BEYOND THE TRACKS

An urban response to the railway barrier at the Amsterdam Eastern Harbour Islands - creating a city campus for UvA between the tracks

GRADUATION PROJECT
TU Delft - Faculty of Architecture

URBAN MASTER PLAN

UNIVERSITY CAMPUS

STRUCTURE & DETAILS

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Hybrid Buildings
for the Dutch City

BKM4AU1  Architectural Design
BKM4AU2  Building Technology

February 18th, 2005
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URBAN MASTER PLAN
Continuing the city grid across the railway barrier

The urban master plan deals with the railway area to the north of the Eastern Harbour Islands in the city center of Amsterdam. For this area, a master plan of building envelopes is constructed, which aims to continue the urban city grid at both sides of the railway barrier. At the meeting of the two main axes of the plan, a campus complex for the UvA is proposed, to initiate the further urban development in the area.

ARCHITECTURAL DESIGN

UNIVERSITY CAMPUS
An island in the city - a public space between the tracks

The campus clusters the UvA facilities currently spread around the center. On the one hand, the railway area zone forms a natural island in the city, while on the other hand the UvA complex will help the continuation of the urban space, linking both sides of the tracks. The public square between the tracks serves as a focal point for the UvA complex, while rendering the railway passage an integral element of the city grid.

STRUCTURE & DETAILS
Structural and technological implications of building around the railway system

Although treated as an integral element of the building complex, the railway is structurally completely separated. The presence of the tracks has an impact on formal and programmatic layout as well as on the structural and technological solutions applied. The rhythm of the track support system is echoed in the measurement system of the building complex - from spatial layout to construction system and façade cladding.

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After the realisation of the railway station in the north of the Amsterdam city center in the 19th century, city and water have been separated. Now, the municipality of Amsterdam is trying to reconnect the banks of the water IJ with the urban fabric. Although new developments have already reinforced city life at the waterfront, the railway still forms a barrier between the old town and the renewed water front. The urban master plan for the railway area aims to reconnect both sides of the tracks. The train keeps running, but the element of the railway dyke is transformed into a chain of building blocks. Connections through this barrier are situated at the end of the existing axes on the Eastern Harbour Islands. To prevent a mere succession of tunnels crossing the railway, the passages are to be a continuation of the city fabric in more ways. The façade line along the axes is continued at the track area, providing entrances to the building complex underneath and over the railway.

The University of Amsterdam has always been spread around the city center. For management reasons, it chose a policy of clustering its facilities. In the master plan, a new cluster has been proposed at the former Stork area. This location, in its proximity to the present clusters, is smoothly accessible by both car and public transport. For the area, a UvA campus could ignite urban life with a value of attraction to further urban development, while the design itself is a further exploration of the possibilities to build around the railway tracks.
Urban Master Plan - Perspective view of building envelopes and indication of project site

- New building façades accentuating the axis
- Approaching the railway barrier
- Barrier passage guided by extended façade line
- Building above and below the tracks
- Integrating the tracks within the building mass
- Showing tracks through the building mass

Urban Master Plan - Perspective view of building envelopes and indication of project site

- Suggested clustering and new connecting routes
- UvA Campus network around Amsterdam City Center
- Amsterdam network of higher education
PROGRAMME

The building complex is to cluster UvA facilities that are currently scattered around in the Amsterdam city center. These facilities are:

**UVA FACILITIES**
- Education spaces: 12,000 m²
- Research and offices: 8,500 m²
- Library and self-study: 8,500 m²

**EXTRA CURRICULAR**
- Information center: 2,500 m²
- Faculty Club: 500 m²
- Restaurant: 2,000 m²

**ADDITIONAL PROGRAM**
- Third-party shop & office: 4,000 m²
- Conference center: 2,000 m²
- Parking: 4,000 m²

FUNCTIONAL LAY-OUT

At ground floor level, all public facilities are situated around two central squares. The additional third-party program is integrated in the plinth at the outer south-east side. Specific student and staff related program is situated on the floors above. These spaces are accessible via the entrances at each end of the complex.

PUBLIC SPACE

All public program is accessible at ground floor level. The entrances to those spaces are accentuated by arcades that serve as an intermediate between outdoor and indoor space. These arcades define the façade line of the complex, at the south-west street side and the public square, and at the railway passages.

PASSING THE BARRIER

The passage through the area is projected as wide as the street it extends and is guided by the element of the arcade. Some entrances of public facilities are situated at the passage. Between the tracks, the passage opens up to the public square.

SPATIAL ORGANIZATION

Exploded view of the general building layout
Elevation - South-West Façade - 1:2000
Elevation - North-West Façade - 1:2000

Plan showing programmatic lay-out on ground floor level in the urban context - scale 1:1000

Typical cross section showing vertical programmatic organization - scale 1:500
THE PASSAGE

The railway passage is composed as a succession of different urban spaces. The passage is guided by arcades that form an intermediate between indoor and outer space.

STRUCTURE & FLEXIBILITY

TYPE CORRIDOR OFFICE
- central corridor
- offices at both sides
- incidental voids

TYPE OFFICE CLUSTER
- circulation in sound buffer
- cluster entrance via infodesk
- professor office and flex office
- stairs to offices on floor above

TYPE EXTERNAL LAB
- entrance via arcade
- stand-alone clusters
- independent facilities
  climate services for entire complex are situated at the back

TYPE SHOP
FIRST FLOOR
- office or shop area
- accessible via staircase
- directly connected to shop

GROUND FLOOR
- entrance via arcade
- large freeflow area
- storage at the back
- internal distribution street

BASIC STRUCTURE
- loadbearing wall elements
- asymmetrical span
- optional voids

MEASURE SYSTEM

Main measurement and derived secondary intervals

RAILWAY STRUCTURE
Support at every 28.800 m

BELOW RAILWAY
Split measure
4 x 7.200 m = 28.800 m

MAIN BUILDING STRUCTURE
Alternating Grid
4.800 m + 2.400 m = 7.200 m

VISIBILITY OF THE TRACKS

The railway tracks are spatially integrated in the building complex and treated in different ways. At the south-west city side, the tracks are hidden by the building parts placed in front of them. At the central public square, these hidden tracks are exposed, but the building parts underneath make them part of the urban volume. At the northeast side, the tracks are fully integrated in the spatial envelope. Although these tracks are hidden completely from the central square, the north-east façade leaves them visible to the Piet Heinjikade. Here, the façade opens up to the tracks - so the trains run literally through the building complex.
**PARKING GARAGE**
fitting the cars in the building structure

**FINAL SOLUTION**
parking fitted into building structure

**SPLIT LEVEL RAMPS**
allowing multi-storey configuration

**TRACK SUPPORT**
separate railway construction

**IDEAL PARKING**
optimal straight parking configuration

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**SPATIAL INTEGRATION OF THE TRACKS**

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**UNIVERSITY CAMPUS**

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CONSTRUCTION PHASES

START
12 railway tracks of which 6 in use

PHASE I
Construction of north-east railway fly-over

PHASE II
Construction of north-east building part

PHASE III
New railway fly-over in use (4 tracks)

PHASE IV
Construction of south-west railway fly-over

PHASE V
Construction of south-west building part

COMPLETION
All tracks in use

STABILITY

Structural zoning and facilities for stability

The complex is divided in several structural parts, which stand on their own. Stability is provided by cores which are situated at the shafts for lifts and for air ducts, and by several stability walls. The system never touches the railway structure, which stands independently.

CLIMATE SERVICES

Zoning, plants and shafts

Climate is controlled by flow of conditioned, fresh air. Spaces with a private character have windows which can be opened to overrule the airconditioning system. Air treatment units are placed centrally within the building structure, at the same level as the railway fly-over.

STRUCTURE & TRACK SUPPORT

Keeping the structures separate

Although formally integrated, the railway tracks are structurally separated elements, around which the building complex is constructed on its own foundation. This structural separation prevents the turbulence of the passing trains to interfere with the building structure. Furthermore, a sound buffer area is projected between the railway tracks and the functional indoor spaces - wide enough to serve as a circulation area as well.
STRUCTURAL ELEMENTS

Applied systems

The structural system relies on stability cores with additional columns and loadbearing elements in the façades. The main span is taken care of by a u-shaped girder element, 2400 mm wide. Between these elements, hollow concrete core slabs are applied.

INTEGRATION OF DUCTS

within the construction depth of the flooring system

Main girders are supplied with holes to integrate the air ducts within construction depth.

STRUCTURE & CLIMATE SERVICES

Integration of ducts and piping within the construction depth of the floor slabs

Detailed cross-section over north-east part of the complex - scale 1:400

Cross section over flooring system - scale 1:50

Longitudinal section over flooring system - scale 1:50

Typical cross section showing the integration of beams, floor slabs, ceiling panels, ducts and end user appliances
DETAILING THE FAÇADES

Axonometric detail of façade cladding - side towers. Façade openings and corners are aligned at the tiling measurement system.

Axonometric detail of cladding - set-back façade. The measurement system is derived from the structural system of the complex.
TU Delft

Faculty of Architecture

This graduation project has been accomplished within the constraints of the Hybrid Buildings Design Studio

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