A DOUBLE LIFE OF HYPER-OPENNESS

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Architectural Engineering
Graduation Project
AELab-09
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I. Recap
Problem Statement: Office Vacancy / Mono-function

I. Recap

Inflexibility of Architecture / Arbitrariness of Design process
Dream: Vertical Autonomy

Ideal Performance: "Highrise Of Homes", SITE, 1981
Road To Hyper-openness: The Convergence of Design and Research

I. Recap
P3 Reflection: Over Flexibility / The Absence of Architectural Quility

I. Recap
P3 Reflection: **Over Flexibility / The Absence of Architectural Quility**

1. Architectural Design Team  
2. For Primary Structure
3. 13 Architectural Design Teams  
4. For 18 Dwellings
5. “1 > 13 > 18” Efficiency
6. Impression

I. Recap
'MASS-CUSTOMIZATION'

Efficiency and low cost of Mass-production + Flexibility and Identity of Individual Customization
II. Game Settings

-Volume-
-Interior Layout-
-Facade-
Modularity: Getting Ready For Standardization and Mass-production

II. Game Settings
Modularity: Getting Ready For Standardization and Mass-production
Volume Possibilities: Customizing Your Space
Volume Possibilities: Customizing Your Space
Simulation: Phase 1 - Initializing

II. Game Settings
Simulation: Phase 1 - Initializing

II. Game Settings
Simulation: Phase 1 - Initializing
Simulation: Phase 2 - In-Use
II. Game Settings

-Volume-
-Interior Layout-
-Facade-
Layout Possibilities: Dwelling TypeLib
Layout Possibilities: Dwelling TypeLib

II. Game Settings
Layout Possibilities: Dwelling TypeLib

II. Game Settings
Layout Possibilities: Dwelling TypeLib
Layout Possibilities: *Dwelling TypeLib*
II. Game Settings

-Volume-
-Interior Layout-
-Facade-
Should the facade panels be customizeable?
Facade Functionality: Dwelling TypeLib
Facade Functionality: **Exterior Expression**
Facade Functionality: 'Front Image'
- Express your Identity
- Buffer Space between public and private
Facade Functionality: 'Front Image'

- Express your Identity
- Buffer Space between public and private
Facade Functionality: From individual housing to communal housing, 'Front Image' disappears

- Exterior pattern harmony
Facade Functionality: From individual housing to communal housing, 'Front Image' disappears

- Exterior pattern harmony
- The absence of Buffer Space disappears
Creating Buffer Space
Front yard / Balcony (west wing)
'Front Image' Customization: 1. Setback Distance
'Front Image' Customization: 1. Setback Distance
2. 'Bridge'
'Front Image' Customization: 1. Setback Distance
2. 'Bridge'
'Front Image' Customization:
1. Setback Distance
2. 'Bridge'
3. Prefab Facade Panel
'Front Image' Customization:
1. Setback Distance
2. 'Bridge'
3. Prefab Facade Panel
4. Finishing
5. Decorations
Neighborhood Communication
‘Surface’:
- Sound barrier
- Dust protection
- Visual filter

‘Surface’: Sound Barrier / Dust Protection / Visual Filter
'Surface': Sound Barrier / Dust Protection / Visual Filter
III. Technical Support

- Infill System-
- Service Shaft-
- Climate-
- Construction Process-
1. Special Floor Slab/Reversed Beam
   Only suitable for new project

2. Computer Floor
   Raised Height: 500 - 600 mm

3. Going Through Walls
   - Maintenance Difficulty
   - Normal Thickness: 600 mm

4. Matrix Tile (Matura Infill)
   - Raised Height: 90-100 mm
   - 0-slope Drainage / Pressure-Assisted Toilet
   - Horizontal Service radius: 10 meters
   Grey/Black Water Drainage / Water supply / Cable & Wiring /
   Floor Heating / Flatten Air Tube

Infill System: Flexible Plumbing
Infill System: Partitions

Primary Partitions

Secondary Partitions
Infill System: Primary Partition

Acoustic resistance: Rw dB 70dB
Fire-stop 90 rating mins
Thickness 340 mm
Infill System: Secondary Partition / thickness 120 mm
III. Technical Support

- Infill System -
- Service Shaft -
- Climate -
- Construction Process -
1. Outside The Floor
   - Free Floor Space / Size Flexible
   - Distribution Distance
   - Detailing difficulties
   - Effect on facade pattern
2. Inside The Floor

- Interruption of Floor Space
- Shaft Size
Shaft: 800 mm x 500 mm / sawge pipe x 2, water pipe x 3-7, cable, data, rainwater drainage x 2
III. Technical Support

-Infill System-
-Service Shaft-
-Climate-
-Construction Process-
Centralized Concept (Existing System)

- Centralized Unit
- Heating/Cooling
- Ventilation

Air Ducts

Decentralized Concept

- Space Saving: the absence of air distribution ducts (Suspended Ceiling)
- Customization: Individualized climate solution
- Energy Efficiency: Individual Control
  - Nature Ventilation can be used
  - Distribution Loss Free
Centralized Concept (Existing System)

Decentralized Concept

- Space Saving: the absence of air distribution ducts (Suspended Ceiling)
- Customization: Individualized climate solution
- Energy Efficiency: Individual Control
  / Nature Ventilation can be used
  / Distribution Lose Free
1. **Nature Ventilation + Ventilator Unit**
   - Basic Solution
   - Lowest cost
   - Heat Loss / Low energy efficiency
   - Dwelling Scenario
2. Decentralized Climate Unit
- Heat recovery 90% / Energy Efficient
- Free Lay-out
- Expansive
- Air Duct Distribution / Suspended Ceiling
- Shaft
3. Decentralized Climate Unit in Facade

- Heat recovery 60%-70% / Energy Efficient
- No Duct Distribution
- Expansive
- Room depth limit 6-7 meters
- Shaft
- Facade Design
4. Decentralized Climate Unit in Facade +
- Heat recovery 60%-70% / Energy Efficient
- No Duct Distribution / Shaft
- Expansive
- Room depth limit 6-7 meters
- Flatten Air Tube
- Facade Design
**Basic**
- Operable Window
- Exterior Blinds

**Optional**
- Ventilator
- Ventilation with Heat Recovery
- Heating/Cooling
... ...

**Exterior Blinds**
- Air Outlet
- Operable Window
- Air Inlet

**Wate/Cable Supply**
- Cavity for Customized Units
- Air I/O
III. Technical Support

- Infill System -
- Service Shaft -
- Climate -
- Construction Process -
Concrete Structure (Existing)
Infrastructure:
- Shafts
- Circulations
- Facade Frame (Back side)

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Concrete Structure (Existing)
Primary Partitions

Infrastructure:
- Shafts
- Circulations
- Facade Frame (Back side)

Concrete Structure (Existing)
Facade Frame (Front side)

Primary Partitions

Infrastructure:
- Shafts
- Circulations
- Facade Frame (Back side)

Concrete Structure (Existing)
Bridges
Facade Frame (Front side)

Primary Partitions

Infrastructure:
- Shafts
- Circulations
- Facade Frame (Back side)

Concrete Structure (Existing)
Front Facade Panel

Bridges
Facade Frame(Front side)

Primary Partitions

Infrastructure:
- Shafts
- Circulations
  - Facade Frame(Back side)

Concrete Structure (Existing)
Climate Units
Back Facade Panel
Front Facade Panel

Bridges
Facade Frame (Front side)

Primary Partitions

Infrastructure:
- Shafts
- Circulations
- Facade Frame (Back side)

Concrete Structure (Existing)
Secondary Partitions
Plumbings

Climate Units
Back Facade Panel
Front Facade Panel

Bridges
Facade Frame(Front side)

Primary Partitions

Infrastructure:
- Shafts
- Circulations
- Facade Frame(Back side)

Concrete Structure (Existing)
Interior Decorations

Secondary Partitions
Plumbings

Climate Units
Back Facade Panel
Front Facade Panel

Bridges
Facade Frame(Front side)

Primary Partitions

Infrastructure:
- Shafts
- Circulations
  - Facade Frame(Back side)

Concrete Structure (Existing)
‘Front Image’
Interior Decorations

Secondary Partitions
Plumbings

Climate Units
Back Facade Panel
Front Facade Panel

Bridges
Facade Frame(Front side)

Primary Partitions

Infrastructure:
- Shafts
- Circulations
  - Facade Frame(Back side)

Concrete Structure (Existing)
Climate
‘Front Image’
Interior Decorations

Secondary Partitions
Plumbings

Climate Units
Back Facade Panel
Front Facade Panel

Bridges
Facade Frame(Front side)

Primary Partitions

Infrastructure:
- Shafts
- Circulations
- Facade Frame(Back side)

Concrete Structure (Existing)
Climate
‘Front Image’
Interior Decorations

Secondary Partitions
Plumbings

Climate Units
Back Facade Panel
Front Facade Panel

Bridges
Facade Frame (Front side)

Primary Partitions

Infrastructure:
- Shafts
- Circulations
  - Facade Frame (Back side)

Concrete Structure (Existing)
DIY

Climate
‘Front Image’
Interior Decorations

Secondary Partitions
Plumbings

Interface
Climate Units
Back Facade Panel
Front Facade Panel

Bridges
Facade Frame(Front side)

Primary Partitions

Pre-Design
Infrastructure:
- Shafts
- Circulations
- Facade Frame(Back side)

Concrete Structure (Existing)
IV. Ground Floor Coordination
A DOUBLE LIFE
OF HYPER-OPENNESS