

PROJECT SHEET

ROOM FOR THE RIVER, THE NETHERLANDS
PROJECTS FOR LOWERING RIVER WATER LEVELS

INTRODUCTION

As part of the 'Room for the River' government program, thirty flood-protection projects are ongoing in the Netherlands. At numerous locations on the IJssel, Rhine, Lower Rhine, Meuse, Lek and Waal rivers, more space is being created for the water. A range of techniques are being applied, such as moving dikes, excavating flood plains, lowering summer beds and lowering groins. Boskalis was and is involved in a large number of these projects. This project sheet gives a short description of a number of activities. Alongside the projects mentioned here, Boskalis is also executing a large number of other assignments, such as the projects 'Grensmaas', 'Noordwaard' and 'IJsseluiterwaarden Olst', and a range of larger and smaller works.

EXCAVATING THE FLOOD PLAINS NEAR DEVENTER

With excavation work going on in the areas of Hengforderwaarden, Zandweerdplas, Bolwerksplas, Worp, Ossenwaard, and the Keizers- en Stobbenwaarden, the IJssel River in the vicinity of Deventer is being given more room, and leisure facilities are being created. Trenches are being dug over a distance of ten kilometers in the flood plains, allowing more water to flow through the river and reducing the risk of flooding. The Engineer & Construct project is being conducted by the IJsselfront consortium, which consists of Boskalis and Van Hattum & Blankevoort, who are responsible for the construction of a concrete retaining wall, a quay wall, and changes to the piers of the Wilhelmina Bridge. The engineering firm Witteveen + Bos is providing support for the project. A total of 2.7 million cubic meters of soil, sand and clay will be moved, and the aim is to optimize the beneficial use of the soil. Some of the sand is being taken by water to Urk, where Boskalis is working on the construction of a 1,100-meter-long berm in the IJsselmeer as part of the construction of a wind farm. The fact that most of the material is not transported by road was an important consideration for the client when it came to giving the assignment to Boskalis. A complicating factor is the presence of bombs from World War II, making clearance operations necessary before the excavation of the area could start. The operations include cutting off gas pipelines, shutting down road, rail and air traffic, and informing local residents. A Location Manager maintained contacts with the parties concerned.

FEATURES

Client	Room for the River Program (an alliance including Rijkswaterstaat (Dutch Directorate General for Public Works and Water Management), provincial authorities, water authorities and municipal authorities).
Location	Various
Period	2006 - 2015
Contractor	Boskalis Nederland, in combination with various partners
Type of contract	Various types of contract



A Deventer Project: aerial view of the work in the Stobbenwaarden area.

ROOM FOR THE LOWER RHINE

The 'Lower Rhine' project is the first Plan, Design & Construct (PD&C) project in aquatic hydraulic engineering, with the plan study, design and execution being integrated in a single assignment. As the director of the project, Boskalis takes over a lot of work from Rijkswaterstaat.

Our early involvement meant we could contribute ideas that saved time and expense, and so the work was finished a year earlier than originally planned by the client. There was collaboration with the engineering firm Grontmij in the field of risk assessment and management. Considerable attention was paid to the spatial quality of each area. Nature and recreational areas are being overhauled, and this includes the creation of footpaths and bicycle paths, and parking areas, for leisure visitors. Work is going on in four areas. In the Doorwerthse Waarden area, the summer dike will be moved. The bank will be lowered and cleaned up between the new dike and the river.

The storage place for stone from the local stone factory will also be moved. A new road will be built on the lowered surface for the offloading traffic going to

the stone factory. The new summer dike will high enough to ensure that there will be no increase in the flood frequency for the farming land. The floodplains will be excavated in the Middelwaard and Tollewaard areas. The river bed will be widened to ensure that there will be a healthy flow with a higher discharge capacity.

At Elst, the former storage site for stone from an old stone factory will be excavated and cleaned up, resulting in a low-lying meadow that can be flooded. The present watercourse will be widened and a nature-friendly riverbank will be created.

LOWERING GROYNES IN THE WAAL RIVER

Between Gorinchem and Nijmegen, groynes are being lowered and, in part, replaced by dams in the direction of the river, raising the discharge capacity of the Waal. Groynes are built across the direction of the river and they are part of the Dutch landscape.

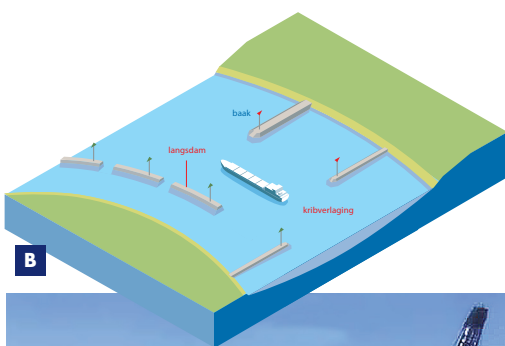
They are important in terms of regulating the discharge of the water, ice, gravel, sand and clay. They maintain the position and the depth of a river. As a result of the increase in the river discharge rate and the erosion of the navigation channel, the position of the groynes in the Waal has risen in recent years. At present, they constitute an unnecessarily large obstacle to the discharge of water.

Between Dalem and Dodewaard, 365 groynes

have been lowered, extended, removed and upgraded. A total of 253 groins have been lowered, improving the flow of the river water. During periods of high water, the water level will be between 6 and 12 centimeters lower. Two dams measuring seven and four kilometers are being built in the direction of the river in the section between Wamel and Ophemert, with the groins are being removed at the locations of these dams. The construction of the dams is a first in the Netherlands: this is a pilot project for Rijkswaterstaat under a UAV-GC contract that Boskalis is executing with Van den Herik. Boskalis is contributing the expertise of its own engineering consultancy and other support services, elaborating the technical design, and developing the working methods.

The preparations and permit applications began in the first six months of 2013. A risk survey was conducted for each groyne that included an assessment of whether there were possible difficulties that could lead to objection proceedings in areas such as archaeology, ecology, the environment, unexploded ordinance, leisure facilities, underground infrastructure or the interests of local residents. The impact for local residents is being limited by using ships for transport to and from the project. Operations began in mid-2013. Proof is required that the groyne and dam structures are, and will remain, sand-proof. Given the fact that a large part of the project will be conducted below the waterline, these checks are conducted using surveying techniques. Six floating pontoons with cranes will be deployed on the construction of the dams. There will be dozens of earthmoving machines to execute the excavation work. Incoming and outgoing equipment will be transported by water using push boats, hopper barges and transport pontoons.

As on the Lower Rhine project, sound location management is a crucial component of this project. Depending on the weather conditions and water levels, the work will be completed in late 2015.



B Dams are being built in the direction of the river between Tiel and Ophemert to replace groins. Their positioning parallel to the flow of the water means that the river can pass more easily.

C Lowering the groins in the Waal. Between Dalem and Dodewaard, 365 groins have been lowered, extended, removed and upgraded.

D Work on the Lower Rhine project

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