



Expertise in Water

WATER: A PRICELESS ASSET

Natural waters play a vital role in our daily life. The seas, the estuaries and the rivers are among the most valuable environmental assets on the globe. Moreover, they contribute heavily to our welfare, constituting an essential element of the waterborne transport cycle (through the infrastructure of waterways and ports). Climate change(s) as well as sea level rise risks have pointed out the vulnerability of these assets, leading to a growing need for a more sustainable way to manage these indispensable resources.

For almost three decades IMDC has been acquiring vast experience through water related studies such as flood risk assessment, hydraulic modeling, coastal protection, sedimentation risks, dredging engineering, blue energy, river training works, inland navigation, port infrastructures and offshore installations.

From the very start IMDC has been systematically expanding its knowledge through research and development activities which are implemented in close collaboration with a broad range of European universities and research entities.



IMDC guarantees the quality of its work through well-defined procedures set out in its ISO-9001 certified quality control system. Both the engineers and the administrative team can rely on state of the art technological facilities including highly sophisticated and specialised commercial software as well as in-house developed software. IMDC's case load is as varied as the background of its engineering staff. Current clients include international organisations such as the European Community, the World Bank, governmental departments, port authorities and industrial agencies. Since its founding in 1982, IMDC has been active in over 50 countries worldwide, thus establishing a strong international reputation.

Flood risk assessment



Expertise in water

IMDC offers highly skilled expertise to tackle a wide range of water-related issues. Our staff has a varied professional background and worldwide experience in dredging engineering, hydrodynamic modeling and integrated water resources management.



The SiltProfiler, a rapid drop profiler



Lock transit planning

MARINE & ESTUARINE SYSTEMS

Our capacity to analyse complex hydrodynamic and morphological systems is based on thorough knowledge of the physical processes combined with detailed in-situ survey campaigns. This enables us to provide solutions for harbour siltation and salt intrusion problems, thermal spreading and turbidity plumes.

DREDGING

IMDC can cover just about any stage of a dredging project, ranging from an initial site visit to detailed designing efforts, drawing up contract documents and budget estimates, to supervision and expert missions. We also handle the specification and selection of dredging equipment including assistance for the innovation of dredging technology.

COASTAL ENGINEERING

Due to the global sea level rise, coastal protection is becoming a hot issue. IMDC provides an extensive range of services based on the combination of profound theoretical know-how in hydraulics, morphology and risk analysis as well as broad experience in technical solutions. Our preference goes to natural and sustainable options wherever feasible.

PORT AND OFFSHORE ENGINEERING

IMDC focuses on the hydraulic design in Master Planning, port layouts, erosion protection structures and breakwaters. Furthermore, any kind of dredging and reclaiming related problems can be tackled (channel design, turning circles, mooring forces, etc).

In the offshore field we provide wave analysis and morphological studies, scour protection design, optimisation of cable and pipeline routes.

BLUE ENERGY

Since the onset of the energy crisis and the Kyoto protocol, people have become more aware of the fact that our future lies in renewable energy sources. Thanks to its extensive hydraulic know-how, IMDC is able to contribute to not only finding the best options for offshore wind farms but also to participating in studies which identify possibilities for wave and tidal energy solutions. Sea Water Air Conditioning (SWAC) systems are yet another expertise our company is proud of.

RIVER BASIN MANAGEMENT

The management of river basins requires an integrated and sustainable approach based on an exhaustive knowledge of hydrology and hydrodynamics. IMDC can provide a wide range of services such as detailed river modelling, real time flood forecasting and flood mapping, inundation risk analysis and flood risk management plans.

WATERWAYS & INLAND NAVIGATION

Waterways are a key component in any sustainable transport system. Based on thorough knowledge of both natural and man-made waterways we can provide solutions for waterborne transport needs including the definition of required river training works, the reduction of maintenance needs and the conservation of ecological values in vulnerable stretches. The definition of optimal navigation routes as well as the set-up of River Information Services (RIS) and lock transit planning are part of IMDC's experience.

HYDRAULIC DESIGN

An erroneous design of water intakes or outlets often leads to suboptimal solutions with excessive abrasion and/or recirculation problems. IMDC can provide an in-depth analysis of your hydraulic systems (water intakes, outlets, pipeline systems and sea outfalls). The proper definition of your requirements will lead to an economical design with low maintenance costs during the exploitation of your system.

ENVIRONMENTAL STUDIES

Our primary environmental concern goes to water-related problems, with special attention given to reducing the ecological impact of hydraulic works and dredging projects. We encourage the beneficial reuse of dredged material and a permanent monitoring effort to understand and minimise the on-site impact of marine activities.

IN SITU MEASUREMENTS AND SAMPLING

IMDC organises project specific measurement campaigns to acquire the necessary data for any complex hydrodynamic or sediment related problem. We work with the most up-to-date equipment, a great deal of which is developed in-house. For the presentation of the results we have developed a powerful computer tool that can be easily adapted to produce custom-made reports.



Cooling water intake site

Services beyond engineering

NUMERICAL MODELING

Mathematical models constitute an essential part of our core business. At IMDC a wide range of commercial as well as in-house developed software is available. Fully independent of any model developer, we are able to select the most appropriate computer tools to study our client's problems in an optimal way and at a reasonable cost.

PROBABILISTIC APPROACH

Analysing and managing the risks associated with extreme hydrological and hydraulic events is part of our core business. We commonly use a high level statistical approach to evaluate inundation risks including the consequences of sea level rise and climate changes. The same probabilistic knowledge is used in our wave analysis procedures and workability analysis for marine equipment.

SOCIAL COST BENEFIT ANALYSIS

Our services surpass the traditional engineering applications. During the selection procedures of the appropriate engineering measures we not only include a comprehensive cost - benefit evaluation, but we also study the effects of the proposed measures on the ecological conditions in the area and on the social welfare of all people affected. These evaluations are generally made in a quantifiable way.

CONTRACT SPECIFICATIONS

We offer support in editing any type of contract documentation for dredging and marine projects. Thanks to the broad theoretical knowledge and the hands-on experience of our engineers we can provide accurate advice for both technical specifications as well as general or specific administrative clauses.

KEY REFERENCES

Danube - Eastern Europe

IMDC has taken care of the hydraulic studies for 2 projects to upgrade the navigation canal in the Danube, from the Iron Gates to the Black Sea. The projects include the base studies, an EIA, the selection of river training works, a cost benefit analysis, detailed design and tender specs.

Scheldt Estuary - The Netherlands

IMDC participated in the hydraulic and morphological studies to develop a long term vision on the deepening of the navigation channel toward the port of Antwerp. This deepening had to be balanced with the ecological values and the safety against inundations.

Korle Lagoon - Ghana

This project, which is running since 1997, includes the sanitation and restoration of a lagoon, the construction of an interceptor with non return flap gates and a pumping station to direct urban waste water directly to a newly built sea outfall.

Flood risk management plan - Belgium

The FRMP project makes an inventory of the flood risks of all non-navigable rivers in the Flanders Region. Alternative protection schemes are optimised based on cost-benefit considerations and priorities for the infrastructural works are defined in order to implement a long-term policy towards flooding risks.

Coastal safety plan - Belgium

IMDC was in charge of the development of a new master plan to enhance the safety level against inundation of the Belgian coast to at least 1 in a 1000 years' level. The project included an inventory of the actual conditions, a full risk analysis and a social cost benefit study.

C-Power - Belgium

Renewable energy is one of our key focuses. C-Power is a new offshore windmill park in deep water (up to 30 km off the coast). As the Owner's Engineer IMDC is responsible for wave studies, the design of scour protection and cable laying supervision.

SIGMA Plan - Belgium

SIGMA is the master planning project for the protection of the river Scheldt basin against flooding. The project includes risk assessment and cost benefit analysis of the different options. The effects of sea level rise have been taken into account.

Manappad - India

In cooperation with Technum- Tractebel Engineering, IMDC was awarded the contract for the Master Planning and detailed design of a new port in India. This port is expected to have a turnover of 60 million tons of coal and iron ore when fully operational.

A focus on sustainability

Any project linked to our estuaries, seas or river basins can have a considerable effect on the ecological value of an entire region. That is why IMDC is deeply concerned about the impact of its projects on the natural environment.

Through systematic assessment of potential impacts and mitigating measures we strive towards sustainable solutions, using the Best Available Technique (BAT) wherever possible.

In this respect we make sure that the teams assigned to your projects have a multidisciplinary background in order to guarantee innovative solutions that improve living conditions for the people involved and that preserve natural resources for future generations.

OUR STAFF

The varied background of the IMDC staff ranges from research scientists and experienced engineers to qualified technicians and high level IT experts. Some of our staff have worldwide experience in dredging and hydraulic engineering both at the service of water authorities and contracting companies.

Besides hydraulic and civil engineers, IMDC staff also includes oceanographers, bio-engineers, chemists, ecologists, geologists and geographers.

PARTNERSHIP WITH TRACTEBEL ENGINEERING

For policy studies and the design of structural elements in our ports and waterways projects, we can rely on a standard partnership with our parent company: Tractebel Engineering (TE). TE is a multidisciplinary engineering office with over 3000 employees in Belgium and worldwide. TE plans, designs and manages large energy, infrastructure and building projects

COMPUTER INFRASTRUCTURE

Our computing equipment is continuously upgraded to the most up-to-date standards in order to cope, in an efficient and economical way, with the steadily growing demands of the rapidly changing modern software applications. Computer clustering for complex models is a routine procedure within our company.

BACKING OF GDF SUEZ GROUP

Tractebel Engineering is part of GDF SUEZ Energy Services, one of the business lines of GDF SUEZ and the European leader in multi-technical services. This international industrial group provides sustainable and innovative solutions for the management of public utility services as a partner of public authorities, businesses and individuals. In addition to our expertise, we can rely on the extensive know-how of the other companies of the GDF SUEZ Group. These synergies provide us with detailed feedback, thus enabling us to fine-tune our understanding of the operational requirements of new and existing installations.

Sustainable river development

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Affiliate of Tractebel Engineering

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International Marine & Dredging Consultants is committed to invest in research and in the development of new technologies. IMDC frequently bridges the gap between the academic world and the client's needs, transferring state of the art knowledge into practical project-oriented solutions.

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