Multi-scale allotment gardening in Q-Port

Integrating urban farming into the redevelopment of vacant office buildings
0. Content

1) Introduction

2) Project analysis

3) Proposed concept

4) Architectural + technical design
1. Introduction

Main problems

1. Population growth, city growth, growing food demand, decrease agricultural space

2. Food scarcity vs. waste of food

3. Lack of green in cities
1. Introduction

4. Abundance of vacant office buildings

5. Strong demand for housing in cities, but no space and money
1. Introduction

Fascination

- Efficient use of space
- Healthy
- Less waste
- Social cohesion
- Education
- Sustainable
- Job opportunities

Can urban farming be the solution?

Source: Designing urban agriculture (Philips, 2013)
How can a vacant office building be redeveloped into a sustainable multifunctional complex, where urban farming facilities have a significant functional, social and architectural value?
1. Introduction

Technical research

How can urban farming techniques be integrated into buildings?

Typology framework

Case studies
1. Introduction

**Technical research**

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<th>Facade</th>
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**Technical value**

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**Social value**

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1. Introduction

Technical research

Functional value

Architectural value
2. Project analysis

Main redesign object: office building ‘Q-Port’
(2002, Amsterdam-West, Teleport area)

Demands from municipality:
1) mixed use in 2020-2030
2) more activity in the plinth
2. Project analysis

- High empty office percentage in Sloterdijk/Teleport area
- Q-Port nowadays 30% empty (source: DTZ Zadelhoff)
- Farming/green around Q-Port
2. Project analysis

Location

De Groote Braak (allotments)  De Bretten (allotments)  Sloterdijkermeer & Nut & Genoegen (allotments)

Greenhouses  De Tuinen van West (allotments)  Food Center Amsterdam

Urban farming around Q-Port
2. Project analysis

Building grid
- Orthogonal, one 45 degree distortion line

Sun orientation
- Tower part catches a lot of sun
- Eastside after morning in shade

Infrastructure: cars/cycling/walking/tram
- Sound nuisance from highway
- No car connection from Sloterdijk

Green/water elements
- Green highway slope (eastside)
2. Project analysis

Q-Port (60m) in the grid with two other tall buildings: Belastingdienst (85m) and Regus (65m)
2. Project analysis

Site

- Cycling
- Car road
- Car parking entrance
- Transparant plinth
- Entrance
- Tunnel
- Bicycle garage
- Tram stop
- Cycling
- Tramway

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P5 Final Presentation
24-06-2014
2. Project analysis

Building structure

Mass 1 - Parking (123 spaces)

Mass 2 - Offices (2800 m²)

Mass 3 - Offices (3900 m²)

Mass 4 - Offices (7000 m²)
2. Project analysis

Building structure

Core 1: Staircase + 4 elevators

Core 2: Staircase

Small staircase
3. Proposed concept

Q-Port as a mixed use building in which **urban farming** unites people on multiple scales
3. Proposed concept

Design principles

1. Green horizontal, glass vertical

2. Strong connection to 3 sides (+ activity in the plinth)

3. Stronger connection substructure and superstructure

4. Optimal lighting conditions for green
4. Architectural design

Food production greenhouse (400 m²)
Public café (400 m²)
29 residences (maisonettes)
Type 1 - 107 m² (4x)
Type 2 - 162 m² (10x)
Type 3 - 137 m² (5x)
Type 4 - 158 m² (5x)
Type 5 - 153 m² (5x)
Total - 4288 m² (29x)
Semi-private collective allotments (1500 m²)

Green market (300 m²)
Restaurant/canteen (1150 m²)
Offices (5500 m²)
Parking (3500 m²)
4. Architectural design

VertiCrop greenhouse - 400 m²
Production: 138 kg leafy greens/day
Consumers potential: 2300 people/day
Control: Maintenance team
Destination: Café + Restaurant + Market + City markets

Collective allotment gardens - 270 m²
Production: various vegetables, fruits, herbs
Consumers potential: 18 people/day/year
Control: Residents + Maintenance team
Destination: Personal use (+ Market)

Vertically sliding hydroponic facade planters - 15 m²/house
Production: small vegetables/crops, herbs, peppers
Consumers potential: 1 person/day/year
Control: Residents
Destination: Personal use (+ Market)
4. Architectural design

**Farming concept**

- **‘Passive’ green roofs - 2000 m²**
  - Production: various vegetables, fruits, herbs
  - Consumers potential: 130 people/day/year
  - Control: Maintenance team
  - Destination: Café + Restaurant + Market

- **‘Active’ green roofs - 600 m²**
  - Production: various vegetables, fruits, herbs
  - Consumers potential: 40 people/day/year
  - Control: Office people + Maintenance team
  - Destination: Personal use (+ Market)

- **Fixed facade planters, hydroponic + soil - 35 m²**
  - Production: small vegetables/crops, herbs, peppers
  - Consumers potential: 3 people/day/year
  - Control: Office people + Maintenance team
  - Destination: Personal use (+ Market)
4. Architectural design

Target groups

1. Visitors
2. Office people
3. Residents
4. Architectural design

Routing visitors

Ground level

Strong axis to 2 elevators + staircase to top level café

No entrance possible to offices and residences
4. Architectural design

Routing visitors

First floor

Second restaurant/canteen floor, embracing the space
4. Architectural design

Routing visitors

Floor 15

Floor 16 (Roof)
4. Architectural design

Routing office people

Floor 2

Floor 3

Floor 4
4. Architectural design

Routing office people

Fire exits

Floor 5
4. Architectural design

Central hall
4. Architectural design

Central hall
4. Architectural design

Central hall
4. Architectural design

Facade as ‘bridge’ between lower and higher part of Q-Port

- Aluminum - extra thick - facade panels, creating plasticity: reference to heavy natural stone of existing facade of Q-Port
- Glass and green reference to upper building part
4. Architectural design

Central hall
Summer

Doors at plinth and at roof open for cooling by natural ventilation (stack effect)

Winter

Space gets heated medium intensively with heat from biomass to biogas, from green of the building

Roof as good insulator
4. Architectural design

Central hall

Connection between old (left) and new (right)
4. Architectural design

Routing residents

Floor 6

Entrance from the two other elevators
4. Architectural design

Routing residents
4. Architectural design

Typical residence

Movement
4. Architectural design

**Space to travel**
**Space to stay**

**Winter**
Cold fresh air gets preheated by floor convector

**Summer**
Sliding green as sunshading + evaporational cooling
Sliding doors open for fresh air
Upper window open for release

Fully climatized
4. Architectural design

**Typical residence**

Construction facade unit

- Wooden sandwich panel walls (340 mm) connected to existing facade
- Wooden sandwich panel floor (370 mm) layed and connected onto walls
- Green glass facade + interior (wooden stairs)
4. Architectural design

Typical residence

Big floor
- From facade to facade
- Living room
- Bathroom
- 2 sleeping rooms
4. Architectural design
4. Architectural design

Thank you for your attention