BETTER LIVING ONE
FLEXIBLE SHARING COMMUNITY
'In our Architectural Engineering programme we seek innovative and inspiring architectural solutions for environmental and societal issues. We are driven by the need to think differently about our building culture. Understanding existing potentials, knowing the possibilities of renewal and discovering how to design, innovate and change.'
HOW TO INNOVATE

Creativity by the brain

ARCHITECTURAL EXPRESSION

Materilization&Tectonics
I. THEORY&SYSTEM

A New Way of Living

An architectural integration of energy efficiency

A Flexible way of building

II. CONTEXT&DESIGN

III. CONCLUSION
A NEW WAY OF LIVING
SINGLE POPULATION INCREASING

A NEW TREND

The period of single living is extended largely nowadays.

Finding Soulmate
Economic power
New lifestyle
....

Source:
URBAN SCALE: WORKING & LIFE BALANCE

Traffic jam

Working  Living
URBAN SCALE: WORKING&LIFE BALANCE
BUILDING SCALE: SHARING COMMUNITY

A. Shared Living
WHY SHARED LIVING COMMUNITY

Social connection helps with urban loneliness

The pain of urban loneliness

Understanding the Unique Challenges of Urban Loneliness

Let’s acknowledge that loneliness and depression is common among urban residents and figure out ways urban planning can foster connections and social interactions between people.

Kayla Matthews | @KaylaEMatthews | May 3, 2018, 6am PDT

Why is living in a big city so isolating?

By Lydia Smith
WHY SHARED LIVING COMMUNITY

Needs of young people

PRIVATE SPACE

PUBLIC SPACE

PRIVATE SPACE

SHARING COMMUNITY

100% 85% 45% 10%
RULES FOR SHARED LIVING

Scale and hierarchy

"Collaborative Communities" by Fromm Dorit

<table>
<thead>
<tr>
<th>Scale (Person)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 15 persons</td>
<td>create a more intimate community but more social friction may occur because of the small number of people</td>
</tr>
<tr>
<td>18-35 persons</td>
<td>provide more choice of association and are small enough to allow members to know each other well</td>
</tr>
<tr>
<td>&gt; 35 persons</td>
<td>afford a greater number of shared amenities, but their large size means that a certain percentage of households will probably not participate in common dining because of the less intimate nature of the large group</td>
</tr>
</tbody>
</table>

"One shared house 2030" by Space 10

<table>
<thead>
<tr>
<th>Minimum + Extended</th>
<th>Studio</th>
<th>Cluster</th>
<th>Group</th>
<th>Building</th>
</tr>
</thead>
<tbody>
<tr>
<td>everyday</td>
<td>1</td>
<td>4-12</td>
<td>20-50</td>
<td>150-300</td>
</tr>
<tr>
<td>Collaborative</td>
<td>4-7 times a week</td>
<td>1-3 times a week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public sharing</td>
<td></td>
<td></td>
<td></td>
<td>once a week</td>
</tr>
</tbody>
</table>

Think 4-10 is the right amount of people for a community.
INTERVIEWS

1. What your best experience/memory in your home? (Enjoyable, cozy, comfort, happy…)
   WEATHER; HOBBY; ACCOMPANY; STATE/MEMORY.

2. What is the essential quality/the imagination of your dream home?
   FRESH FEELINGS; PERSONAL SPACE; VIEWS; PRIVACY;
   NATURAL SUNLIGHT & VENTILATION; PUBLIC SPACE; CONVENIENCE; CONTROL.

3. What extra space would you like to have if you have a very big apartment?
   MOVIE; CAT; SPORTS; MUSIC; WORKSHOP.

4. What spaces would you share with others if you have to choose one/two/three?
   LIVING ROOM, KITCHEN > TOILET > BEDROOM

5. Which one do you prefer? A studio totally belongs to yourself, or a sharing house living with others?
   IT DEPENDS...

Thanks to Yaqi, Yingda, Yi, Gongbu, Yuchen, Alex, Ton
RULES FOR SHARED LIVING

- Bathing 2.9m²
- Dressing 1.1m²
- Living 1.7m²
- Working 2.1m²

- Bathing 5.7m²
- Dressing 4.3m²
- Video room 7.9m²
- Reading Working 9m²
- Sports 11.8m²
RULES FOR SHARED LIVING

Sleeping 3.6m²

Sleeping 4.7m²

Sleeping 9.3m²

Kitchenette 1.3m²

Kitchen 6.1m²

Dining 1.5m²

Dining 10m²
WHY SHARED LIVING COMMUNITY

Smaller space with SUSTAINABLE quality

Basic

Collaborative

Private

Public

Sleeping

Dressing

Bathing

Living + working

Cooking + eating

Cooking & Eating

Workshop

Playing room

Music room

Sports room

7:30 am

7:35 am

7:45 am

8:20 am

6:00 pm

7:30 pm

10:00 pm

10:30 pm

18/117
RULES FOR SHARED LIVING

30m² + sharing = basic & personality + social & luxurious

PRIVATE

~30m²

- Sleeping
- Dressing
- Bathing
- Living + working
- Cooking + eating

SHARING

~7m² / person

- Workshop
- Playing room
- Cooking & Eating
- Music room
- Sports room
LOFT APARTMENT

Choice 1: sharing kitchen and dining space

Sharing member: 9

Private space

entrance floor plan

first floor plan

- private space
- semi-private cluster sharing space
- semi-public group sharing space
LOFT APARTMENT

Choice 1: sharing kitchen and dining space

Sharing member: 9

Private space: 25m²

Sharing space: 50m²

entrance floor plan

first floor plan

Personal space
LOFT APARTMENT

Choice 2: sharing the living and working space
Sharing member: 9

Private space

![Entrance floor plan]

![First floor plan]

- semi-private balcony
- private space
- semi-private cluster sharing space
- semi-public group sharing space
LOFT APARTMENT

Choice 2: sharing the living and working space
Sharing member: 9

Private space: 29m²

Sharing space: 65m²

Personal space
LOFT APARTMENT
LOFT APARTMENT
ATRIUM FACADE
ATRIUM FACADE
EXTERIOR FACADE
1F APARTMENT

Choice 3: sharing music recording room

Sharing member: 5

Private space

- semi-private balcony
- private space
- semi-private cluster sharing space
- semi-public group sharing space
1F APARTMENT

Choice 3: sharing music recording room

Sharing member: 5

Private space: 35m²

Sharing space: 44m²

Personal space
1F APARTMENT

Choice 4: sharing kitchen and dining space

Sharing member: 5

Private space

- semi-private balcony
- private space
- semi-private cluster sharing space
- semi-public group sharing space
Choice 4: sharing kitchen and dining space

Sharing member: 5

Private space: 35m²

Sharing space: 50m²
1F APARTMENT

Choice 5: sharing kitchen and dining space

Sharing member: 11

Private space

- semi-private balcony
- private space
- semi-private cluster sharing space
- semi-public group sharing space
1F APARTMENT

Choice 5: sharing kitchen and dining space

Sharing member: 11

Private space: 44m²

Sharing space: 50m²
1F APARTMENT

Private space
1F APARTMENT
Sharing space
1F APARTMENT
ATRIUM
Symbol of Sharing community

Source:
Treehouse Apartment Building / Bo-DAA
ATRIUM

Core of Sharing community
ROOF GARDEN
PUBLIC GYM & RESTAURANT
WORKING & LIFE BALANCE

B. Shared Working
SHARING WORKING COMMUNITY

Connection, Cooperation, Inspiration for freelancers and companies

Common maker space and exhibition
PLANS OF SHARING WORKING SPACE

Shared working space

Public exhibition space
EXHIBITION SPACE
AN ARCHITECTURAL INTEGRATION OF ENERGY EFFICIENCY
CHALLENGES IN THE BUILT ENVIRONMENT

CONSUMPTION IN THE BUILT ENVIRONMENT

36% CO2  40% ENERGY

- All new buildings must be nearly zero-energy buildings (NZEB) by 2020.
- High energy performance + renewable energy sources.
- Reduce the need and demand: passive, bioclimatic design.

DEMAND FOR AFFORDABLE STARTERS HOUSING

+ 1 Million New Homes by 2030

PASSIVE FIRST

HOW TO BE SUSTAINABLE?

MAKE USE OF THE ENVIRONMENTAL RESOURCES
ENERGY-EFFICIENCY ACTIVE SOLUTION

Solar radiation per hour (W/m²) Rotterdam.
Source: http://www.soda-pro.com/home

Heat pump system combined with low-temperature floor heating and geothermal source can reduce lots of energy consumption.

<table>
<thead>
<tr>
<th>Jan</th>
<th>Feb</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>25</td>
<td>44</td>
<td>28</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>34</td>
<td>97</td>
<td>133</td>
<td>100</td>
<td>49</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>0</td>
<td>0</td>
<td>30</td>
<td>128</td>
<td>216</td>
<td>247</td>
<td>211</td>
<td>140</td>
<td>85</td>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>21</td>
<td>113</td>
<td>256</td>
<td>389</td>
<td>362</td>
<td>332</td>
<td>248</td>
<td>199</td>
<td>84</td>
<td>15</td>
</tr>
<tr>
<td>9</td>
<td>31</td>
<td>83</td>
<td>212</td>
<td>362</td>
<td>436</td>
<td>472</td>
<td>434</td>
<td>319</td>
<td>308</td>
<td>174</td>
<td>68</td>
</tr>
<tr>
<td>10</td>
<td>84</td>
<td>151</td>
<td>273</td>
<td>419</td>
<td>503</td>
<td>552</td>
<td>511</td>
<td>356</td>
<td>388</td>
<td>222</td>
<td>118</td>
</tr>
<tr>
<td>11</td>
<td>120</td>
<td>209</td>
<td>307</td>
<td>462</td>
<td>527</td>
<td>592</td>
<td>587</td>
<td>375</td>
<td>435</td>
<td>251</td>
<td>150</td>
</tr>
<tr>
<td>12</td>
<td>156</td>
<td>229</td>
<td>319</td>
<td>496</td>
<td>536</td>
<td>575</td>
<td>537</td>
<td>416</td>
<td>431</td>
<td>252</td>
<td>166</td>
</tr>
<tr>
<td>13</td>
<td>146</td>
<td>216</td>
<td>304</td>
<td>479</td>
<td>534</td>
<td>580</td>
<td>562</td>
<td>405</td>
<td>398</td>
<td>238</td>
<td>151</td>
</tr>
<tr>
<td>14</td>
<td>112</td>
<td>196</td>
<td>270</td>
<td>439</td>
<td>488</td>
<td>533</td>
<td>517</td>
<td>381</td>
<td>354</td>
<td>205</td>
<td>108</td>
</tr>
<tr>
<td>15</td>
<td>62</td>
<td>139</td>
<td>225</td>
<td>383</td>
<td>436</td>
<td>485</td>
<td>467</td>
<td>331</td>
<td>293</td>
<td>145</td>
<td>55</td>
</tr>
<tr>
<td>16</td>
<td>15</td>
<td>70</td>
<td>166</td>
<td>298</td>
<td>362</td>
<td>414</td>
<td>400</td>
<td>291</td>
<td>205</td>
<td>72</td>
<td>9</td>
</tr>
<tr>
<td>17</td>
<td>0</td>
<td>14</td>
<td>80</td>
<td>175</td>
<td>258</td>
<td>313</td>
<td>294</td>
<td>190</td>
<td>98</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>18</td>
<td>0</td>
<td>0</td>
<td>13</td>
<td>66</td>
<td>139</td>
<td>185</td>
<td>179</td>
<td>98</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>19</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>45</td>
<td>76</td>
<td>71</td>
<td>21</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>20</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>14</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>21</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>22</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>23</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>24</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

1 W electrical energy can provide 6.7 W heat
SHARED ENERGY

During the cold period, inhabitants share a warm common living and dining room, the temperature inside each studio can be lower only for sleeping.
NATURAL VENTILATION

Nature ventilation

Mechanical ventilation
 USERS' CONTROL

There is no Single Comfort Temperature.

Users’s control has the priority, computer control assists.

- opening a window for fresh air, choosing different areas for daily activities, pulling down the shading, and turning on the heating system......
- automatic control acts once every three hours

Researches show that if inhabitants have some form of input to the control of their own indoor environment, their subjective view of comfort zone changes and they are more willing to accept wider conditions.
ARCHITECTURAL INTEGRATION

Atrium

SOLAR ENERGY

STACK VENTILATION

BUFFER ZONE & PREHEAT
ATRIUM
Solar energy
ATRIUM

Energy Efficiency

Closed Mode

<14°C (1m/s)
ATRIUM

Energy Efficiency

Closed Mode

>26°C (1m/s)
SUMMER
ATRIUM

Energy Efficiency

Mild Mode

>16°C and <22°C (1 m/s)
ATRIUM

Energy Efficiency

Open Mode
Summer <20°C (3-5m/s)
ARCHITECTURAL INTEGRATION

Balcony

SHADING

Winter

Warm summer

Hot summer

MIGRATION & BUFFER ZONE

Winter daytime

Winter night

Summer daytime

Summer night

VENTILATION

Section

Plan

INDOOR CLIMATE

Closed mode
INDOOR CLIMATE

Open mode
A FLEXIBLE WAY OF BUILDING

NOW

IN 30 YEARS

IN 70 YEARS

5500+3000 living mode

4250+4250 office mode
LAYERS OF THE BUILT ENVIRONMENT

Infrastructure

Building

Furniture
NEW INFRASTRUCTURE

Mega concrete & Wooden infilling

1. Pre-fab concrete mega structure

2. Light-weight wooden infills with small slabs
STRUCTURE ORDER

1. Pre-fab concrete mega structure (relatively permanent)
   - Shelf(columns)
   - Beams
   - Floors

[Diagram of structure order]

Dry construction technical layer
Pre-fab concrete slab
SHELF

Shelf 1:
1. electricity
2. Internet
2. LTP floor heating/cooling
3. water (normal+hot)
4. sewage pipes
5. ventilation for toilet and kitchen

Shelf 2:
1. Natural ventilation exhaust
2. Possible spare space eg. mechanical ventilation input pipes
2. Exterior facade
relatively permanent and need to be installed from outside

8500-height panel fixing on the concrete floor
STRUCTURE ORDER

3. Secondary pre-fab timber structure
relatively flexible and can be installed through the atrium
CLT beams and boxing floor elements
<250kg per piece
**STRUCTURE ORDER**

4. Inner division wall (relatively flexible and can be installed through the atrium)
   - <250kg per piece
   - facade towards the atrium
   - partition walls

Double wall in timber panel structure
DETAIL DRAWINGS
DETAIL DRAWINGS
ADAPTABLE COMPONENTS

STEP 1
ADAPTABLE COMPONENTS

STEP 2
ADAPTABLE COMPONENTS

STEP 3
ADAPTABLE COMPONENTS

STEP 4
ADAPTABLE COMPONENTS

STEP 5
APPLICATION&POSSIBILITIES

- Building
- Atrium
- Balcony
- Balcony
- Sharing green garden
II. CONTEXT & DESIGN
SITE

Merwe Vierhavens (M4H), Rotterdam
A old harbor in Rotterdam transforming into Makers District.

Source:https://m4hrotterdam.nl/
'Companies out - houses in' is broken and replaced by a mix of working and living destinations.

Source:https://m4hrotterdam.nl/
MOBILITY & PARKING

Mixing facilitates sharing, for example, of parking spaces (during the day for workers, in the evening for residents). Parking does not take place on the street and is not per company solved on its own lot. Instead there will be collective places. A mobility transition (less car, more public transport and bicycle) will be applied in this area.

Source: https://m4hrotterdam.nl/
SITE: $11200M^2$
CONTEXT ANALYSIS

Function & Scale

Traffic

Water & View

Orientation & Sunlight
TRYING
OPTIONS
**PROGRAM**

**Maker space**
2050m²

**Co-working**
10050m²

**Public&exhibition**
890m²

**Restaurant**
650m²

**Gym**
600m²

**Loft living (205 units)**
14000m²

**1-F living (126 units)**
10200m²

**Roof garden**
3050m²

**Other**
4500m²

**Total 45990m²**
PLANS

3F PLAN
PLANS

6F PLAN
PLANS

7F PLAN
PLANS

8F PLAN
PLANS

9F PLAN
PLANS

10F PLAN
NORTH FACADE
NORTH FACADE
SOUTH FACADE
SOUTHERN FACADE
SOUTHEAST FACADE
PERSPECTIVE
PERSPECTIVE
CONCLUSION

NEW INTERPRETATION OF STRUCTURALISM

Order means freedom.

Completed Flexibility: interventions by the occupants, open to users.

To organise a building as a pattern of linked identical spatial units.

Draw people together.
CONCLUSION

Illusion of the industrial harbor
CONCLUSION

WHAT WE ACHIEVE

A community for young people to settle down in cities, where they can meet friends and enjoy a happy balanced life.

We provide living facilities with quality as well as possibilities for social life. There are big kitchens and living rooms for parties, a gym and restaurant for sports and food, roof gardens where you can plant your own fresh vegetables... There are both practical social space and quality living space. The community is a platform from where you can start your wonderful life.
CONCLUSION

WHAT WE ACHIEVE

A natural controllable indoor climate and a flexible structure system.

The project achieves good integration of the architectural elements and the energy-efficient system. It advocates natural ventilation and using natural resources. Inhabitants are encouraged to control their own living environment based on their feelings and the advice of the system.

The concrete megastructure acts as the first layer to support the building. The infilling wooden elements create different spaces based on the function and they can be moved to a new position if the function changed. The flexible structure system provides small spaces for living as well as big spaces for social events and working.
CONCLUSION

ECONOMIC SCENARIO

The building is owned by one company. They provide rental housing to young people as starters and rent working space to company agency or freelancers. The rental contract is at least 6 month to maintain the stability of the community.

The company can provide similar working and living community at different locations and different cities. The service of rental living and working space can become a membership for young people, so they can work and live around the world and easily settle down anywhere.