

Ports and Marine Terminals



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Over 90% of the world's trade is carried by the international shipping industry (according to the International Chamber of Shipping), so our ports and harbours are the gateway to the global economy. Ongoing changes such as the Panama Canal expansion and the continual demand of goods and commodities from emerging economies are exposing more ports to the international trade market. Consequently, improvements and expansions in port infrastructure are required to meet short and long term import and export demands.

Hatch in joint venture, were appointed project manager for the engineering, procurement and construction management (EPCM) of Dalrymple Bay Coal Terminal's phase seven expansion (DBCT 7X). This phase increased capacity by 40 percent, taking it to above 85 Mtpa. This AU \$1.3 billion project represented the largest construction program in the terminal's history.





The Hatch Mott MacDonald and Goba (HMG) JV assisted Transnet in deepening the Cape Town Container Terminal's existing four berths as well as reconfiguring and modernizing the container storage yards.

Hatch Ports and Marine Terminals Centre of Excellence

Hatch's Ports and Marine Terminals group understands the complexity in the fulfilling the functional requirements of a port development from site selection and master planning to the design and construction of wharves, piers, coastal structures and terminal infrastructure.

Staffed within four centres of excellence (COE) in Brisbane, Australia; Johannesburg, South Africa; Santiago, Chile and Vancouver, Canada; Hatch's port and marine professionals have extensive experience working with dry and liquid bulk terminals, container ports and cruise ship facilities

in North and South America, Asia Pacific and Africa. Furthermore, Hatch's multidisciplinary Project Delivery Group of over 7,000 engineering professionals allows us to manage projects from conceptual engineering through procurement, construction management and operational support.

Hatch's background in the mining and energy sectors, combined with our understanding of the key issues facing port owners and operators enable us to offer clients customized solutions that help optimize capital and operational costs.

Cover: Hatch and its JV partner completed the master planning, preliminary and detailed engineering for Abbot Point Coal Terminals, Australia. It is one of Queensland's five major coal export ports and provides a strategic link in the Australian coal supply chain.

Core Strengths

Bulk Material Handling

Stockpile capacity and layout are key to determining capital cost and component capacities. Hatch understands the crucial link between handling, processing, storage systems and transport design to maximize efficiency and productivity. For instance, our involvement in every major coal export terminal development on the eastern seaboard of Australia has led to valuable experience in bulk material handling systems. Our experience includes the engineering and design of systems related to conveyance, loading and unloading, sampling, stocking and stacking.

Coastal Engineering

Because a port's structural stability and operational viability is largely dependent on the condition of its coastal environment, coastal engineering plays a central role to the development of marine facilities. Hatch's coastal engineers have expertise in the areas of wind and wave climate analysis, ship motion analysis, sediment assessment, hydraulic (physical and numerical) modelling, navigation simulation and site investigation planning. We have assisted clients in coastal protection, breakwater and dredging design.

Construction Management

Hatch's Project and Construction Management Group has successfully implemented some of the world's major resource and industrial developments. Hatch works with clients to increase efficiency in terms of both capital expenditure and whole-of-life operational performance for both brownfield and greenfield operations. Our integrated approach optimizes people resources, champions technology and innovative construction methodologies (such as modularization), brings consistency across operations and maintains a high level of certainty for safety, performance, quality, cost and schedule.

Dynamic Simulation

Hatch provides in-house capability which specializes in modelling and analyzing operational environments and locating problem areas and evaluating future opportunities to help decision makers and stakeholders better understand the implications of decisions before they are made. Our dynamic simulations experts have experience with modelling various operational systems with static and dynamic models that assist with mine-to-port logistics including materials handling and logistics, port modeling, scheduling and berth planning.

Marine Structures

Hatch combines global intelligence with local experience in working with major port terminals around the world. Through this in-depth understanding of many factors that influence the design of marine structures, we help clients to control initial costs and reduce maintenance requirements over the life of the structure. Our experience includes the design and construction of gravity based quay walls, sheet pile bulkheads, driven piled wharves and jetties, moorings, gangways and trestles.

Master Planning

Master planning is a critical tool for a port's short and long term development and operations. Hatch's port planners and engineers have extensive knowledge of international and local port operating practices in each region and a successful track record of working with project stakeholders, which enable us to help clients deliver a sustainable and economically viable port development while meeting the industry's capacity demands.



The Hatch, Mott MacDonald and Goba (HMG) JV refurbished the material handling facilities and the expansion of infrastructure at the Port of Saldanha in South Africa.

Operational Readiness

At Hatch, we believe that organizational and operational readiness ensures a project not only provides facilities that can meet the future business needs, but also that the business organization is equipped with the appropriate business processes, systems, functions and capabilities to support the project goals and ongoing business plan outcomes.

Hatch Operational Services has been globally supporting clients' projects and Owner's teams with operations readiness for more than 20 years. Our operational readiness teams can assist our clients to ensure that new and upgraded port projects are operationally ready for start-up. The teams are focused on and able to support the rapid ramp-up of the terminal operation while identifying, developing and implementing solutions for improving and optimizing asset performance in terms of uptime, efficiency and cost.

Procurement Services

The success of many projects is strongly influenced by the procurement methodology. Understanding the many distinctions that exist within contractor packages for project construction is critical for effective management of construction interfaces through construction, commissioning and handover. Hatch's procurement group provides a full range of procurement services (from the selection and management of contractors and suppliers to the arrival of material) to ensure that material and equipment meets quality standards, arrives on schedule to the project and is within budget.

Shipping Logistics

Remote locations of mining and energy operations often mean limited routes and high shipping charges. As a result, early analysis of transport options and costs can underpin project viability and/or identify next stage actions. To help clients optimize the efficiency and cost of shipping commodities overseas, Hatch's shipping group is normally involved in the early stages of a project analyzing transport requirements by identifying methodologies, routes and transportation costs of ore, reagents, fuel, materials and equipment, personnel and product – to the nearest port or overseas destination. In addition, Hatch has in-depth experience with marine voyager calculators to determine port to port shipping distances and voyage times with optional speed accuracy and piracy avoidance routing.

Minera Los Pelambres retained Hatch Proconsa to provide basic engineering, detailed engineering, permits and regulatory support as well as onsite and technical inspection of the project during the construction phase. (please see project description on page 8 for more details)

Structural Asset Management

Port facilities and maritime infrastructure represent critical business operations with significant capital investment. The marine environment is extremely harsh in terms of rates of corrosion and the nature of environmental loads. Many current facilities and machinery nearing the end of their original design life require refurbishment or upgrading to suit changing operational requirements. As a result, effective management of structural assets can literally make or break your operation. Breakdowns in structure or machinery can cause bottlenecks in the supply chain which can result in delays or even loss in revenue.

Hatch's Structural Asset Management (SAM) group provides full structural, mechanical, electrical, control and system audits to verify life expectancy and life extension and capacity upgrade options and annual inspections if required. Comprised of a team of structural engineers and technicians, SAM is dedicated to assisting clients in maintaining their structural assets, particularly with mobile bulk material handling machines.



The Hatch, Mott MacDonald and Goba JV (HMG JV) was the EPCM provider for the Cape Town Container Terminal Project.



World-Wide Project Experience | Dry Bulk Terminals

Hatch's experience with dry bulk terminals spans over two decades worldwide. In Australia, we (together with our JV partners) have been involved in every major coal export terminal development along the eastern seaboard. Santiago-based Hatch Proconsa has been engaged on a number of technical feasibility and economic studies in South America, leading to the design of major copper export terminals along the coastline of Chile.

The Hatch, Mott MacDonald and Goba (HMG) joint venture in South Africa has been engaged since 2006 by Transnet to undertake the managing of the country's engineering, procurement and construction (EPCM) for all projects related to its C\$12 billion rail and port infrastructure expansion program. In North America, Hatch Mott MacDonald has been engaged on several of Canpotex's potash expansion programs in western Canada and the USA to upgrade port facilities at its brownfield terminals as well as develop a new greenfield port.



NCIG Coal Export Terminal

Newcastle Coal Infrastructure Group (NCIG), Australia

Hatch, in joint venture, was involved with the prefeasibility and feasibility studies and provided engineering, procurement and construction management (EPCM) services for three phases of the NCIG Coal Export Terminal. This three-phased project increased the terminals capacity to 66 Mtpa.



Port Elizabeth Manganese Terminal Refurbishment

Transnet, South Africa

The Hatch, Mott MacDonald, and Goba (HMG) JV provided engineering, procurement and construction management (EPCM) services for the overall project from the feasibility phase onwards for the refurbishment of a 50-year old operating plant at the Port Elizabeth manganese ore terminal. The objective of the project was to increase the reliability of the plant and to achieve an annual capacity of 4.5 million tonnes by 2015.



Mary River Iron Ore Development

Baffinland Iron Mines Corporation, Canada

In 2011, Hatch provided feasibility level engineering and cost estimates for the marine structures and shiploading systems at the Steensby and Milne Inlets project sites. This included an ore dock, suitable for shipping 18 Mtpa to 25 Mtpa on a year-round basis, freight dock, bridge link from the mainland to Steensby Island and two construction docks.



Puerto Punta Chungo Copper Concentrate Shipping Terminal

Minera Los Pelambres, Chile

Hatch Proconsa was retained to provide engineering and project management services for a copper concentrate shipping terminal which included field, location and orientation studies; bridge for conveyor engineering; docking and mooring works; maritime concessions preparations; maritime structure, berthing and mooring dolphin and buoy designs; procurement support; technical advisory services and inspections.

World-wide Project Experience | Liquid Bulk Terminals

Hatch's energy sector has been involved in the LNG industry for over 30 years dating back to the initial phases of the North West Shelf (NWS) development in Australia. Since then we've been providing engineering, procurement and construction services to major oil and LNG projects world-wide. In addition to Australia, our professionals have been involved in LNG terminal projects in North and South America.



North West Shelf Gas Project

Woodside Offshore Petroleum Pty Ltd., Australia

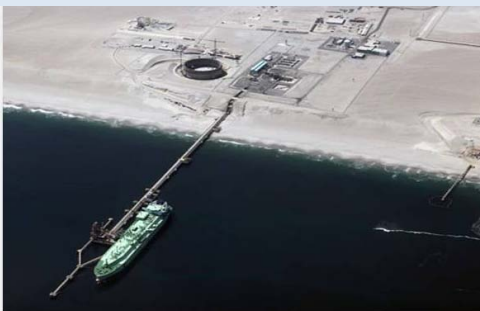
Hatch, in a JV with Kellogg Clough, was involved in Phase 2 of the project, where we provided design, drawings, technical specifications and geotechnical site investigations for dredging the shipping channel and manoeuvring area. In addition, the JV provided engineering, procurement and construction management (EPCM) services for a LNG and condensate load-out jetty and expansion of the plant utility system to process 4 million tons of LNG annually.



Gorgon Project

Chevron Australia (Operator), Australia

Hatch is part of the Kellogg Joint Venture Gorgon (KJVG) and has been involved with the project since 2004, undertaking both pre-FEED and FEED studies. In 2010, the KJVG was awarded the engineering, procurement and construction management (EPCM) contract for the execution phase of this \$43 billion project. The port infrastructure for the project includes a material offloading facility, heavy lift facility and LNG jetty.



Mejillones LNG Unloading Terminal Project

GNL Mejillones/Suez Energy, Chile

Hatch Proconsa was involved with the preliminary engineering, FEED and technical review of final design developed by the EPC contractor, and technical inspections during construction.



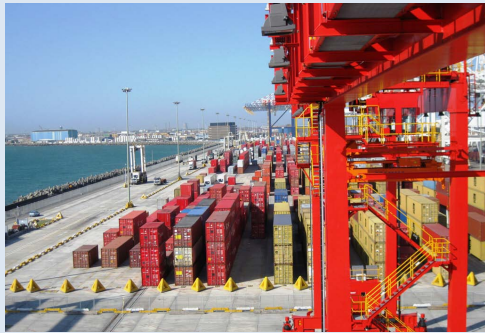
Quinteros LNG Transfer Terminal

Oxiquim, Chile

Hatch Proconsa was retained to complete a preliminary engineering study for an LNG unloading terminal. Study elements included vessel downtime analysis at the exposed site using Termsim II.

World-wide Project Experience | Container Terminals

Hatch has worked with port operators, port authorities and construction companies on numerous container terminal projects (land and water side) around the world. From design of quayside berths, STS crane support structures, and container storage yards to simulation modeling and operations, our container terminal specialists have extensive experience in the planning, design and construction of balanced, flexible container terminals meeting capacity demands as well as help providing options for future terminal expansions.



Cape Town Container Terminal

Transnet Limited, South Africa

The Hatch, Mott MacDonald, Goba joint venture provided engineering, procurement, construction management (EPCM) services for the overall project from the feasibility phase onwards. The project involved the deepening of four existing berths to 15.5 metres, and the reconfiguration and modernization of the container handling areas.



Ngqura Container Terminal

Transnet Limited, South Africa

The Hatch, Mott MacDonald, Goba joint venture provided engineering, procurement, construction management (full EPCM) services for the overall project from the feasibility phase onwards for this project which included the construction of a 4-berth container terminal, associated container yard and installation of half the container terminal equipment (6 STS cranes, 22 RTG's, etc.)



BC Inland Container Terminal Analysis

BC Ministry of Transportation, Canada

Hatch Mott MacDonald provided engineering input to the development of Inland Container Terminals of various sizes, and locations, including review of rail networks, road access, equipment and staffing estimates to provide generic cost estimates.



Manila International Container Terminal

Port of Manila, Philippines

Hatch provided detailed design services for the North Harbour development of the Manila International Container Terminal. This project involved a 50 metres wide, 300 metres long wharf extension along the existing berth alignment, including slope protection. This berth is used to service container ships of the post-panamax class and corresponding post-panamax cranes on rails. The berth provides a draft of 14.5 metres.

World-wide Project Experience | Multi-purpose Terminals

Multi-purpose and specialized terminals (such as autoports) require facilities which can handle heterogeneous cargoes, including containers, bulk and general cargo. These terminals not only require special handling equipment that can handle more than one type of cargo, but they also need to have the flexibility to specialize when the market's supply and demand pattern changes. As a result, master planning is critical for the success of specialized and multipurpose terminals. Hatch is experienced in the area of master planning for bulk, liquid and container terminals and has completed a number of multipurpose terminals worldwide.



Newcastle Multi-purpose Container and General Cargo Terminal

BHP Rod and Bar, BHP Transport, Australia

Hatch was an alliance participant with BHP and Leighton for the preparation of the feasibility study which includes a container terminal, a general cargo roll-on/roll-off terminal, a car terminal and container and cargo related services. We provided services related to the final landform earthworks, roadways, railways, stormwater drainage, services, landscaping, dredging, terminal transport logistics and train movement modelling.



Port of Durban

Transnet, South Africa

The entrance to the Port of Durban, South Africa, was deepened and expanded to accommodate larger ocean-going vessels carrying goods and commodities both in and out of South Africa. Hatch and its joint-venture partners, Mott MacDonald and Goba, provided EPCM services for deepening and widening of the harbour entrance which had a targeted depth of 19 metres in the outer channel decreasing to 16 metres in the harbour and a targeted width of 220 metres. This project is part of Transnet's C\$12-billion capital expansion program.



Eastern Passage, Wharf Replacement and Upgrade Phase 1 and 2

CN, Canada

Hatch Mott MacDonald was the prime consultant responsible for design and construction management including feasibility study, pre-design studies, concept design development, design management and detailed engineering, environmental reviews, geotechnical investigations, inspection and commissioning support. The project involves the decommissioning and demolition of seven floating barges and a wharf designed to dock 262 metre-long auto carrier ships.



San Antonio International Terminal

STI S.A., Chile

Hatch Proconsa provided field studies, basic and detail engineering for containers and general Cargo Terminal. This projects involved a 50 metres wide, 150 metres long wharf extension along the existing berth alignment, including structures, access, coastal protection and services. The berth provides a depth of 15.0 metres.

Hatch is an employee-owned, multi-disciplinary professional services firm that delivers a comprehensive array of technical and strategic services, including consulting, informational technology, engineering, process development and project and construction management to the mining, metallurgical, energy and infrastructure sectors.

Hatch has served clients for over 80 years and has project experience in more than 150 countries around the world.

With 11,000 people in over 65 offices, the firm has more than \$35 billion in projects currently under management.

Contacts

Shashi Shrivastava
Global
sshrivastava@hatch.ca

Conrad Stark
Africa
cstark@hatch.co.za

Jason Pope
Asia Pacific
jpope@hatch.com.au

Harold Westerman
North America
hwesterman@hatch.ca

Jose Retamales
South America
jretamales@hatch.cl

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