A phenomenological study of innovative strategies for building upgrade and their architectural use to achieve a new intensified atmosphere in the existing urban heritage
RESEARCH

THEORETICAL FRAMEWORK

THEMATIC RESEARCH

CONTEXT

VALUE ASSESSMENT

PROGRAMME RESEARCH

GRADUATION PROJECT

DESIGN

DESIGN APPROACH

URBAN DESIGN

PROGRAMME DESIGN

ARCHITECTURAL DESIGN

TECHNICAL DESIGN

The sustainable upgrade of the historic city from the architectural perspective: the architectural analysis of strategies for building upgrade

Research methods position paper: "Shields of rationality. Objective claims and rhetoric to ground and justify architectural design"

"The library of the future: the evolution of the function of library through time and its relevance in contemporary society as the place where knowledge is stored, shared and developed"

Site specific research Urban, architectural and technical analyses of the Binnengasthuisrein site and of the chosen building

Definition of the fundamental concepts and ideas informing the design

Establishment of a network of libraries and improvement of the public space

Assignment of a specific programme to the existing building and its new addition

Interpreting, enhancing and transforming the architectural qualities of the existing with the new intervention

Upgrade the building to future standards of comfort and energy efficiency in a balance between functionality and beauty

Research methods position paper: "Shields of rationality. Objective claims and rhetoric to ground and justify architectural design"
RESEARCH
PROBLEM STATEMENT

The need to reduce energy demand in buildings: upgrade of the existing stock

Ecological relevance

Economical relevance

Cultural and social relevance

Architectural relevance

Challenge to intervene in the historic context
The phenomenological and architectural study of strategies for building upgrade

<table>
<thead>
<tr>
<th>ADDITION INSIDE</th>
<th>REPLACEMENT</th>
<th>ADDITION OUTSIDE</th>
<th>COVERING</th>
<th>NETWORKING</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONCEALED</td>
<td>RECONSTRUCTION</td>
<td>NEW SKIN</td>
<td>ENERGY HARVESTING</td>
<td>SEASONAL STORAGE</td>
</tr>
<tr>
<td>De Koningsvrouwen v.L. Archivolt Architecten</td>
<td>The White House Bendheim Restoration</td>
<td>School in Utrech Erick van Egeraat</td>
<td>British Museum Foster &amp; Partners</td>
<td>Villa Flora Jón Kristinsson</td>
</tr>
<tr>
<td>EXPOSED</td>
<td>JUXTAPOSITION</td>
<td>NEW BODY</td>
<td>ENERGY PRODUCTION</td>
<td>SYNERGETIC CAMPUS</td>
</tr>
</tbody>
</table>
CONTEXT: urban analysis

City as a campus condition

Mix of functions and public/private

A complex history of different layers
CONTEXT: urban analysis

A quiet and introvert area in the city centre

Particular spatial configuration

Problems in the open spaces

Demographic pressures: bike parking

Future plans: sustainability and upgrade
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1877</td>
<td>Academic hospital complex</td>
<td></td>
</tr>
<tr>
<td>1889</td>
<td>New Clinic</td>
<td>Architect: Hendrik Leguyt, Neo-renaissance</td>
</tr>
<tr>
<td>1983</td>
<td>Hospital transferred to AMC</td>
<td>Faculty of Sociology and Behavioural Sciences, Renovation: from hospital to university, Interior layout</td>
</tr>
</tbody>
</table>
CONTEXT: technical analysis

Structure: load bearing walls of brick
Foundations: timber poles and masonry
Floor construction: masonry
Roof construction: timber structure
Insulation: mass of the brick walls
Windows: single pane glass
VALUE ASSESSMENT

Expert value: Dutch neo-renaissance monument

Social value: cultural significance of the hospital and of the university

Urban value: context of the Binnengasthuis

Architectural value: beauty of the historical building

Not a value: interior renovation of 1983 and atrium addition of 1991
PROGRAMME: the function of library through time

2600 BC
Early library
Clay tablets

300 BC
Classical period
Papyrus library

476 AD
Demise of
Roman Empire
Crisis of culture
Only 1% could read

Middle Ages
Monastic library
Amanuensis

21st century
Internet
Bookless library

19th-20th c.
Administration,
storage, reading

Enlightenment
Total work of art
Book production

Renaissance
Humanism
Academy
Place where knowledge is stored, ordered, preserved and passed on

Extension of the public realm

Symbol of knowledge and culture

A signifier of public identity

**Bibliothèkè: book (biblion) and storage (thèkè)**

“Books are the carriers of civilisation. Without books, history is silent” (Voltaire)

Library as a network

Multifaceted public space

Egalitarian agent to ensure the existence of knowledge and communication
### PROGRAMME: case studies

<table>
<thead>
<tr>
<th>HEART</th>
<th>PROGRAMME</th>
<th>CIRCULATION</th>
<th>LIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROTUNDA</td>
<td>SPECIFICITY</td>
<td>LIGHT WELLS</td>
<td>ENVIRONMENT</td>
</tr>
<tr>
<td></td>
<td>Stockholm Public Library&lt;br&gt;Gunnar Asplund</td>
<td>Birmingham Public Library&lt;br&gt;Mecanoo</td>
<td>Free University Library Berlin&lt;br&gt;Foster + Partners</td>
</tr>
<tr>
<td>VOID</td>
<td>FLEXIBILITY</td>
<td>PROMENADE</td>
<td>COMPOSITION</td>
</tr>
<tr>
<td></td>
<td>Exeter Academy Library&lt;br&gt;Louis Kahn</td>
<td>Sendai Mediathèque&lt;br&gt;Toyo Ito</td>
<td>Zurich Faculty Library&lt;br&gt;Santiago Calatrava</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Utrecht University Library&lt;br&gt;Wiel Arets</td>
</tr>
</tbody>
</table>
DESIGN
DESIGN APPROACH

INTERPRETING

1. Rhythm → New structure relating to the existing rhythm

2. Movement → Creation of a sequence of spaces

3. Light → Warm and diffused light through a new cover

4. Perception → New perceptions through platforms and water

5. Sustainability → Balance between upgrade and poetry

6. Context → Urban plan

7. History → Ever-changing stage of memory and identity

ENHANCING

TRANSFORMING

New intensified atmosphere in the existing heritage
PROGRAMME: network of knowledge
A new bookless library to complement and empower the existing network

**MEETING**  →  Atrium; café

**STUDYING**  →  Different study spaces types  
(More than 500 study seats)

**UNIVERSITY**  →  6 lecture halls (20, 30 and 40 seats)

**LOGISTICS**  →  Bike parking (more than 400 spots  
New staircases and elevators  
Hierarchy of access points

---

Covered entrance and café  
Enclosure walls: reception, vending machines, printers  
Atrium: space with the most public character  
Interior study spaces (bicycle parking in the basement)  
Lecture halls
URBAN PROPOSAL: water to define the urban space
COMPOSITION: rhythm and movement
COMPOSITION: rhythm and movement
The entrance
A covered meeting place outside and café inside
Entrance: inviting hints of the interior
Platforms: a vertical succession of planes, staircases and ramps
Café: a warm atmosphere shaped by paper
Enclosure: the wall as a borderline but also as a place for circulation and logistics
Materialization

**STRUCTURE**
Steel profiles coated in white
Purity and abstraction

**PLATFORMS**
Satin glass laminated and sound absorbing
Play of transparency and noise control

**WATER**
Define the architectural and urban space and enhance the perception of the existing
Climate control which avoids overheating in the summer

**PAVEMENT**
Polished granite (red for the lines and crystal moon for the surface)
Creation of a floor grid following and emphasizing the structure of columns

**COVER**
Shading in paper
A warm and diffuse light shape the interior atmosphere

**INTERIOR**
Contrast between wood and concrete operating at different sensorial levels
(Visual, tactile, acoustic)

**CONCRETE VOLUMES**
Enclosure walls, new elevators, round shape addition
Aggregates to define a colour which is in harmony with the existing brickwork

**COVER**
Shading in paper
A warm and diffuse light shape the interior atmosphere

**PLATFORMS**
Satin glass laminated and sound absorbing
Play of transparency and noise control

**WATER**
Define the architectural and urban space and enhance the perception of the existing
Climate control which avoids overheating in the summer

**PAVEMENT**
Polished granite (red for the lines and crystal moon for the surface)
Creation of a floor grid following and emphasizing the structure of columns

**COVER**
Shading in paper
A warm and diffuse light shape the interior atmosphere

**INTERIOR**
Contrast between wood and concrete operating at different sensorial levels
(Visual, tactile, acoustic)
Possible configurations of a platform:
- Study spaces along the edge
- Temporary exhibitions with movable supports
- Armchairs and coffee tables
- Circulation shortcuts

Atrium: a multifunctional public living room of suspended platforms
Platforms: translucent satin glass creates an enigmatic play of transparency
Platforms: new and unexpected vistas
Cover: a canopy of glass and paper creates a new warm and diffused light
Connections between new and the old
Interiors: study spaces with different atmospheres and characters in each room
Acoustic glass for inner layer roof and platforms to minimize noise

STRATEGIES
Covering
Addition inside
Energy storage

INSTALLATIONS
Floor heating
Electrical installations in the columns

WATER
Water collection: roof-column-foundation
Water re-use: fire safety sprinkles and pond
Energy: cooling in the summer
Architectural value: define space, enhance perception
Urban value: connection to urban gutters and canals

UPGRADE

LIGHT
Double-skin roof with ventilated cavity
Shading in paper

SOUND
Acoustic glass for inner layer roof and platforms to minimize noise

WIND
- Cross ventilation rooms former hospital
- Ventilation roof cavity
- Openable windows on the cover
- Air ducts in the beams
Stratigraphy of the roof