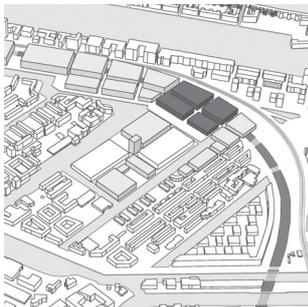


BEYOND THE TRACKS

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

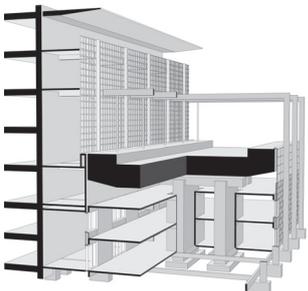
GRADUATION PROJECT
TU Delft - Faculty of Architecture



URBAN MASTER PLAN



UNIVERSITY CAMPUS



STRUCTURE & DETAILS

Jeroen Homan
bk9357154

Hybrid Buildings
for the Dutch City

BKM4AU1 Architectural Design
BKM4AU2 Building Technology

February 18th, 2005

BEYOND THE TRACKS

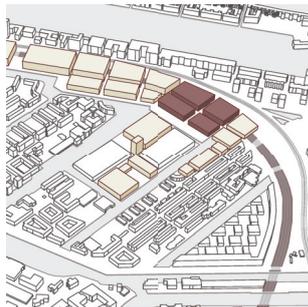
An urban response to the railway barrier at the Amsterdam Eastern Harbour Islands - creating a city campus for UvA between the tracks

GRADUATION PROJECT
TU Delft - Faculty of Architecture

HYBRID BUILDINGS
for the Dutch City
MSc semester 3 & 4

TUTORS
Roberto Cavallo (A)
Henk Muhl (BT)

EXAM COMMITTEE
François Claessens



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.

URBAN PLANNING



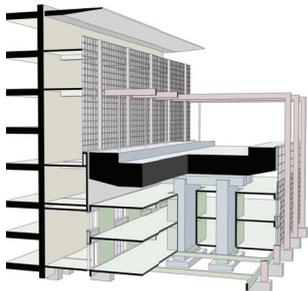
UNIVERSITY CAMPUS

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.

ARCHITECTURAL DESIGN



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 struc-

tural 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.

BUILDING TECHNOLOGY

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STARTING POINTS

RESULTING
MASTERPLAN
BUILDING MASSES



CONNECTING
THE ISLANDS
ACROSS THE WATER



EXTENDING
THE AXES
ACROSS
THE RAILWAY



MINIMIZING
THE BARRIER
REMOVING THE
UNUSED TRACKS



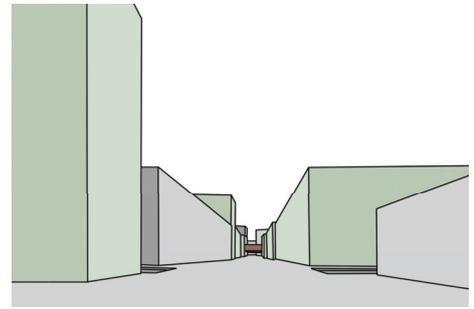
CURRENT
SITUATION
RAILWAY BARRIER



Planometric view showing principles for Master Plan

CONTINUING THE FORMAL AXES

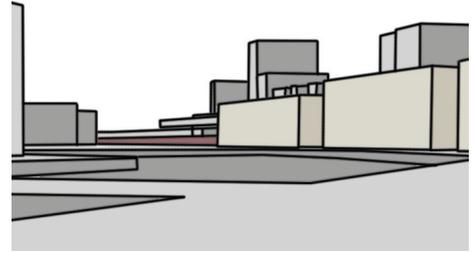
Successive perspective
views approaching the
railway barrier



Existing start of the Oostenburg Axis

INTEGRATING THE BARRIER

Investigating possibilities
of dealing with the tracks
in the built environment



Building blocks in front of railway barrier

URBAN MASTER PLAN

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 *DJ* 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.

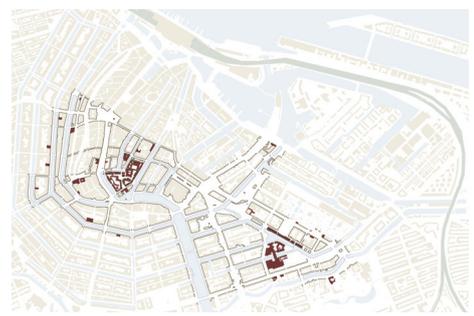
UVA CITY CAMPUS

The University of Amsterdam has always been spread around the city center. For management reasons, it chooses a policy of clustering its facilities. In the masterplan a new cluster has been proposed at the former Stork area. This location, in its proximity to the present

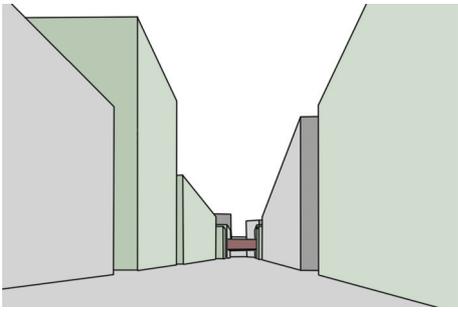
clusters, is smoothly accessible by both car and public transport. For the area, a UvA campus could ignite urban life with a value of attraction to further urban development, while the design itself is a further exploration of the possibilities to build around the railway tracks.

CLUSTERING UVA CAMPUS NETWORK

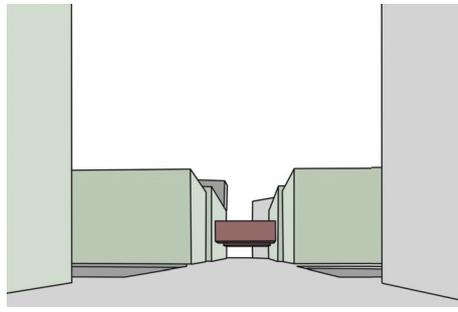
Scattered facilities and
building clusters in the
UvA city campus network



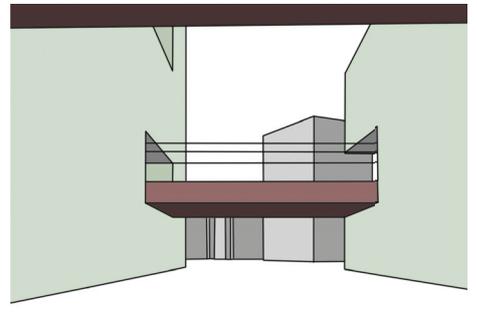
Buildings currently used by UvA and connecting routes



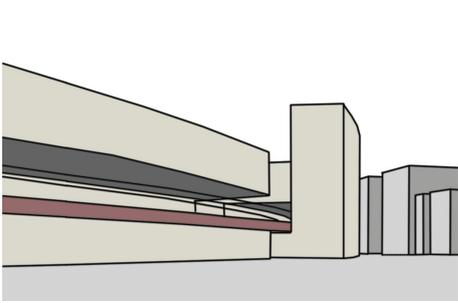
New building façades accentuating the axis



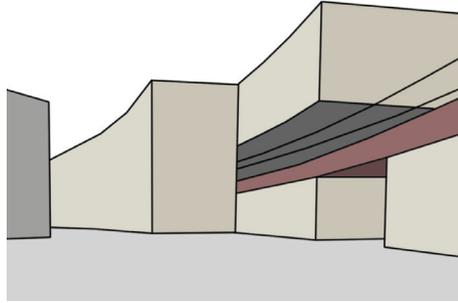
Approaching the railway barrier



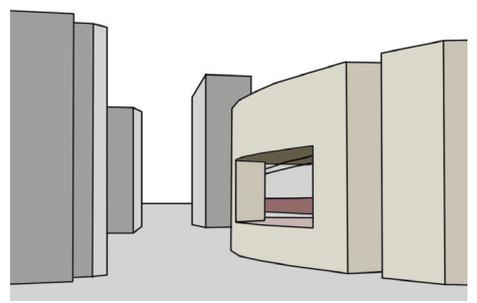
Barrier passage guided by extended façade line



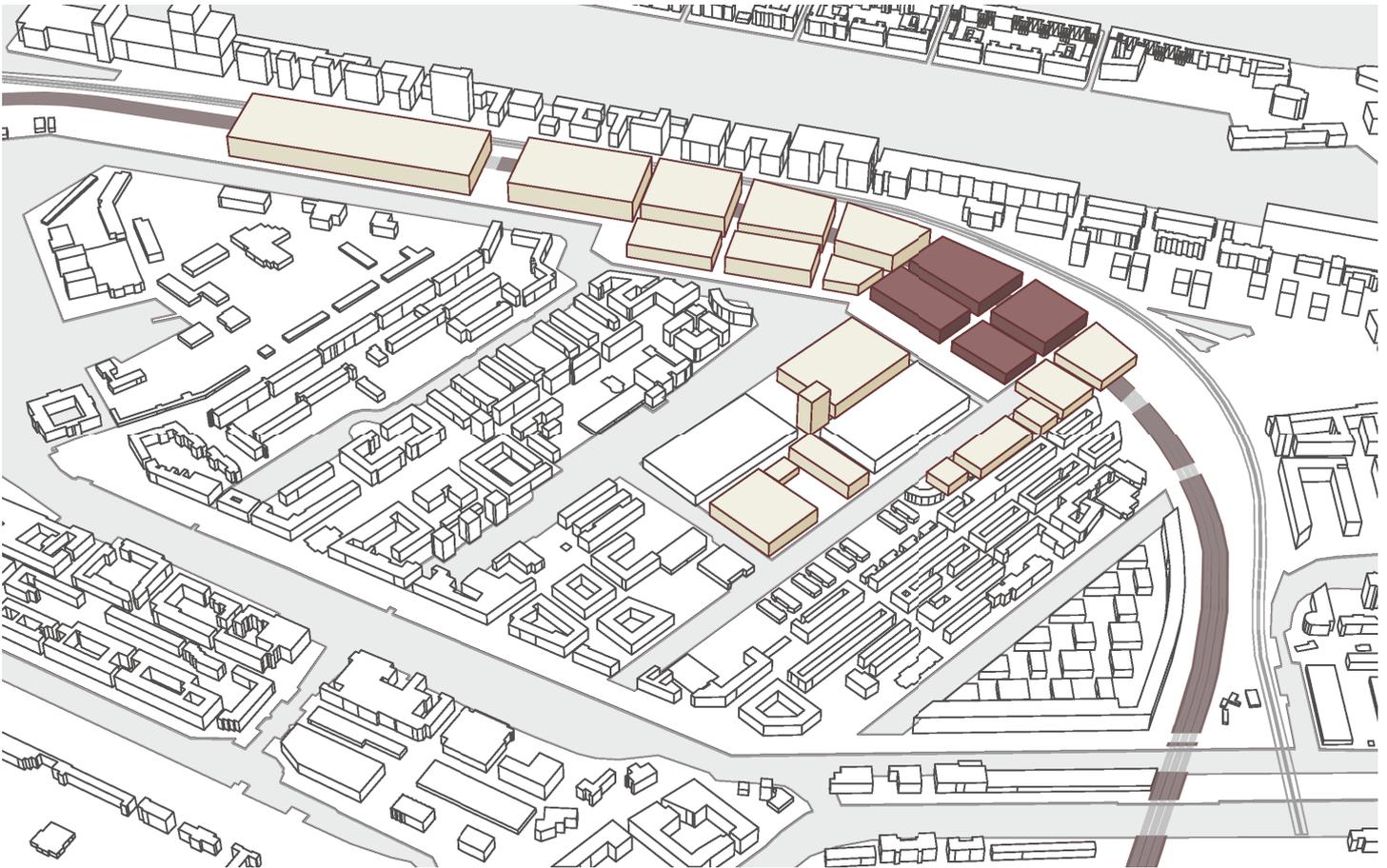
Building above and below the tracks



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



Elevation - North-East Façade - 1:2000



Elevation - South-East Façade - 1:2000

PROGRAMME

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

UVA FACILITIES 27 000 m²

- Education spaces 12 000 m²
- Research and offices 8 500 m²
- Library and self-study 8 500 m²

EXTRA CURRICULAR 5 000 m²

- Information center 2 500 m²
- Faculty Club 500 m²
- Restaurant 2 000 m²

ADDITIONAL PROGRAM 10 000 m²

- Third-party shop & office 4 000 m²
- Conference center 2 000 m²
- Parking 4 000 m²

FUNCTIONAL LAY-OUT

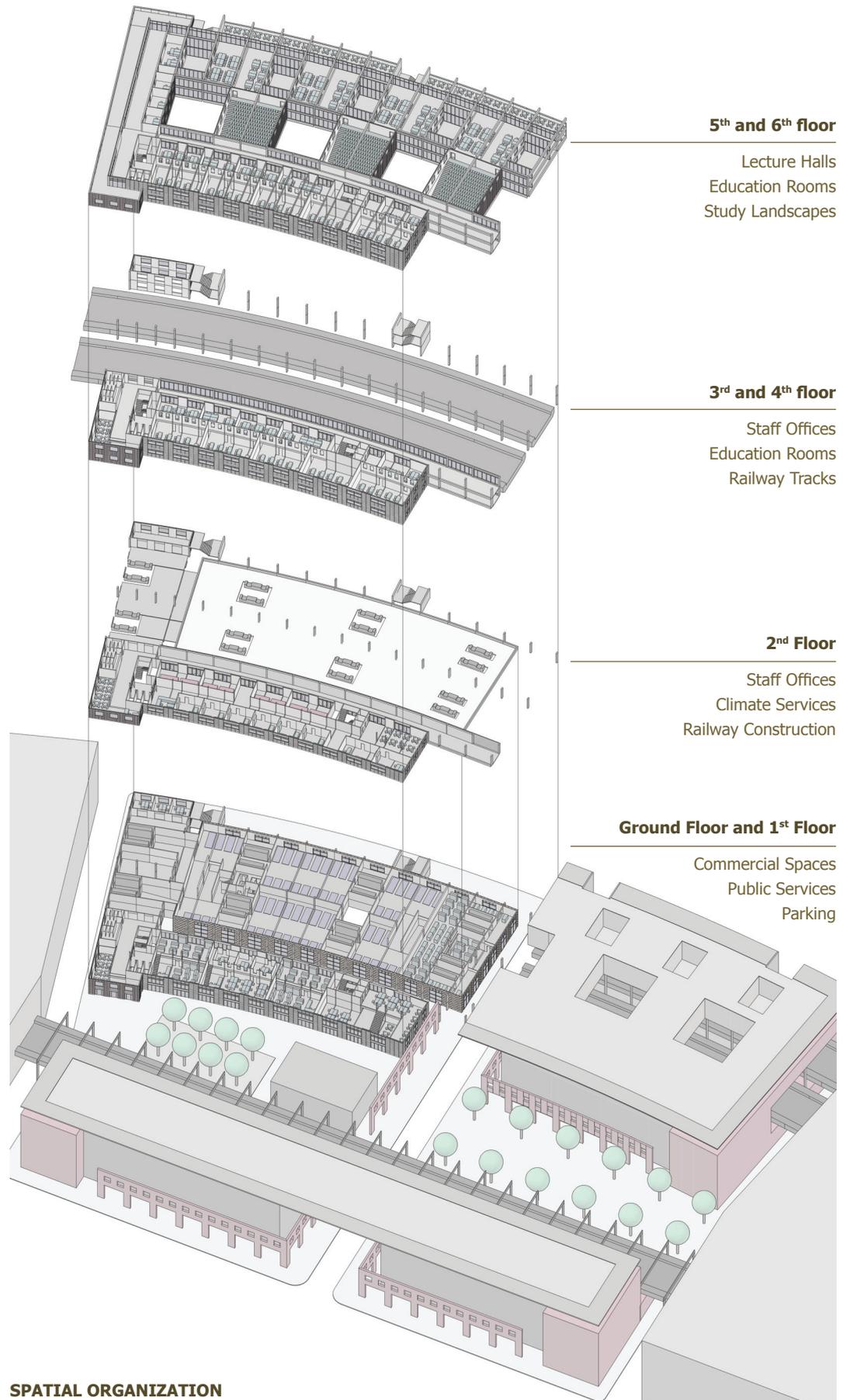
At ground floor level, all public facilities are situated around two central squares. The additional third-party program is integrated in the plinth at the outer south-east side. Specific student and staff related program is situated on the floors above. These spaces are accessible via the entrances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



5th and 6th floor

- Lecture Halls
- Education Rooms
- Study Landscapes

3rd and 4th floor

- Staff Offices
- Education Rooms
- Railway Tracks

2nd Floor

- Staff Offices
- Climate Services
- Railway Construction

Ground Floor and 1st Floor

- Commercial Spaces
- Public Services
- Parking

SPATIAL ORGANIZATION

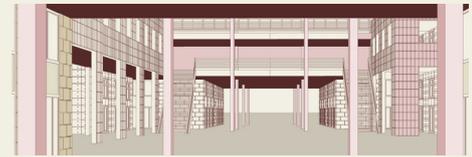
Exploded view of the general building layout

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.



Arcade folding towards railway passage

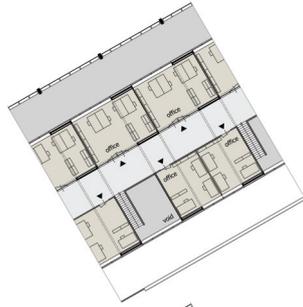


Railway passage is guided by building façades

STRUCTURE & FLEXIBILITY

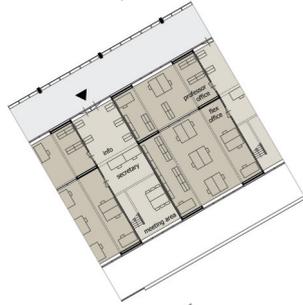
TYPE CORRIDOR OFFICE

- 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



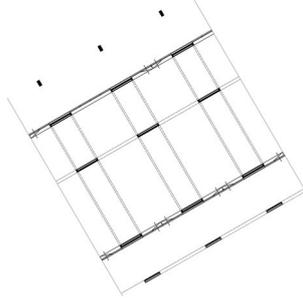
GROUND FLOOR

- 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



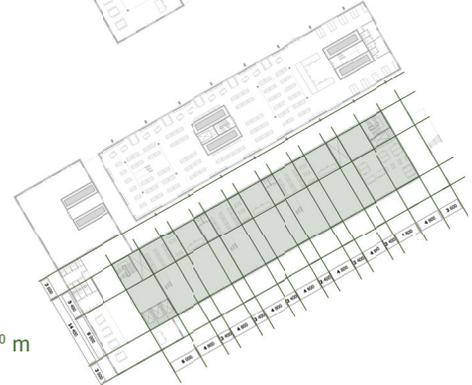
RAILWAY STRUCTURE

Support at every 28.⁸⁰⁰ m



BELOW RAILWAY

Split measure
 $4 \times 7.200 \text{ m} = 28.800 \text{ m}$

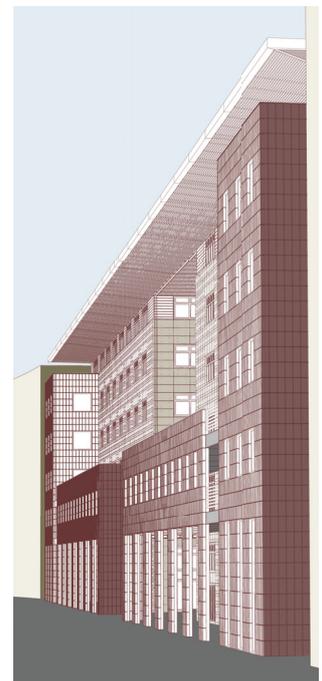


MAIN BUILDING STRUCTURE

Alternating Grid
 $4.800 \text{ m} + 2.400 \text{ m} = 7.200 \text{ m}$

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 north-east 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 Heijnkade. Here, the façade opens up to the tracks - so the trains run literally through the building complex.



Arcade at Dijkstrastraat - hiding the tracks



Passage opens up to public square between the tracks



Arcade as intermediate space between building and square



Looking back through the railway passage

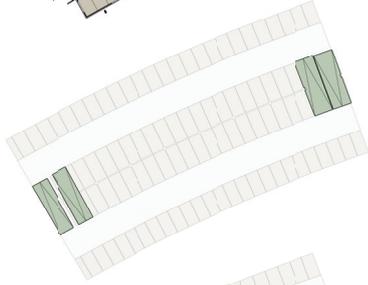
PARKING GARAGE

fitting the cars in the building structure



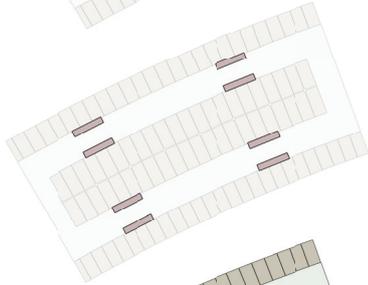
FINAL SOLUTION

parking fitted into building structure



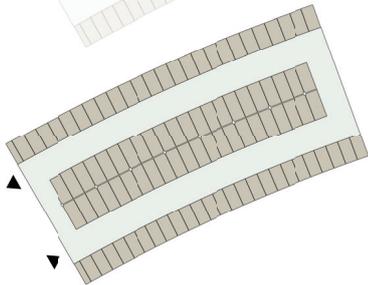
SPLIT LEVEL RAMPS

allowing multi-storey configuration



TRACK SUPPORT

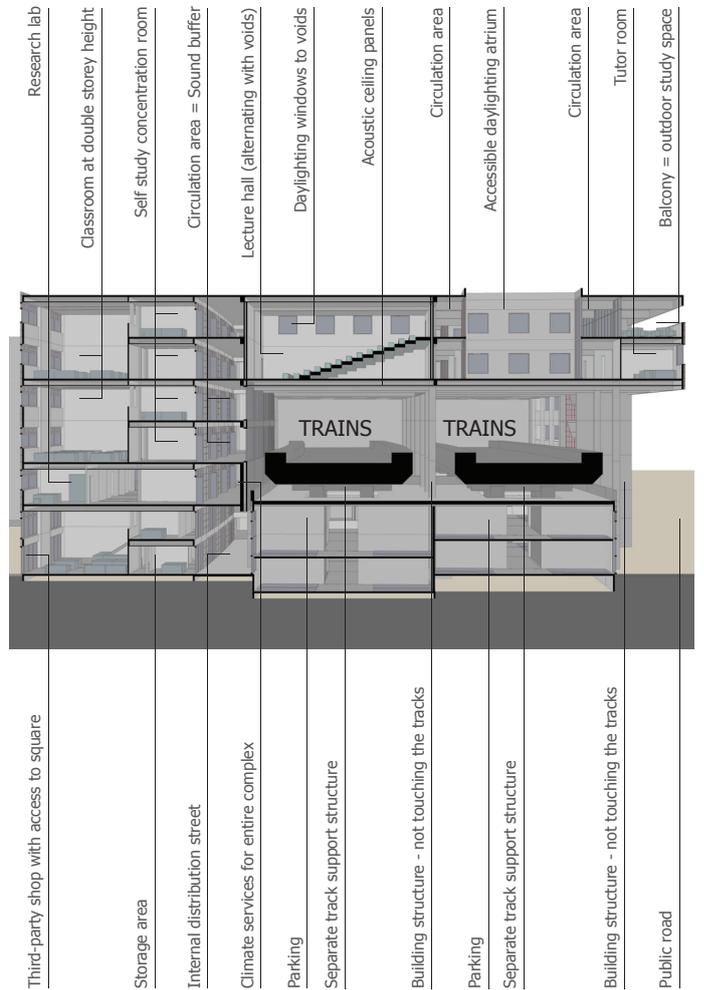
separate railway construction



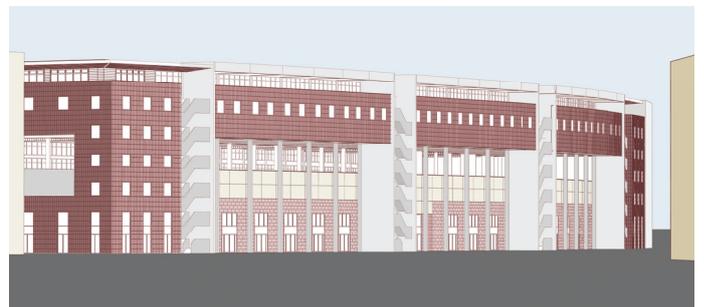
IDEAL PARKING

optimal straight parking configuration

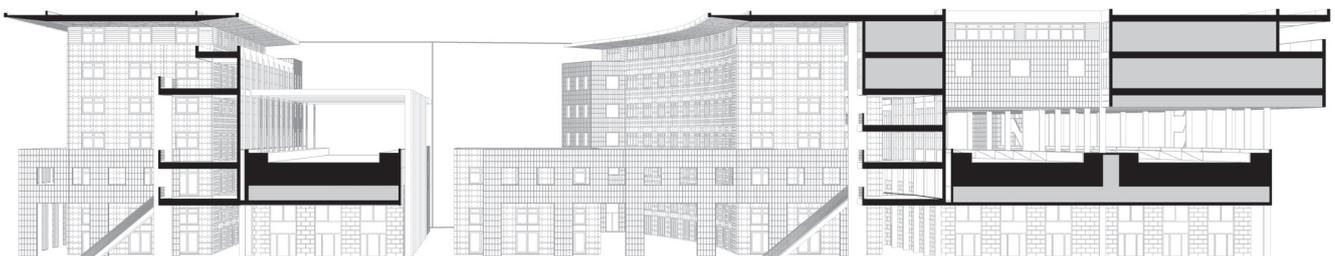
SPATIAL INTEGRATION OF THE TRACKS



Perspective view in inner court yard - tracks exposed at one side

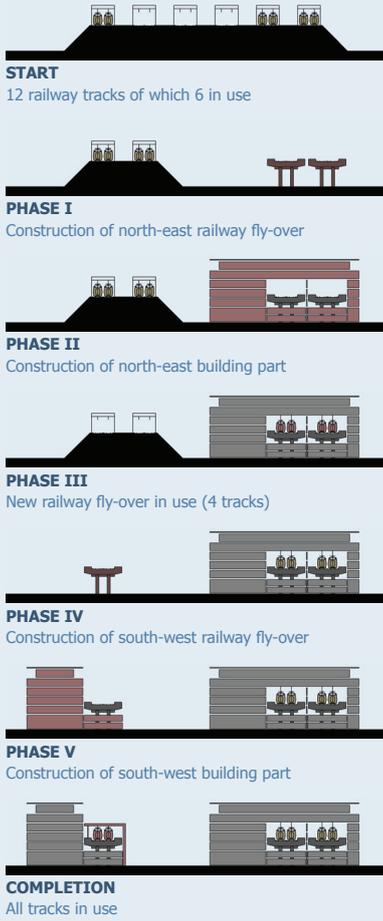


Perspective view along Piet Heijnkade - railway visibly running through the building complex



Sectional perspective over the extended Oostenburg Axis - the actual railway passage, treated as an ongoing street

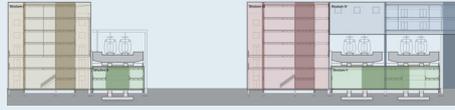
CONSTRUCTION PHASES



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.



Schematic section showing structural zoning and stability cores



Schematic plan showing structural zoning and stability cores

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.



Schematic section showing plants, shafts and basic airflows

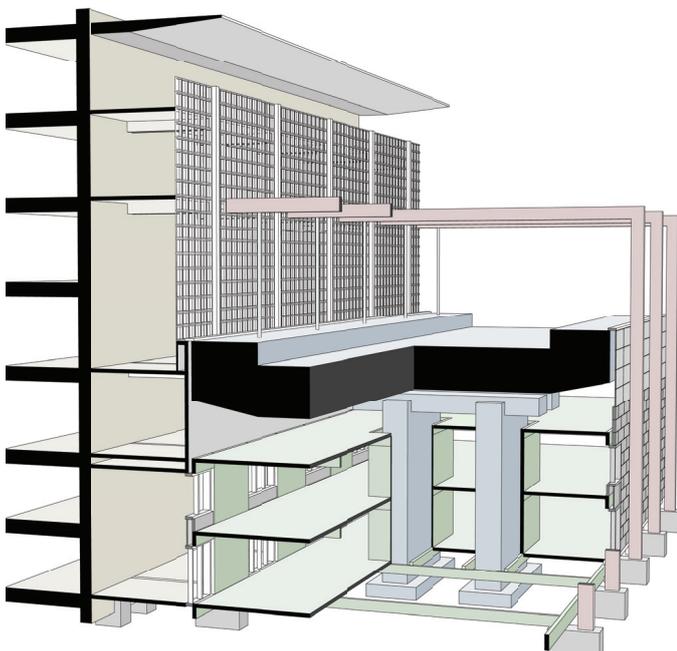


Schematic plan showing climate zones

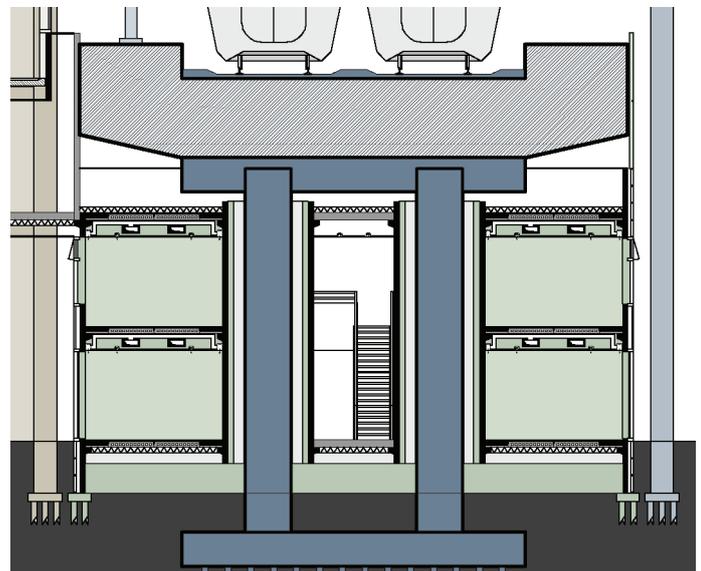
STRUCTURE & TRACK SUPPORT

Keeping the structures separate

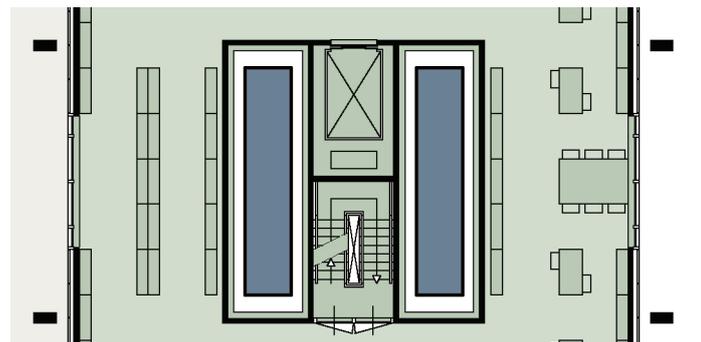
Although formally integrated, the railway tracks are structurally separated elements, around which the building complex is constructed on its own foundation. This structural separation prevents the turbulence of the passing trains to interfere with the building structure. Furthermore, a sound buffer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



Perspective showing railway support related to building structure



Section of railway support construction and surrounding building structure - scale 1:200



Plan of railway support construction and surrounding building structure - scale 1:200

STRUCTURAL ELEMENTS

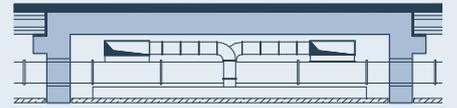
Applied systems

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.

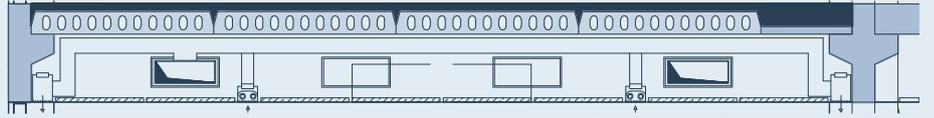
INTEGRATION OF DUCTS

within the construction depth of the flooring system

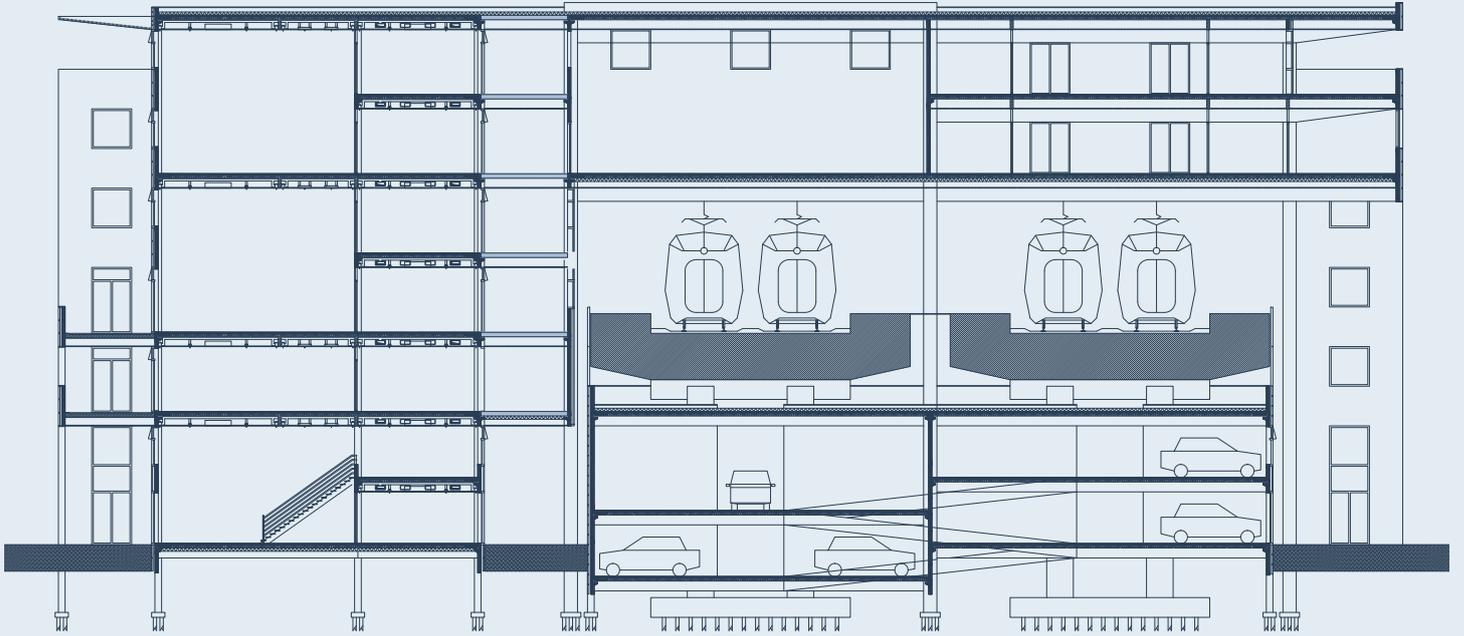
Main girders are supplied with holes to integrate the air ducts within construction depth.



Longitudinal section over flooring system - scale 1:50



Cross section over flooring system - scale 1:50



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

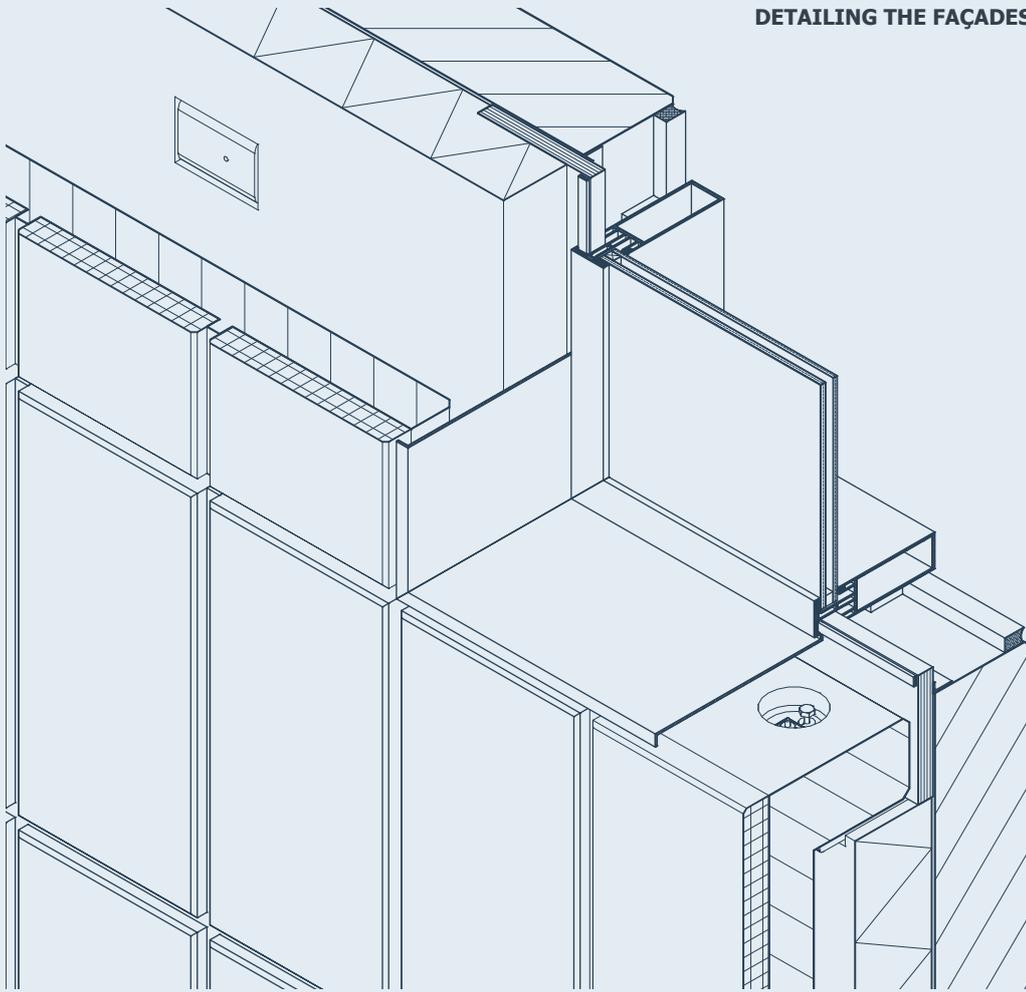
STRUCTURE & CLIMATE SERVICES

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

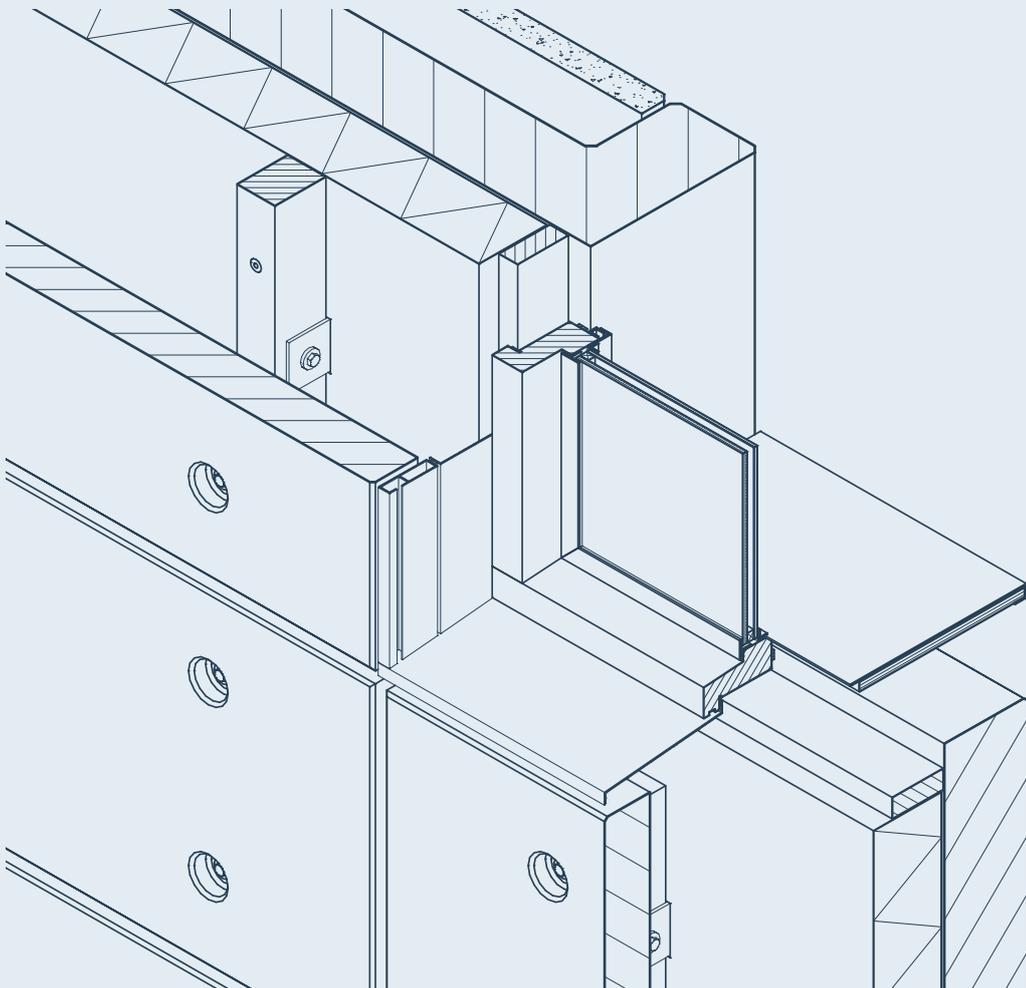


Typical cross section showing the integration of beams, floor slabs, ceiling panels, ducts and end user appliances

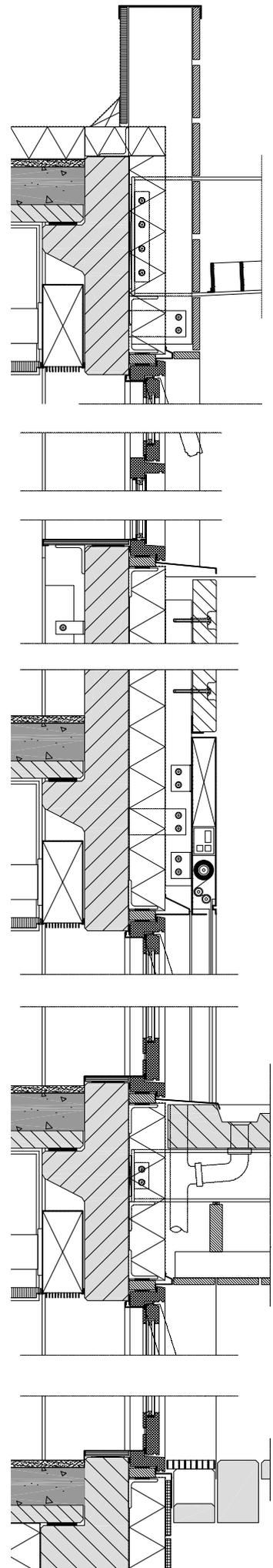
DETAILING THE FAÇADES



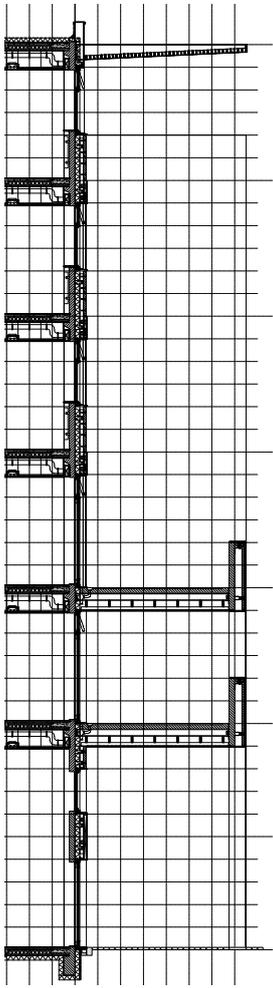
Axonometric detail of façade cladding - side towers. Façade openings and corners are aligned at the tiling measurement system.



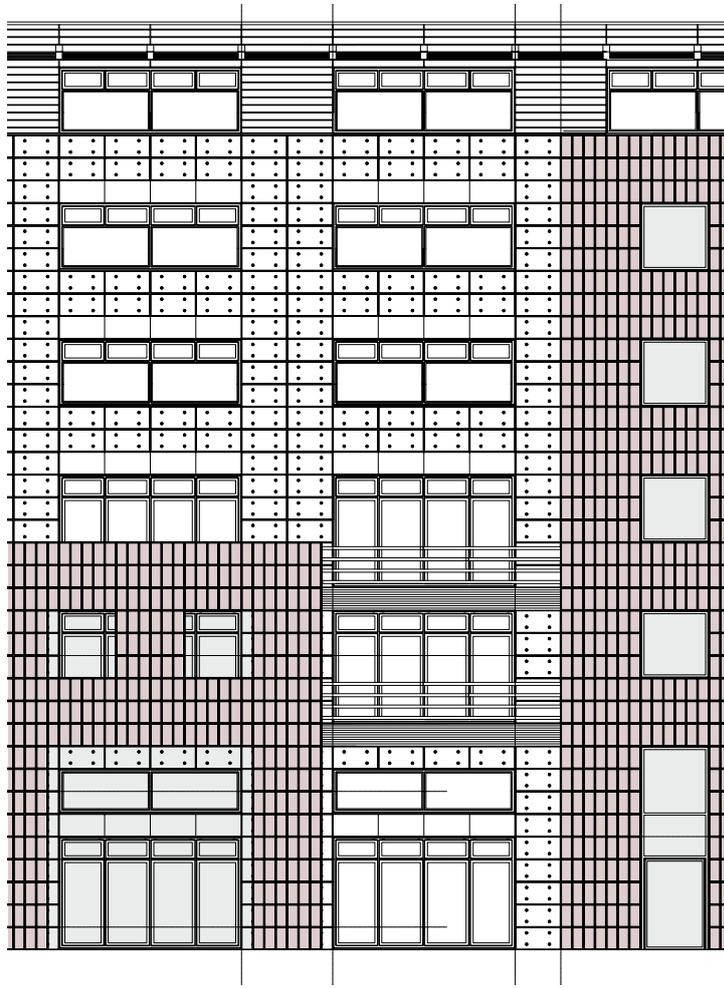
Axonometric detail of cladding - set-back façade. The measurement system is derived from the structural system of the complex.



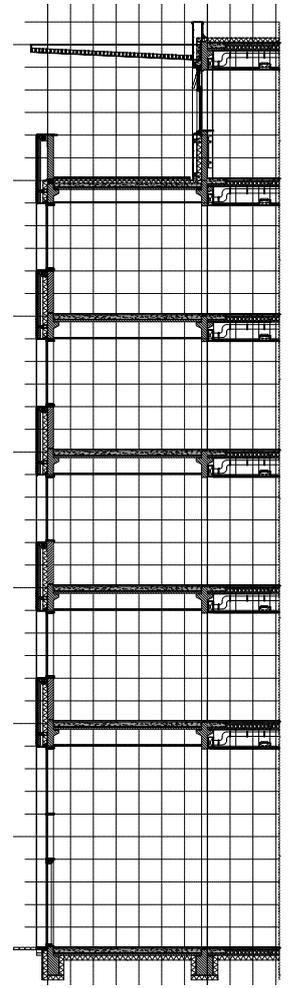
Vertical details façade
scale 1:20



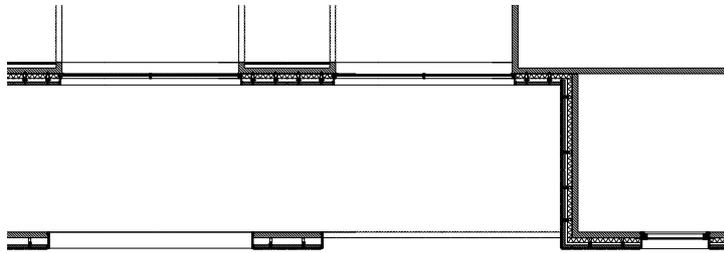
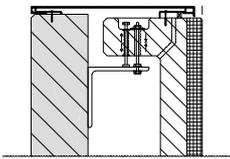
Vertical section of set-back façade
scale 1:200



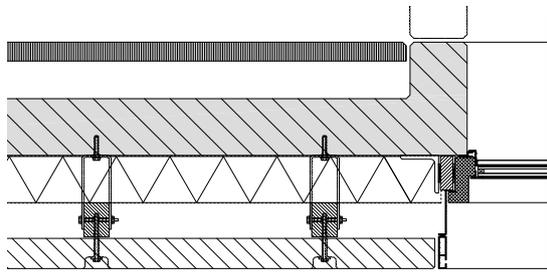
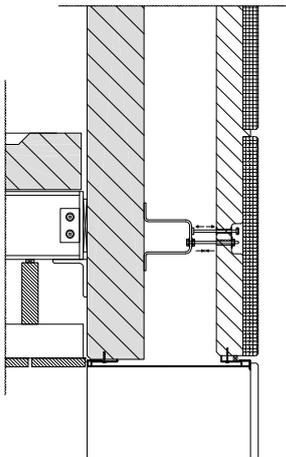
Elevation of façade fragment
scale 1:200



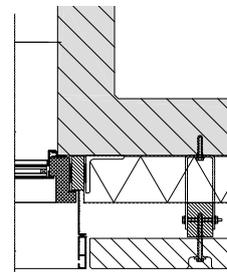
Vertical section of tower façade
scale 1:200



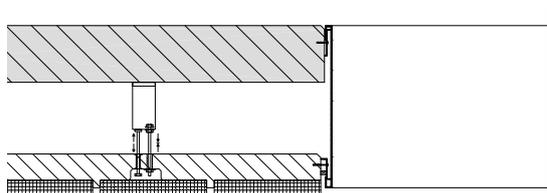
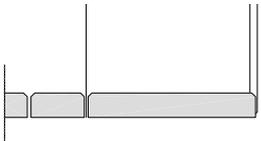
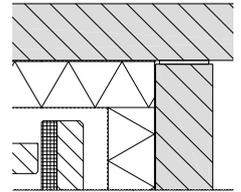
Horizontal section of façade
scale 1:200



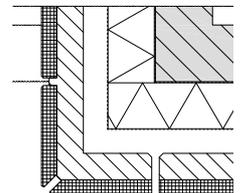
Horizontal detail set-back façade
scale 1:20



Connection façade - tower
scale 1:20



Horizontal detail arcade
scale 1:20



Horizontal detail tower
scale 1:20

Vertical details arcade
scale 1:20

TU Delft

Faculty of Architecture

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

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