

Sand extraction: Sand for land

An enormous amount of sand is required to build Maasvlakte 2, Rotterdam's new port area in the North Sea – probably some 365 million m³. This is enough sand to fill the Rotterdam Feyenoord soccer stadium 'De Kuip' to the rafters nearly 250 times over.

SAND EXTRACTION PIT

Most of the sand used for Maasvlakte 2 will be extracted from an offshore sand pit. The best site for sand extraction was selected after extensive research. This was no simple task, incidentally, as there are quite a few restrictions. The final selection had to take account of nature areas, munitions dumps, military training grounds, cable and pipeline corridors and archaeological sites. The future sites of wind turbines are also 'off limits'. In addition, the heavy off-coast shipping traffic must remain able to safely navigate this zone.

It is common to extract sand to a depth of some two metres, but in consideration of the amount of sand required to construct Maasvlakte 2, this would mean removing a section of North Sea sea bed of approximately 11 by 30 kilometres. Therefore, in the case of Maasvlakte 2, sand will be extracted to a maximum depth of 20 metres, to ensure that a smaller section of the seabed is put under pressure.

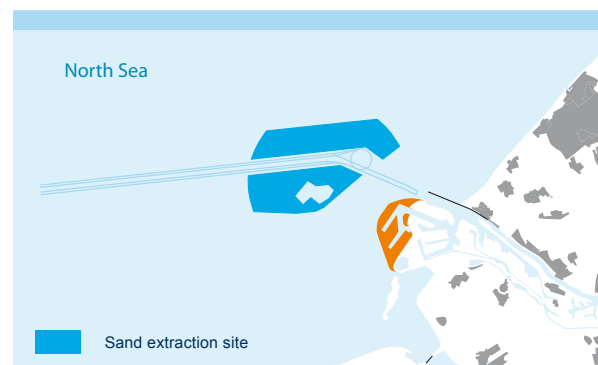
SAND EXTRACTION

The preferred ship for working the offshore sand pits is the Trailing Suction Hopper Dredger – TSHD for short. Moving slowly through the water, this type of dredger scrapes sand

off the sea bed using a draghead connected to a suction tube. The suction tube transports the sand to the ship's hold. Once the hold is filled up, the TSHD moves to the Maasvlakte 2 construction site to unload the sand.

RECYCLING

The sand required for the land reclamation project will not all be extracted off the North Sea coast. A small share (some 15%) can be obtained from sites directly adjacent to the newly constructed site. For example, suitable sand will become available when the Yangtzehaven is extended and



Sand for land

EXTRACTION TURNOVER

In order to round off the first phase of Maasvlakte 2 on time, from the start of activities a maximum of 150 million m³ of sand per year needs to be extracted. This equals some 24,000 TSHDs loaded to full capacity.



MULTIPLE APPLICATIONS

Sand will be required for various operations in the Maasvlakte 2 project:

- The construction of a 11 km seawall on the western edge of the land reclamation. Two-thirds of this structure will be a soft seawall consisting of sprayed-on beach and dunes; one-third will be a hard seawall (with a sand core).
- The spraying on of the new port sites.
- The construction of new dunes to the north of Hoek van Holland. This project will be realised to compensate for damage inflicted to existing dunes and to reinforce the Delfland coast.

widened. This port basin will be the new area's entrance channel from the North Sea. In addition, sand will become available when the port basins and waterways are excavated in the land reclamation of Maasvlakte 2.

QUALITY REQUIREMENTS

Sand quality is a key concern when extracting sand for the reclamation. Coarse-grained sand is preferred for the construction of the soft seawall for Maasvlakte 2. This sand is flushed away less easily by the tide, which helps keep maintenance costs down. In other sub-projects such as the spraying on of new industrial sites, the sand's average grain is less of an issue.

CONSTRUCTION ON SCHEDULE

The construction of Maasvlakte 2 is carried out in phases. In effect, the phases are determined by the rate at which the Port of Rotterdam Authority is able to enter into contracts with clients. This prevents sites from being sprayed on while no clients have been attracted for them yet.

After an international call for bids, the PUMA (Project Uitbreiding Maasvlakte) consortium was awarded the contract for constructing the first sites. PUMA is a partnership between Boskalis and Van Oord. All in all, this first phase involves some 700 ha of new port sites. The first phase requires 240 million m³ of sand. Upon completing the project in 2013, PUMA will also bear responsibility for the maintenance of the seawall for a period of five years.

This section is also covered by the contract. The remainder of the sites will be constructed as soon as there is a demand for them. Around 2030, Maasvlakte 2 will be fully developed and operational.

CARE FOR THE ECOSYSTEM

Offshore sand extraction has an impact on the species living on and beneath the sea floor and the movement of water around the sand pit itself. The effects of sand extraction activities have been extensively researched. The most important effect is that silt will be released back into the water during extraction, which clouds the water. In addition, there can be sound pollution in the area – both above and below the water surface. These possible effects have been deemed 'not significant'. In order to establish the actual consequences of the construction of Maasvlakte 2, the environmental impact will be closely monitored throughout the project.

All large-scale projects within the Netherlands must be preceded by an Environmental Impact Assessment (EIA). This mandatory report describes the consequences of a specific project for the environment and the local surroundings. The EIA dealing with the construction of Maasvlakte 2 outlines, among other things, the consequences of the sand extraction activities. In addition, the EIA report includes measures that should be taken to alleviate the project's negative impact and possible compensatory measures.

Maasvlakte 2

North Sea



The Netherlands

Rotterdam port area



Europe

The Netherlands



ROTTERDAM MAINPORT DEVELOPMENT PROJECT

The construction of the new port area, Maasvlakte 2, is part of the Rotterdam Mainport Development Project (PMR). This project also includes environmental compensation measures connected to the construction, the development of a 750 ha area for nature and recreation and improvements to the Existing Rotterdam Area. PMR is a partnership between national and regional government and the Port of Rotterdam Authority. For further information, please visit www.mainport-pmr.nl.

MORE INFORMATION?

Port of Rotterdam Authority
Maasvlakte 2 Project Organization
PO Box 6622
3002 AP Rotterdam,
The Netherlands
T +31 (0)10 252 25 20
info@maasvlakte2.com
www.maasvlakte2.com

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