

Pauline van Rijn

The Roman Harbour of Velsen

Abstract

Though the Dutch are considered world leaders in the dredging industry, many archeological excavations in The Netherlands reveal that in the first four centuries of our era, the Roman army were already busily at work in The Netherlands. Archeological sites show examples of the engineering skills of the Roman army.

Recent discoveries in Velsen, North Holland during construction of a new tunnel underneath the North Sea Canal, the canal that connects Amsterdam Harbour with the North Sea, indicate the extent to which Roman technicians were active. Amongst their dredging and infrastructure activities were permanent dikes, roads, long-distance canals and elaborate harbours. All information on the construction of the camp and harbour of Velsen and all drawings can be found in the PhD thesis of Dr. J.-M.A.W. Morel "De Vroeg-Romeinse versterking te Velsen 1, Fort en Haven", Amsterdam, The Netherlands, 1988. Photographs made by Mark IJdo, Institute of Pre- and Protohistoric Archaeology (IPP), University of Amsterdam, The Netherlands. Drawings and photographs are used with permission.

Introduction

Dredging activities and the construction of harbours, dikes and large waterworks are often seen as typically Dutch enterprises. The export of these services to other countries forms a significant contribution to the Dutch economy. Activities such as reclaiming land and building defense systems to protect land against the forces of nature led to the expression that "God created the world, the Dutch made Holland". Archeological finds make clear that dredging had started long before a country named The Netherlands existed, and that the first peoples to engage in such large-scale operations were the Romans, not the Dutch.

The Roman army was, in the first four centuries of our era, the "company" that built the first dikes and real roads, dug the first long-distance canals, and constructed regular harbours in Holland. Many archeological sites show examples of the engineering skills of the Roman army and its capacity to adapt to local conditions in the use of materials at hand.

Excavations carried out between 1985-1989 at Valkenburg, halfway between Katwijk and Leiden, revealed amongst many other features two Roman roads, constructed on a dike-like body along the southern bank of

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the Rhine River. Between The Hague and Leiden, at Voorburg, remnants of the so-called canal of Corbulo were found. This canal formed the North-South link between the two big rivers Meuse and Rhine and was dug in AD 47 to ensure an easy and safe passage inland. On the outside of Roman fortresses situated along old river beds, pilings of piers and mooring places for boats have been found (Figure 1).



Figure 1. The Netherlands with Roman excavation sites indicated: 1) the harbour of Velsen; 2) Valkenburg by Leiden; 3) Corbulo canal in Voorburg near The Hague.

Many of these sites have been only partially excavated, with one exception: Velsen. The Roman site of Velsen is located at the South entrance of a new tunnel in construction underneath the North Sea Canal, the canal that connects the Amsterdam Harbour with the North Sea. Construction activities were preceded by large-scale excavations that took place from 1974 till 1990. During the excavations, remains of a Roman fortress, a fleet station with boathouses and fortifications, harbour basin, moles and jetties, were brought to light, making possible the investigation of the total compound of the enclosed camp as well as of the harbour.

450 YEARS OF ROMAN PRESENCE IN THE LOWLANDS

When, in the first century BC, the Roman legions set foot in the regions of what is nowadays known as The Netherlands, Rome had already existed for some 700 years. Between BC 58-50 Gaius Julius Caesar had conquered Gallia, now known as France, and the southern part of Belgium. This was the first time the highly developed Roman civilization left the Mediterranean to penetrate into the regions of the North European river estuaries of the Escaut (Schelde), Meuse and Rhine and the Atlantic coast. But Caesar did not succeed in establishing lasting Roman control in the parts north of Gallia. It took another 40 years before, under Emperor Augustus, military operations in the Rhine area were started again, in an attempt to secure the northern borders of the empire against the invasions of Germanic tribes. The river estuaries and waterways in central Holland were instrumental to these plans. Several fortresses were built along rivers, equipped with quays and harbours, where the troops could embark on their expeditions to the far North.



Figure 2. Camp and harbour at Velsen in an early phase: triangular camp terrain; at the riverside the harbour with the wooden platform (yellow) with west and north piers and on the east side a separate third pier. The harbour silted up and there is clear evidence of dredging activities.

Dredging and Archeology

Quite often during dredging activities in lakes and rivers, the remains of ancient forests and woods are excavated. Although these materials are simply another part of the dredgers' work, these trees can sometimes be 8,000 years old and are of extreme archeological and scientific value.

Dendrochronology, the study of the growth rings of trees, is an interdisciplinary science and its applications range from art, archeology and history to climatology, ecology, forestry, geology and physics.

In The Netherlands this research is done by the Dutch Center for Dendrochronology RING. Dredging companies which encounter such important "archeological finds" are urgently requested to report this to RING, c/o Rijksdienst voor het Oudheidkundig Bodemonderzoek, Kerkstraat 1, 3811 CV Amersfoort, The Netherlands, tel. +31 033 634 233. This Dutch organisation works in close contact with similar organisations in other countries and will be happy to refer any information to these groups.

Rivers were canalised by Roman commanders to improve the waterways and ensure a good passage.

However, it again proved impossible to bring the regions North of the Rhine under total control, and in AD 47 Emperor Claudius decided to establish the Rhine River as the northern and northeastern border of the Roman Empire. Within a few years, a series of fortresses with a defensive function were built on the southern bank of the Rhine, from the North Sea coast all the way down to central Germany. This defense line ran right across the heart of the modern-day Netherlands: Katwijk on the coast, Leiden, Utrecht, Nijmegen. One century of relative peace and prosperity followed in the Roman-ruled territories south of the border. Long distance roads were constructed, small market towns developed, such as Forum Hadriani (Voorburg), a site close to The Hague, and Noviomagus, located in the modern town of Nijmegen. Around the military fortresses civilian settlements developed with an indigenous population and small industries. At the end of the second century, the pressure on the northern and eastern borders increased again under the westward migration of Germanic tribes. Incessant invasions destabilised the border provinces even more in the following centuries. The Roman rule in the northern provinces of the Roman Empire was effectively brought to an end in the first decade of the 5th century when hordes of Germanic tribes crossed the old Roman borders.

ROMAN FORT AND HARBOUR AT VELSEN

The fortress and harbour of Velsen were in use from AD 15 until about AD 30. This is the period in which Rome was still trying to gain control over the whole of Germania and set up fortified fleet stations for military expeditions into Germanic territories. Velsen was the most northerly situated Roman base on the continent. The Roman occupation of Velsen did not last long. Tacitus writes in his "Annals" about the violent attack on a fortress called "castellum Flevum" by rebelling Frisians in AD 28 (Annals 4,72-74). The fortress of Velsen was situated in Frisian territory and traces of violence and combat actions have been found during excavation. There is some evidence that this happened around AD 30. It is highly probable that the fortress of Velsen is the "castellum Flevum" of Tacitus.

The fortress and harbour of Velsen were positioned on the south bank of a wide river, on a strategic point between the dunes in the west and the peat bogs in the east, a landscape intersected by sluggish, meandering streams and gullies. The sea was only about 7 kilometers away. The low sandy dunes to the west were almost treeless, with some Juniper and Buckthorn shrubs and dune grasses. The open, wet and windy landscape must have been rather desolate in the eyes of a Mediterranean born soldier.

The purpose of the Velsen base was to bring the surrounding local tribes and the passage to the north under Roman control and serve as point of departure for the troops sent North. The waterways made possible easy and fast transport of troops and goods in countryside where decent roads were nonexistent. After arriving in enemy territory, the first concern of the Roman commander was to build a temporary defensible camp on the river bank. Once safe, they started to build a more permanent fortress and the harbour. The fortified terrain of the camp had a triangular form with its longest side (182 m) along the river. On the land side and along the eastern half of the river the terrain was surrounded by an earthen wall, supplemented on the land side by a moat. On the western part of the riverside the waterfront was open and boats could be pulled directly up on to the river bank. A boathouse was built to house a light galley, that could swiftly be put in the water in case of an attack over the river. No traces of barracks were found on the camp terrain. The troops lived in leather tents. Parts of the tents and hundreds of wooden tent pegs have been found.

CONSTRUCTION OF THE HARBOUR

On the river side a wooden platform on posts was constructed projecting into the river. Two solid moles extended from the platform, the west and north pier. These were meant for use by the Romans, situated as

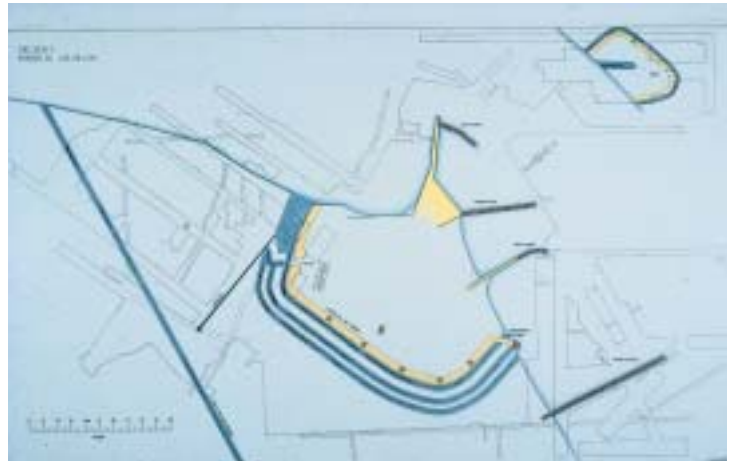


Figure 3. Camp terrain is strengthened, with moats and a heavier wall; the platform in the harbour has been enlarged; and piers are replaced by open and longer jetties. After these alterations, silting up ceased to be a problem.

they were within the defense line of the camp. To the east a third mole was constructed, that could only be reached from inside the camp through a gateway in the rampart (Figure 2). The dam walls of the west pier were 55.75 m long and made of thin wooden posts, set closely together. The dam body was divided into compartments, formed by cross rows of posts. The compartments were filled with alternating layers of willow withies and layers of clay packed in reed mats. To compensate for the slope of the river bottom, extra layers were added at the end of the pier. The dam was 6 to 9 m wide at the foot. Full grown willow leaves still present on the withies, show that the dam filling must have been put in during summer. The north and east pier were probably constructed in a similar way.

The system of caisson construction or compartments, filled in with clay and reed, was not new. The Roman architect Vitruvius describes how stone harbour moles should be constructed (Lib. V, cap. X11.5). First two double dam walls of the length of the future mole had to be built, with posts closely set and held together by ropes. The space in between each double wall had to be filled in with clay packed in reed baskets. After that, the drained bottom within both dam walls could be leveled and finally the stones could be deposited on the dry and leveled bottom. In Velsen there was no natural stone to be found in the far surroundings and to fill in the dam body the Roman Imperial Engineers adapted the system to the specific local circumstances by using wicker work and clay in reed mats.

Dredging

However, the predominantly western winds and subsequent, constant scouring by the waves caused erosion of the river bank west of the west pier and damaged the pilings of the pier itself. Sand was de-



Figure 4. Artefacts found during excavations at Velsen: from left to right, reconstruction of a scabbard inlaid with silver and enamel; bronze statue of Hercules drinking (*Hercules bibex*), and a sculponea, a wooden slipper for in the bath-house.

posited in the harbour basin. Within the piers the current was almost non-existent and the basin silted up.

At first the Romans attempted to deepen the harbour bottom by dredging. The dredging was done by clearing away the soil of the shallow bottom of the basin and pulling it towards the deeper parts. This gave the harbour bottom a very uneven surface, with deep cuts into the pre-Roman deposits. The process of "dredging" produced, in the deeper parts, a homogenised layer of silt clay mixed with rubbish one always find on the harbour floor, such as discarded objects, industrial refuse and twigs and branches from the surrounding vegetation. From the stratigraphy it is clear that these dredging activities were repeated several times.

To allow for more current in the harbour basin and prevent the harbour from silting up again, the curved head of the north pier was replaced by an open jetty. They replaced the revetments of the damaged west pier and reinforced the head of the pier with heavy oak posts.

RECONSTRUCTION OF THE HARBOUR

The alterations did not have much effect. The deposition of silt in the basin went on because the solid dams stagnated the water displacement. The only solution seemed a drastic change of the harbour. An open jetty was added to the west pier projecting from it parallel to the river bank and enclosing the harbour basin. The entire north pier was replaced by a long open jetty and the east pier was lengthened by adding an open jetty. From now on, dredging was no longer necessary, as no other traces were found (Figure 3).

At the head of the north jetty, traces of pile driving have been found in the river bottom in the form of impres-

sions of two small square posts at either side of each pile. Because of the orientation of the piles and the impressions, it seems that, at least in these cases, the pile driving operations took place from a barge or pontoon and not from the finished trave of the jetty.

Cranes and Pile Drivers

The use of cranes and pile drivers was certainly known. Caesar mentions both mechanical structures in his description of building a bridge across the Rhine in BC 55 (*De bello Gallico* IV, 17). For pile driving an apparatus must have been used consisting of guides, hoist and pile hammer. A crane was needed to place the pile in position. For pile driving in water, the crane was placed on a raft or barge. In order to lift the pile on to the guide-way and control it as it glided down, there would be a hoist uppermost on the guide. Once the pile had been firmly positioned on the bottom in between the guides, it had come so far down the guide-way that there was a good drop between hoist and top of the pile. The pile was then loosened from the hoist and the pile-hammer attached to it.

The last alterations of the harbour and the strengthening of the camp fortifications must have taken place somewhere between AD 22 and 30. The ending of the Roman occupation of this camp was violent. The terrain west of the camp and harbour bottom were covered with lead sling shots. Bodies had been thrown into waterwells. In the harbour, many artefacts including parts of human skeletons have been found (Figure 4).

Although the Romans were still active in the area after these events, the camp no longer had an important function. Some years later Emperor Claudius abandoned the policy of conquest of northern Germania, to direct his attention to the invasion of Britannia. All expansion activity north of the Rhine stopped and this was the end of Velsen.

Conclusions

In the early part of the first century AD the Romans were at work trying to establish Velsen as a harbour. The use of waterways, the importance of the River Rhine and the defense function for the transport of troops and goods were recognised by the Roman military attempting to spread and maintain its influence. Dredging was used to keep the harbour at Velsen open but this was not sufficient. The harbour continued to silt up because the solid dams stagnated the water displacement. The solution was eventually found by drastically changing the harbour by the construction of several open jetties.

Around AD 30 the strategic need for the harbour ended and the harbour was abandoned. The Romans however had left behind the first memories of dredging and port development in The Netherlands.