How can the last remaining vacant site along Oostelijke Handelskade be the first statement for a "housing Hybrid" for the 21th century?
How can the last remaining vacant site along Oostelijke Handelskade be the first statement for a "housing Hybrid" for the 21st century?
Historical Example

Right after Automobiles was invented...

House

Garage

John Brinckerhoff Jackson, 1998, Landscape in Sight (Yale University Press)
Historical Example

Change of Lifestyle such as the Ownership of Automobile
Historical Example

House

Party (Public)

Recreation (Private)
01 THEME RESEARCH
02 SITE ANALYSIS
03 CONCEPT OF DESIGN
04 MASS DESIGN PROCESS
05 COMPOSITION OF BUILDING
06 URBAN PLAN
07 GROUND PLAN
08 FAMILY DWELLING WITH MEDIATHEQUE
09 SINGLE OR SHORT-TERM DWELLING WITH ORGANIC FOOD COURT
10 ELDERLY DWELLING WITH SPA
11 SECTION AND ELEVATION
12 BUILDING TECHNOLOGY
13 CLIMATE DESIGN
14 IMPRESSION
THEME RESEARCH
Research Question

“What is happening between the (public) street and the (private) dwelling?”
- In what way is the route of the dweller framed?
- How are the transitions shaped by architectural elements?
- What are the differences and similarities in transitions between horizontal and vertical housing projects?
- Can we translate the horizontal transitions to a vertical building?

Criteria of Case Study

- Visible transitions between street and dwelling
- Residential building
- Urban area (preferably in Amsterdam)
- Built projects
- Entrance facing the street
- Different projects over time
Horizontal Cases

- Streets of the city centre, Amsterdam
- Haarlemmerhouttuinen
  H. Hertzberger
  Amsterdam, 1982
- Noordbuurt
  VMX Architects
  Amsterdam, 2008

Vertical Cases

- Student Housing
  Weesperstraat
  H. Hertzberger
  Amsterdam, 1966
- Shinonome Canal Court Block 2
  Toyo Ito
  Tokyo, 2005
- La Grande Cour
  Meyer & van Schooten
  Amsterdam, 2007
Student Housing

1. Urethane (Reddish Brown)
2. Boundary Concrete Block
3. Concrete Tile
4. Concrete Tile (Smaller Pattern than Street)
5. Concrete
6. Concrete Tile (Same with Acade)
7. Glass Door and Expansion of Concrete Tile
Conclusion: Own Function of Elements

<table>
<thead>
<tr>
<th>Visual transition</th>
<th>Visual barrier</th>
<th>Physical transition</th>
<th>Physical barrier</th>
<th>Physical obstruction</th>
</tr>
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<tbody>
<tr>
<td>change of pattern</td>
<td>pole</td>
<td>step</td>
<td>fence</td>
<td>door</td>
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<tr>
<td>change of material</td>
<td>colonnade</td>
<td>ramp</td>
<td>chain</td>
<td>entrance door</td>
</tr>
<tr>
<td>change of pattern &amp; material</td>
<td>blocks</td>
<td>low stairs</td>
<td>wall</td>
<td>vertical sliding door</td>
</tr>
<tr>
<td>lawn</td>
<td>underpass</td>
<td>one floor stairs</td>
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<tr>
<td>plateau</td>
<td>column</td>
<td>staircase</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>overhang</td>
<td>elevator</td>
<td></td>
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</tr>
</tbody>
</table>
CONCLUSION: INFLUENCE OF ELEMENTS TO THE CITY AND PEOPLE

Protection
- column
- wall
- one floor stairs
- staircase
- elevator
- fence
- door

Border
- change of pattern
- change of material
- change of pattern & material
- plateau
- pole
- blocks
- colonnade
- low stairs
- step
- vertical sliding door

Invitation
- lawn
- underpass
- overhang
- step
- ramp
- low stairs
- entrance door

Repellence
- chain
- door
- one floor stairs
- fence
SITE ANALYSIS
MY SITE ITSELF IS THE TRANSITION IN AMSTERDAM
OOSTELIJKE EILANDEN
- less densified than center
- more green
- support the center of Amsterdam
OOSTELIJKE HANDELSKADE
- old industrial area
- vertical density
- wide open
- border between urban structure and nature
- relaxed life but busy flow
IJHAVEN
- unique nature in the city
- make quiet life
Transition between Past and Present

legacy of old warehouses

ridden on the roof of warehouses
Transition between Urban Structure and Nature

SITE

busy
competitive
fast
consumptive

quiet
slow
recreational
CONCEPT OF DESIGN
How do I make a balance between extremely opposite characteristics such as dwelling and hybrid program (private and public) within one building of transitional site that itself has opposite characteristics?

Junwoo Lee, 2013
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“It is in the nature of relativity that all twin phenomena should be inextricably interwoven. The whole fabric is distorted throughout if you damage one by splitting it into conflicting alternatives, for each half will then of itself take place on a pedestal and become a meaningless absolute. You cannot come to terms with one twin phenomenon without coming to terms with adjacent ones.”

Aldo van Eyck, 1962
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Aldo van Eyck, 1962

Which Architectural Approach could be helpful to solve my Dilemma?
THE ANSWER IS DUTCH STRUCTURALISM

ARCHETYPE
- pure function of dwelling and public programs
- unity of each dwelling units

AESTHETIC OF NUMBER
- appropriateness to vertical housing
- not standardized repetition of functionalism
- diversification under the one theme
- mutual relation between part(unit) and all(building mass...)

CO-DETERMINATION
- reinforce the identity of users
- give autonomy to dwellers

TWIN PHENOMENON
- mutually contradicting relationships and interactions of complexity and allelism
- unity/diversity, part/all, open/close, inside/outside etc
- our site is the conflicting point of urban structure/nature, past/present, busy life/relaxed life, main road/backside road

PHILOSOPHY OF DOORSTEP
Concept of Dwelling Typology
Concept of Dwelling Typology

- Single Dwelling / Short-term Dwelling
- Kitchen
  - cooking
  - eating
  - guesting
  - party
- Organic Food Court

Diagram showing the transition possibilities between different dwelling types and hybrid parts.
Concept of Dwelling Typology

DWELLING

POSSIBILITY OF TRANSITION

HYBRID PART

Eldery Dwelling

Bathroom
- shower
- sauna
- recreation

Spa

Concept of Dwelling Typology
MASS DESIGN PROCESS
Process 01_Architectural Language of Neighbor

- 35m height
- 11 floors
- Main characteristic of the Train creation by backside road
- 26m
- 8 floors
- Lower and narrower than language 01
Process 02_Merging
Process 03_Bending
Process 04_One Street
- no fresh air
- no natural sunlight
- no greenery space
- no feeling at HOME
Sunlight Chimney
- for natural sunlight - for natural ventilation
- with vertical garden - with reflecting panels

Opening for Dwelling
- for fresh air to dwellers who live in the north units
- for showing of the existence of public programs to the city

Opening for Mediathque
- for fresh air to dwellers who live in the north units
- for observatory of dwellers as communal space
COMPOSITION OF BUILDING
Relation between 2 Programs

Hybrid Part
Nature
Relaxed Life
Slow

Dwelling Part
Urban
Busy Life
Fast
Detailed Composition of Programs
URBAN PLAN
FAMILY DWELLING WITH MEDIATHEQUE
5, 6, 7TH FLOORS
TYPOLOGY OF FAMILY DWELLING
Arrangement Scheme of Units

**Type A**

- Parents
- Service
- Children
- Living Room

**Type B**

- Second Living Room for Multi-Use

---

Basic Number of Dwelling Unit

\[
\begin{align*}
\text{Basic Number of Dwelling Unit} & = 6 \\
\text{Type A} & \quad + \quad \text{Type B} \\
\text{Parents} & \quad + \quad \text{Service} \quad + \quad \text{Children} \quad + \quad \text{Living Room} \quad + \quad \text{Second Living Room for Multi-Use}
\end{align*}
\]
Arrangement of Dwelling Units
Arrangement of Dwelling Units
Model of Arrangement
TYPOLOGY AND ROUTING SYSTEM
FAMILY DWELLING
Starting Point of Routing System Movie
Impression of Observatory
Floor Plan of Observatory
Scale 1:50

- Observatory with Natural Stone
- Community Room
- Communal Space with Vertically Used Brick Panel
- Corridor & Wall: Bright White Material for the Reflection of Sunlight
- Type B Family Dwelling
- Type A Family Dwelling
- Sunlight Chimney
Floor Plan of Observatory
Scale 1 : 50

COMMUNAL SPACE & WALL
with Vertically Used Brick Panel
Typology B Upper Dwelling _7th Floor
Routing System within Dwelling Unit
Arrangement within Dwelling Unit

- Library of Mediatheque
- Kitchens
- 2nd Living Room for Multi-Use
Routing System within Dwelling Unit
Co-Determination of Dutch Structuralism
- Motivation to Dwellers
- Not only Living Room, But Office, Reading Room, Guest Room, Play Room, etc.
Typology B Lower Dwelling _5th Floor
Routing System within Dwelling Unit
SECTION OF TYPOLOGY B
5TH, 6TH, 7TH FLOORS
TYPOLOGY A
5TH, 6TH, 7TH FLOORS
FLOOR PLANS
5TH, 6TH, 7TH FLOORS
CONCLUSION OF ROUTING SYSTEM
Comparison of Routine Circulation

Usual High Rise Dwelling

- Dwelling Unit (Private)
- Corridor
- Outdoor Life (Public)
- Entrance Hall
- Parking Lot

Chain Housing

- Dwelling Unit (Private)
- Corridor
- Communal Space (Public)
- Living Room (Private)
- Entrance
- Library (Public)
- Mediatheque (Public)
- Entrance Hall
- Parking Lot

OUTDOOR LIFE (PUBLIC)
SINGLE OR SHORT-TERM DWELLING WITH ORGANIC FOOD COURT
GROUND and 1ST FLOOR
Concept of Single or Short-term Dwelling

Gradation From Private to Public Space

- to keep the privacy
- to overcome solitude
- to bond with neighbors who have same life styles
- not to disconnect from the Amsterdam (base of daily life)
Activities in Each Spaces

DWELLING UNIT (PRIVATE)
- break from busy daily life
- sleeping
- guesting with private relationship
- eating something simple

COMMUNAL LIVING ROOM (SEMI-PUBLIC)
- communicate with neighbors
  - party, gaming, chatting
  - guesting

ORGANIC FOOD COURT (PUBLIC)
- eating regular meal
- reduction of money and time to cook
- seeing, listening, talking to the others
TYPOLOGY AND ROUTING SYSTEM
Typology of Single or Short-term Dwelling

Scale 1:50

Type A

Type B
ACCESS OF PEOPLE
Access of Mediatheque and Spa Users

- ORGANIC FOOD COURT
- KITCHEN
- STORAGE
- DINING ROOM FOR SINGLE DWELLERS
- SECURITY OFFICE
- CAFETERIA
- BIKE PARKING

ENTRANCE HALL FOR USERS

ENTRANCE HALL FOR DWELLERS

DINING ROOM FOR DWELLERS

BAKERY

STORAGE

KITCHEN
CONCLUSION OF ROUTING SYSTEM
Concept of Single or Short-term Dwelling

Transitional Elements by Theme Research

- Dwelling Unit (Private)
- Communal Living Room (Semi-Public)
- Organic Food Court (Public)

- Door
- Change of material
- One floor stairs
- Entrance door
ELDERLY DWELLING WITH SPA
8, 9, 10TH FLOOR
Concept of Elderly Dwelling

Gradation From Private to Public Space

- to keep the privacy
- to overcome solitude
- to bond with neighbors who have same life styles
- not to disconnect from the Amsterdam (base of daily life)
- to keep the connection to the others
Concept of Elderly Dwelling

Activities in Each Spaces

- **DWELLING UNIT** (PRIVATE)
  - enjoy retired life
  - sleeping
  - guesting with private relationship
  - eating something simple

- **COMMUNAL LIVING ROOM** (SEMI-PUBLIC)
  - communicate with neighbors
  - party, gaming, chatting
  - preparing to go to SPA

- **SPA** (PUBLIC)
  - physical and psychological recreation
  - take care of whole body
  - seeing, listening, talking to the others
TYPOLOGY AND ROUTING SYSTEM
Typology of Communal Living Room

Scale: 1:50
CONCLUSION OF ROUTING SYSTEM
Concept of Elderly Dwelling

- Dwelling Unit (Private)
- Communal Living Room (Semi-Public)
- Spa (Public)

Transitional Elements by Theme Research

- One floor stairs entrance door
- Door
- Entrance door
- One floor stairs
Opposite Facade Materials

- Glass
- Hybrid Part
- Dwelling Part
- Brickwork
REASON OF FACADE
Reason of Brickwork

Proportion of Old Warehouse

Surrounding Buildings

- Legacy of Amsterdam's History
- Conservation of Oostelijk Handelskade's Identity
Reference Project

Funen Park by Dick van Gameren
Source: My Own Image
- Preparation for the Future of Amsterdam
- Motivation to Cross het IJ
- Connection between the South and North
SOUTH ELEVATION
North Elevation
Scale 1:100
LOAD BEARING SYSTEM
Diagram of Load Bearing System

The Interval of 5m between Columns
Removal of Columns

Diagram of Load Bearing System
Diagram of Load Bearing System
Diagram of Rigid Node
Diagram of Rigid Node
Main Material of Load Bearing System

**UHPC (Ultra High Performance Concrete)**

- from infrastructure
- when it is precasting, steel fibre of nano units
- exceptional resistance under traction and compression (8 to 10 times better than conventional concrete)
- exceptional durability (100 to 1000 greater than conventional concrete, depending on the criteria)
- more strong fire resistance (more than 3 hours in the event of fire)
- any shape
- savings in natural resources
- low consumption of primary energy
- reduced greenhouse gas emissions
Main Material of Load Bearing System

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Reduction of Columns’ Volume
SEQUENCE OF CONSTRUCTION
STRUCTURAL DETAIL
Diagram of Structural Connection

Main Structure
Rhombic Structure System
400mm X 350mm UHPC
(Ultra High Performance Concrete)

Truss Structure System
200mm x 200mm UHPC

Shaft for Mediatheque

Column for Sulingt Chimney

Ground Truss Structure System
200mm X 200mm UHPC
300mm Concrete Beam

Precast UHPC Bracket for Connection with V-Shaped UHPC Columns and Beam

400mm x 350mm Precast UHPC V-Shaped Columns

13mm Reinforced Steel

Cushion of Mortar

Liquid Reinforced Concrete for the combination of UHPC V-Shaped Columns and Bracket

Continuity 13mm Reinforced Steel

Precast UHPC Bracket for Connection with V-Shaped UHPC Columns and Beam

300mm Concrete Beam
UHPC Bracket for Connection with V-Shaped UHPC Columns and Beam

400mm x 350mm Precast UHPC V-Shaped Columns

Liquid Reinforced Concrete for the combination of UHPC V-Shaped Columns and Bracket

Cushion of Mortar

13mm Reinforced Steel

UHPC Bracket for Connection with V-Shaped UHPC Columns and Beam

Holes to Pass 13mm Reinforced Steel

300mm Concrete Beam
FACADE SYSTEM OF MEDIATHEQUE
DETAILED ELEVATION
- 20mm Steel Sheet to support Tensile System
- ø30mm Pre-stressed Cables
- 400mm x 350mm UHPC Column
- 45mm Carbon Steel of Grade S355
- 12mm Clear Glass
- Electronic Openable Glass Louver
- Opening of Reinforced Steel Duct for Ventilation of Dwelling Part
20mm Steel Sheet to Support Tensile System
Louver for Natural Ventilation of whole building
ø30mm Pre-stressed Cables
Electronic Openable Glass Louver
12mm Clear Glass
400mm x 350mm UHPC Column
Ø32mm Pre-stressed Cables
45mm Carbon Steel of Grade S355
(with all screw heads are embedded on the cast steel piece)
Ø30mm Pre-stressed Cables
CLIMATE DESIGN
AIR FLOW OF 5, 6, 7TH FLOOR
AIR FLOW OF ENTIRE BUILDING
NATURAL SUNLIGHT
Composition of Vertical Garden
Glass Dome
High Glossy Aluminium Tube
Isolation Element to Concentrate Sunlight
Diffuser
Vertical Garden

Reference

Detail of Solar Tube
Scale: 1:10
Diagram of Natural Sunlight
IMPRESSION
NOT THE END BUT A NEW BEGINNING
Thanks to Birgit, Paul, Ype and Peter
Special Thanks to My Sweetheart, Eunjin Lee and Eunyool Lee