EU TOWER
TALL - VCE 2012/13

TU Delft

MIXED USE HIGH RISE TOWER FOR EUROPEAN UNION IN BRUSSELS

JAYADEEP PREMNATH
Student number 4181174
Tutor Tanner Merkeley
Assignment

A tall building cluster in Brussels for the European Union 220,000 sqm of flexible offices, a conference centre and a public atrium.
Integration of a high-rise structure in a low-rise neighbourhood

A form that can relate to the image and identity of EU
EU
1951
EUROPEAN COAL AND STEEL COMMUNITY

1958
EUROPEAN ECONOMIC COMMUNITY

growth, new members

1993
MAASTRICHT TREATY
Architecture of EU
A ‘postmodern’ state in the virtual realm ??

Organisations that do without boundaries, icons and images.... Exists in networks, agreements and treaties...

EU and Form
In a permanent struggle to define its form??

Monofunctional and contextless buildings symptomatic of an organisation unsure to express itself...

EU and Form
Lack of connection with the public...

Designed to house bureaucrats and lobbyists, there is lack of engagement with the citizens...

EU and Form
Aim

A language that can represent the spirit of European Union

A building which can engage and absorb public activities
The launching of the European Union in 1957 with offices in the Leopold quarters accelerated the changes in the character of the traditional lowrise neighbourhood.
Total office space: 33%
Total inhabitants: 2.65%
The streets, squares & public space of Europe
Rue de la Loi suffers from the common problems facing European cities with the development that took place in the CBDs of these cities in the last few decades. The streets are no longer welcoming to pedestrians, with buildings shutting down their ground level to the basements, leaving nothing for them to look at or engage with. The office building typology which includes glass towers filling up the city has led to the last few decades have destroyed much of the original fabric of the European cities and leaves behind streets and neighbourhoods devoid of life or activities.

Rue de la Loi - an ‘un’European street

Inserted in a traditional urban fabric...

Empty streets

Opaque ground levels
“Towers have a problem: they end. Although they are icons for densification and therefore city life, they actually behave like introverted and isolated islands. Although they are meant for intense networks they, actually operate like dead end streets.”

- MVRDV ‘KM3’
An architectural language that tackles the issues of image and identity of EU

To re-establish the lost relationship between street and building

A context generated design that will relate to its immediate neighbourhood
PROGRAM
= 6000 sqm

Program of requirements

- offices: 180,000 m²
- conference center: 30,000 m² (25 conference rooms varying in size)
- public atrium: 6,000 m² (private owned covered public space)
- retail: 4,000 m²
- total: 220,000 m²

(incl. circulation and cores and excl. building services and parking)

Public space (could be on all levels): 4,000 m²

Monofunctional
Not suitable for offices of the future
<table>
<thead>
<tr>
<th>Requirement</th>
<th>Area (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offices</td>
<td>120,000</td>
</tr>
<tr>
<td>Conference center</td>
<td>30,000</td>
</tr>
<tr>
<td>Public atrium</td>
<td>6,000</td>
</tr>
<tr>
<td>Retail</td>
<td>10,000</td>
</tr>
<tr>
<td>Hotel</td>
<td>25,000</td>
</tr>
<tr>
<td>Apartments</td>
<td>25,000</td>
</tr>
<tr>
<td>Mixed/semi-public</td>
<td>6,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>220,000</strong></td>
</tr>
</tbody>
</table>

- **New program of requirements**
- **Offices of the future**
- **Diversity**
- **Self sustainable offices of the future**
- **Monofunctional Not suitable for offices of the future**
Volume-program studies
Volume-program studies
DESIGN
DEVELOPMENT
URBAN STRATEGY
Heritage structure
Pedestrian pathways crossing site
foot prints of tower between these walk ways
developing public plaza
developing public plaza
Image and Identity

Generic tower form
Image and Identity

Generic tower form
Fails to stand out
Image and Identity

Dynamic form
Gives distinct identity
To represent the identity of EU was to distill the essential construct of the institution as one formed of disparate but mutually beneficial individual institutions and nations....
The tetris
FAÇADE CONCEPT
Brussels lace
PUBLIC SPACE
DIAGRAMS AND PLANS
Hotel floor
full floor plan
deluxe / corner unit

business
Hearst tower, New York
Entry lobby and auditorium
Typical Office floor plan
SUSTAINABILITY
PRINCIPLES
Triple glazing and ceramic fritting helps the residential units to save energy.

APARTMENTS DECENTRALISED CLIMATE CONTROL

By clubbing similar programs in one tower, optimal utilisation of ducts and services is possible.

HOTEL CENTRALISED CLIMATE CONTROL

Rainwater from the many terraces is collected in underground storage tanks which is then utilised for heating the floor and toilets.

Ceramic fritting for the office facades helps in cutting down glare and reduce load on climate control systems.

Climate facade system reduces the loss of internal heat by radiation during winter.

Hydronic floor heating systems save energy spent on heating the office floors.

OFFICES CENTRALISED CLIMATE CONTROL

The floor of the atrium is paved with heat conductive limestone.
Green roof
Provides insulation

Rainwater collection
Floor

Hydronic heating
Circulating water for cooling in the summer and heating in the winter
Covered by heat conductive flooring
Facade

Ceramic fritting

Reduces solar gain
Facade

Climate facade
Provides insulation
Energy savings on heating and cooling

Climate facade
- Double glazed external panel with ceramic fritting
- Single glass operable shutter as the internal panel
- Operable curtains inside the climate facade cavity

U value: 1.1 W/m²
g value: 0.90
Key

1. Aluminium cladding window
2. Aluminium louvers
3. Floor finish
4. Curtain wall (6 + 6mm with 12mm gap) with ceramic pattern on the outer panel
5. Aluminium mullion 72 x 125
6. Aluminium transom 72 x 125
7. 120mm thick insulation
8. Spandrel glass
9. 12mm thick insulation
10. Air circulation unit of climate facade
11. Wall down blinds in the cavity of climate facade
12. False ceiling @ 3m from floor level

Climate facade
Office tower
Key
1. Triple glazing, 6mm + 4mm + 4mm with 1.2mm gap of insulating gas
2. Aluminium transom member
3. Insulation 125mm thick
4. Insulation 125mm thick attached to beam
5. Spandrel glass
6. False ceiling
7. Aluminium frame for casement window
8. Operable shutter of window to open inside
9. Floor finish

Triple glazing
residential tower
STRUCTURAL CONCEPTS
STRONG CORE

view

elevation
3D TRUSS FLOOR

view
elevation
10 FLOORS SUSPENDED

view
elevation
3D TRUSS FLOOR ABOVE
(counterbalancing)
10 FLOORS IN COMPRESSION
Grids and shear walls
VERTICAL TRANSPORT