

Bustling Wharves



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A Medieval Port in the Heart of Utrecht

Bustling Wharves

The canals of Utrecht are unique in the world. They are part of an ingenious medieval dockland development with wharves and cellars connected under the streets with the huge storage cellars of the canal houses. This harbour came into being some seven hundred years ago when the merchants of Utrecht made a clever use of the difference in levels between the canals with their mooring stages and the street with its houses a few metres higher up. For centuries to come the canal with its heavily laden ships, its rotating cranes, sweat-drenched workers and calls of market vendors, was a hive of activity. Wine, linen, fish, corn, vegetables, fruit, wood, peat and cattle – all kinds of goods were stored and sold here. It was only at the start of the twentieth century, after shipping had ceased to be so crucial to the city, that transport by water to and from these storage depots disappeared. The wharves however are still there and the Oudegracht, which was the centre of the historical port, remains the bustling heart of the city to this day. With its many restaurants and pavement cafes, shops and market vendors, the canal and its wharves continue to be of vital economic importance. What is more, ships still moor here, even if they are now mainly round-trip boats and pleasure launches or the occasional boat with supplies for the catering concerns. The tourists lean over the railings on top of the walls and gaze in admiration at the sight of a medieval harbour that is the only one of its kind in the world.

New Trading Routes

Anyone who strolls above or along the wharves in Utrecht will have difficulty believing that they were not a single vast medieval building project, rather than the result of hundreds of individual enterprises. At some time in the late twelfth century a Utrecht merchant

must have come up with the idea of no longer hauling the cargo from the quayside up to the banks several metres higher only to have to drag them again down a flight of steps to the cellar of a canal house. Wouldn't it be much more efficient to build a tunnel straight from quay to cellar, so the goods could quickly be transported under the street to the storage rooms on the same level? The reason why wharves and canal house cellars were on the same level was that the canals were fairly

◀ Originally a medieval port, the Oudegracht remains the vibrant heart of the city.





Up the Banks (1000-1150)

The history of the wharves and their cellars can be divided in different periods. In the first period there was a considerable difference in height between the low-lying quaysides and the street with its houses, but there were as yet no wharf cellars. All the merchandize had to be hauled up the banks only to be conveyed down a flight of steps to the canal house cellars.

▲ View of the harbour from the Jansbrug looking towards the Viebrug in 1875, with ships and storage spaces.

low-lying in relation to the street with its houses. There was also a natural explanation for this, because when the canal was dug in the twelfth century the excavated soil was thrown onto the banks. These higher banks formed a kind of dike and defence against flooding from high water. It is true that this danger was considerably reduced in 1122 by the building of a dam across the Kromme Rijn, a branch of the Rhine, at the village of Wijk bij Duurstede, which meant that water levels became much more consistent. It was this dam however that necessitated the digging of an important part of the Oudegracht. Cut off from the Kromme Rijn, Utrecht had lost an important waterway and trade route. The merchants of that time were fully aware of the problem and devised a hugely ambitious plan to solve it. By digging the eight-kilometre long canal from the trading settlement to the Hollandsche IJssel River further south, Utrecht was given a new shipping route. The canal flowed as far as the hamlet of 't Gein where the ships were hauled over the dike by a portage (an installation by which ships could be hauled over land to another waterway) and could then continue via the Hollandsche IJssel and Lek rivers towards the commercially interesting hinterland. It was a major undertaking but a manageable one, because it wasn't the first time



◀ This oldest extant map of the city, dating from about 1570, by Jacob van Deventer, shows the most important medieval waterways through and near Utrecht.

- 1 Oudegracht
- 2 Stadsbuitengracht
- 3 Vecht
- 4 Vaartsche Rijn
- 5 Kromme Rijn

Utrecht had witnessed a project like this. At the end of the tenth century, when the west side of the Rhine silted increasingly, with the water becoming shallower, a canal was dug to the Vecht River to let shipping through. It was only eight hundred metres long, but it proved that digging a canal was a meaningful option. In around 1125 therefore the first shovelful of earth was dug to build the canal, known as the Vaartsche Rijn, which ran southwards towards the Hollandsche IJssel.

The Oudegracht as a Trading Centre

In return for building the dam at Wijk, Utrecht was granted a city charter in 1122. The new city was fairly large and work was started that year on building a fortified wall around it with a wide outer moat. A waterway was to be dug from north to south through the new city, a trading route that would provide the basic





◀ Jan de Beijer drew this view from the Bakkerbrug in 1753. On the right, the gates and outbuildings show that the wharf was still in private ownership. On the left are the two 'urban castles' of Fresenburg and Oudaen tower above the other houses.

▶ Unlike the wide wharf cellars we see today, the first link between the quays and the cellars under the canal houses consisted of little tunnels. Later on virtually all these tunnels were replaced by cellars to gain storage space, but at Fresenburg there is still a tunnel in addition to two cellars. The entrance is behind the white gate shown in this photo of about 1900.



Via a Tunnel from the Quayside to the Canal House Cellars (1150-1200)

Some time around the end of the twelfth century the first tunnel was dug under the street, allowing the goods to be transported from the quayside to the cellar of the canal property on the far side of the street.

conditions for a flourishing urban economy. The northern part was formed by the canal previously dug in around the year 1000, while the southern section would form part of the new canal to the Hollandsche IJssel. In between, in the original commercial centre of Utrecht, part of the former course of the Rhine was used as a linking canal. This shipping route right through the city – between two of the city gates, the Weerdpoot and the Tolsteegpoot – ended up as the Oudegracht, even if it wasn't until the end of the fourteenth century that another important canal was added – the Nieuwegracht.

Prime Site

The plots along the newly dug Oudegracht formed a prime location; this, after all, was where the trade was. In no time a ribbon development of storage depots was built on both sides. The principle of private ownership applied not just to the houses but also to the area of quay or wharf in front of them, even extending to the middle of the canal. That meant that the owner of a property on the canal was responsible not just for the upkeep of his own house, but also of the wharf and even of the stretch of water regarded as belonging to his lot. The only part owned by the city was the street in front of the houses. Without this specific right of ownership, the Utrecht wharves as we see them today could never have

been developed. Merchants, weary of having to haul their wares from the quayside to street level, only to store them again in the cellar of their houses, could now simply dig tunnels from wharf to cellar, without them ever leaving their properties. And it was this underground structure – under the public highway – that made the Utrecht wharves and cellars so unique.

Tunnels and Cellars

Over recent decades the wharves and wharf cellars have undergone a major restoration, offering a good opportunity for an in-depth study of their architectural history. Virtually all the 732 wharf cellars have been studied and measured and this has provided us with a treasure trove of information about the architectural history of the wharves, the wharf cellars, the canal premises with their private cellars and the layout of streets and alleys around the canals. The first tunnel appears to have been built some time during the second half of the twelfth century, shortly after the Oudegracht was dug. The idea was a good one, but it needed improving before it would attract imitators. By widening the little tunnel into a barrel-vaulted cellar the breadth of the owner's lot, this space, like the cellar under the house, could be used for storage. In many instances the tunnel was also enlarged later to form a wharf cellar, although wharf cellars

without an initial tunnel had been built even before the thirteenth century. This was often the case with the immense, typical Utrecht 'urban castles', built on the canal in the thirteenth century, and of which some magnificent examples, such as Oudaen and Drakenburg, can still be admired.

Larger Storage Capacity

In the fourteenth century the construction of the wharf cellars really got under way and two centuries later development along the Oudegracht was almost complete. From that time on the wharves and wharf cellars formed a single long row on both sides of the canal. Here and there an old tunnel interrupted the series, but effectively the nearly two-kilometre long harbour, with quays on both sides – a total of almost four kilometres! – was more or less complete. This wasn't the end of the affair however. Between 1500 and 1700 the increasing demand for storage space meant that many cellars had to have their ceilings raised. This was possible because since the building of the first tunnels and wharf cellars the street level had risen by a good half metre. Also many of the tunnels were replaced by cellars to meet the growing demand for storage. After 1700 extra space was mainly gained by extending the length of the cellars, which had previously varied greatly. Today the cellars



◀ The Oudegracht with trees, wharves and canal houses photographed from the Dom Tower in 1877.

▼ Cellars were even built under the bridges. These bridge cellars, like the one shown here under the Bakkerbrug, were built at a ninety degrees angle to the bridge, so that the entrance was on the wharf.



Tunnels and Wharf Cellars (1200-1300)

The tunnel would soon get its imitators. Quite soon however people started building barrel-vaulted cellars the width of their lot. The cellars were also used as storage space and they ended up replacing virtually all the tunnels.



have therefore all ended up roughly the same length, even though they still don't have a continuous front. From then on they were also all closed off by a wall with a door and sometimes a few windows. Until the eighteenth century the fronts of many cellars were either open or else secured by a simple wooden gate. If you look closely, you can recognize many of these originally open cellars from the large brick arch in the present-day masonry. Another way of expanding the storage space was by renting or purchasing a nearby cellar, something that

mainly occurred from the eighteenth century onwards. As soon as a neighbouring cellar came free, an opening was made, providing easy access from one cellar to another. Earlier on those who lived near a street or alley were fortunate, because that ground was also usually treated as private property. Wharf cellars were therefore also dug under the street and even in an adjoining canal bridge when there was one next to one's property. These bridge cellars were built at an angle of ninety degrees to the others because an entrance to the cellar under a bridge was awkward. Moreover it was not good for the structure of the bridge if the barrel vault of the cellar lay in the longitudinal axis.

▲ In the nineteenth century people even lived in some of the cellars. It must have been very crowded and damp in these 'underground dwellings', as the draftsman Verhoeven called them.

had to remain free to use as a towpath, and that was all the public space there was. The area near today's town hall was especially busy, because since 1402 the city crane, used for moving merchandise from the ships to carts, had been installed there. These carts could then be hauled up the sloping street, which we still see today, and from there into the city or other destinations beyond. Next to the city crane, on the corner of the Ganzenmarkt (goose market), was the Weighhouse where goods were weighed before being put on sale.

Hundreds of Fences and Gates

Because the cellars were built or converted during so many different periods and by such a wide range of owners, no two of them are alike. The wharves moreover were private property until well into the twentieth century and there was no public access to them. This atmosphere of privacy was added to by the variety of goods stored there, by the hundreds of fences, gates and walls, by the various types of paving, or else the complete lack of any, and by the private cranes stationed here and there along the quays. Later on little gardens were even planted there. A narrow strip along the water

Miniature Wharves: the Nieuwegracht

The Nieuwegracht was dug to the east of the Oudegracht between 1391 and 1393, with partial use probably being made of older watercourses. It was intended more as a drainage channel than for trade. It also meant that the houses and cloisters, mainly dating from the late fourteenth century onwards in the district round the Nieuwegracht, were easier to provision by ship. Because



▼ The Nieuwegracht was dug in 1393 and was in a sense a miniature version of the Oudegracht. Unlike the more westerly Oudegracht, it never had much trade.



Wharf Cellars Occupy the Whole Length of Both Sides of the Canal (1300-1500)

After 1300 the construction of cellars on the wharves of the Oudegracht proceeded apace. No new tunnels were built and the cellars increasingly began to form a continuous row. Increasingly often they were closed off with a gate or brick front.



▲ Loading and unloading of wares in the Jacobskerkhof, end of nineteenth century.

the new canal was also sunk below street level, wharves and cellars were built here too. It was however not much more than a miniature version of the Oudegracht. Some sections of the canal, today's Kromme Nieuwegracht, Drift and Plompetorengracht, were so narrow that no wharves were possible and such cellars as there were fronted directly on the water. Supplies that had been ordered, such as peat and wine, were offloaded directly from ship to cellar by way of a door on the canal. The absence of any commercial activities on the Nieuwegracht made it much less busy than the Oudegracht. Today too, with its trees and little bridges, the canal is an oasis of calm in the city centre.

A Street on the Wharf

At the end of the nineteenth century, when traffic by land started to dominate, the Utrecht cellars lost their function. Their upkeep was neglected and they fell into decay, a situation that sometimes proved dangerous. Before the Second World War the residents of Utrecht called for the wharves to be restored, but that was more easily said than done. The hundreds of different owners made it virtually impossible to carry out a systematic restoration. From 1948 the city council instituted a

► Before a wharf cellar could be built, the site had first of all to be excavated right down to the wharf below. Then walls had to be built on both sides to support the vault.

▼ The Oudegracht at the Jansbrug in 1890. A man stands on the bridge, watching a woman doing her washing below.



Building a Vault

Building the cellars would have caused a great deal of nuisance in the Middle Ages, because it meant that the street above had constantly to be dug up. To build a cellar, one had first of all to excavate the site down to the level of the wharf below. Then two walls had to be erected, one on each side, about one metre high. From there the barrel vault was built in header bond, with only the short ends of the bricks visible. This could be done without one having to resort to a temporary wooden structure, or centring, because, with the right mortar, the bricks remained in place long enough for the vault to be completed. To make the cellars more waterproof, one or two layers of recycled flagstones were often also placed on top of the vault. After that, soil was piled on up to street level and that was it. Streets were only generally provided with cobblestones after about 1400.



◀ The Oudegracht in around 1900. In some places the quay wall was of brick while other parts still had wooden camp shedding. On the still private wharves, there were hutches for rabbits or chickens, as one sees in this photo (below left).

▶ In the first half of the twentieth century the wharves fell into decline. After the Second World War the city council took it on itself to restore both wharves and cellars.



Vertical and Horizontal Expansion (1500-1700)

At the beginning of the sixteenth century the whole length of the Oudegracht was more or less occupied by wharf cellars. The need for storage space however increased all the time. With no space for any new wharf cellars, the existing ones were enlarged as much as possible in the centuries that followed. Vaults were raised and cellars extended lengthways – in the latter case, frequently at the expense of the wharf. Due to the varying lengths of the cellars, the wharves looked quite different in the seventeenth century from their appearance today.



policy of taking over the ownership of the wharves. Most of them were transferred voluntarily by the individual owners and, where this wasn't the case, compulsory purchase orders were resorted to. This cleared the way for a major overhaul. After most of the structures and gates on the wharves had been demolished, the city replaced the wooden camp sheeting with brick quay walls. The wharves themselves, part of which were still unpaved were surfaced with cobbles. The change was dramatic. For the first time ever a public highway ran along the waterfront, accessible to the public between the bridges and in some cases even under them.

Restoration of the Walls

There were still plenty of problems to be solved however. For instance the walls of the wharves – the cellar façades, that is – required restoration. From the beginning of the 1950s the city authorities worked systematically to acquire ownership of them. Once more they succeeded and, with very few exceptions, the 730 wharf fronts were transferred. Because a large number of the walls were in a sorry state, restoration proved extremely expensive and the city simply did not have the funds. What funds were available were used to draw up plans and carry out some restorations. By no means

all the walls could be restored however and it proved hard to keep pace with ongoing dilapidation. Half way through the 1970s, the city received funds from a national grant scheme for major reconstruction and redevelopment. This made an end sprint possible and between 1975 and 1985, a hundred and forty walls were restored and thirty-five flights of steps repaired or replaced.

The Danger of Fire

For centuries the canals of Utrecht have served as a lifeline for the city, a route for both trade and construction materials. The water was also used for a wide range of production processes – in the brewery and tanning businesses, for instance. Canal water was also used for putting out fires. It is no coincidence that virtually every street and alley along the canals has a flight of steps leading to the water, so that a human chain could pass on buckets of water from the canal to the scene of the conflagration as quickly as possible. In a crowded city like medieval Utrecht with its numerous wooden houses or façades, it was essential to extinguish fires before they had time to spread. One was obliged by law to keep some buckets in one's house, with their number depending on the size of the premises.

A Public Sewer

The water of the canal was also used for drainage, making it an open sewer for centuries. It is hardly surprising that this was the case in the Middle Ages, but that it should have continued until well into the twentieth century is, to say the least, curious. Moreover this had nothing to do with ignorance of sewer technology, because every new urban expansion from the end of the nineteenth century on included a sewer system. Their absence along the canals had to do with the special structure of the wharves and cellars. Normally sewers would be dug in the street in front of the houses to be connected. This wasn't possible however with the canals in Utrecht, where the countless vaults of the wharf cellars were situated just under the street. Digging a sewage system beneath the wharves was also problematic, especially because they were privately owned prior to the 1950s and were also lined with beautiful trees. With increasing concern about pollution, not to mention public health, the use of the canals as an open sewer became intolerable. Between 1984 and 1989 therefore sewers were dug along both banks, but below water level and just in front of the low retaining walls, with the houses at street level linked up with them via the cellars and wharves. In 2007 the last houses were connected, so that the canal has finally ceased to be used for drainage.



A Continuous Front (1700-1900)

The present state of the wharves on the Oudegracht came about gradually during the final period of our story. The wharf cellars were now roughly equal in length and almost all were closed off with a brick wall with a door and some window openings. The wharves were still in private ownership, so that one could not speak of any public right of way. Many of the brick parapets at street level were replaced by iron railings.



Market Bridges and Cellars

The bridges across the canal were also part of the medieval port, not just because of the cellars under them, but above all because they were essential to all the activities around the port and its trade. Many of them had a double function as markets and it is no coincidence that to this day they still have names relating to the products sold there – Broodbrug (bread bridge), Bezembrug (broom bridge), Huidenbrug (pelt bridge) and Visbrug (fish bridge). Obviously the bridges provided plenty of opportunities for crossing the canal, but they were particularly valuable for traders, since both sides formed part of the same harbour. Without them the port would never have functioned so effectively. Like the wharves and their cellars, the medieval bridges had become dilapidated by the twentieth century. When the sewers were installed, their foundations were exposed, making it clear that something had to be done quickly, if they were to be spared for the future. The next large-scale restoration project, carried out between 1993 and 2002, concerned some twenty-eight monumental bridges over the different canals. How does one adapt medieval bridges to contemporary life where cars play such a crucial role? Luckily the idea of replacing them with concrete structures was rejected. What alternative was there however? To restore the foundations, the 'Utrecht method' was devised. This involved

◀ For centuries the canal was the most important source of water for extinguishing fires. Whenever a fire broke out, a human chain was formed from canal to the scene of the conflagration, so that buckets of water could be passed from person to person to put out the fire. This is why almost every street or alley has a flight of steps to the wharf below.

▶ One of the three hundred carved lamp corbels introduced since 1953. The corbels form a fine art route, which can be seen excellently from the water.



drilling the brickwork of the bridgeheads from the top of the bridge right down to about seven metres beneath it. Through the hollow core of this special drill, grout was then squeezed. By slowly pulling the drill upward, a column of grout of about fifty centimetres wide was created, which made a very effective foundation pile once it had hardened. The same method was used for all the bridges, giving them a firm, new foundation. All the vulnerable parts of the brickwork were then replaced; fissures in the brick were filled in and the upper side of the arches were given a waterproof finish, protecting them from damp and limiting potential frost damage. These restoration operations have ensured that Utrecht's bridges will live on into the future.

Creative Use

After years of repairs to the cellars it was now the turn of the seven hundred vaults to undergo restoration. This took place between 1993 and 2002 in a way that can only be described as remarkable. In a legal sense the situation was extremely complex. The vaults belong to individual owners but the street above them is a public highway and is maintained by the city authorities. A faulty structure could cause damage to the street, while the reverse was also true, that careless use of the street could harm the vault. It is in the interest

Street Lamp Corbels

The elegant brick corbels holding up the cast iron street lamps on the walls of the wharves are such a natural feature of the walls that you would think they had been there for centuries. In fact the first corbel was only installed in 1953 during the restoration of the wall below. Before then the lamps were situated on the pavement at some distance from the iron railings. The reorganization and paving of the wharves turned them into a public space, a sort of lower-level street. Placing the lamps on top of the walls means that they now light both canal and wharf. An incidental advantage of this new arrangement is that it has created additional parking space, something sorely needed in these days of increasing congestion. As the base of the lamps was wider than that of the wall, it projected on the wharf side. The addition of a corbel or bracket solved the problem. The idea of designing the stonework as a piece of sculpture was a brilliant one. Since the first example of 1953 the number of corbels has grown to three hundred; combined, they form an example of public art, integrated in the city scene in a unique fashion.



◀ On this illustration of the Oudegracht dating from around 1615, the oldest known to us, many of the houses still have wooden fronts with awnings. Next to the Bakkerbrug is a wooden shed with a hoist next to it, used to lift goods from the ships to the wharf.

▼ Barrel vaults under the Oudegracht are dug out for restoration.

Invisible Waste Disposal Containers

All the funding and restoration programmes described above have led to the wharves becoming a public domain for the first time. They are available for many more purposes than before and the cellars now form attractive premises for many catering establishments. The wharves teem with restaurants and pavement cafes especially between the Stadhuisbrug and the Jacobibrug. In the 1990s however getting rid of kitchen waste became a serious problem. The solution was to install underground waste disposal storage spaces at various points. The exploiters of the wharves can dump their rubbish there when it suits them and the waste disposal collectors remove them as part of their normal route. To ensure that these waste storage spaces are kept as inconspicuous as possible, the lids have cobbles stuck onto them, similar to those in the surrounding streets.

► Not only was the Oudegracht used for storage and for the supply and conveyance of goods; there were also markets on the bridges and sometimes in the street above the wharves.

then of both individual owners and the municipal authorities that the vaults are properly maintained. Both parties collaborated in this project, forming a joint body, the Wharf Cellars Foundation, which operated as principal for the contractors. For the vaults to be repaired, they had first to be cleared and this was a good opportunity to add a waterproof layer as well. The cellars below were thus given a drier atmosphere, adapting them for many more purposes than their traditional storage function. It goes without saying that it is good for both city and owners that creative use is made of the cellars.

Ongoing Work

After all these major restoration works you would think that all that was now required was proper supervision and upkeep. Things are not that simple however. Recently a handbook for the maintenance of the wharves has been printed analysing the best approach to this supervisory work. It discusses for instance the proper way of dealing with the cultural and historical value of

the wharves in relation to their use today. Solutions are also offered for a variety of problems, such as selecting the best method of paving the area around the numerous trees, some of which are pushing the cobbles upwards with their roots.

Major repair works moreover will continue to be needed. For this reason workers have appeared on the wharves once again. The low retaining wall between the canal and the wharves, for instance, has cracks at many points and there are also problems with parts of the wooden foundation structures. Given that the total length of the wharves is a good four kilometres, the repair of these quays will again require a sizable investment. And once that job has been done, there will be more work on the walls of the wharves because forty years after their restoration, they will again need repairs.

The Waterfront Clinched by its Quays (J.C. Bloem)

The wharves will always need upkeep, but this work won't be a waste of time. After all what is involved is the preservation of a unique world-famous monument. Moreover, it is one that is not just a tangible record of the great trading past of the city that cleverly exploited





◀ The Oudegracht remains the vibrant heart of the city.

▶ Like the cellars, the wharves were also frequently used for storing all kinds of goods – barrels and baskets for instance.



the difference in level between water and land; it is also a monument that still plays a vital role in the city after so many centuries. With its many beautiful trees, it is also an oasis of green and quiet in the city. From the top of the hundred and twelve-metre high cathedral tower, the Domtoren, one can see the Oudegracht and the Nieuwegracht cutting like winding green ribbons right through the historical heart of the city. It is with good reason that the canals, and especially the Nieuwegracht, are a favourite venue for a romantic Sunday afternoon walk. An observant person may discover rare ferns and other plants in the most unexpected places. The wharves then also have a recreational and ecological value. At the beginning of the twentieth century when trade and shipping on the canals dwindled, the future of the wharves and cellars seemed pretty hopeless and it was hard to see how thus remarkable medieval port could ever recover. Today the canals, the wharves and the cellars are once more a pivotal point in the city in many different ways. Since the twelfth century Utrecht and the wharves have needed each other. And this will always be the case.



▲ The 'beer boat' supplies present-day cafes and restaurants on the Oudegracht in the traditional manner, via the canal.

The Beer Boat

Up until ten years ago food and drink for the cafes and restaurants on the wharves was transported from street level via the wharf steps. That could only be achieved however with very light carts that did not put too much pressure on the vaults. A number of suppliers made use of special chutes for the beer barrels, but the wharf steps were sometimes also used as an aid. Not only was it heavy work supplying goods in this way; the barrels banging against the stairs also caused damage. Why make things difficult for yourself however in what was originally an ancient port? They already had a clever system in medieval times. In 1996 special beer boats were introduced, which supplied the cafes directly from the canal. With the crane mounted on the boat, the roll-on containers could simply be set on the wharf and rolled into the premises. This was more or less how it had been done since time immemorial.

The Utrecht Wharves: Some Statistics

- ▶ Wharf cellars: 732
- ▶ Wharf fronts: 584
- ▶ Canal bridges (municipal and privately owned): 43
- ▶ Length of the wharves: c. 4100 metres
- ▶ Total length of the city canals: c. 5500 metres
- ▶ Total area of the wharves: 14.500 m²
- ▶ Lamp brackets: c. 330
- ▶ Vault gutters: c. 1400
- ▶ Street gutters: c. 200
- ▶ Flights of steps to the wharves: 96