

We move the earth  
to a better place



**Boskalis  
International bv**



We move the earth to a better place



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## Offices of Royal Boskalis Westminster nv around the world

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## Boskalis International: at home in the world

Dredging, coastal defense and land reclamation; in a nutshell, that is what Royal Boskalis Westminster nv is all about. The company has come a long way since 1910, when the families Bos and Kalis joined forces and established Boskalis. Nowadays, Boskalis is a global market leader with an impressive range of vessels and other equipment. Whether it's engineering, offshore or project development, we have the knowledge, equipment and manpower to successfully get the job done. From Egypt to Alaska and from the estuaries of the Amazon to the polders of the Netherlands.

Boskalis International, the global operation of Boskalis, is active in fifty different countries on five continents. Besides carrying out individual projects, Boskalis has a number of home markets and permanent local branches in various countries. Our extensive knowledge of local (working) conditions, geology, climates and cultures combined with our expertise in the fields of dredging, coastal defense, land reclamation and similar activities makes Boskalis International your ideal partner. Anywhere in the world!

Worldwide, we employ some 3,200 people. Our fleet consists of more than 300 different vessels and we have a wide range of auxiliary crafts and equipment. We have the perfect piece of equipment for each project. And because our large fleet is spread throughout the world, our mobilization and response time is very low. In addition, we pay a lot of attention to safety. Boskalis has for example implemented a Plant Management System to deploy its fleet as safely, efficiently and quickly as possible. Besides the fact that Boskalis is ISO-9001 certified, our vessels also meet the strict requirements of the international ISM Code.





## Boskalis cornerstones: dredging, coastal defense and land reclamation

### Dredging: Invisible, but essential.

For almost a century, dredging has been one of the cornerstones of Boskalis. And it still is. Dredging, after all, is an important first step for the construction of ports and canals. In addition, dredging can restore access to silted-up ports and avoids rivers to flood surrounding areas. Although Boskalis has a lot of experience with dredging, we still consider each project unique. Time and time again, we have to use the most appropriate techniques and equipment and find just the right combination of time, environment, design and implementation. Our dredging activities by the way are not just limited to capital dredging and the maintenance of ports and waterways. With their extremely accurate electronic positioning systems, today's sophisticated dredgers are also used for the construction of pipeline trenches, outfalls and immersed tunnels. Dredging may be invisible, but it is essential for prosperity.

### Coastal Defense: Creating a safe haven.

Redirecting water flows to keep coastal regions safe from flooding, that is what the second Boskalis cornerstone, coastal defense, is all about. Continuous research and vast amounts of experience mean Boskalis has what it takes to realize any project on the waterfront. Besides expertise with regard to the construction of coastal defenses, the company is a specialist in riverbank and riverbed protection works.

We use our in-house research and development capabilities and our comprehensive on-site experience to create innovative solutions for engineering and construction problems. And if necessary, Boskalis especially develops new techniques and equipment for a certain project.





*Restoration of beach in progress*

#### **Land reclamation: The ground beneath your feet.**

Land means valuable room for growth. And where there is water, there can be land. Regarding our third cornerstone, land reclamation, Boskalis is involved in large and small land reclamation projects throughout the world. In many cases, we are the ones who lay the foundations of ports, industrial and housing areas, refineries, airports, bridges, power stations, tourist areas and so on. Often, suitable materials excavated during dredging operations are pumped ashore for land reclamation purposes.

Large-scale land reclamation requires greater amounts of sand, often dredged at greater depths and transported over greater distances. Our state-of-the-art jumbo dredgers enable us to achieve greater economies of scale and play a major role in fulfilling the needs of our customers regarding land development.



## At home in North and Central America

A huge variety of landscapes, coastlines, climates and cultures; that is what characterizes this region of the world and causes Boskalis to be involved in numerous different activities. From dredging for ports to land reclamation and from beach replenishment to restoration of fresh seawater circulation in large lagoons, respect for the environment is an integral element of the Boskalis approach, all over the world.

*Construction of new cruise  
port and marina at Ensenada  
(BC) Mexico*



# North and





Especially in this part of the world, marine infrastructures often pass through rainforests, mangrove areas and the habitats of protected species such as whales and turtles. Apart from our company-wide certified quality standards, Boskalis therefore uses special environmentally friendly working methods and equipment where necessary, in close consultation with our clients. Infrastructure development does not have to clash with environmental interests. In the United States, some of the dredging equipment has been fitted with special deflectors to protect the turtle population during operations such as maintenance dredging and beach replenishment. Another good example is the coastline of Mexico. There, extensive mangrove areas and lagoons are a very important natural habitat for numerous types of animals and plants. The most important industry in the area is commercial fishing. Environmentally sound methods for maintenance dredging are vital, both for this important economic industry and the flora and fauna in general.

# entral America

## At home in South America and the Caribbean

In the Caribbean, Boskalis mainly focuses on port maintenance and land reclamation for urban and industrial development. In South America, the emphasis predominantly lies on long-term dredging activities in various river deltas. To ensure that vessels can pass safely at all times, it is essential that the navigation channels in the gigantic river deltas are properly maintained.

Examples of this can be found in Guyana, Cayenne and Uruguay; there, Boskalis dredges millions of cubic meters of sand and clay annually. In addition, Boskalis is also involved in land reclamation schemes for the construction of embankments, roads and bridges.

*Construction of the embankments for the  
Rosario-Victoria Fixed Link project in Argentina*



# South and t



In South America, dredge mining is an important activity for Boskalis. In Surinam and Guyana, Boskalis has extensive experience with this. Compared to conventional open-pit mining, dredge mining is an accurate and fast way of dredging overburden and minerals. Boskalis has special dredge vessels that can be assembled on

site. This allows us to also operate in areas that are not directly accessible by water. Where deposits are located on dry land, temporary man-made lakes can be created or tailings from old mines can be dredged for retreatment. In short, dredge mining has proven a reliable method of excavation, based on proven technology; it can lead to substantial cost reductions compared to conventional mining methods.



# America e Caribbean



## At home in Africa

Good infrastructure is an important condition for developing trade and the economy. In Africa, Boskalis focuses on port development. From home market Nigeria to all the other countries in Africa, Boskalis has made room to accommodate the growing number of container and bulk vessels bound for this continent.

*Ghana, Tema, capital dredging  
including drilling and blasting for  
deepening of Port of Tema with a  
Cutter Suction Dredger.*



# Africa





Projects in Africa often involve extending and deepening ports and entrance channels. Boskalis carries out both capital dredging projects in, for example, Egypt, Ghana, Ivory Coast, South Africa and Tunisia and recurrent maintenance dredging projects in, for example, Benin, Cameroon, Gabon and Guinea. Boskalis understands the requirements of our African customers and has a rich history of providing tailor-made solutions. Besides dredging projects, Boskalis has been involved in many other projects regarding, for example, breakwaters, lake restoration and outfall projects. But the company does more than just carry out projects in this region. It is an important partner in civil works, project design and, for some projects, financing. With regard to the latter, Boskalis can help by either facilitating donations from the Dutch government or by assisting in finding alternative financing schemes such as commercial loans and donor loans.



## At home in Europe

From the rough coasts of sunny Portugal to the ice-covered lakes of Kazakhstan: Europe has no more secrets for Boskalis. Our activities in this part of the world take place under extremely different conditions and range from environmental dredging to offshore activities.

In Southern Europe, Boskalis mainly focuses on dredging for both industrial ports and small fishing ports. As in other areas, Boskalis pays a lot of attention to minimizing the level of harm to the environment. In Portugal, for example, Boskalis dredged a channel in the wetlands just behind the beaches of the Algarve to regulate the passage of seawater. Now, numerous fish again populate this nature reserve, ensuring an adequate food supply for the large populations of migratory birds that visit this area.

Eastern Europe, with its harsh working conditions, is quite a different story. There, Boskalis mainly has a pioneering role. Pioneering for the oil industry, for example. A good example in this respect is the Caspian Sea, home to the largest oil reserve in the world. Boskalis has created several artificial islands there which enable the oil companies and national governments to successfully win oil.







*Restoration of environment in  
wetlands in Portugal*

# Europe



## At home in the Middle East

Boskalis has been active in the Middle East since the Oil States emerged in the early seventies. Dredging for large infrastructure projects was and still is very important; other projects in this region entail reclamation for housing, power and desalination plants, infrastructure for roads and bridges and, more recently, marina and tourist development.

*Bahrain, Manamah, extensive  
reclamation works for Second  
Manamah - Muharraq Crossing  
with CSD Taurus*



# Middle East





In almost all countries in the region, Boskalis has contributed and is still contributing to both the construction of major ports and their adaptation to the latest generation of container vessels and smaller projects.

Especially in the Middle East, Boskalis is expanding its core activities. In this respect, Bahrain is a good example: there, Boskalis designed a fifteen-meter high embankment for the construction of a bridge. In addition, we are involved in stone protection, cable laying, pipe installations and landfalls. These works are often executed in co-operation with local civil construction companies or our allied partner Archirodon. Especially for the tough dredging conditions in the Middle East, Boskalis has designed and constructed the world's largest fleet of self-propelled rock cutter suction dredges.



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## At home on the Indian Subcontinent

From expansion of infrastructure to prevention of flooding, Boskalis has a strong position on the Indian Subcontinent. The last decade several dredging and reclamation projects have contributed to the development and growth in this region.

*Bangladesh, Goral river:  
capital and maintenance  
dredging for redirecting  
waterflows in the Goral river  
with CSD Gemini.*



The Indian Subcontinent – Sri Lanka, Bangladesh and India – has its share of economic growth. And growth means higher investments in infrastructure. On the Indian subcontinent, Boskalis among other things contributes to the development of ports; maintaining and expanding existing ports, for example, to make them accessible to larger ships. Besides furthering economic growth, Boskalis also carries out projects to prevent large-scale flooding, to which the area unfortunately is quite vulnerable.





Land reclamation and beach replenishment, whereby sand from riverbeds and the sea is used, are good examples of important protection methods in coastal and delta areas that are vulnerable to flooding. Boskalis actively tries to minimize damages as a result of flooding by dredging and adjusting riverbeds and building dikes. A good example is the Gorai River in Bangladesh. This tributary of the river Ganges became silted up, which led to flooding of the Ganges and not enough water in the Gorai. Boskalis removed the excess sediments and restored the natural balance. This improved the living conditions of the local people, whose health for example strongly depends on the availability of running water.

# Indian Subcontinent

## At home in the Far East and Australia

Boskalis has been active in the Far East and Australia since the 1950s. In Australia and New Zealand, Boskalis mainly focuses on port development. In the Far East, the emphasis lies on land reclamation.

*W.D. Fairway in action at  
Jurong 4 land reclamation project  
in Singapore*



# Far East and Australia





The most striking examples of our land reclamation activities can be found in Hong Kong, Singapore and Taiwan, where reclaimed land is used for the construction of complete airports, residential areas and industrial zones. Throughout the region, including Korea and Malaysia, we are involved in a wide range of projects.

Port development, for example, or the construction of large breakwaters. And numerous offshore activities, such as protecting underwater pipelines and cables by using rock armour. Here, Boskalis often first dredges a trench and covers it up again after the pipes have been laid. The fact that we have been present in this part of the world for decades means we have acquired a vast amount of specific expertise and experience. This is accurately reflected in the size and specialized nature of our fleet, our people and our project methods. Increasingly, we are looking to expand our activities to new emerging markets such as China, Vietnam and Cambodia. To fully understand and meet the needs of our customers there, our local presence in the region is essential.



## Adding value: from contractor to partner

The days when Boskalis was synonymous for dredger alone are long past. Royal Boskalis has developed into a company that offers a wide array of expertise and added value. Increasingly, Boskalis acts as a partner. An overview of some of our other activities.

### Design and Construct

Listening, discussing and suggesting solutions: that is what 'design and construct' is all about. We work closely with our clients. To make the most of our worldwide know-how and experience, we jointly first define a problem before looking at possible solutions. This new role is ideal for Boskalis, which for example has its own in-house civil engineering service: Hydronic. Hydronic combines all our expertise in hydraulic engineering, soil mechanics, offshore and environmental sciences. Our engineers design solutions in consultation with our clients and provide on-site design coordination. One of their strongpoints is coming up with practical solutions. Practical solutions that can be implemented the very next day if necessary!

### Project Development and Financing

Boskalis can significantly help its clients with project development and financing. First of all, there are concessional funds from the Dutch government and the EU and multilateral institutions such as the World Bank and regional development banks. Furthermore, Boskalis also acts as an intermediary for project financing via commercial banks.







*A Trailing Suction Hopper  
Dredger working in Hong Kong  
waters for the construction of  
the Yau Ma Tei Reclamation,*

#### **Worldwide network of expert parties**

Throughout the world, Boskalis offers integrated solutions that go beyond our core business of dredging, coastal defense and land reclamation. For this, we maintain close relationships with a global network of expert parties such as Lamnalco (port services) and Archirodon (marine construction) and specialist in house companies such as Rock Fall (drilling & blasting) and Boskalis Offshore (pipe laying, pipe pulling).

## Equipment

Trailing Suction Hopper Dredger



The Trailing Suction Hopper Dredger can load its own hold using centrifugal pump(s). Loading takes place with pipes, which drag along the bottom while the ship is moving. Trailing suction hopper dredgers operate independently of other equipment and have the power to transport material over long sailing distances. Dredged materials are discharged via bottom flaps or doors or, more commonly, are pumped ashore via a pipeline for disposal or land reclamation. Boskalis has around thirty of these vessels, including two of the largest in the world: the **W.D. Fairway** and the **Queen of the Netherlands**.

Cutter Suction Dredger



Dredging with a Cutter Suction Dredger takes place while the vessel is moored by means of spuds and/or anchors and combines powerful cutting action with suction. Dredged materials are discharged into barges or, more commonly, pumped ashore via a pipeline for disposal or land reclamation. Boskalis has around fifty cutter suction dredgers, including three of the largest self-propelled rock cutter suction dredgers in the world: the **Cyrus**, the **Taurus** and the **Ursa**.

Backhoe Dredger



The Backhoe Dredger is based on the giant common land-based backhoe excavator that is mounted at one end of a spud-rigged pontoon. Its main advantage is its ability to dredge a wide range of materials, including debris and soft, weathered or fractured rocks. Boskalis has around 25 of these vessels, including four of the largest backhoe dredgers in the world: the **Colbart**, the **Nordic Giant**, the **Manu-Pekka**, and the **Rocky**.



## Colophon

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