

## **LAKE URBANISM:**

### **An integrative lake design as basis for the urban development of Aspern – Die Seestadt Wiens**

Knollconsult Umweltplanung ZT GmbH

Project lead: Thomas Knoll, Heinz Wind

Commissioned by: Wien 3420 Aspern Development AG

Area: 5 ha lake (quarter total 240 ha)

Planning and design: 2007 - 2009

Implementation: 2010 - 2014 / 2015 (park areas)



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**Aspern – Die Seestadt Wiens, Austria's largest urban development project, is currently transforming into a modern and multifunctional 21<sup>st</sup> century quarter, accommodating approximately 20.000 residents and additionally 20.000 workplaces until 2028. This development started with the resourceful idea of a large lake, structuring and influencing the urban development from the beginning. Designed as identity raising landscape element, structuring the new quarter, the lake at first served as medium for a comprehensive green procurement and material recycling concept. Today, lake and adjoining lakeside park function as resilient landscape (eco)system and as attractive recreation area likewise.**

#### **A lake: basic element of the urban development**

The opening of the European east in 1989 caused an increasing population growth in Vienna, Austria. Due to housing requirements, the city started to acquire potential urban expansion zones and brown-field sites. The 240 ha covering former airfield Aspern, situated in a north-eastern outskirt of the city, offered one of the most promising developments. The extension of underground and highway as well as the settlement of a General Motors branch, staffing about 2.000 employees, allowed a relevant urban development with dense structures. Because of the large scale, the owners (Bundesimmobiliengesellschaft; Vienna Business Agency) intended to break new grounds by building an exceptionally modern quarter, offering high qualities of life.

An informal working group in charge established an innovative strategy, determining a spacious, five

hectares lake as basis for Aspern's urban development. With this idea, the working group responded to various fundamental requirements: developing with high environmental compatibility; building a structuring landscape; creating a public open space, that offers recreation areas but remains affordable in construction and maintenance; establishing synergetic systems. The working group identified the lake as ideal element, connecting the existing cultural landscape of the Vienna Marchfeld with the projected modern urban structures and embedding the massive planning interventions. The lake should be a characteristic medium, structuring and organising the undefined space and creating identity within an all-out artificial settlement. And it should be planned as operative and integrative landscape element. Aspern – Die Seestadt Wiens / Lakeside City of Vienna was born.

## Landscape architecture first

The subsequently initiated international urban design competition asked for a centrally located, five hectares lake and a four hectares lakeside park as basic elements for Aspern's further urban development. The winning project (Tovatt Architects and Planners AB) integrated the lake as heart of the urban structure, showing a straight linear lakefront at the northern part and a naturally shaped shore in the south.



Masterplan Airfield Aspern / Tovatt Architects & Planners  
© Tovatt Architects & Planners AB



Concept Aspern - Die Seestadt Wiens with centered lake / basing on masterplan (Tovatt Architects & Planners) and „Die Partitur des öffentlichen Raumes“ (Gehl Architects ApS)  
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The commissioned office for lake design, detailed planning and construction, Knollconsult Umweltplanung ZT GmbH, was previously part of the lake-inventing working group. Pursuing some challenging ambitions, the landscape architects of Knollconsult established a systemic, functional and aesthetic landscape concept, offering strategic instructions as well as precise measures, formalized in a phased implementation plan.



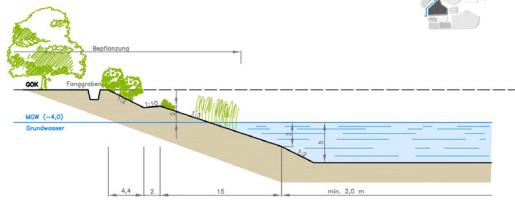
The Lake / Green Construction Concept and Management by Knollconsult  
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## Green construction management

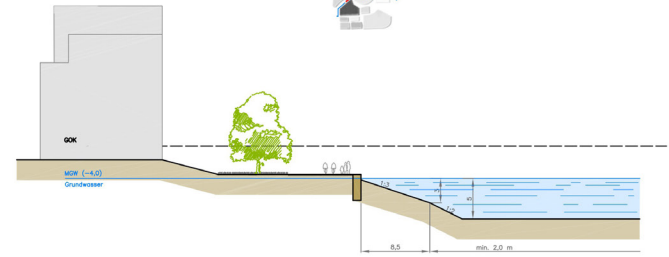
The excavation of the lake was part of a green procurement strategy and basis for an environmental orientated recycling concept. The lake, fed by a supporting groundwater stream of the Danube, resulted from excavation work. Excavation materials such as gravel and sand were temporarily stored on site, to be processed in mobile preparation plants during later construction phases. By-products such as intermediate soil layers were used for topography and terrain modelling.

The recycling system and production of building materials on site affected the cycle of materials positively and reduced traffic, emissions and noise enormously. A reduction of about 170.000 truck movements could be achieved. The sale of recycling materials covered the main expenses for building the lake, this strategy resulted in total construction costs of only 500.000 EUR. Considering the vulnerable ground water system and the crossing underground construction, the excavation was executed in two working phases and five spatial sections. The lake today has a maximum depth of water of 7.2 m (mean water level).

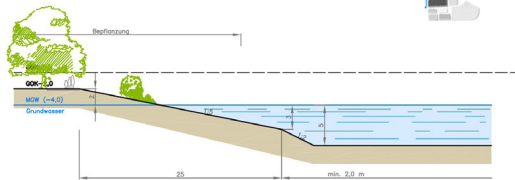
Gewässertyp 1 – unbefestigtes Ufer



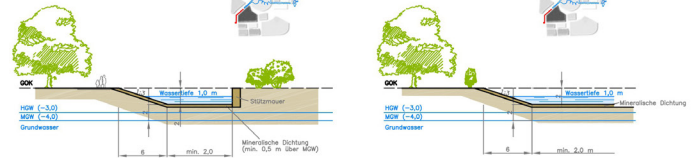
Gewässertyp 1 – befestigtes Ufer



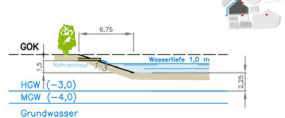
Gewässertyp 1 – unbefestigtes Ufer (Flachbereich)



Gewässertyp 2

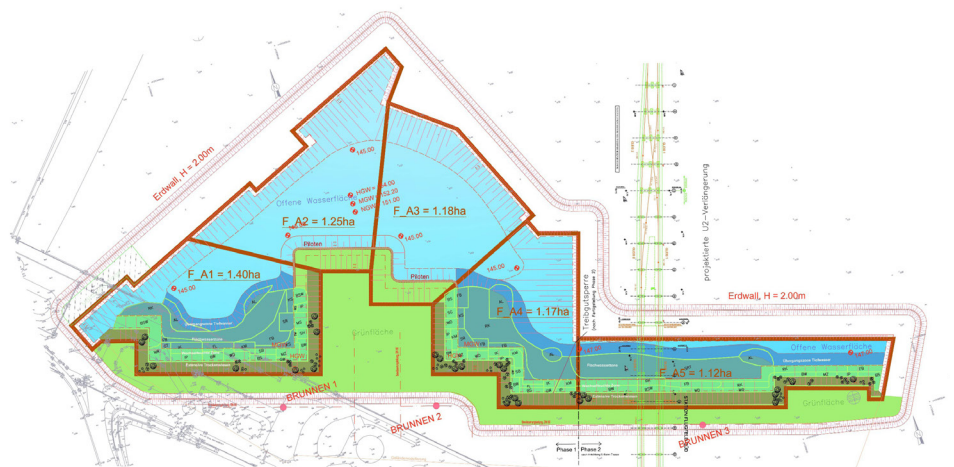


Gewässertyp 3



#### Materialmanagement Kiesabbau

Abraum ca. 200.000 m<sup>3</sup> zur Planie vor Ort  
 Kiesabbau bei Gewässertyp 1 ca. 400.000 m<sup>3</sup>  
 – Verarbeitung und Verwendung vor Ort  
 – Vermarktung der Abbauflächen (ca. EUR 1 pro m<sup>3</sup>)



Material management, construction (5 sections, 2 phases, 3 typologies)

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Construction site, excavation work  
 © Wien 3420 Aspern Development AG



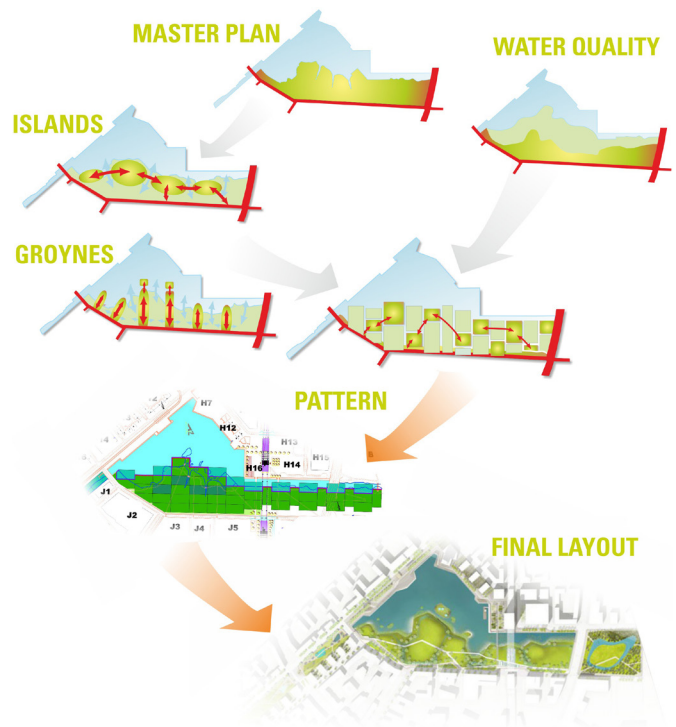
## Designing a resilient landscape system

Besides planning, supervising and coordinating logistics and construction work, Knollconsult designed the lake and applied high ecologic standards in creating a sustainable landscape system.

Tovatt's masterplan with tongues of bay land growing into the lake could not be carried out for reasons of construction and water quality, the shape of the lake had to be adapted (see figure „Development process of the lake's shore line“). The lake should serve as recreation area for about 20.000 residents and visitors but likewise providing regulative and ecosystemic functions. Therefore the established ecosystem had to be extremely resilient. The specific shape of the lake as well as precisely planned ecologic recultivation zones made the sustaining of an outstanding water quality possible, even in times of intense human use, such as expected in the final phase of settlement. The recultivation zones cover 30% of the shallow and shore areas. Populated with supplemented plants and macrozoobenthos (submerse macrophytes, diverse sorts of *Chara* and *Nymphaea alba*), the zones allow the water to self-adjust and regenerate. A 5.000 m<sup>2</sup> extending area of *Iris pseudacorus*, *Nuphar lutea* and *Nymphaea alba* attract and regenerate.

Shore areas and the riparian vegetation were designed in coordination with the lakeside park's designers (ARGE Lavaland Landschaftsarchitektur & TH Treibhaus Landschaftsarchitektur). Reed bays (*Phragmites australis*) and a diverse variety of marsh plants transformed the shallow banks and water-to-land-transition areas into a beautiful and environmentally-rich water landscape.

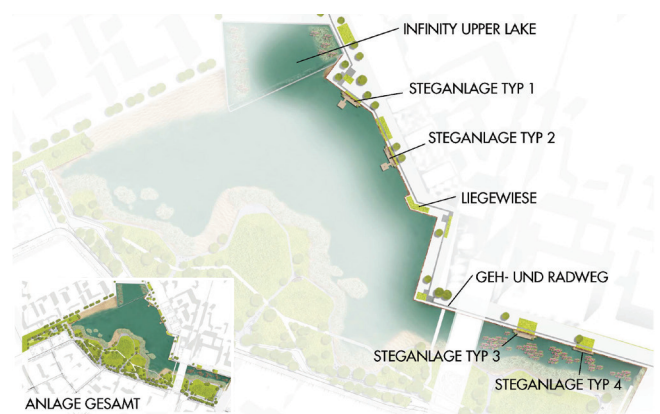
For protection of the regeneration zones and the riparian vegetation, attractive bathing areas were designed and as such identified. Planted parts were protected through construction measures. Part of the design work was the construction of pedestrian bridges and walkways as well as the design of the lake promenade. The lakeside park's design concept included four artificial floating islands off the coast. Knollconsult interpreted the islands as additional environment for flora and fauna, quoting the aesthetics and ecology of the lake.



Development process of the lake's shore line  
© Knollconsult Umweltplanung ZT GmbH



Water zones, shore areas and phyto-ecological system (overview)  
© Knollconsult Umweltplanung ZT GmbH



Design concept promenade (general scheme)  
© Knollconsult Umweltplanung ZT GmbH



One of the bathing areas along the lakeside park  
© Knollconsult Umweltplanung ZT GmbH



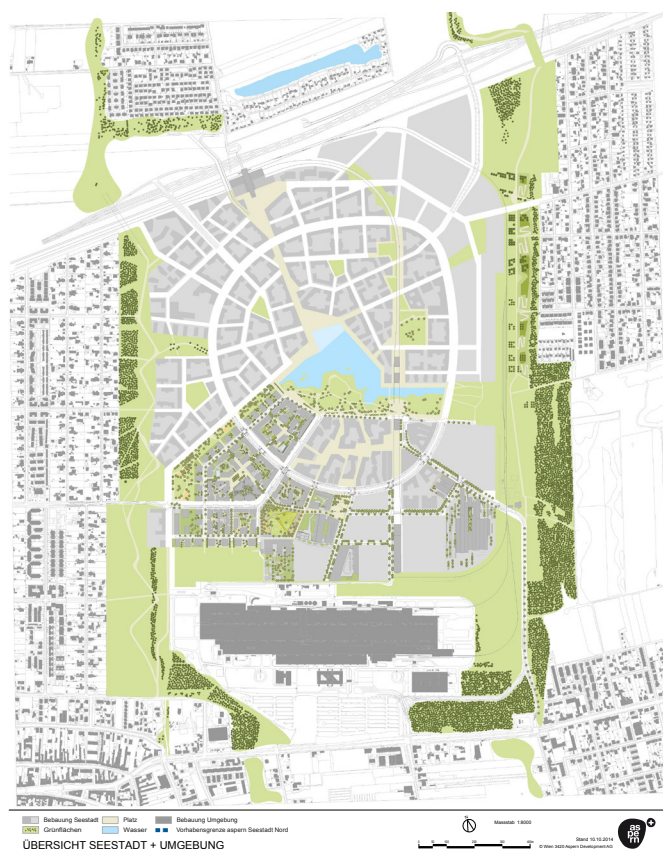
Lake shore and crossing underground construction  
© Knollconsult Umweltplanung ZT GmbH

## Landscape based development

Within the first phase of Aspern's major urban development, landscape architecture participated as an urbanistic discipline, positioning important landscape approaches. The early and continuous landscape architectural involvement, starting with the idea finding phase, made the landscape based urban development possible and allowed the implementation of integrative landscape systems. Today, the lake is a landmark and identity of the quarter, an intact and aesthetically appealing environment and an intensely used open public space.

The landscape architects of Knollconsult performed a multi-purpose demand, using a set of instruments. Implementing a broad knowledge, they worked as process strategists, as general planners, as management and logistics specialists, as site coordinators of the multi-disciplinary team of planners and experts, as environmental planners (water-, landscape- and ecosystem), as civil engineers and as designers.

The ability to answer complex and interdisciplinary questions of growing cities and offering sustainable solutions through the design of resilient and aesthetically appealing landscape systems, makes landscape architecture to one of the leading future disciplines of our time, planning the urbanized world.



Aspern - Die Seestadt Wiens / the plan showing the entire quarter, and realisation phase 1 (lake, infrastructure, open and green space, aspern IQ, residential buildings in the southern part)  
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Aspern - Die Seestadt Wiens / areal view, realisation phase 1  
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