MARINE STRUCTURES

Maritime Business Line is a specialist skill group providing planning and engineering services in the marine environment.

OVERVIEW: A specialist team providing waterfront civil engineering solutions in challenging, environmentally sensitive locations.

OIL UNLOADING JETTY
RABEC | Rabigh, Saudi Arabia
Black & Veatch Energy was appointed to the role of Owner’s Engineer for the design and construction of two 660MW heavy fuel oil power plant. The project includes a new fuel unloading jetty for 20,000 to 100,000dwt bulk carriers. Black & Veatch undertook design checks and reviews for all the marine works, including mooring dolphins, breasting dolphins, unloading platform, small boat berth and an approach causeway protected with concrete armour units. The team was led by B&V Energy in Beijing, and included a Chinese main contractor and a maritime design consultant based in Greece.

PORT TALBOT IRON ORE JETTY
Associated British Ports | Port Talbot South Wales, UK
The dedicated iron ore unloading jetty serving Port Talbot steelworks was constructed in 1970 and provides a berth for up to 180,000dwt bulk carriers with a draught of 16m. A berth for self-unloading vessels was added in 1989 but is now disused. The facility is owned by ABP but leased to and operated by the steel company Tata.

Black & Veatch has been commissioned by ABP to investigate the feasibility of upgrading to accommodate 250,000dwt carriers and on three occasions to undertake a detailed structural survey of the jetty. The scope of the survey includes steel piling, concrete deck, dolphins, fendering and access bridges and to advise on maintenance requirements and the provision of safe access.

BOAT HOIST JETTY
Defence Infrastructure Organisation | Plymouth, UK
Black & Veatch was appointed to undertake the detailed design and provide construction support for a new finger jetty for a 200 tonne boat hoist within a military training facility. The works consisted of two rows of tubular steel piles, each supporting a reinforced concrete runway, and a holding platform also supported on piles.

The group operates in the following sectors:
- Marine terminals
- Harbours
- Marinas
- Waterfront development
- Regeneration

Cradle to grave:
- Site selection
- Project appraisal
- Investigation
- Environmental assessment
- Consents
- Design
- Construction supervision
- Owner’s engineer
- Structural survey
- Refurbishment

IRON ORE JETTY, PORT TALBOT

UNLOADING JETTY, RABIGH

BOAT HOIST JETTY, PLYMOUTH
**BREAKWATER MAINTENANCE STRATEGY**

**Stena Line Ports | Holyhead, Isle of Anglesey, UK**

The Port of Holyhead is protected by a 2.5 km long breakwater completed in 1873. Black & Veatch was commissioned by the port’s owner to develop an affordable maintenance strategy. This involved wave modelling to target the most vulnerable sections of the breakwater and identifying those parts of the structure that needed to be maintained or strengthened so that it was possible to cease maintaining other parts.

**FISHGUARD MARINA**

**Conygar Investment Company plc | Fishguard, Pembrokeshire, UK**

Proposals have been brought forward to develop a 350 berth marina, boatyard and mixed use onshore development in Fishguard Harbour. Working with the client’s architect and planning consultant, Black & Veatch has been responsible for drawing up the marina proposals, developing a scheme that will provide additional land for port development and yet not interfere with port operations on land or sea.

Black & Veatch has also completed the outline design of the breakwaters, drainage studies and Flood Consequences Assessment and the water quality, sustainability, coastal engineering and geomorphology sections of the Environmental Statement.

A key element of the project is using dredged arisings with poor engineering properties within the site to minimise disposal costs and aggregate levy charges.

**HARBOUR PROTECTION**

**Lymington Harbour Commissioners | Lymington, Hampshire, UK**

Lymington has developed over the past 50 years as a major leisure boating centre, ferry terminal and base for commercial fishing vessels. It is designated as an Area of Outstanding Natural Beauty, a Special Area of Conservation, Special Protection Area for Birds and a Ramsar site.

Black & Veatch was commissioned to design a response to the ongoing loss of natural wave protection provided by extensive salt marshes. The solution was the phased construction of two low crested rock mound breakwaters. Black & Veatch was also responsible for the Environmental Statement to support the proposal and steered the consents process to a successful conclusion, no mean feat for hard engineering in such an environmentally sensitive site. Phase 1 was completed in 2010 and Phase 2 in 2014.

**FALKLANDS JETTY UPGRADE**

**Defence Estates | Marchwood Military Port, Southampton, UK**

The military wished to use their 30-year old jetty for modern commercial vessels and make more use of larger charter vessels to supply overseas military operations. By upgrading the existing multipurpose jetty with heavier duty fenders, new 200 tonnes storm bollards and an additional mooring dolphin it could economically accommodate 20,000dwt tonne ro-ro carriers. Black & Veatch was the lead consultant, responsible for design and specification of all works. The project was carried out under the seven year Regional Prime Contract between Debut and Defence Estates.