REFURBISHMENT WESTRAVEN FACADE

active facade of louvres with pv cells and reflective hydrides

This assignment is a combination of research (analysis) and (re)design of an existing building façade. This façade design stands not for itself and should be considered in combination with a designed main construction and a climate installation.

The to be redesigned building Rijkswaterstaat Westraven in Utrecht is owned by the 'Rijksgebouwen dienst' (RGD); the Dutch government. The RGD leases the building to different users. This constellation leads to the fact, that the owner is mainly concerned with keeping the building flexible and adjustable to the demands of the user.

...

more

next

Requirements

Heal sick building syndrome
The syndrome is mainly caused by indoor air pollution, absence of sunlight and poor ventilation.

Good insulation
will reduce the energy cost and losses. Next to insulation material the louvre façade acts as a second skin.

Installations - Individual
The installations (sun protection/ tubing etc.) will be integrated.The climate will be individually adjustable.

Removing asbestos parts
Part of the excisting façade (the balustrade) contains asbestos and will therefore be removed.

Reduce noise pollution
The A12 highway is on the north side of the building.Therefore this side will be a closed glass façade.

Reduce air pollution
The A12 highway produces air pollution. By using air filters in the air intake system this is reduced.

Openable windows
On the higher floors manually openable windows is a must to heal the sick building syndrome.

Flexible use
The building needs to be adjustable to the demands of the user. Therefore the sizing of the façade will correspond with the construction.

Concept: Louvres

By replacing the excisting façade with an aluminium-glass façade and introducing a second façade of louvres, all requirements can be met in an integrated intelligent façade design. The louvre façade is used for sun protection, noise protection, bringing more light in the back of the offices, pre-heating air, producing energy (with PV cells), allowing sight and preventing glare.

Louvres: Hydrides

Transparent
In the normal situation reflective hydride glass is transparant and allows light and sight to penetrate from both directions.

Reflective
When electricity is guided through the ions in the glass the outside will reflect light but sight can still penetrate from the inside.

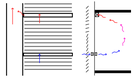
Louvres: PV cells

Electricity
The louvres with PV cells rotate with the sun and produce electricity for the building.

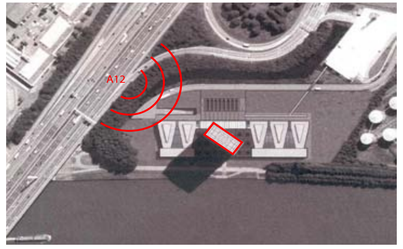
Heat air
Air cools the PV cells. Heated air is used for the offices and for the chimney effect to suck air out of the offices.

Air system

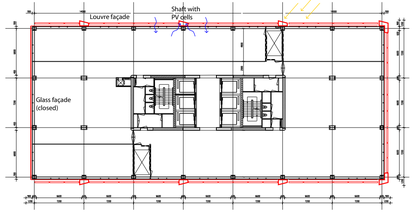
Breathing façade
Air is guided between de louvres and the glass façade (and is heated when the façade is closed). Then it is guided inside through the noise reduction box where the air is also filtered and brought to the right temperature. The air get sucked out through a box on the ceiling and goes to the vertical air shafts where the suction is created by an air stream which is created by the rising temperature of the shaft.



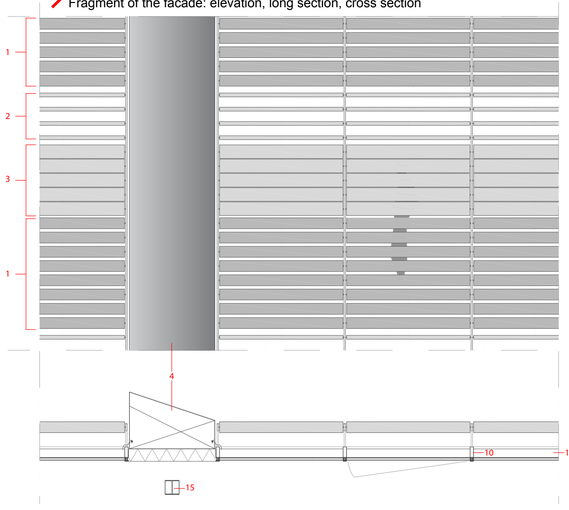
Situation Rijkswaterstaat Westraven Utrecht

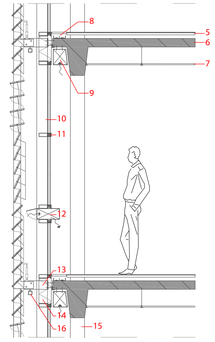


Floorplan - Upper levels



Fragment of the facade: elevation, long section, cross section

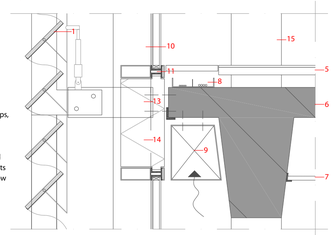




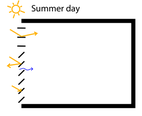
Legend

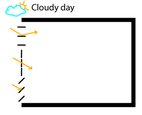
1. Louvres - PV cells
2. Louvres - Hydrid reflictive glass
3. Louvres - Hydrid reflictive glass
4. Vertical ventilation shaft - PV cells
5. Suspended floor
6. Concrete floor and beam (construction)
7. Suspended ceiling
8. Cable gutter
9. Air (out) shaft
10. Vertical aluminium window frame, rubber strips, clickable cornice
11. Horizontal aluminium window frame, rubber strips, clickable cornice
12. Noise reduction box, with louvre, heating and cooling by tubing, electral and network sockets
13. Angular profile for montage of vertical window frame and louvre frame
14. Insulation
15. IPE-column with fire protection cover
16. Maintainance rail (for automated cleaning)

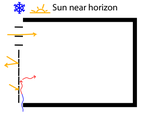
Detail of facade - floor

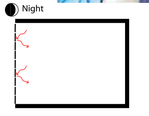


Impression materials









Louvre configurations

Building - 3D impression

this project is part of

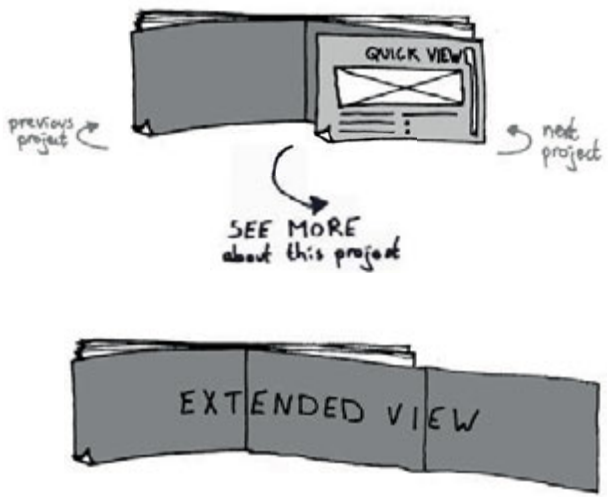
Portfolio Jasper Moelker

I'm Jasper Moelker, an architect - engineer with a fascination for technology and new media.

My portfolio is a collection of my recent projects and initiatives ranging from architectural and engineering projects I carried out during my Masters at Delft University of Technology, to web development projects of my design studio Active IDs and to educational and professional workshops I organized as partner at Urban Detectives.

Each project is presented in one spread with a quick and an extended view.
If you only wish to browse through them quickly you will find an introduction to each project on the right page (odd pages in web version) of the spread, consisting of a cover image and a textual description of the assignment, concept, methodology and result as well as quick links to online documentation.
If you would like to explore the project in more depth you simply open the folded spread (even pages in web version) for a full visualisation of the project.

Enjoy browsing through my work and please feel free to contact me for more information.



JASPER MOELKER
portfolio

about (me)

projects

for more projects visit

www.ActiveIDs.nl/jbmoelker