Final Presentation
Saynzo Osinga

2 July 2009
17:00

Hybrid Buildings
TU Delft

Emre Alturk
Roberto Cavallo
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Studio Hybrid Buildings

3 locations in Amsterdam:
  - Zeeburgerpad
  - Haarlemerweg / A10 West
  - NDSM wharf

Masterplan

No fixed program

Around 10,000 m²
ANALYSIS

History
Circulation
Morphology
Typology
Eye-catchers

URBAN SITUATION

Master Plan
Vision
Program

BUILDING

Concept
Plans
Sections
Facades

BUILDING TECHNIQUE

Force Construction
Building Order
Installations
Details

OVERALL IMPRESSION

3D images
Location of the NDSM wharf

1200

1585

1672

1920 Founding of the NDSM wharf

1795

1885

1940

Zoom in of the location

1970

2009
Towards the Noordzee

NDSM wharf

The IJ

Towards the Central Station of Amsterdam
EDUCATION ON THE WHARF

ANALYSIS
ANALYSIS

OPEN SPACE
CIRCULATION

NDSM wharf
NDSM wharf

CS Amsterdam

ANALYSIS

CIRCULATION

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CIRCULATION

ANALYSIS

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S116  A10  NL

CS  CENTRE A'DAM
HOUTHAVEN

NORTH A'DAM

NORTH A'DAM

35 MOLENWIJK - CS
37 MOLENWIJK - AMSTEL STATION
94 CS - ZAANDAM
38 MOLENWIJK - NIEUWENDAM

SMALL HARBOUR

2012

2° COENTUNNEL

2016 ?? NZ LINE
Tuindorp Oostzaan
Build in the twenties and there are mainly elderly people living.

Bloemenbuurt
A neighbourhood build in the end of the twenties in the style of the Amsterdamse school.

Terrasdorp
Especially two room housing build in the fifties, mostly owned by the housing corporations. The population reflects these of whole North Amsterdam.

Rural north
Situated north of the ring A10 called the Green Waterland. Dike- and stroke-building like the street Zuideinde. Through the area are many waters and a few small roads crossing.

NDSM site
Old shipwharf being used from 1919 until 1980. Still filled with old harbour elements. Like big halls, shipslips, traintracks and cranes.

Twiske Kadoelen
A neighbourhood with a rural character with buildings before the war and from the last decennia. A high percentage of houses in private ownership. There are living a lot of young people.
**TYPOLOGY**

**Tuindorp Oostzaan**
Build in the twenties and there are mainly elderly people living.

**Bloemenbuurt**
A neighbourhood build in the end of the twenties in the style of the Amsterdam school.

**Rural north**
Situated north of the ring A10 called the Groen Waterland. Diff- and stroke-building like the street Zuidinde. Through the area are many waters and a few small roads crossing.

**Twiske Kadoelen**
A neighbourhood with a rural character with buildings before the war and from the last decades. A high percentage of houses in private ownership. There are living a lot of young people.

**NDSM site**
Old shipwarp being used from 1919 until 1980. Still filled with old harbour elements. Like big halls, ships slopes, traintracks and cranes.
Big halls which provide space for new program and activities. Urban elements are used to provide this character.
Place where a lot of creativity comes together. The character of the site is inspiring and offers a lot of possibilities for creative work.
Through the positioning of the buildings and the industrial elements from the program of the past. The site offers an enormous quality in open space. With a wide and clear look over the IJ towards the centre of Amsterdam.
The NDSM wharf is 1 of the 5 biggest event spaces of Amsterdam. Through its character, open space and unique location a lot of events want to use this location.
Centre of energy and creativity

Expansion to the rest

Core - NDSM-wharf

Amsterdam Noord

Expansion to A'dam NL+ World
Crane horizon

Closed straight box

Creativity

Creativity caught in a straight box
URBAN SITUATION
DEVELOPMENT OF THE AREA

De Bongerd
NDSM werf-zuid
NDSM werf-noord
NDSM werf-oost
Buiksloterham
Houthavens
- Offices for creative industry

- Dwellings (towers)

- Event space

- Art Academy
  library
  lecture rooms
  offices
  machine park
  exposition space
  ateliers 50x
POSITION  BIG VOLUMES
- Carrying the roof construction
- To hang the atliers
- Provide circulation space
- Space for toilets
EVOLUTION OF CROSS BUILDING
EVOLUTION OF CROSS BUILDING
EVOLUTION OF CROSS BUILDING
EVOLUTION OF CROSS BUILDING

[Diagram of a cross-shaped building structure, with arrows indicating flow or connection points.]
**Building**

**Position of the Crosses**

- #1 Columns
- #2 Lecture floors and ateliers
- #3 Library floors and ateliers
- #4 Expo floors and ateliers
- #5 Completing columns and ateliers
- #6 Main roofbeams construction
- #7 Sub roofbeam construction and facade columns
- #8 Facade volumes
- #9 Roof with solarcells
- #10 Completing facade with metal mesh

**Construction schemes**

**Evolution of the column**

**Building order**

**Evolution Transition Influence**

**Forces diagrams**

**Roof**

**Atelier**
POSITION OF THE CROSSES

#1 Columns
#2 Lecture floors and ateliers
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#7 Sub roofbeams construction and facade columns
#8 Facade volumes
#9 Roof with solar cells
#10 Completing facade with metal mesh
Art Academy NDSM-wharf
Saynzo Osinga
Studio
Hybrid Buildings
Teachers
Emre Alturk, Roberto Cavello, Henk Mihl
TU Delft
June 2009

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Construction schemes

Evolution of the column
Building order
Evolution Transition Influence
Forces diagrams

Roof
Atelier

POSITION OF THE CROSSES
Art Academy NDSM wharf

Ground Floor +0 m  1:200

Storage
Exposition Space
Shop

Machine
Work
Space
Atelier

Atelier

Atelier

Atelier

Atelier

Atelier

Atelier

Atelier

Atelier

Atelier

Old Ship Building Slope

Performance area 0 2 4 10 20 m

BUILDING LAYOUT

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WATER SIDE

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SECTION TO THE EAST
Starting in a corner with making the concrete crosses.
At the place where the crosses are ready, the floors of the lecture volume will be made and the ateliers will be hanged at these crosses. Next to it there will be made new crosses.
At the place where the crosses are ready, the floors of the library volume will be made and the ateliers will be hanged at these crosses. Next to it there will be made new crosses.
At the place where the crosses are ready, the floors of the exposition volume will be made and the ateliers will be hanged at these crosses. Next to it there will be made new crosses.
At the place where the crosses are ready, the floors of the machinery volume will be made and the ateliers will be hanged at these crosses.
After all the crosses are made and the ateliers are hanging the construction of the roof will take place. First the main structure of the roof beams, which are positioned between the crosses.
After putting the main beams of the roof structure in place the secondary beams of the roof will be put in place in combination with the columns of the facade of the building.
Also the facade of the volumes with the supporting facilities will be put in place.
The next step is to put the glass panels on the roof which contain PV cells to generate energy from the sun.
And the last step is to put on the horizontal steel beams and the metal mesh on the facade of the building.
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Complete Construction schemes
Evolution of the column
Construction of the roof
Building order
Evolution Transition Influence
Forces diagrams
Roof
Atelier

FORCES ROOF
BUILDING TECHNIQUE

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Position of the Roof

Winter situation

Summer situation

0-10 °C

10-20 °C

Heat pump

Heat pump

Installations Atelier
Facade glass surface = 4x7x3 = 84 m
Volume Atelier  = 7x7x3 = 147 m
HR++ glass   = U =1,3 W/m
Tmax    =  20 °C
Tmin    = -10 °C

Lost of heating through facade:
Glass   P = A*U*∆T = 84*1,3*30  = 3276 W
Roof   P = A*U*∆T = 49*0,25*30 = 367   W
=  3 6 4 4   W

Lost of heating through fresh air supply:
2 persons, machines, working, painting
250 m/h of fresh air supply needed
Heat recovery ventilation system
WTA HR 300 of NED AIR
P = ρ*V*c*∆T =1,2*250/3600*1000*30  = 2500 W
Heating back 90% =0,1*2500    = 250  W
Total lost of heating     = 3644 W
=  2 5 0   W  +
= 3894

Floor heating:
(around 80 W/m)
P = A*P/floor heating = 49*80    = 3920 W

Solar Energy
The roof is constructed with glass panels combined with PV cells. The position of the PV cells is 5° to the east seen from the south and are 5° tilted. This orientation of the PV cells is good for 95 % of the maximum of 1083 kWh/period.
The roof is 80 by 80 meters of which 50 % is covered with PV cells of monokristallijn Si with a profit of 113-141 kWh/m and 30 % amorf Si (transparent) with a profit of 45-53 kWh/m.

Glass panels with PV cells (monokristallijn Si, amorf Si) for the roof 8x8 m.
PV CELLS ON ROOF
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A B C D E F G H I J K

8,00 m 8,00 m 8,00 m 8,00 m 8,00 m 8,00 m 8,00 m 8,00 m 8,00 m 8,00 m

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Construction schemes

Evolution of the column
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ROOF STRUCTURE CONCEPT

BUILDING TECHNIQUE

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ROOF STRUCTURE CONCEPT

BUILDING TECHNIQUE
<table>
<thead>
<tr>
<th>Pavement</th>
<th>Facade</th>
<th>Atelier</th>
<th>Cross</th>
</tr>
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<td><img src="image1" alt="Pavement Image" /></td>
<td><img src="image2" alt="Facade Image" /></td>
<td><img src="image3" alt="Atelier Image" /></td>
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<td><img src="image11" alt="Atelier Image" /></td>
<td><img src="image12" alt="Cross Image" /></td>
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</tbody>
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**Building Technique**

**Materialisation**

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VIEW OVER THE IJ
VIEW FROM THE IJ
Art Academy NDSM-wharf Amsterdam

PARTY
Binnenrotte 181 Rotterdam
Welkom 21:00

THANKS
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