

## Between the North and the South Elbe - Water Management Projects of the International Building Exhibition IBA Hamburg

Hamburg-Wilhelmsburg is located between the north and the south Elbe. Here port facilities, heavy industries, charming and rundown neighborhoods, agricultural land as well as natural preservation areas can be found approximately 100 kilometers away from the North Sea. Hamburgs location on the river always had an impact on its urban development. The port is known as the “Gate to the world”. It attracts trade and is a source for vital economic activities. Next to the chances coming with the third largest port in Europe there are also challenges. The risk of storm surges like the one experienced in 1962 - where one fifth of the city of Hamburg was flooded and the management of raising groundwater levels is to be considered by politicians architects and urban planners when it comes to new projects.

If they had not realized before, the presentation of the 4th IPCC report in January 2007 must surely have made it clear to every politician and town planner that climate change is threatening the existence of our planet and that, apart from being the areas that stand to suffer most, big cities and metropolises are also doing most to cause climate change. It was therefore only logical that the International Building Exhibition IBA Hamburg (Internationale Bauausstellung IBA Hamburg) should take “Cities and Climate Change” as one of its key themes.

At the end of 2006 the Free and Hanseatic City of Hamburg constituted IBA Hamburg as a municipal corporation. Its task was to prepare, for presentation in 2013, an international building exhibition on the river islands which occupy an area of 35 square kilometres in the heart of Hamburg. Germany has a long history of building exhibitions (the first was in 1901) and IBA Hamburg is the 8th in the series. IBA is more than a showcase for architecture: building exhibitions drive urban development. Building exhibitions concentrate and coordinate private and public spending on construction in an area or region with specific problems as well as specific opportunities.

The morphological condition of Wilhelmsburg was researched and visualized in the **Wasseratlas** (Water Atlas). The book indicates that big parts of the land are at- or even underneath sea level, that there is a complex system of drainage channels to get rid of pushing groundwater if it comes to heavy rain and that there is a dike line of 28,5 km which makes it difficult to experience the water as a quality. Today, seven year after the IBA started several projects have been implemented to improve flood protection as well as the quality of the urban environment along the dike line.

The IBA Project **Kreetsand**, a pilot project in the framework of the Elbe tidal concept of the Hamburg Port Authority (HPA), will create additional space for the Elbe river on the east side of the Elbe island of Wilhelmsburg. The tidal volume will be enlarged and the tidal hub reduced as a result of these river engineering measures. At the same time, new possibilities for an integrative planning and implementation of a variety of interests and concerns relating to flood protection, use of the port, water management, nature conservation and recreation areas will be dealt with. In this situation the Kreetsand project will be presented as part of the IBA project Deichpark-Elbinsel (Dike-Park Elbinsel). These aspects for the complete Elbe island will be analyzed during the project and beneficial measures and strategies developed for the combination of the different requirements.

The creation of the Tidepark Kreetsand will enlarge the flood plain of the Elbe and consequently reduce the tidal hub. At the same time, the Hamburg Port will benefit from the reduction of the sedimentation and incidentally the risk of flooding will be diminished. In the course of the pilot project, the now de-embanked former flushing field Spandenlander Busch / Kreetsand will be

deepened. In the 30 hectare shallow water area, the tide will be able to flow in and out freely – resulting in an additional tidal flow of around one million cubic meters. However, the pilot project is not planned merely as a purely hydraulic measure; it also takes the aspects of the quality of designing and landscaping as well as of nature conservation and recreational value into consideration.

The **WaterHouses** were built on 110 piles in a water retention basin with a surface area of about 4,000 square metres, that has been integrated into the existing waterways network. They show that water does not always is a barrier but can add new qualities to residential developments. The artificial basin (0,745 meters deep) is fed with rainwater and is located in an area of Wilhelmsburg Central that is at risk from flooding and groundwater.

The WaterHouses, designed by Schenk + Waiblinger Architekten from Hamburg were completed by March 2013. The complex consists of four TriPlex Houses with three separate, three-floored apartments each, and the nine-floored WaterTower, which contains twenty-two apartments. Each of the apartments has a balcony or terrace overlooking the water. Each apartment in the TriPlex Houses has its own “natural” or water terrace with large glazed panels, while the residents of the WaterTowers have access to a spacious common water terrace area. The connection with the water is palpable throughout the whole complex: there are boat jetties, floating terraces, underwater gardens, and water walls as privacy shields, all of which emphasise the special quality of life on the water.

### **The Importance of Water in the Energy Concept**

The buildings are constructed to passive house standard. That means that they require a minimum of heating and all of their energy needs can be met using renewables. A geothermal heat pump uses the water to heat the houses, while solar thermal elements in the façades ensure the provision of a basic hot water supply. The WaterHouses are also linked up to the Wilhelmsburg Central Energy Network. Smart building technologies control the ventilation and the energy supply, and give the residents feedback on their energy consumption. The German Society for Sustainable Building, the DGNB, awarded the WaterHouses their gold certificate in recognition of the high standard of building. (German Sustainable Building Council).

In addition to the key IBA theme “Cities and Climate Change”, IBA Hamburg is also concerned with social issues. The objective was to make the island liveable once again for all parts of society. To achieve this aim, the emphasis has been placed on better education, in particular better schools, on refurbishing and modernizing housing, constructing innovative new buildings and affirmative action for an intercultural urban community. IBA has initiated 70 building projects and some 14 social and cultural projects in order to demonstrate what is possible when an entire city district is remodelled according to social and environmental considerations. Achieving modern standards of energy efficiency plays a key role by acting as catalyst and driver of the varying aspects and tasks which together make up a holistic planning approach. Partly these projects are designed to show what the future of modern environment-friendly town planning might be and how cities could be remodelled so as become climate-friendly or even climate-neutral. Another advantage is that a hitherto somewhat neglected district of Hamburg with a negative image can reinvent itself as the pioneer of energy-efficiency in the city.