Vixel:
A catalogue for
Re-designing Intervam Flats

Chi Teng 4510801
Re-housing Graduation Studio
Post-war Social Housing
& non-traditional building system
VAM System
- Prefab heavy mounting elements
- Built 1962-'70s
- Mostly built around Utrecht
- Portiek flat
- Main production in factory Utrecht
- Factories made 6 houses a day
- 1000 Man-hours for one property (factory and on-site)
Introduction | System
Introduction | Site

1964 five-storey in Camera Obscuradreef
1966 five-storey
1966 ten-storey
1967 ten-storey
1970 ten-storey
1966 ten-storey
1962 five-storeys, demolished in 2011

Chi Teng | Re-housing VIXEL-Redesign of Intervam Flats

1964 five-storey in Camera Obscuradreef
1966 five-storey
1966 ten-storey
1967 ten-storey
1970 ten-storey
1966 ten-storey
1962 five-storeys, demolished in 2011
Cultural Value | Structure
Cultural Value | Skin
Problem

Nuclear families
Starters

Large families

Large Families

Single Commuters

Students
Lack of Storage & Narrow Corridore
Unmatched dwelling and occupant
Difficult Circulation
Problem | Observation

Difficult Circulation
Problem | Analysis

[Diagram with icons representing different elements]
Two conflicts:

**Rigid space plan designed for unitary tenant VS Requirement of serving tenant group with modern lifestyle and diverse requirement**

Problems of space plan **VS** Difficulties of relocation
Problem of the whole system

Camera Obscuradreef

Marcopololaan

Stanleylaan
How to re-design Intervam flat to serve residents with diverse requirements in an efficient way?
A renovation method that:

- Provide better quality of living
- Quick
- Relatively cheap
- Flexible
A renovation method that:

- Provide better quality of living
- Quick
- Relatively cheap
- Flexible

Redesigned space plan

Shorter design process; Shorter construction period

Less relocation cost; Less design cost; Less labour cost;

Provide dwellings that accommodate different tenant groups;
Can be applied to most of Intervam flats with similar typology
Can be conducted in a small scale
Vixel

A catalogue for renovating Intervam flats in apartment scale
Client: **Housing Cooperation**

Commercial mode: **Rented social housing**
Design starts!

Housing cooperation and architects set an overall plan to the final outcome
Section 1
Floor plan typology

Ambition

- Studio
- Shared apartment
- Duplex

Simplex

Section 2
Interior fragments

- Studio
- Shared apartment
- Floor plan prototype
- Kitchen with balcony
  - Normal
  - Small
  - Opened
  - Enclosed
- Handrail
- Doors
- Enclosed
- With french balcony
- Kitchen + Sanitary
- Storage
- Entrance

Section 3
Exterior fragments

- Window
- Normal
- Enclosed
- Handrail
- Doors
Providing a standardized fixed frame that enables different use of space

- Fixed: Load-bearing structure (Kept)
- Fixed: Service facilities (Kept)
- Semi-fixed: Skin (replaced)
- Flexible: Infilled fragments
The simplex:
The subdivided apartment for smaller dwellings for smaller size households
New typology: studio
The duplex: new entrance and new circulation
Problem

The Simplex:
New routes and possibility for flexible use
The Simplex:
New routes and possibility for flexible use
Kept original typology: Duplex
Kept original typology: Simplex
Fixed: Load-bearing structure (Kept)

Fixed: Service facilities (Kept)

Semi-fixed: Skin (replaced)

Flexible: Infilled fragments
Design

Section 1
Floor plan typology

- Shared apartment
- Duplex
- Simplex
- Studio

Section 2
Interior fragments

- Studio
- Grouped shaft
- Linear shaft

Section 2
Floor plan typology

- Shared apartment
- Simplex
- Duplex
- Studio
Chi Teng
Re-housing
Vixel
Redesign of Intervam Flats
What CAN be different?

Fixed: Load-bearing structure (Kept)

Fixed: Service facilities (Kept)

Semi-fixed: Skin (replaced)

Flexible: Infilled fragments
What SHOULD be different?
What SHOULD be different?

- Extra bedroom
- Extra bathroom
- Opened kitchen
- Enclosed kitchen
- Enlarged kitchen
- Extra storage
- Flexible use of Gathering space
- Opened gathering space
- Enclosed
- Relocated toilet
- Enlarged bathroom
What can be the differences?

- Extra Toilet for the master's bedroom
- Larger bathing space: Space for baby's bathing; 1-2 adults + 1 kid; Large bathroom for the old
- Seperated Wash basin, bath room and toilet
- Enough storage space
- Easy to clean
- Extra bathroom for the master's bedroom

- Extra storage
- Large working space
- Large amount of natural daylight
- Less fume problems
- Flexible space
- Open to gathering space

- Walk-in closet for master's bedroom
- Utility room for housework
- Storage of clothings and shoes for entrance
- Place for (foldable) baby carriage/handcart/ladder
- Sports accessories
- Small goods for daily use (toilet paper, toolbox...)
- Possibility of having extra dining space

- Sufficient daylight
- Extra storage
- Connected dining space and livingroom
- Connected diningroom and kitchen
- Multi-function space
- Connected with outdoor space

- Opened for free-flow
- Enclosed for private
- Mirror
- Seat for changing shoes
- Place for (foldable) baby carriage/handcart/ladder
- Sports accessories
- Small goods for daily use
Design

Combination of toilet, bathing, cooking and dining

Bedroom storage/utility room

Entrance
Basic Information:

<table>
<thead>
<tr>
<th>Number</th>
<th>Sqm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toilet</td>
<td>1.1</td>
</tr>
<tr>
<td>Kitchen</td>
<td>13.2</td>
</tr>
<tr>
<td>Bathroom</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Matched floor plan:
A2

Matched interior fragments:
- Entrance: Ei, Eii
- Storage and utility room: Si, Sii, Siii, Siv

Feature:
- Pro: Separated kitchen and dining space, Large bathroom
- Con: Working space of the kitchen can be limited, Smaller bedroom

External elements required: /  
Internal elements required:
- Toilet: T112
- Bathroom: B112
- Kitchen: K112

Floor plan typotype:
open and enclosed balcony

Kitchen and sanitary

Extra storage

Entrance:
Openness and storage
**Basic Information:**

<table>
<thead>
<tr>
<th>Number</th>
<th>Sqm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toilet</td>
<td>1</td>
</tr>
<tr>
<td>Kitchen &amp; Dining</td>
<td>13.2</td>
</tr>
<tr>
<td>Bathroom</td>
<td>3.5</td>
</tr>
</tbody>
</table>

**Matched floor plan:**

- A2

**Matched interior fragments:**

- Entrance: Ei, Eii
- Storage and utility room: Si, Sii, Siii, Siv

**Feature:**

- Pro: Separated kitchen and dining space, Large bathroom
- Con: Working space of the kitchen can be limited, Smaller bedroom

**External elements required:**

- /

**Internal elements required:**

- Toilet: T112
- Bathroom: B112
- Kitchen: K112

**Specific Requirements:**

- Extra storage
- Large working space
- Adequate artificial light
- Less fume problems
- Flexible
- Open to gathering space
- Space for baby’s bathing: 1-2 adults + 1 kid
- Separated Wash basin, bathroom and toilet
- Enough storage space
- Easy to clean

---

**Basic Information:**

<table>
<thead>
<tr>
<th>Number</th>
<th>Sqm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balcony</td>
<td>4.2</td>
</tr>
<tr>
<td>Living room</td>
<td>21.75</td>
</tr>
</tbody>
</table>

**Matched dwelling type:**

- Shared apartment

**Matched kitchen and sanitary combo:**

- B1, B2

**Feature:**

- Small living room with a balcony, the enclosed rear balcony
- Pro: Possibility of combining kitchen and dining room, Outdoor space connected with the living room, Possibility of having more than one dining space, The free-flow kitchen
- Con: Relatively small living room

**External elements required:**

- H1/H2/H3; D1, B1/B2

**Specific Requirements:**

- Extra space for infants
- Walk-in closet
- Dependent toilet
- Make-up space
- Connected with utility room for some housework

---

**Floor plan typotype:**

- Open and enclosed balcony

**Kitchen and sanitary: Extra storage**

**Entrance: Openness and storage**

---

**Difficulty of changing**

---

**Frequency of changing**
Design

Basic Information:
Number Sqm
Balcony 1 4.2
Living room 1 21.75

Matched dwelling type:
Shared apartment
Matched kitchen and sanitary combo
B1, B2

Feature:
- Small living room with a balcony
- the enclosed rear balcony

Pros:
- Possibility of combining kitchen and dining room
- Outdoor space connected with the livingroom
- Possibility of having more than one dining space
- The free-flow kitchen

Cons:
- Relatively small livingroom

External elements required:
H1/H2/H3; D1, B1/B2

Basic Information:
Number Sqm
Balcony 1 4.2
Living room 1 21.75

Matched dwelling type:
Shared apartment
Matched kitchen and sanitary combo
A11, A12, A21, A22

Feature:
- Large Livingroom with enclosed balcony
- Working balcony connected with kitchen

Pros:
- Possibility of combining livingroom and dining room
- Possibility of setting playing area for children
- Dining room totally separated from kitchen, not influenced by cooking fumes;

Cons:
- The kitchen in isolated from the other parts in the apartment
- No outdoor space connected with the livingroom

External elements required:
H1/H2/H3; D2/D3, B1/B2

Floor plan prototype
Livingroom with balcony
Large kitchen

Kitchen with balcony
Large gathering space
Design

Feature:
Pro: Free-flow and flexible large kitchen and dining space
Con: Dining space may be influenced by cooking fumes

- Large working space
- Adequate natural daylight
- Flexible space
- Open to gathering space
Design

Basic Information:

<table>
<thead>
<tr>
<th>Number Sqm</th>
<th>Toilet</th>
<th>Kitchen +Dining</th>
<th>Bathroom</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>1.1</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Matched floor plan:
A2

Matched interior fragments:
- Entrance: Ei, Eii
- Storage and utility room: Si, Sii, Siii, Siv

Feature:

Pro: Free-flow and flexible large kitchen and dining space
Con: Dining space may be influenced by cooking fumes

- Large working space
- Adequate natural daylight
- Flexible space
- Open to gathering space

- Connected diningroom and kitchen
- Multi-function space
- Possibility of having an extra dining space

- Space for baby's bathing: 1-2 adults + 1 kid
- Separated Wash basin, bathroom and toilet
- Enough storage space
- Easy to clean
Feature:
Pro: Separated kitchen and dining space,
    Large bathroom
Con: Working space of the kitchen can be limited
    Smaller bedroom

- Large working space
- Adequate natural daylight
- Flexible space
- Open to gathering space

- Connected diningroom and kitchen
- Possibility of having an extra dining space
Design

Vixel: Redesign of Intervam Flats
Chi Teng (Design)
**Design**

**Feature:**
- Pro: Extra toilet with natural ventilation and daylight
- Con: Small kitchen

- Less fume problems
- Connected to working balcony

- Extra Toilet for the master's bedroom
Design

Feature:
Pro: Seperated kitchen and dining space,
Large bathroom
Con: Working space of the kitchen can be limited
Smaller bedroom

- Large working space
- Adequate natural daylight
- Less fume problems
- Connected to working balcony
- Connected diningroom and kitchen
Basic: No extra storage
- Utility room opened to the whole flat for housework
- Extra storage of clothings and shoes for large family
Design

- Walk-in closet for master's bedroom
- Extra storage of clothing and shoes for large family
Design

- Extra space for infants
- Walk-in closet
- Dependent toilet
- Make-up space
- Connected with utility room for some housework

Specific Requirements

Master Bedroom
- Walk-in closet for master's bedroom
- Extra storage of clothing and shoes for large family
Design

- Storage of frequently used clothings and shoes for entrance
- Small goods for daily use (toilet paper, toolbox...)
- Opened for free-flow
- Mirror
- Seat for changing shoes
Design

- Storage of frequently used clothings, bags and shoes for entrance
- Storage of other bags and shoes
- Place for (foldable) baby carriage/handcart/ladder
- Sports accessories
- Small goods for daily use (toilet paper, toolbox...)
- Enclosed entrance for privacy
- Mirror
- Seat for changing shoes
- Connected diningroom and Livingroom
- Flexible use of living-room
- Possibility of having an extra dining space
- Clear space (ideal for wheelchair and baby carriage)
- Adequate daylight

- Clear space (ideal for wheelchair and baby carriage)
- Enclosed for private

- Connected diningroom and Livingroom
- Flexible use of living-room
- Possibility of having an extra dining space
- Enclosed for private
Design
Ambition:
Express the variant;
Organize the variant;
Not to show-off from the context
Design

Composition

Grid:
Flexible infills
Organize variants

Axisymmetric:
Organize variants

Windows:
rigid

Balcony:
flexible
Material of parapet:
- Fibre cement panel
- Thin
- Light weight
- Variable colour and texture
- Easy to be maintained
Chi Teng
Re-housing
Vixel-Redesign of Intervam Flats

Design

Basic Information:

<table>
<thead>
<tr>
<th>Number</th>
<th>Sqm</th>
<th>Balcony</th>
<th>Living room</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.2</td>
<td>21.75</td>
</tr>
</tbody>
</table>

Matched dwelling type:
Shared apartment
Matched kitchen and sanitary combo

Feature:
- Small living room with a balcony
- the enclosed rear balcony

Pros:
- Possibility of combining kitchen and dining room
- Outdoor space connected with the livingroom
- Possibility of having more than one dining space

Cons:
- The free-flow kitchen

External elements required:
H1/H2/H3; D1, B1/B2

External elements required (cont.):
H1/H2/H3; D2/D3, B1/B2

Floor plan prototype

Basic Information:

<table>
<thead>
<tr>
<th>Number</th>
<th>Sqm</th>
<th>Balcony</th>
<th>Living room</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.2</td>
<td>21.75</td>
</tr>
</tbody>
</table>

Matched dwelling type:
Shared apartment
Matched kitchen and sanitary combo

Feature:
- Large Livingroom with enclosed balcony
- Working balcony connected with kitchen

Pros:
- Possibility of combining livingroom and dining room
- Possibility of setting playing area for children
- Dining room totally separated from kitchen, not influenced by cooking fumes

Cons:
- The kitchen in isolated from the other parts in the apartment
- No outdoor space connected with the livingroom

External elements required:
H1/H2/H3; D2/D3, B1/B2

Additional notes:

77 | Unit Re-design of Intervale Flats
Chi Teng (Referring...
Design

Basic Information:

<table>
<thead>
<tr>
<th>Room</th>
<th>Number</th>
<th>Sqm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living room</td>
<td>1</td>
<td>21.75</td>
</tr>
<tr>
<td>Balcony</td>
<td>1</td>
<td>4.2</td>
</tr>
</tbody>
</table>

Matched dwelling type:
- Shared apartment
- Matched kitchen and sanitary combo

Features:
- Small living room with a balcony
- Enclosed rear balcony

Pros:
- Possibility of combining kitchen and dining room
- Outdoor space connected with the living room
- Possibility of having more than one dining space
- The free-flow kitchen

Cons:
- Relatively small living room

External elements required:
- H1/H2/H3; D1, B1/B2
Design

Chi Teng

Re-housing Vixel - Redesign of Intervam Flats

[Diagrams of different window designs]
Stage 2 Construction
Construction
83 | Chi Teng

Re-housing Vixel-Redesign of Intervam Flats

Construction
Chi Teng

Re-housing

Vixel

Redesign of Intervan Flats

Construction
Chi Teng
Re-housing
Vixel-Redesign of Intervam Flats

Ambition
Chi Teng
Re-housing Vixel
Redesign of Intervam Flats
Construction
Construction
Climate
Chi Teng
Vixel - Redesign of Intervam Flats

Climate
Value added by the scheme

- Gradually renovate the old building

- Potential to gradually replace and update the occupants of neighborhood

- Provide an efficient method to partly “customize” the systematic and rigid post-war construction system, making the system more sustainable

- Can be applied in various scale
- Artistic: the method of prefabrication means imperfect skin finish
- Technology: not perfectly insulated
- Limiting the change of space plan since no changes can be done outside the renovated apartment.
- Limiting the re-design of facade because of kept cladding, and following the current composition
- Can be a long process, which might mean a lot of problem