

The Fine Dutch Tradition

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The Urban Fine Dutch Tradition is a dynamic tradition of making urban designs using the parameters of the natural system – incorporating in an efficient way the hydrological cycle, the soil and subsurface conditions, technology and urban development opportunities. Sustainability is the capacity of making a sensible choice for enabling technology taking a perspective from the natural system to design the human system. Urban design is the *trait-d'unions* between the natural and the human system. The Dutch history of water management and urban design shows great examples of how this has been done until the Industrial Revolution. In the 20th century, segregation from the natural system took place, overruling it with manipulating technology. Today, a new relationship between technology, the natural system and urban design is sought for in order to responding to the changing climate and successively the hydrological system successively. This essay shows the evolution of this relationship in six phases. In every phase a short visit to Bangkok is made.

The power of nature until 1000 AD *Netherlands*

Until the year 1000, nature has always ruled over cultures, and what is now the Dutch territory consisted largely of thick peat layers, cut through by meandering rivers and streams. First settlers lived on the higher parts in the landscape along rivers and on the sand ridges along the coast, accepting the rough circumstances and adapting to them. Except for the Frisians in the north, though they also adapted to the natural conditions, during the floods they fled onto the mounds they built themselves. This first phase is characterized by the attitude of submission to the nature: environmental conditions and natural phenomena defined how people live.



Hegebeintum, the highest mound in Friesland (Hooimeijer)

Bangkok

The territorial ecosystem of what is now Thailand has been dominated by a river system coming from the higher inlands and flowing steep into the low alluvial plain to the sea. The Chao Phraya River is the main artery that forms a watershed in central Thailand, a tropical and subtropical moist broadleaf forest ecoregion. The river has been considered a critical component in settlement development because it has facilitated transportation, communication and trade with other areas and regions. A small fishing village that later became Bangkok started almost at the end on the river banks.

The power to defend (1000 – 1500 AD)

Netherlands

When the dyke came about, the attitude of submission changed into people defending themselves against the water. Dykes were built not systematically, but only there where land was newly claimed and to protect the settlements. In this phase, large peat areas were drained by digging ditches to enable agriculture. The products were traded on the markets of the cities that started to grow in the 14th century. The dyke was also used for creating new settlements, linear villages and also small harbour cities. Because of the dyke, people could live closer to the water and thus the water became part of the urban composition and made possible by cooperation between people. This integration of design with technology and economic and social structures makes the dam city the most interesting type of water city of the defensive phase. The dam was a hydrological switch, the market was placed there, as well as the church and the city hall.

Bangkok

In 1351, King Ramathibodhi I (r. 1351 - 1369) established his throne in Ayutthaya. A village situated at the point confluent of three rivers, Pa Sak to the northeast, Lopburi to the north, and Chao Phraya to the east, 80 km. north of contemporary Bangkok. Ayutthaya's geographical position was perfectly suitable to be a commercial and political center, as well as strategically easy to defend the capital from any possible invasions.

It rose quickly to power in the region around the Chao Phraya basin. The rivers were utilized for water supply and fishing, artificial canals were dug for storage of water and better water connections.

The power of unity (1500 – 1800 AD)

Netherlands

This phase is characterized by a proactive attitude towards the water. People started to anticipate to its mechanism. The introduction of the windmill helped anticipating by enabling an enlargement in scale, and that more water could be moved for drainage purposes. This came at the right time because urban growth started by flourishing economics, politics, religion and technical development that concentrated in cities. Political unity is established and institutionalized socially in the Republic of the Seven Provinces. People also united in water management in the form of Water Boards. The army that was part of the institutionalization became a center providing cutting-edge knowledge regarding buildings in the bad conditions of the soft and wet territory. This knowledge, together with the more systematic approach in connecting dyke rings and the availability of windmills, made urban expansion possible. These expansions, in succession of the dam city, showed a high degree of technical and spatial design and planning, resulting in a polder city.

The settlements of the two first phases form the first important characteristic of the polder city, the higher level 'dry core' on which the settlement started. Prosperity and growth led to expansion of the surrounding wet soil, derived from peat or already prepared for cultivation, but not yet prepared to be built upon. The most significant area was the dam town like Amsterdam because the dyke residents, who lived alongside a peat bog and controlled the water by building a dam together, were conceptually ahead of the peat polder city dwellers. This is where a second important characteristic can be seen: the need for 'strict control' and design as the expansion of the polder city needed to be realized cautiously. First, the size of the expansion needed to be determined. Not only was it demanded to comply with the requirements of that time,

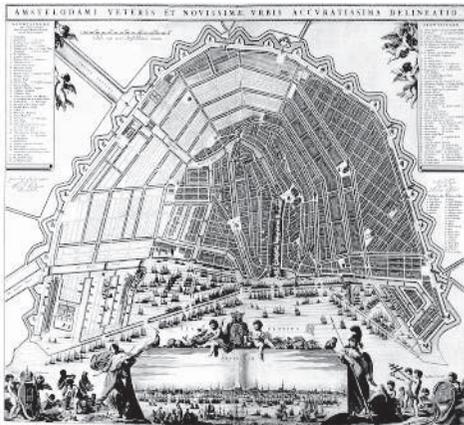


Development of Amsterdam (Hooimeijer)

but it should have catered to the ever-growing city for centuries to come as well. Secondly, a technical plan was required to ensure that water could be discharged and controlled, and that city canals maintained a constant water level. In Amsterdam the expansion was done by building four encircling canals for drainage, connected by small canals. The canals followed the position of the former city wall and connected the Amstel with the IJ. The outer canal also had a military or defensive function and all canals were for transportation with access to warehouses. The water level of the canal system was regulated and excess water discharged by means of sluices and windmills. The reclaimed land was raised to the required protection level, consolidated and prepared for building. Mud excavated from the canals was used for raising the land level, and was supplemented by fill, which often needed to be transported from far away. In the ground, long foundation piles were driven in order to stabilize the housing in the deep-set stratum of sand.

The Grachtengordel, or ring of canals, was not a design from an aesthetic point of view, it was the result of integrating, systematically, the spatial and technical design. The aesthetics was consolidated in pride, the fact that they could build this and was emphasized with the architecture, tree rows and design of bridges.

Thus a system of canals was also a way to ensure supply and storage of water for crop production and water for consumption and as a means for transportation. The ancient city of Ayutthaya was, as a river city, morphologically “designed” by water which served spatially as public space. The layout of the city blocks in the available land inside the water protection shows also efficient rectangular blocks, clearly drawn here on a map by land surveyor and mapmaker Isaac de Graaff (1690-1705). On the map we can clearly see the location of the Dutch Lodge or *Hollandsche Logie* of the VOC The Dutch trading company).



Grachtengordel 1662 (Municipal Archive Amsterdam)

Bangkok

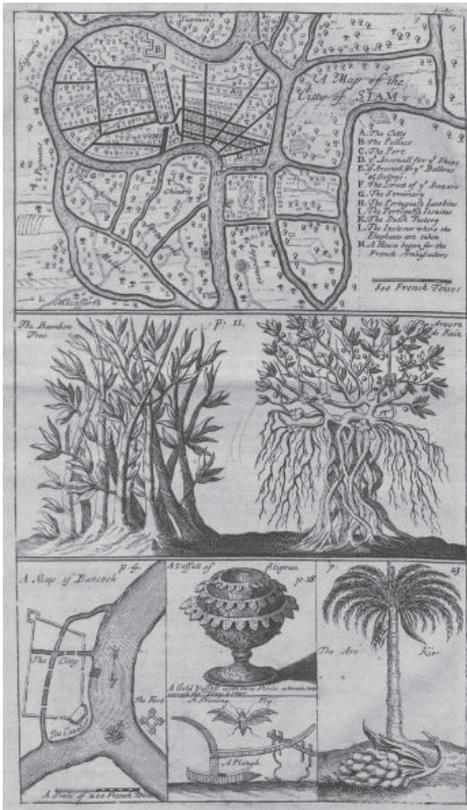
Throughout Thailand, cities and even small towns were surrounded by moats and earthen mounts. These moats were there to keep out elephants and men in battle. The supply of water itself became an issue in these fortified towns which soon grew in size to become large cities.

In the 15th century, a fishing village that later became Bangkok evolved into an important trading settlement. Its geographical advantage lies in the great loop of the Menam (mother water, i.e., river), where the Ayutthaya Kingdom built a short-cut canal (1542), which surrounds the city to the north, west and south allowing natural protection against Burmese attacks. The digging of canals here was also important for the drainage of the low lying and exceedingly swampy terrain. Being a great difference from the Netherlands, this was served for irrigation in Ayutthaya. The town was constructed out of an entrepôt as a hub for maritime trading and a fortified foreign settlement where the merchant traders could live.

The new offensive power (1800-1890 AD)

Netherlands

The new power of steam engine arrives in the next phase that is characterized by an offensive attitude towards the natural system.



Bangkok in 1691 drawn by Simon de la Loubere (Collection: Southeast Asia Visions)



The Water Project 1854 (Municipal Archive Rotterdam)

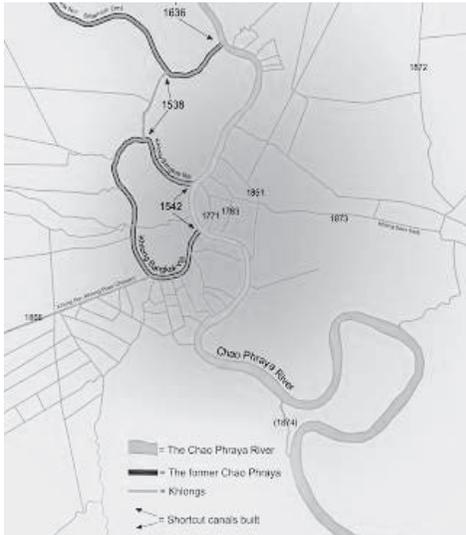
Again, water management and urbanization underwent a scale enlargement in having more capacity to control the water. The first large expansion in the 19th century after more than a century of inertia was the water Project in Rotterdam. Here, for the first time, building site preparation was done by lowering the groundwater level, instead of filling in. Because the designer Willem Nicolaas Rose was (city) architect and military engineer, he was able to integrate water management principles in the urban design. He used height differences and the dike system as means of design, and with a help of a landscape architect family Zocher, designed a park and a high quality living environment along the waterway.

Bangkok

After Ayutthaya was razed by the Burmese in 1767, the settlement of Bang-Kok, which means 'water hamlet of the wild plum tree', was formally established as the capital city in 1782. The first canals constructed in 1782 were to the east and north of Rattanakosin Island to provide a complete circle of water around the new city and its brick wall fortifications. This circle of water was duplicated yet again later with the digging of the second ring canal to create a further moat barrier between what was then called "the Middle Rattanakosin". So the Rattanakosin city expanded eastwards and southwards on the east side of the Chao Phraya River and so did the system of canals. In 1850, a third ring of canal was dug for the expanding city in the east. Soon the defense aspect for the use of canals changed from the development of war weapons to a system servicing the new and extended areas of former marsh land for agriculture of sugar, rice and other crops for trade and consumption. In the second half of the 19th century canals serviced a demand for expanding agriculture production. In 1890, the Rangsit project opened up an additional 500,000 acres of cultivated land. Additionally the system of canals provided a system for drainage as well as transportation.

The modernization of Bangkok was a consequence of the opening of the country to colonial European trade through treaties after 1855. This coincided with extensive road building which was initiated during the Westernization period (1851-1925) and was a response to a petition from European residents to King Mongkut (Rama IV) to provide land-based access. In 1862, he ordered that a road should be built parallel to the river. The Charoen Krung (Prosper

the City), commonly known as the 'New Road', formed the first main commercial land-based artery of Bangkok until well into the 20th century. The New Road was built on an old elephant track and extended southwards parallel to the river.



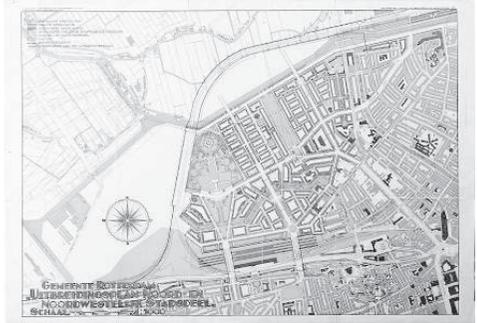
The water system in Greater Bangkok (<http://en.wikipedia.org/wiki/Bangkok>)

By the middle of the 19th century, it was reported that three quarters of the total population of Bangkok, then 400,000 people, lived either in floating houses, on houses on stilts and on river or canal banks. The Chao Phraya River and its offshoot water ways were a city of infrastructure and boats were the universal means of conveyance of goods, people and communication.

Accelerating power (1890-1990 AD)

Netherlands

Once again a new source of power – the induction engine and electricity – stimulated and enabled a scale enlargement. Industrialization and an explosive expansion of the urban area brought about another spatial order. The city became a technical object that was assembled by a series of experts that worked sectorial, just like in a Ford factory. This phase is characterized by a manipulative attitude towards the natural system because technology made everything possible. The accelerating development of technology in this phase produces three episodes of urban design due to another availability of technology per episode and a changing attitude towards the natural system:



Blijdorp Rotterdam, first project where the urban design could be free from considering the natural conditions and concentrate on aesthetics (Municipal Archive Rotterdam)

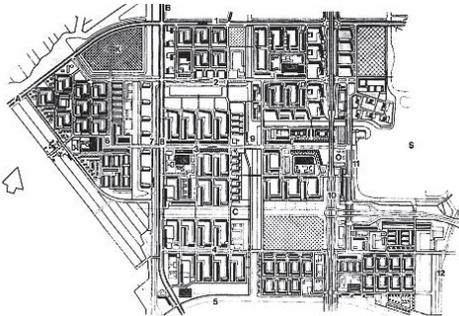
Accelerating machine power 1890-1940 AD

In the first episode, a separation between the systems of groundwater level control, discharge of sewer water and the supply of drinking water was realized, because of the building of the sewer and drinking water network. The availability of transport by road took over the water transport and many canals were filled in, bringing down the percentage of surface water in cities dramatically. The water system remained importance for drainage and storage of water because the artificial system had not been perfect yet. In the Housing Law of 1902, an expansion plan for municipalities larger than 20,000 inhabitants becomes an obligation. The thinking and planning on a larger scale went hand in hand with industrial housing production and the invention of hydraulic filling to prepare large building sites at once. Urban design which was based on design of the infrastructure, water and green structures were bundled in a new element in the city: public spaces. In the second expansion that was hydraulically filled in Rotterdam, Blijdorp, the connection to the natural system was done by connecting waterways.

Accelerating man power 1940-1970 AD

After World War II, large urban expansions were realized to fulfill the large demand for dwellings. The idea of the "wijkgedachte" and the principle of the open city became leading. The latter was realized by using strip buildings on a larger parcel with a lot of public green and a functional infrasystem. The urban designs were fully built on social economical desires, the natural conditions did not play a role because every mishap could be handled by a technological intervention. Urban designers and civil engineers were two fields of experts working on another side of the project, fully segregated. The civil engineer ensured a tabula rasa on which the urban designer could realize any design. Hydraulic filling and drainage systems made the large-scale, the

production process and all designs possible. Water lost its role as a structuring element and the water system disappeared largely underground. Cities became icons of urban concepts and have resembling appearances. The changing climate especially affected on these urban areas because they usually planned on places that were not saved from river flooding and their water system was based on pipes and pumps that could not deal with large rain storms that accompanied with the climate change.



Osdorp in Amsterdam, designed on the base of virtual eye contact with towers in the inner city (Municipal Archive Amsterdam)

Accelerating flower power 1970 – 1990 AD

The last episode of the manipulative phase is situated in the ‘Flower Power’ of the seventies. In reaction to the former era: its technocratic approach, its civil society, its homogeneous cities brought about an urge for heterogeneity and identity. The Club of Rome, their report “Limits of growth” in 1972 and the oil crisis in 1973 claimed attention for environment and its

relation to economy. Nature and ecology gained in importance in spatial order, and the landscape architect became a new player in the field of urban development. Water returned as a structuring element and a new technique of building site preparation was developed: partial filling in. Only under houses and roads, a layer of sand was placed. The nature and garden areas were making use of the original natural conditions.

Bangkok

The traditional canal and river-based transport infrastructure defined and centered Bangkok’s way-of-life on the Chao Phraya River and the surrounding man-made canal system. This water infrastructure also defined urban public space of Bangkok until the 20th century. From the beginning of 1900, the Thai Government’s priority was then to construct roads which were becoming the more efficient system of transport, no new canals were dug after 1915 and those that remained were neglected or their positions filled in to make space for roads.

Bangkok’s districts at the beginning of the 20th century were very dense with intensively mixed land uses. New roads were often built, lined with shop-houses which appeared to have long been a characteristic of Chinese communities. Economically, the planning approach used in road orientation paid off as indicated by the increasing trader settlements both outside and within the city walls and a new business district grew up in the Bangrak area behind the main waterfront



Almere Haven is a nice example of the return of water in the urban design of this New Town, it even has a dam. (picture Aeroview)

southeast of the old center. The structures were low-rise (typically 2 to 3 levels) with a compact urban form. These typical inner city dwellings became even denser following World War II, and some of them became informal settlements which still exist in today's Bangkok.

Adaptive power (1990 –)

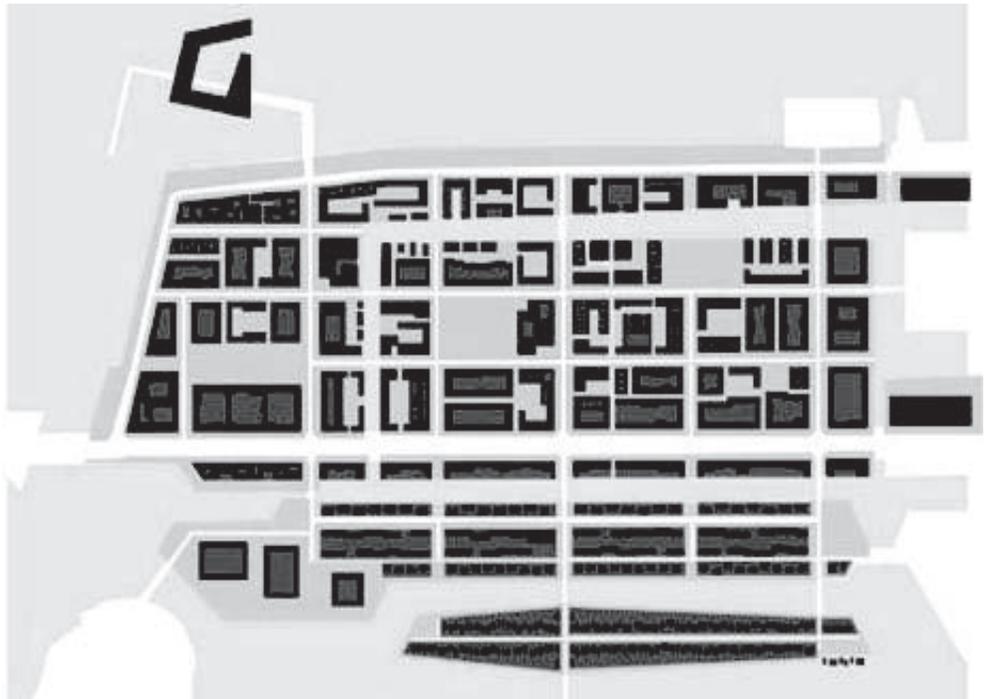
Netherlands

This phase is characterized by a growing importance of cultural heritage and water as steering principle in spatial order. Historical canals, harbours, and channels are brought back to life to stimulate the local economy and improve the quality of the living environment. Water has returned as a structuring element in urban designs and making a sensible water plan has become part of legislation. Integral water management and adaptation to climate change are two important issues. Urban design is a way to integrate interests of the human and natural system and make sensible choices in applying technology.

Next to the climate change, also an energy transition, a financial crisis and a changing course in governmental policy are changing urban development in the Netherlands. It concentrates on urban renewal instead of expansion, from large to small scale and self-organized development in which water as a public issue has become an interesting subject of discussion. The water system goes through all scales, it is a system of communicating vessels. Measures on the larger scale need to be combined with small-scale measures such as, grey water systems, green roofs and even water barrels, in a high number that can offer great solutions. Again this needs a systematic approach where urban design can be an integrating discipline.

Bangkok

Now Bangkok is home to nearly 11 million people, and notwithstanding. Buses, motor vehicles, motorized boats and motorboats carry hundreds of thousands of commuters each day. So the river and the canals are still important in this respect, notwithstanding, they were polluted by the stench of sewerage and other putrid.

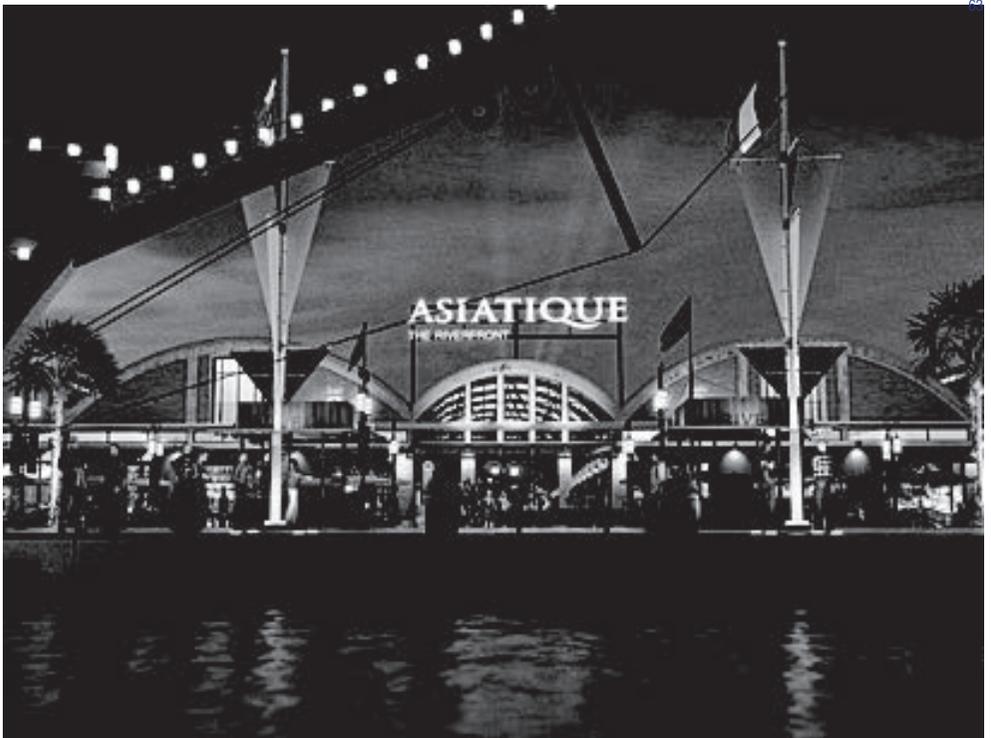


IJburg (Amsterdam) is a newly built island for highly-dense, mixed use urban area, close to recreation and nature. The urban design is done by using the natural conditions for programming and spatial quality. The side of the island that is subjected to wind and water is built with robust building blocks while the inner side is designed with a lot of nature and ground-bound houses. The canals that are needed for drainage are used to cut the urban grid and design nice spatial quality in crossing the canals and using them as backyards. On the place where it was too expensive to build an island, floating houses are situated.

Both the municipality and private developers seem to realize the importance of the river as a cultural and recreational place. However, the developments are in opposition to the traditional stance of transportation and public place. In the historical city, the municipality and Crown Property Bureau (a private developing company managing lands that belong to the crown) have joined together to renovate a number of waterside projects. Most of them are for public use, for example, a park near Wat Pho. Due to a specific planning system in the historical areas and some areas on the opposite of the river, majority of the private-run companies develop hotel and high-rise condominiums outside this special zone. These building tend to be gated and highly controlled for the river access.

In a sense, the situation in Bangkok is becoming like the Dutch development instead of returning to the Thai norm of waterway involvement despite the recognition of the importance of the river again. Having said that, the canals are still overlooked even though they form the finer scale of living in relation to the river.

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'Asiatique the River front' was developed through the renovation of the old rice silos. It offers a huge open and public accessible space right at the river bank. It also runs its own boat service from Surasak BTS station.