

# Kinderdijk



Getting to know Kinderdijk

**World Heritage Kinderdijk**  
Dutch water management  
through the ages





# Meet Kinderdijk

**Take the time to look around: you are standing on a unique spot! Kinderdijk is the only place in the world where there are so many windmills close together in an authentic polder landscape. This is Holland below sea level. The nineteen mills, pumping stations, low and high 'boezems' (storage basins), ditches and sluices together form an ingenious water management system in the low-lying polders.**

This is a pure Dutch landscape with world-class, delightful views, an overwhelming, sometimes cloudy sky and characteristically stunning nature. The polder is embraced by wide rivers into which the mills used to discharge the surplus water. This happened for centuries near Kinderdijk-Elshout.

The Kinderdijk windmills are a Dutch icon throughout the world. The seventeen windmills that were used to drain the water were built between 1738 and 1740. Before then, the area already had polder mills, two of which can still be seen. For many years, these windmills kept the low-lying, peat land of the Alblasserwaard dry. This land was continually threatened by floods and soil compaction.

In the nineteenth and twentieth centuries, the mills were gradually replaced by pumping stations. Initially by the steam-powered pumping stations Wisboom, on the Overwaard and Van Haften on the Nederwaard. Later by the diesel- and respectively electrically-powered stations J.U. Smit and Ir. G.N. Kok/Overwaard. The third-generation pumping stations are now draining the water from both the Overwaard and the Nederwaard.

In Kinderdijk, the almost one thousand years of 'battling the water' is visible in the polder landscape, with its waterways, dykes, pumping stations, sluices and windmills. The Kinderdijk-Elshout windmill complex was added to the UNESCO World Heritage List in 1997. This brochure guides you through an unforgettable area that is mostly below sea level.



United Nations  
Educational, Scientific and  
Cultural Organization



Mill Network  
at Kinderdijk-Elshout  
inscribed on the World  
Heritage List in 1997

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## Visitors' Centre in the Wisboom pumping station

The former steam-powered pumping station is now the Kinderdijk Visitors' Centre. The entrance hall of the station houses a small exhibition. After visiting the World Heritage Kinderdijk site, take home a Kinderdijk souvenir as a keepsake or present. You can have a cup of tea, coffee or a soft drink in the cafe and enjoy the view from the terrace or the picnic tables. The Wisboom Visitors' Centre also houses a VVVi Tourist Information mini office.

Surrounded by the flywheels and centrifugal pumps in the machine room, you can watch – on six screens – a film about the Kinderdijk windmill area. The film is subtitled in four languages. The proceeds of the Visitors' Centre and the entrance fees are used to maintain and manage the World Heritage Kinderdijk site.

### Overwaard and Nederwaard

The Alblasserwaard was drained naturally until the thirteenth century. Peat rivers drained the surplus water to the large rivers. Due to dewatering, which led to the land settling, increasing problems were seen when the river level was high. Floris V Count of Holland ordered the establishment of the first water board, it was tasked with managing and maintaining the Alblasserwaard ring of dykes. In the mid-fourteenth century, two large drainage systems were created: the Overwaard and Nederwaard Low Boezems.

### High and low boezem

The Alblasserwaard was drained into the river Lek at the lowest point near Kinderdijk. Here the main waterways of the Overwaard (the Achterwaterschap) and the Nederwaard (Nieuwe Waterschap) came together, even now only separated by a narrow strip of land. When the water level in the river was low, these waterways could be individually drained via a series of sluices.

This system operated until the new water storage system, a system of boezems (storage basins), was built around 1738. The increasing drainage problems led to the construction of high boezems. To be able to pump the water from the low boezem into the high one, sixteen polder mills were built, which now form the unique Kinderdijk windmill landscape.





### Steam-powered pumping station

In 1868, the windmills were supplemented by two steam-powered pumping stations. The Wisboom pumping station, named after the then chairman of the board of the Overwaard, drained the Overwaard. Four scoop wheels drained the water from the Lage Boezem of the Overwaard into the Hoge Boezem. Incidentally, the windmills continued to operate. The Nederwaard steam-powered pumping station was demolished. The J.U. Smit pumping station now stands on the foundations of the former station.

### Electrical pumping stations

In 1924, the steam-powered pumping station of the Overwaard was converted to electricity and the steam installation and the large chimney were demolished. The former boiler house provided room for the transformer room, machine room and a workshop. New wings were built to house two double-sided Pannevis centrifugal suction pumps. They were driven by two three-phase 115-195 kW motors. In 1953, a second electrically-driven auxiliary pumping station was built next to the Wisboom pumping station to increase the pumping capacity (this has now been demolished).

### Monument

In 1995, the current screw pumping station, the Overwaard (Ir. G.N. Kok pumping station/Overwaard), was taken into use and the Wisboom station taken out of service. However, the Wisboom station and the installations were retained as a monument. It has now been restored to working order by the World Heritage Kinderdijk. In addition to its status as a monument, it has the new function of a Visitors' Centre.

### How do the pumps work?

Step into the Wisboom pumping station to get a glimpse of the world of water management.

The vacuum pumps, which can be found at the front against the wall, create a vacuum in the spiral housing of the centrifugal pumps. In response, the water in the spiral housing rises. When the water is sufficiently high, pumping can start. The electric motors in the rear of the hall power large belts that drive the centrifugal pump in the spiral housing.



## Windmill workshop

How is a windmill built? How do you maintain a windmill? How does a windmill work? What does a miller do and how do you actually become a miller? All questions that you can have answered in the Overwaard workshop, close to the Wisboom pumping station. Using parts of windmills and construction drawings, a guide explains how the windmills of Kinderdijk work and are maintained. He explains how you can pump and discharge water using the power of the wind. In the workshop, you can hear about cogs and rods, rotating sails, lantern gears, shafts, scoop wheels, screws and water levels. The workshop is only open to visitors by reservation.



## 6 Siphon weir

In 1981, a siphon weir was built in the dyke behind the two low boezems (storage basins). Due to the removal of the sluice at Nieuw-Lekkerland, the area it served also started to drain to the Overwaard low boezem, as does the Streefkerk polder. The weir was a solution to discharge this additional water. The estimated volume of water that drained from Nieuw-Lekkerland and Streefkerk into the Overwaard boezem could be 'returned' to the Nederwaard using this weir. This means that, if required, the screw pumping station could also discharge the surplus Overwaard water. This increases confidence in the entire Alblasserwaard water management system. The main function of the siphon weir today is to move water from one boezem into the other.



## 7 Overwaard

The Overwaard water board had eight windmills built on the Boezem dyke, which were completed in 1740. These wooden, octagonal cap winders are thatched with reed and also have an internal waterwheel. The wooden Overwaard windmills are lighter, therefore their foundations are less robust. However, these mills pose a greater fire risk. In 1981, the second Overwaard mill burnt down. However, it has been rebuilt. Windmill 2 now has the largest 'sail diameter' of all the World Heritage Kinderdijk site windmills, that is to say that the stocks are the longest, namely 29.56 metres.

To the east of the Overwaard boezem system lies the former boezem system of Nieuw-Lekkerland. This system had three windmills, namely two octagonal polder mills and one octagonal boezem mill. The boezem mill (the Hoge Molen – High Mill) and one of the polder mills (the Lage Molen - Low Mill) are still standing. The second polder mill was demolished in 1956. The Hoge Molen is exceptional because it is the only mill that has a screw.



## 8 Museum Windmill Nederwaard

Eight brick drainage mills, built in 1738, stand guard on the west side of the Middelkade. This is the central path through the Kinderdijk windmill area. With your back to the Lekdijk, the Nederwaard windmills are on the right and the Overwaard mills on the left. The Nederwaard windmills form the last stage of the western lower section of the Alblasserwaard drainage system, the Nederwaard. The second windmill has been turned into a Museum Windmill and can be visited via a bridge; it is operated if there is sufficient wind.



The miller is always present and is pleased to answer your questions. You can recognise him by his blue overall and clogs. Beware of the turning sails, they almost scrape the ground. That is why this type of windmill is called a 'ground-sailer'. The sails can be easily attended to from the ground. Step into the mill and step back in time: the interior stems from the 1950's when the last inhabitant left. As you can see in the original living room, the inhabitants slept in a 'bedstede' (alcove bed).

The mechanical part of the windmill is also fascinating to see. Climb the stairs to the three floors, where you can inhale the atmosphere of life in the 50's. You get a great view of the surrounding windmills from the top floor. At various points in the mill, you can watch film clips showing glimpses of mill life and the operation of the mill.

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### Nederwaard

The Kinderdijk windmills are 'ground-sailers' (the sails almost reach the ground as they turn), however, there is a difference between the windmills of the Nederwaard and those of the Overwaard.

The eight, round, brick ground-sailers in the Nederwaard are of the 'cap- and external-winding' type. They are thatched with reed and have a covered waterwheel.

The sail cross can be turned into the wind by just turning (winding) the cap. This explains why this type of mill is called a 'cap winder'. It is handy if the wind suddenly shifts!

## What are the differences between the Nederwaard and Overwaard windmills?

The Nederwaard had eight, round, brick ground-sailers built that were completed in 1738. At the time, old painters' specifications show that the Nederwaard mills had caps roofed with slates instead of them being thatched with reed. The fifth mill was known as the 'leaning mill' because of its 65-centimetre lean. It was straightened and then made operational in 2011 at a restoration cost of more than 1 million euros. The bake house of the fifth mill was demolished and rebuilt at the Museum Windmill, the second mill in the Nederwaard.

The Nederwaard windmills do not stand neatly in a row but are staggered. This was done to ensure that they did not 'take the wind from each other's sails', particularly when the wind blew from a certain direction. This was considered less important for the Overwaard mills, because they are spaced further apart. Moreover, it was more difficult to stagger the mills here because the Overwaard dyke does not have 'avelingen' (wide strips of land along dykes to prevent dyke subsidence).

## 10 Contra mill

The fourth Overwaard mill is a 'contra mill', meaning that it originally had two channels each with a scoop wheel. One to move water from the low to the high boezem (storage basin), and one to move the water the other way round. The 'contra' part was only used for a short time (from 1740 to 1800). The necessity of the second scoop wheel had actually gone by 1800, as the Hoge Boezem was only occasionally used for grazing and was more often needed to store surplus water. The scoop wheel was removed in 1799 and the channel filled. The front walls of the mill, twice the normal width, immediately stand out. During the last restoration, the contra channel was restored. The intention is to also reconstruct and reinstall the scoop wheel.

## 11 Blokweer Museum Windmill

Almost in line with the boezem canals, you find the nineteenth windmill. This mill, the 'Blokkerse wip' (official name: De Blokker) is a hollow post or 'wip' mill raised on a brick base. The exact date of construction is unknown, however, it is said that there was a hollow post mill at this location around 1500. There are two explanations for the origin of the Dutch name. The first is the term 'wippen' meaning wobble, which describes the movement of the mill when it is rotating quickly. The second is that the scoop wheel as it were 'wips' (scoops) the water from the polder into the high boezem. Contrary to the other eighteen mills, this mill is not located within the precincts of Kinderdijk village, part of the Molenwaard, but in the adjacent Alblasserdam. Together with an auxiliary pump, it drained the Blokweer polder into the Nederwaard until 1956. During its restoration in 1975, the tiles, which had protected the substructure since 1875, were replaced with reed thatch. In 1997, the Blokker was damaged by fire, it was rebuilt to the original state in the following years. The substructure of the Blokker is now tiled. The wooden body is black. The cap is weatherboarded, meaning overlapping horizontal wooden boards. The Blokker's scoop wheel is installed outside the mill. The enormous cap (the body) weighs 30 tonnes.

In 2013, the interior was renovated in such a way that the working parts are visible behind a glass screen, giving the windmill an educational function for school children.