COASTAL ENGINEERING

Providing planning and engineering solutions in challenging, environmentally sensitive locations in the marine environment
SELECTED PROJECT EXAMPLES

SOUTHERN FELIXSTOWE FLOOD ALLEVIATION SCHEME | Environment Agency & Suffolk Coastal District Council | UK |
Black & Veatch was appointed to undertake a Feasibility Study for the Felixstowe South frontage, followed by detailed design and site supervision of the resulting coastal defences works, which consisted of the construction of 21 fish tailed rock groynes, seawall repairs and approximately 250,000m$^3$ of beach recharge. On completion the project was awarded the ‘ICE East Merit Award’.

HINKLEY POINT | Somerset | UK |

DIEGO GARCIA REVETMENT | San Juan Construction | British Indian Ocean Territories |
Black & Veatch was ‘Designer of Record’ for the construction of approximately 275m of shoreline revetment at the U.S. Naval Port Facility, to protect the shoreline infrastructure on the Indian Ocean atoll of Diego Garcia. Black & Veatch services included the preparation of design submissions and certification of completed structures.

FORELAND POINT TO HINKLEY POINT | Environment Agency | UK |
Black & Veatch were commissioned by the Environment Agency to investigate how the terminal rock groyne, constructed as part of the wider Minehead Flood Defences Scheme, may be affecting the movement of sediment and to determine if it is having a detrimental impact on the adjacent coastline. Black & Veatch carried out analysis of erosion and deposition patterns, volumetric changes, sediment distribution and developed wave and coastal models.

SOUTHERN FELIXSTOWE | Suffolk | UK |

SEASALTER TO GRAVENEY SEA DEFENCES | Environment Agency | UK |
This 6.7km coastal protection scheme protects 1700ha of flood plain, which includes almost 1400 properties and other critical assets within an environmentally designated area. The works included the construction of a number of timber groynes and beach recharge activities. CAD drawings were produced for the final scheme and contract documents prepared, including technical specification for the works. The project was completed ahead of programme and under budget.

SEASALTER TO GRAVENEY | Kent | UK |

PROJECT AWARD

“An outstanding example of a civil engineering physical achievement project.”

‘ICE East Merit Award’ | Felixstowe Flood Alleviation Scheme

TESTIMONIAL

“The team members should be recognised (for future similar coastal schemes) as capable of delivering to a challenging programme. Good site team communication to ensure works (particularly the groyne timber refurbishment) is constructed right first time.”

Kevin Talbot | EA Project Manager

BLACK & VEATCH HAS CAPABILITIES IN THE FOLLOWING SECTORS:

- Coastal Protection
- Flood Defence
- Flood Risk Management
- Coastal Climate Resilient Infrastructure
- Beach Management
- Habitat Creation
- Seafront Development & Public Realm Creation
- Integrated Coastal Zone Management & Land-use Planning
- Economic & Financial Analysis
- Coastal Strategies
- Public Private Partnership

DIEGO GARCIA REVETMENT | British Indian Ocean |

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NEWTON’S COVE COASTAL PROTECTION SCHEME | Weymouth & Portland District Council | UK |

This reconstruction project to replace the existing seawall incorporated the construction of 350m of re-curved wall, encasing the existing wall using reinforced concrete. It also included two contiguous bored mini piled walls, soil nailing works and a rock revetment to stabilise the upper slopes. The award winning project was particularly praised for its sympathetic approach to constructing a hard engineering solution within an environmentally sensitive area.

STALLINGBOROUGH SEA DEFENCE IMPROVEMENTS | Halcrow | UK |

Detailed design and construction stage design advice for improvement works to 1.6km of revetment frontage on the south bank of the Humber Estuary. Erosion of the existing open stone asphalt revetment had substantially increased the risk of failure of the flood defences and remedial works were required. Black & Veatch carried out the detailed engineering design, prepared all contract documentation and provided construction stage advice.

SEA DEFENCE IMPROVEMENTS | PORTLAND GROUNDS | Natural Resources Wales | UK |

Black & Veatch prepared a successful Project Appraisal Report (PAR), and all contributing elements, to satisfy the requirements of the Severn Estuary Strategy for this area. The project considers 2km of embanked earth tidal defences along the Severn Estuary between Newport and the New Severn Bridge in Wales. In addition to the coastal flood risk issues key factors were the Wales Coastal Path along the crest, a site constrained between internationally designated habitat, deep ditches and over wintering birds.

TESTIMONIAL

“A hard engineering defence that sympathetically reinforced an exposed sea cliff, whilst taking great care during construction to ensure the natural rock benches exposed on the foreshore remained unblemished.”

Judges Comment | Environmental Project Award

TESTIMONIAL

“Thank you for the work to get the environmental documents for Tabbs and Portland ready for issue today. I know a lot of work has gone into them – they are excellent ...”

Alex Scorey | Natural Resources Wales
GRIMSBY DOCKS FLOOD RISK MANAGEMENT SCHEME | Environment Agency | UK |
Black & Veatch worked in collaboration with Halcrow to improve 3.5km of flood defences around Grimsby Docks on behalf of the Environment Agency. Due to the nature of the site and the existing defences it was not deemed possible to create a uniform style of defence around the entire docks. Therefore, a number of different types of defence were proposed, including: sheet-piled walls, concrete sea walls, refurbishment of dock gates, rock armour, repurfeling of embankments and repairs to existing revetments. These works were subsequently spread across ten different reaches. Black & Veatch scope of works included a Project Appraisal Report (PAR), an economic scheme appraisal and detailed modelling of flood risks for the various options, which optimised the use of Grimsby Docks to store flood water, reducing the height and cost of the sea defences required.

SHOEBURY COMMON FLOOD DEFENCE IMPROVEMENTS | Southend-on-Sea Borough Council | UK |
Black & Veatch was appointed by Southend-on-Sea Borough Council to investigate options and develop a business case for flood defence improvements at Shoebury Common. The existing sea wall currently provides a low standard of protection in places, due to variations in crest levels and beach condition, particularly at access points. Black & Veatch investigated all available options to provide an improved level of protection against coastal flooding. Consideration of amenity use of the frontage, particularly the beach huts, was a key component of the option appraisal process. The preferred option was to construct a secondary line of flood defence behind the promenade. An environmental scoping report was also produced to identify any environmental receptors that either influenced option selection and/or require mitigation during implementation.

FELIXSTOWE FERRY ROCK REVETEMENT | FAILURE INVESTIGATION | Environment Agency | UK |
Felixstowe Ferry is a coastal village located within a floodplain, protected by a complex flood defence system including concrete armour mattresses, concrete wave walls, groyne fields, rock armour and an earth/shingle embankment. Effects of the River Deben Estuary outflows and wider coastal processes make site management very challenging and a potentially serious flood risk hazard to people, property and economic assets. The purpose of this project was to assess the problem and provide indicative costs of potential solutions, taking into account wider strategic issues. Black & Veatch investigated the existing structure design, reviewed historical aerial photographs, developed conceptual options for flood defence and viable options for indicative costing and produced high-level economic appraisal and a viability report on the assessments.

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Black & Veatch is an employee-owned, global leader in building critical human infrastructure in Energy, Water, Telecommunications and Government Services. Since 1915, we have helped our clients improve the lives of people in over 100 countries through consulting, engineering, construction, operations and program management. Our revenues in 2016 were US $3 billion. Follow us on www.bv.com and in social media.

Black & Veatch
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