forster's terns, black skimmers, roseate spoonbills, and tricoloured herons. Over the years, the island has suffered severe erosion, caused in part by the migration of a tidal channel and sea level rise.

Solution

The Texas General Land Office retained Mott MacDonald to help protect the island from further erosion and restore its marsh habitat. To pinpoint the primary causes of erosion, we performed a geomorphologic analysis, then evaluated a range of shoreline protection alternatives.

Outcome

About 51,000 cubic metres of sandy material was dredged from a channel approximately 457m long and used to create a new habitat and a protective bar about 183m long adjacent to the island. The result is a larger and more sustainable environment for birds and other wildlife.

Opening opportunities with connected thinking.

Talk to us.
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