

„Urban Nature“

Most of the plant species found in Block 6 emerged as a result of the plantation process, while some other species cropped up spontaneously.

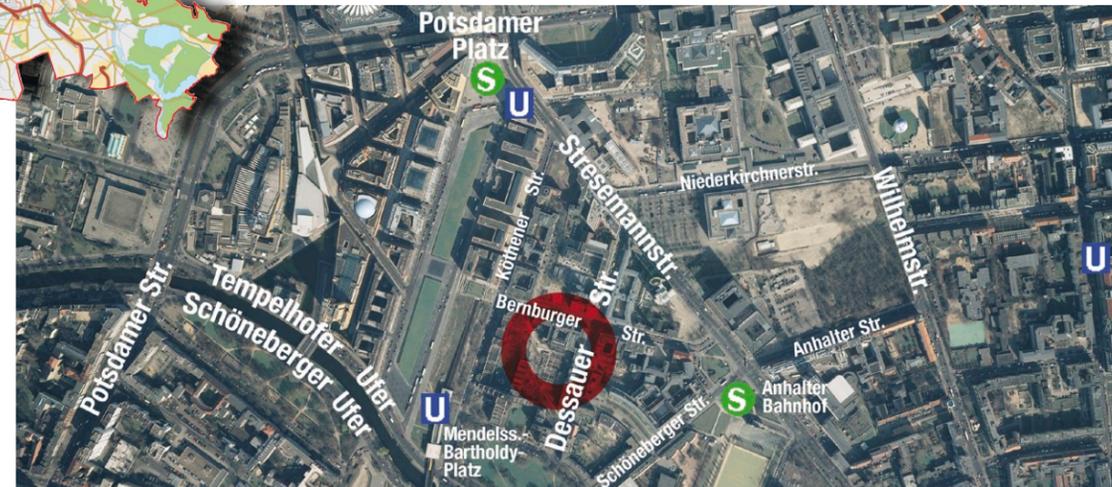
Several years following shut-down of the old plant and discontinuation of the water supply, many plant and animal species typically found in wetlands but rarely in inner cities are still found on some site areas, even after the reconstruction and start-up phases of the rainwater concept. Among these are also plant species which are considered endangered and worthy of preservation from the perspective of nature conservation. The emergence of different willow species including purple willow, goat willow and osier in addition to wetland species such as hemp-grimony, buck bean, and purple loosestrife in an inner courtyard in Kreuzberg in the centre of Berlin is worth noting. These have usually run to seed from other cultivated areas and have established themselves there.

Trees which have been felled for traffic safety reasons were replaced with new plantations. Besides different bird species, numerous invertebrate animal species benefit from the vegetation stock and the reactivated water surface area of the inner courtyard. When observed closely, one can see a vast number of water fleas in the water which form the staple food for predatory dragonfly larvae, water beetles and water scorpions. It is assumed that in a few years the site will become colonised by many animal and plant species that are typically found in wetlands.



Berlin Programme for Urban Ecological Model Projects

Based on the Federal State Programme for Experimental Housing and Urban Development (EXWOST), the "Urban Ecological Model Projects", a Berlin State programme, was developed in 1988. The Berlin model projects like Block 6 in Kreuzberg rank as some of the pioneers of ecological building. New interlinked concepts are being field tested, as the requirements for planning and building have become increasingly complex. The exemplary residential site appeals particularly to ecologically interested persons who appreciate the value of combining the proximity to Potsdamer Platz with the "urban nature" found there. Through the different projects of the Berlin State Programme, important insights have been gained



in recent years regarding the enhancement of the housing and urban development sector, development of new systems and technologies and as guidelines for public as well as publicly-funded building projects.

The aim of the model project was and is to prepare, implement and manage the planning, building and operation of the projects in such a way that:

- the environment and natural resources can be conserved
- a maximum level of environmental and social tolerance can be achieved
- sustainable healthy living and working conditions can be realised and secured.

Further aims are the adaptation of the ecological standards for the public and publicly-funded building measures to up-to-date knowledge, the development and testing of new procedures and technologies in selected projects and the reduction of costs during planning and construction as well as the minimisation of the future running and life cycle costs.

Project Partner / Contracting Body

Berlin Senate Department for Urban Development,
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With friendly support from:



Block 6

Integrated Water Concept Ecological Integrated Concept

Project Description

Site:	Berlin Kreuzberg, Dessauer Straße / Bernburger Straße
Completion Date:	1987 within the scope of the International Building Exhibition (IBA 1987)
Accompanying research:	financed up to 1993 by the German Federal Ministry of Regional Planning, Building and Urban Development and the Federal State of Berlin
Optimisation/ Restructuring:	2006 / 2007

Historical Background

The "Integrated Water Concept" in Block 6 in Berlin Kreuzberg was originally developed as a project of the International Building Exhibition 1987 (IBA 87) as well as a model project of the Experimental Housing and Urban Development (EXWOST) research programme. It was financed by Federal and State funds and was researched and documented within the "Urban Ecology and Environmentally-Sound Building" research field. During the initial planning phase, the project incorporated different sub-concepts of ecological building.

The model project is a cooperation project between the Federal State of Berlin and the plant owner. The **integrated water concept** used an interesting approach to the local water supply and wastewater disposal. It included, among other aspects, the installation of the following elements:



* Service water: recycled, clean non-potable water



- water-saving facilities in households
- a cold water metre in each apartment
- constructed wetland in the inner courtyard (utilisation of service* water from greywater)
- a rainwater pond bordering the constructed wetland

Following the completion of construction in 1988 and a subsequent research and optimisation phase, the constructed wetland was shut down in December 1993 after Phase II of the research project had been finalised. This was due to technical and economical reasons.

Many of the project approaches stemming from that period have progressed from experiment to norm such as:

- the water-saving sanitary engineering and cold water metres
- interlinked concepts of rainwater management
- technologies for greywater recycling
- quality requirements for service water
- separate collection of wastes
- integration of as well as supply of information to tenants and users.

The Project

The aim of the Federal State of Berlin was, with the consent of the owner, to secure and optimise the plant as a **"technical monument"** and enable operation management under economically feasible conditions.

Objectives:

- substantial utilisation of the available plant and plant components
- preservation and restoration of a biotope
- optimisation of the plant as a „technical monument“ coupled with a new innovative water concept for service water utilisation and rain-water management
- realisation of an operator model
- minimisation of the running costs for the tenants.

The development and implementation of measures were carried out within an ecological integrated concept which especially had to illustrate how the aspects of energy and water, open space design, material selection, dealing with residual material and solid waste and the impact on the running costs were to be handled.



Service Water Concept

As intended in the Experimental Housing and Urban Development (EXWOST) project, the separation of the household wastewater into two streams has been retained. Phosphorus and nitrogenous blackwater (faeces and urine) continue to reach the existing wastewater sewer of the Berlin Water Company. The comparatively low-nutrient wastewater from bath tubs, showers, handbasins as well as the wastewater from kitchens and washing machines, which has a high organic composition is designated as greywater. This water undergoes a purely mechanical-biological treatment with a low energy input and without the addition of chemicals in the modern, environmentally friendly AquaCycle system to yield service water which is hygienically safe. The treated water is used to flush 90 toilets and to a lesser extent to irrigate the tenants' gardens.

Although the former concept required 790 m² of planted soil filter and a 110 m² large polishing pond for the treatment of the greywater, the overall treatment takes place today in 12 plastic containers, each having a capacity of 1.5 m³, over the area of the former polishing pond. The system is designed to treat 10,000 litres of water a day.



Rainwater Management

Rainwater from 2,350 m² of roof surface area and 650 m² of sealed open space is discharged into the original constructed wetland, which is then either subject to evaporation or a time-delayed infiltration into the adjacent trough following heavy rain events.

The evaporation of the rainwater contributes to the improvement of the micro-climate in the local residential environment, especially during the summer months. A further positive impact is the relief of the strain on the combined sewer (environmental relief).

As a result of being uncoupled from the sewer, the rainwater fees paid to the Berlin Water Company will no longer be levied. Consequently, the running costs can be reduced by more than 2,000 € per year. Last but not least, a valuable area for "urban nature" has also been developed.



Operations Building

For the housing of the greywater recycling plant, it was necessary to construct an operations building integrated in the overall ecological concept, which also provides an opportunity for environmental education.

The available polishing pond protrudes 1.4 m into the ground and was an integral part of the original water concept.

Today the reinforced concrete basins serve as the load-bearing foundation of the new building, which houses the greywater treatment plant. As a result, the generation of building and demolition wastes and the new sealing of valuable open space were evaded and resources conserved.

The outer wall of the operations building follows exactly the physically curved basin form. Building materials were selected taking into consideration their environmental compatibility. By using a wood construction that is open to diffusion and requires a low primary energy input, a short construction period was facilitated. The partitions of the pre-fabricated wood racks were insulated with a 16 cm thick cellulose material.

The aim is to heat the building solely with the residual heat originating from the greywater. The wood profiles made from larch wood were left untreated.

Extensive greening of the far-projecting roof (constructional wood protection) was carried out as an integral part of the rainwater management scheme as well as to protect against overheating during the summer months.

The three dome lights allow seven times as much daylight into the building than vertical windows do, thus minimising the need for artificial lighting.

