de Kastelein

Passive design strategies in Texel’s dune landscape

tutors

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Architecture  
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Research  
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P4 presentation
Max van den Berg

aE graduation studio
context: dune landscape
3 Stories
3 Stories

de Kastelein
3 Stories

de Kastelein

the Path
3 Stories

de Kastelein

the Path

the Settlement
de Kastelein
de Kastelein
de Kastelein van Eyerland
Het Eyerlandse Huis
ca. 1600
ca. 1600
“by 2020 Texel wants to be self-sufficient in the areas of energy and fresh water.”
“by 2020 Texel wants to be self-sufficient in the areas of energy and fresh water.”

“Texel wants to be a laboratory for experimentation in the area of sustainability.”
“by 2020 Texel wants to be self-sufficient in the areas of energy and fresh water.”

“Texel wants to be a laboratory for experimentation in the area of sustainability.”

island = clearly defined community
“by 2020 Texel wants to be self-sufficient in the areas of energy and fresh water.”

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island = clearly defined community

scale = small = achievable
“by 2020 Texel wants to be self-sufficient in the areas of energy and fresh water.”

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Potential

island = clearly defined community

scale = small = achievable
“by 2020 Texel wants to be self-sufficient in the areas of energy and fresh water.”

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Potential

island = clearly defined community

scale = small = achievable

inspire people from all over who visit Texel
Samsø
Samsø

- Until 1997: Oil & coals for electricity + heating
Samsø

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- 1997 Government competition: model renewable energy community
Samsø

- Until 1997: Oil & coals for electricity + heating
- 1997 Government competition: model renewable energy community
- since 2004, 100% energy self-sufficient & 100% CO2 neutral
- Until 1997: Oil & coals for electricity + heating

- 1997 Government competition: model renewable energy community

- since 2004, 100% energy self-sufficient & 100% CO2 neutral

**Instruments:**

- 11 onshore wind turbines (1.0MW)
- 10 offshore wind turbines (2.3MW)
- 3 straw heating plants
- 1 solar & wood chip heating plant
Samsø
Prof. Søren Hermansen

Samsø
Samsø

- Community becomes the Plan

Prof. Søren Hermansen
Prof. Søren Hermansen

Samsø

- Community becomes the Plan
Prof. Søren Hermansen

- Community becomes the Plan
Samsø

- Community becomes the Plan

1. Why? to build Commonities
   > become independent

Prof. Søren Hermansen
Samsø

- Community becomes the Plan

1. Why? to build *Commonities*
   > become independent

2. How? *Good conversations*
   > the *Campfire*
Samsø

- Community becomes the Plan

1. Why? to build *Commonities*  
   > become independent

2. How? Good conversations  
   > the *Campfire*
Samsø
Samsø

- Campfire

Texel
- Campfire
- Community owned & operated (Commonity)
Samsø - Campfire – Community owned & operated (Commonity)

4k

Texel

- Campfire
- Community owned & operated (Commonity)
- 3* Population

14k
Samsø

- Campfire
- Community owned & operated (Community)
- 3* Population
- 5* Visitors

4k
170k

Texel

14k
800k
- Campfire
- Community owned & operated (Commonity)
- 3* Population
- 5* Visitors

≠ Inspirator

4k
170k

14k
800k
- Campfire
- Community owned & operated (Commonity)
- 3* Population
- 5* Visitors
≠ Inspirator
≠ Vision

4k
170k

14k
800k
Ambitions > Reality
Ambitions > Reality

Design a building
Ambitions > Reality

Design a building

- **Campfire**
  - discuss & develop ideas
Ambitions > Reality

Design a building

- Campfire
discuss & develop ideas

- Open to visitors
showcase projects & ideas > inspire visitors

Texel
Ambitions > Reality

Design a building

- Campfire
discuss & develop ideas

- Open to visitors
showcase projects & ideas > inspire visitors

- As a Commonity
Community owned & operated
Ambitions > Reality

Design a building

- **Campfire**
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- **As a Commonity**
  Community owned & operated
Ambitions > Reality

Design a building

- **Campfire**
  discuss & develop ideas

- **Open to visitors**
  showcase projects & ideas > inspire visitors

- As a **Community**
  Community owned & operated

Texel
“the shelter a house should offer, its essential function, means no more than that it should shut out the undesirable influences of nature while at the same time being as open as possible to those influences that are desirable.”
“the shelter a house should offer, its essential function, means no more than that it should shut out the undesirable influences of nature while at the same time being as open as possible to those influences that are desirable.”

- Gerrit Rietveld
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Passive design strategies
Passive design strategies

shelter
Passive design strategies

shelter    filter
3 basic principles of the Vernacular Approach
3 basic principles of the Vernacular Approach

1. React to climatic conditions
   create indoor comfort
3 basic principles of the Vernacular Approach

1. React to climatic conditions
   create indoor comfort * Passive Design Strategies
3 basic principles of the

Vernacular Approach

1. React to climatic conditions
   create indoor comfort  * Passive Design Strategies

2. Local building materials
   from natural source; wood, stone, clay,…
3 basic principles of the Vernacular Approach

1. React to climatic conditions
   create indoor comfort * Passive Design Strategies

2. Local building materials
   from natural source; wood, stone, clay,…

3. Low-tech building techniques
   preserve cultural identity of a region & sustain community
Texelse Schapenboet
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Apply Vernacular Approach
Apply Vernacular Approach

1. React to climatic conditions
   create indoor comfort
Apply Vernacular Approach

1. React to climatic conditions
   create indoor comfort
   * Passive Design Strategies
Apply Vernacular Approach

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Apply Vernacular Approach

1. React to climatic conditions
   * create indoor comfort

2. Local building materials
   * from natural source; wood, stone, clay,…

3. Low-tech building techniques
   * preserve cultural identity of a region & sustain community
the Path
the sublime
5km

30 min drive

't Horntje
De Slufter

- 500 cars
- 300 bicycles

Distance:
- 130m
- 70m
De Slufter

- 130m
- 70m
- 500 cars
- 300 bicycles

De Slufter
sand & shells
90 x 45 x 45 cm
Legend
1. restaurant (69 seats) 63m²
2. conference room (+96 seats) 98m²
3. kitchen
4. terrace
5. covered walkway
6. walkway
7. square
8. viewpoint west
9. viewpoint east
10. viewpoint north

Plan +1
De Slufter
Nationaal Park Duinen van Texel
South-West Elevation
Section AA’
De Slufter

Nationaal Park Duinen van Texel

Legend
1. entrance
2. square
3. crafts workshop 100m²
4. shop 55m²
5. stone factory 40m²
6. stone storage 80m²
7. walking deck
8. changing exhibition 140m²
9. permanent exhibition 120m²
10. restroom entrance
11. restroom disabled
12. restroom ladies
13. restroom gentlemen
14. wine room 15m²
15. storage restaurant 48m²
16. installations room 58m²
17. water pond
18. campfire spot
19. bicycle parking
20. car parking
21. bicycle & pedestrian entrance
22. rainwater tank
De Slufter
Nationaal Park Duinen van Texel

Legend:
1. entrance
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19. bicycle parking
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21. bicycle & pedestrian entrance
22. rainwater tank
the Settlement
the intimate
the Settlement
the Settlement
Xingu village, Brasil
Wae village, Indonesia
Hoeve, Limburg
Legend
1. restaurant (69 seats) 63m²
2. conference room (+96 seats) 98m²
3. kitchen 50m²
4. terrace 90m²
5. covered walkway
6. walkway
7. square
8. viewpoint west
9. viewpoint east
10. viewpoint north

Nationaal Park Duinen van Texel
Plan +0

Nationaal Park Duinen van Texel
de Kastelein
the intimate
the intimate

- bla bla
towards the P5
P4 > P5
- Work on 1:5 details; improve existing & determine details to be made (Mauro)
- Work on 1:5 details; improve existing & determine details to be made (Mauro)

- Consider fire prevention / fire safety in design
- Work on 1:5 details; improve existing & determine details to be made (Mauro)

- Consider fire prevention / fire safety in design

- Create impressions of key moments / scenes of the building
- Work on 1:5 details; improve existing & determine details to be made (Mauro)

- Consider fire prevention / fire safety in design

- Create impressions of key moments / scenes of the building

- Work on continuity & completeness in story and presentation
P4 > P5

- Work on 1:5 details; improve existing & determine details to be made (Mauro)

- Consider fire prevention / fire safety in design

- Create impressions of key moments / scenes of the building

- Work on continuity & completeness in story and presentation

- Finish models and experiments
- Work on 1:5 details; improve existing & determine details to be made (Mauro)

- Consider fire prevention / fire safety in design

- Create impressions of key moments / scenes of the building

- Work on continuity & completeness in story and presentation

- Finish models and experiments

- Enjoy the last chapter of my studies :)
thank you
2 Fascination
2 Climate
“Old buildings”
“Old buildings”

How they work
“Old buildings”

How they work

≠ Representative architecture

Opera, Paris
“Old buildings”

*How they work*

≠ Representative architecture

= Vernacular architecture / local building culture

*Opera, Paris*  
* Minka house, Japan
“Old buildings”

How they work

≠ Representative architecture

= Vernacular architecture / local building culture
Planet Texel …
Planet Texel ...
Planet Texel …
What kind of architecture suits the project’s vision?
What kind of architecture suits the project’s vision?

Where in Texel’s dune landscape should it be?
Massive exterior wall - Spain - Passive airco

captures night temperatures to keep spaces cool during hot day
Low pitched roofs - the Alps - Thermal insulation

Gentle slope collects layer of snow which insulates the house
Willow lane - Holland - Adaptive sun screen & wind protection

Trees provide shade in summer and let light into the house in winter + block wind
Texel’s 2020 Vision
Texel’s 2020 Vision

- Self-sufficient by 2020
Texel’s 2020 Vision

- Self-sufficient by 2020

- Laboratory for sustainable experiments
Texel’s 2020 Vision

- Self-sufficient by 2020
- Laboratory for sustainable experiments

Realized
Texel’s 2020 Vision

- Self-sufficient by 2020
- Laboratory for sustainable experiments

Realized

- A cooperative energy company for renewables, TexelEnergie (2007)
Texel’s 2020 Vision

- Self-sufficient by 2020
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Realized

- A cooperative energy company for renewables, TexelEnergie (2007)
- A research collaboration with TU/e & TUD, Planet Texel Academy (2014)
Texel’s 2020 Vision

- Self-sufficient by 2020
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Realized

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- An online platform for sustainable projects, TexelGeeftEnergie.nl (2015)
Texel’s 2020 Vision

- Self-sufficient by 2020
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Realized

- A research collaboration with TU/e & TUD, *Planet Texel Academy* (2014)
- All public lighting to LED (2016)
Texel’s 2020 Vision

- Self-sufficient by 2020
- Laboratory for sustainable experiments

Realized

- A cooperative energy company for renewables, TexelEnergie (2007)
- A research collaboration with TU/e & TUD, Planet Texel Academy (2014)
- An online platform for sustainable projects, TexelGeeftEnergie.nl (2015)
- All public lighting to LED (2016)
- A plan to construct wind turbines around the island
Samsø

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Samsø

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- 1 solar and wood chip heating plant
Samsø
Samsø

- Community behind the plan

Prof. Søren Hermansen
Samsø

- Community behind the plan

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1. Why? to build *Commonities*  
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Texel

Similarities

Samsø
Texel

Similarities

- Both are islands

Samsøø
Texel

* Similarities
  - Both are islands
  * clearly defined community

Samsø
- Both are islands
  * clearly defined community
  * small scale > achievable
Texel | Similarities | Samsø
---|---|---
- Both are islands
  * clearly defined community
  * small scale > achievable
  * islanders mentality
Texel  

* Both are islands

  * clearly defined community
  * small scale > achievable
  * islanders mentality

Samsø

Similarities

Differences
Texel

Similarities
- Both are islands
  * clearly defined community
  * small scale > achievable
  * islanders mentality

Differences
- Population

14k

Samsø

4k
Texel

* Clearly defined community
* Small scale > achievable
* Islanders mentality

Samsø

Similarities
- Both are islands

Differences
- Population
- Visitors

14k
800k

4k
170k
**Similarities**
- Both are islands
  - * clearly defined community
  - * small scale > achievable
  - * islanders mentality

**Differences**
- Population
  - Texel: 14k
  - Samsø: 4k
- Visitors
  - Texel: 800k
  - Samsø: 170k
- Inspirator & Vision
Texel

Texel’s vision > Reality
Texel

Texel’s vision > Reality

Design a building
Texel

Texel’s vision > Reality

Design a building

- Campfire
discuss & develop vision
Texel

Texel’s vision > Reality

Design a building

- *Campfire*
  discuss & develop vision

- *Spread the word*
  showcase projects, inspire visitors
Texel

Texel’s vision > Reality

Design a building

- Campfire
discuss & develop vision

- Spread the word
showcase projects, inspire visitors
Planet
Texel
Texel’s vision > Reality
Texel’s vision > Reality

- Campfire
discuss & develop vision
Texel’s vision > Reality

- **Campfire**
  discuss & develop vision

- **Spread the word**
  tell Texels story & inspire visitors
Texel’s vision > Reality

- Campfire
discuss & develop vision

- Commonity
community build, owned & operated

- Spread the word
tell Texels story & inspire visitors
Texel’s vision > Reality

- **Campfire**
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Texel’s vision > Reality

- Campfire
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- Commonity
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- Spread the word
  tell Texels story & inspire visitors

- Vernacular Approach

(Samso lessons)
Texel’s vision > Reality

- **Campfire**
  discuss & develop vision

- **Commonity**
  community build, owned & operated

- **Spread the word**
  tell Texels story & inspire visitors

- **Vernacular Approach**
Texel’s vision > Reality

Assignment: design a building

- Campfire
  discuss & develop vision

- Commonity
  community build, owned & operated

- Spread the word
  tell Texels story & inspire visitors

- Vernacular Approach

(Samsø lessons)

and i add…
- Vernacular Approach
How?
Sand & Shells
| Sand & Shells | Wood |
| Sand & Shells | Wood | Wool |
Sand & Shells  Wood  Wool  Plastic washed ashore
3 Design
3 Design
3 Design
Structure

1  Context
2  Fascination
3  Problem statement
4  Research
5  Design
Graduation presentation
Max van den Berg

tutors
Roel van de Pas  Architecture
Mauro Parravicini  Building Technology
Carolin Bellstedt  Research
Roberto Cavallo  University Board
1 Context