Towards a simple complex
1. Problem statement

2. The role of the architect

3. Expression of the building

4. Internal design

5. Ventilation and heating system
Sustainability
Maslow’s hierarchy of needs

- Physiological needs
- Safety needs
- Belongingness and love needs
- Esteem needs
- Self-actualization needs
Self-fulfillment needs
Psychological needs
Basic needs
Sustainability
Esteem needs
Belongingness and love needs
Safety needs
Physiological needs
Sustainability

Self-actualization

Esteem needs

Belongingness and love needs

Safety needs

Physiological needs

Basic needs

Psychological needs

Self-fulfillment needs

Physiological needs
Recognize and understand the problem

Find solutions to the problem, change lifestyle

The new lifestyle will slowly becomes common

Basic needs
  - Safety needs
  - Physiological needs
  - Safety needs
  - Belongingness and love needs
  - Esteem needs
  - Self-actualization
  - Self-actualization
  - Self-actualization

Psychological needs
  - Self-actualization
  - Self-actualization
  - Self-actualization
  - Self-actualization
  - Self-actualization
  - Self-actualization
  - Self-actualization

Sustainability
  - Awareness
  - Consciousness
What can we as architects do?
The built environment should be a means to foster and stimulate consciousness (about sustainability)
EXPOSE & FACILITATE
Change human impact on the environment
Methods to simply minimize the need of energy
Low-tech architecture - ventilation and heating systems

Change human impact on the environment
State of the art architecture - natural ventilation

Manitoba Hydro Place, Winnipeg
Theory books - natural ventilation

1. Overdrukruimte
2. Verblijfruimte
3. Shuntkanaal
4. FiW/Hex installatie
5. Hulpventilator
6. Venturi ejector
7. Recirculatieklep
8. Warmteopslag
9. Technische ruimte

EWF principle - Ben Bronsema
Nature - prairie dog cave ventilation principle
Nature - termites hill ventilation principle
Sustainability

Ecological
- Use natural sources
- Facilitate circular processes
- Minimalize human impact
- Flora and fauna diversity
- Solar energy
- Wind energy
- Food production
- Water purification
- Water re-use
- Visibility
- Fostering consciousness
- Behavioral stimulation
- Mass

Technological
- Product efficiency
- Innovation
- Product sustainability
- State-of-the-art products
- Materials
- Demountability
- Embedded energy
- Visibility
- Fostering consciousness
- Behavioral stimulation
- CO2 regulation
- Climate control
- Facilitate circular processes
- Water purification
- Water re-use

Change human impact on the environment
Sustainability

Ecological
- Minimalize human impact
- Flora and fauna diversity
- Use natural sources
- Solar energy
- Wind energy
- Water re-use
- Visibility
- Fostering consciousness
- Behavioral stimulation
- Food production

Sociological
- Sustainable mindset
- Choice architecture (nudging)
- Frugality
- Self-sufficiency
- Voluntary simplicity
- Environmental orientation
- Loneliness
- Collaboration
- Individuality by collectivity
- Fostering consciousness
- Efficiency
- Behavioral stimulation

Technological
- Embedded energy
- Production efficiency
- Innovation
- State-of-the-art products
- Demountability
- Local products
- Embedded energy
- Materials
- Production efficiency
- Circularity
- Visibility
- Fostering consciousness
- Behavioral stimulation

Change human impact on the environment
The four types of mindsets regarding sustainability

1. Undifferent or opposed
2. Aware but clueless
3. Aware and trying
4. Conscious and acting accordingly
Voluntary simplifiers

1. Undifferent or opposed
2. Aware but clueless
3. Aware and trying
4. Conscious and acting accordingly
The cost of a thing is the amount of what I will call life which is required to be exchanged for it, immediately or in the long run.

- Henry David Thoreau
Live simply so that others may simply live
- Gandhi
Target group characteristics

• Free choice of a frugal lifestyle
• Rejection of consumerism
• Low material dependency
• Environmental concerns
• Consciousness about their own ecological footprint
• Respect the rights of flora and fauna

• From diverse cultures
• From diverse social classes
• From diverse ages
• Families and older individuals
• Youngsters

• Urban residents
• Well educated
• Average to high income
• Be a healthy role model for the next generation

• Escape the “rat race”
• Stressful working conditions
• Search for autonomy
• Partly activists
• Actively promoting
• Use internet as a source of information

• Individual: live better with less
• Collective: take part in the development of a sustainable society

• Sharing of resources
• Trust and fairness
• Conscious approaches to life rather than impulsive behaviour
• Focus on the essentials
• Simplify the details which frittered the essence of our lives away
• Search to achieve a sense of authenticity
• Live a more meaningful life
• Support human development
• Durable relationships with others and nature
• Enjoy life in its unadorned richness

• Sustainable economical development
• Greater financial independence by cutting back spending on extras

(Elgin, Mitchell, 1977; Marchand, Walker, 2004; Roubanis, 2008; Elgin, 2011; Bozoklu, Korkmaz, Sertoglu, 2015)
Site introduction
Site introduction
Site introduction
Site introduction
Growth of the shape

Interactive shape

Communal housing typology

Private outside space

Dwelling

Semi-private

Communal garden

Shared facilities

Dwelling

Semi-private

Communal garden

Shared facilities

Private outside space
Growth of the shape
Growth of the shape
Growth of the shape

Interactive shape

Translate to location

Solar orientation

Roof terraces for interaction with neighborhood

Amsterdam centre

Mill De Gooyer
Growth of the shape

Interactive shape

Translate to location

Solar orientation

Roof terraces for interaction with neighborhood

Landmark at crossroad as eyecatcher

Amsterdam centre

Mill De Gooyer
Growth of the shape

Interactive shape

Roof terraces for interaction with neighborhood

Translate to location

Landmark at crossroad as eyecatcher

Solar orientation

Opening up to the surroundings

Amsterdam centre

Mill De Gooyer
Facades
Streetside facade
View from Oostenburgergracht
Streetside facade
Streetside facade
Wintergarden facade
Wintergarden façade
Internal facade wintergarden
Tower facades
View from windmill
De Gooyer
View from windmill
De Gooyer
View from windmill
De Gooyer
Roof landscape

Recreational

Ecological
Ground floor
Collective functions
Permeable vs impermeable facades
Staircases
Researching on projects in which the inhabitants reflected on the functioning of their collective structure, it became clear that clustering and the size of the clusters is essential.

**Number of dwellings per cluster**

- 6
- 8
- 12

Cluster sizes
Public private organisation
Elevator access
Constructive grid
Constructive grid
Constructive grid

This is a result on a research to maximize solar gain into the dwellings, while keeping the wintergarden as spacious as possible.
Shape development

Wide galleries which should function as vibrant streets
Shape development

Wide galleries which should function as vibrant streets

Enhance quality of the space
Shape development

Wide galleries which should function as vibrant streets

Enhance quality of the space

Optimize daylight entrance
Shape development

- Wide galleries which should function as vibrant streets
- Enhance quality of the space
- Optimize daylight entrance
- Daylight entrance optimization and quality enhancement
Dwelling typologies - height
Dwelling typologies - bay width
Dwelling typologies - bay width
Dwelling typologies

- **2 bedrooms**: ± 43 sqm
- **3 bedrooms**: ± 55 sqm
- **4 bedrooms**: ± 70 sqm
- **Studio**: ± 28 sqm
Height difference divides public and private areas

Kitchen and bathroom divides public and private areas
A variety of bedroom layouts possible
Minimize essential movement area
Build-in storage spaces

+3a

Build-in storage spaces

+3b

Build-in storage spaces

+3c
Cluster configuration
Laundry area
Technical room
Toilet
Room for at least 2/3\textsuperscript{th} of cluster residents
Technological simplification
Ventilation and heating - Summer situation
Ventilation and heating - Summer situation
Ventilation and heating - Winter situation

The winter situation is a bit more complicated because you want your air to be heated by the wintergarden while using this space at the same time for ventilation purposes. Therefore I added a hermetically sealed compartment in the wintergarden which is connected on the ground floor level with a perpendicular shaft.
Ventilation and heating - Winter situation
Ventilation and heating - Winter situation

Ventilation gap 5mm
Window sill 300×90mm
Insulation glass 7 - 13 - 7
Lammelae
Water retaining layer
Gutter
Fibreboard with clay plaster render
Structural column 300×300
35 mm Drainage layer
260 mm Substrate
Blinds 2700×2600
19 mm Clay plaster
16 mm Floor heating system
22 mm Fibreboard
Finnjoist beam FJI 89×300
100 mm Hemp insulation
Roller blind 90×90
Rimboard 89×300
6 mm Sliding panel for ventilation control
6 mm Perforated chipboard
15 mm Fibreboard with clay plaster render
Awning window sill
Ventilation and heating - Winter situation
Ventilation and heating - Winter situation
Ventilation and heating - Winter situation
Ventilation and heating - Winter situation
Ventilation and heating - Winter situation
Ventilation and heating - Winter situation
Schoorsteenhoogte: 60m

$R\leq 57,6\ \text{mm}$

$D\leq 0,65\ \text{mm}$

$L\leq 3,00\ \text{mm}$

$g\leq 2,73\ \text{m}^2\text{h}^{-1}$

$R = \text{referentieconditie}$
Schoorsteenhoogte: 60m

R = referentieconditie