IMDC

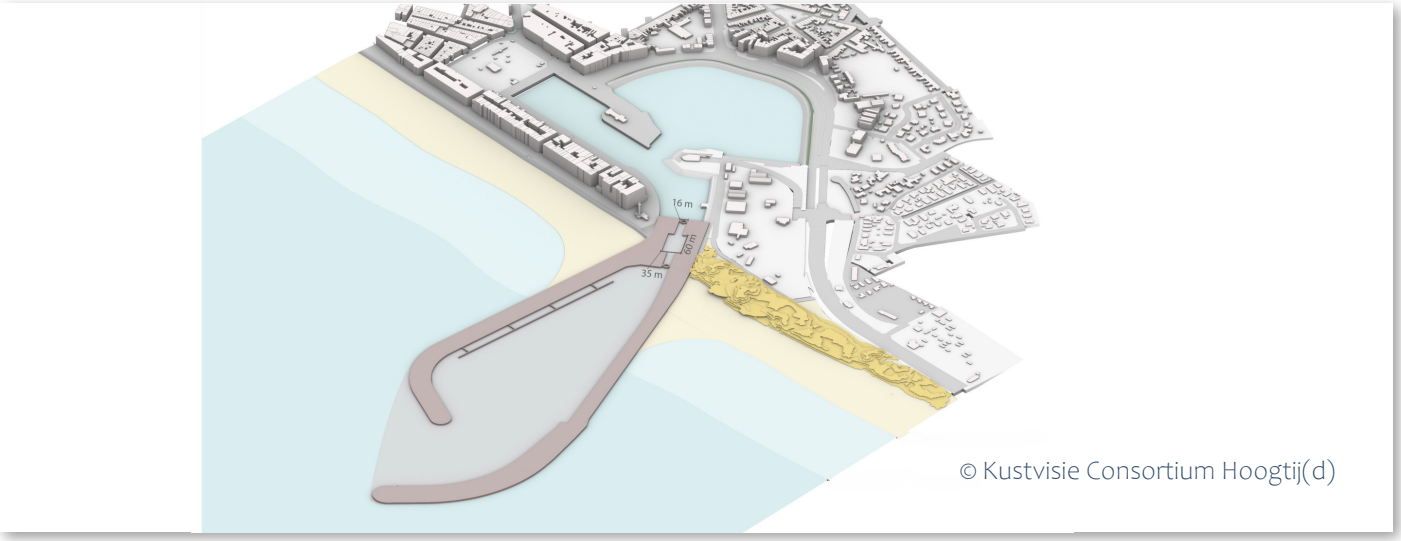
International Marine and Dredging Consultants (IMDC) is an engineering and consultancy company specialized in a vast range of water related projects. Our highly qualified staff offers advice based on recent research results of leading universities and research institutes and hands-on experience acquired throughout the years. One of IMDC's activities is Marina and Waterfront Development.

More information can be found on our website www.imdc.be

Marinas and coastal waterfront development

Marinas and coastal waterfront developments are at the core of sustainable coastal growth, combining economic vitality, social connectivity, and environmental resilience. From leisure harbours and marina basins to promenades, coastal protection works, and beach nourishment schemes, these projects create long-term value for communities through tourism, recreation, and mobility while safeguarding them against erosion, flooding, and the growing effects of climate change. As coastal zones face increasing development pressure and tighter environmental regulation, well-planned infrastructure must harmonise human activity with the protection of sensitive marine and estuarine ecosystems.

IMDC provides the expertise to realise marina and coastal development projects that are technically robust, environmentally compliant, and resilient to future change. With decades of experience in coastal and estuarine engineering, we deliver integrated services ranging from feasibility studies and hydrodynamic modelling to detailed design, permitting, and construction follow-up. Our added value lies in the fusion of scientific precision with practical, buildable design. IMDC combines advanced wave, sediment transport, and water quality modelling with a deep understanding of marine construction, sediment management, and operational performance. This approach ensures that every project - whether a marina, promenade, or coastal protection scheme - is safe, cost-efficient, and adaptive, turning complex coastal dynamics into enduring, high-performing assets for our clients and society.



© Kustvisie Consortium Hoogtij(d)

Services

Marina Master Planning & Design

IMDC delivers holistic and innovative marina development solutions that unite visionary master planning with solid engineering and environmental expertise. From the earliest feasibility and site selection stages through detailed design, permitting, and construction supervision, we guide clients in creating marinas that are functional, resilient, and environmentally sound. Our multidisciplinary team integrates coastal and hydraulic engineering, manoeuvring studies, geotechnics, environmental sciences, and spatial planning to ensure each project is optimised for local conditions and long-term performance. We provide a complete range of services, including marina zoning and waterfront spatial planning, hydrodynamic and sediment transport studies, social and environmental impact assessments, and the design of maritime structures such as pontoons, quay walls, breakwaters, shore and flood protection, dredging, and reclamation. Supported by quantity surveying and cost consultancy, IMDC transforms coastal visions into high-performing marina facilities that balance operational excellence with sustainability and enduring value.


Qinhuangdao Marina


Middelkerke casino waterfront

Waterfront development

IMDC designs waterfront developments that enhance accessibility, support tourism, and strengthen coastal resilience while maintaining environmental balance. In response to erosion, sea-level rise, and storm impacts, we apply advanced coastal modelling and engineering design to develop sustainable, site-specific solutions. These include nature-based measures such as beach nourishments, dune and foreshore restoration, and, where required, conventional protections like breakwaters, revetments, or seawalls. Our multidisciplinary approach integrates hydrodynamic, sediment, and ecological assessments to ensure each design achieves reliable protection, functional performance, and compatibility with its surroundings. IMDC's waterfront projects provide lasting value-protecting communities and infrastructure while preserving ecosystem integrity and recreational use.

Hydrodynamic modelling

IMDC applies advanced hydrodynamic modelling to analyse and optimise coastal and harbour environments under a wide range of conditions. Using state-of-the-art tools such as TELEMAC, MIKE 21/3, SWASH, and XBeach, our specialists simulate wave propagation, agitation, circulation, and sediment transport processes to support the design and assessment of marinas, harbours, and coastal defences. These studies enable accurate evaluation of wave tranquillity, current patterns, sedimentation risks, and water quality, ensuring safe navigation and sustainable operation of marine facilities. By integrating hydrodynamics, morphology, and environmental performance within a single modelling framework, IMDC provides clear, data-driven guidance for design optimisation, maintenance planning, and regulatory compliance. Our modelling expertise underpins resilient, efficient, and environmentally responsible coastal and waterfront developments.

NEOM marina: wave modelling study

Coastal and marine infrastructure design

IMDC delivers comprehensive design services for coastal and marine infrastructure, combining advanced numerical analysis with practical construction insight. Our expertise covers the full range of structures essential to safe and resilient coastal operations, including quay walls, moorings, jetties, pontoons, breakwaters, revetments, and shore protection systems. We also design flood protection works, dredging schemes, and land reclamation projects that ensure structural stability, hydraulic efficiency, and environmental compliance. Each design is supported by detailed geotechnical and hydraulic assessments, material durability evaluations, and constructability reviews to guarantee long-term performance and cost efficiency. Through an integrated, evidence-based approach, IMDC develops infrastructure solutions that meet international standards, minimise maintenance requirements, and remain effective under dynamic coastal and operational conditions.

VVIP master plan assessment

Environmental and Social Impact Assessment

IMDC conducts environmental and social impact assessments that ensure coastal and marine projects are designed, permitted, and implemented in full alignment with regulatory and sustainability requirements. Our specialists integrate ecological, hydrodynamic, and socio-economic analyses to evaluate potential impacts and define effective mitigation and monitoring measures. We assess both construction and operational phases, addressing issues such as water and sediment quality, habitat disturbance, noise, and community interactions. By combining field surveys, modelling, and stakeholder engagement, IMDC develops balanced, science-based assessments that support informed decision-making and transparent communication with authorities and the public. Mitigating measures and Nature based Solution are also proposed to reduce environmental impact. This integrated approach enables our clients to achieve environmental compliance, project acceptance, and long-term operational sustainability.

Key references

Complex project Kustvisie (Coastal Vision)

Belgium, 2017-2025
Client: Flemish Gouvernement

IMDC shapes the Flemish Coastal Vision 2100, preparing society for sea level. Through innovation and co-creation, we combine technical excellence with participatory work to safeguard the coast for next generations. Using advanced flood modeling and scenario planning, we assessed the impact of sea level rise. Together with over 100 stakeholders, we co-developed adaptive strategies that balance safety, ecology, and spatial.

Sustainable Development Goals

Coral Cliff beach resort Curacao

Curaçao (Netherlands), 2023
Client: GSM Realco B B.V

IMDC supported the development of a new beach resort at St Martha Coral Beach in Curacao. A key challenge of the project was the presence of sensitive coral reefs along the coastline, highly vulnerable to increased turbidity and sediment transport. IMDC designed a solution that balanced recreational needs with environmental protection, creating a pleasant sandy beach through the construction of detached breakwaters while safeguarding optimal conditions for the coral reef ecosystem.

Sustainable Development Goals

Cadzand Marina

Netherlands, 2022-2024
Client: Cadzand Bad Port

IMDC was engaged to support stakeholders of Cadzand-Bad marina in finding a solution to the wave action problem in the harbour. Through in-harbour measurements and advanced wave agitation modelling. IMDC identified the underlying problem and developed pragmatic, well-calculated solutions. In addition to deepening the marina to its design level, the feasibility of floating breakwaters was also assessed as a complementary measure.

Sustainable Development Goals

Marina Qinhuangdao China

China, 2013
Client: Architect Christian de Portzamparc

In front of the port of Qinhuangdao, Bohai Sea in Chine, an artificial island with a lagoon and marina is under development. Architect Christian de Portzamparc has requested IMDC to assist on technical issues for a sustainable design of the lagoon. IMDC performed a preliminary analysis of the site conditions and analysed the sustainability of the lagoon based on the water quality, the in-and outlet pumping system and the water tightness.

Sustainable Development Goals

Al Numan Island marine consultancy

Kingdom of Saudi Arabia, 2024-2026
Client: Red Sea Global

IMDC is delivering marine engineering services for Al Numan Island. The scope includes marine planning, design, and early works, supporting the creation of a destination focused on wellness, culture, sustainability, and refined coastal living. This high-profile project showcases IMDC's expertise in shaping visionary waterfront environments with global appeal.

Sustainable Development Goals

Tanjung Aru Eco Development (TAED) tender design assistant

Malaysia, 2016-2017
Client: DEME

DEME offered for the Design and Build Contract for the Tanjung Aru Eco Development (TAED) project situated in Tanjung Aru, Kota Kinabalu, Malaysia, and requested IMDC to provide marine scope design assistance. IMDC assistance consisted of geotechnical support for the land reclamation and associated structures, and assessment of the proposed shore protection works (including a beach design).

Sustainable Development Goals

Marine engineering services VVIP Palace Abu Dhabi

UAE, 2013-20217
Client: TRACTEBEL ENGINEERING S.A.

WS Atkins & Partners Overseas were commissioned by the Crown Prince Court of Abu Dhabi to carry out the design project of the villa at Mina Palace. The scope of services under the marine engineering scope were the engineering design for marine infrastructures (beach and pontoon), as well as the tender documentation for contractors and selection assistance, and supervision (technical).

IMDC was responsible for all the preliminary studies leading to the engineering design of the artificial beach nourishment works in front of the villa at Mina Palace, including the technical specifications and construction guidelines for the contractor and selection assistance, as well as the technical supervision during construction.

Sustainable Development Goals

Breakwaters and Port Development, Ostend

Belgium, 2007 - 2012
Client: CTractebel

IMDC undertook the detailed design and evaluation of the coastal protection in Oostende. This included the creation and correction of the measurement series of the hydrometeo databank, the direction-dependent frequency-analysis of the wind velocities, the water levels, the storm design and the wave heights in deep waters, the combination of these statistics and the rendering of the wave heights in shallow waters. Additionally, IMDC carried out current and morphologic models, to look for the optimal sand winning location and check the port safety and the design of the eastern breakwater.

Sustainable Development Goals