# Academie van Bouwkunst in Amsterdam, the Netherlands

Ed MELET

**Why and What (vice versa)**

The teaching of construction and, more general, of building technologies at the Academy of Building Arts (Amsterdam) differs most probably a lot from that of most other schools of architecture.

Only students with Bachelors in Building Technology who are working at an architectural firm for a couple of years are allowed to join the Academy of Building Arts.

For long, it was supposed that their technical knowledge was sufficient.

The emphasis lay and lies therefore on transforming this technological knowledge of the students into an 'architectural' tool. The students are taught how to use the different building techniques in an architectural way instead of in a pure technological way.

**How**

Transforming the formal technical knowledge of our students is done in three different ways:

1) the students have to design the construction of the building they designed themselves in the first semester. They also have to design the architectural details.
2) lectures are given by well-known architects, urban designers, landscapers but also by construction engineers on how the different technologies are used to achieve sound and exciting technical translations of the designs and to amplify their vision on the integration of building techniques in the building designs.
3) in the fourth semester students have to make an in-depth study on specific ways in which technologies can be used or are used in architecture. One of the projects is a study on the integration of techniques of the buildings of well-known architects. In this study they also have to explain the constructions. Last year we gave the students a more abstract subject, namely the Total Skin. This study contained a general study on the possible functions a façade can have and on the materials/techniques already available. This training is seen as a leg up for they architectural design which has to be technically sound.

**Who**

The students are trained by well-known architects and building engineers. They are all working with important architectural firms. The emphasis lies on the designing of the construction. In what way can the construction, or more general the building techniques, contribute to the architectural qualities of the design. As can be seen in the work of the most interesting architects the construction is an important tool to deepen the impact of the architectural designs.

The students are therefore trained to reach beyond the obvious constructional solutions. Of course, it is necessary and expected that the students have some feel for construction. If not, extra classes are organized in order to improve the technical insight of the students.

Because the emphasis lies on the design instead of the calculations of the construction the teaching is done to a large extent by architects. During the training period well-known building engineers are invited to comment on the designs of the constructions and to give instructions on how the technical soundness of the designs can be improved or reached.

## When and to What Extent

Techniques as pure techniques are not a real topic during the study at the Academy. The students are not trained to calculate beams, columns, etc. It is/was supposed that the students possess a technical knowledge that is sufficient in order to act as an architect.

Therefore the teaching of constructions is done in a problem solving way.

During their studies the students have to prove that their own architectural designs are technically sound. Not necessarily by calculations, but primarily by argumentations. In this way we train the students to discuss their architectural constructions with the building engineers.

A real threat to this teaching method is that the technical knowledge of the students of the Academy of Building Arts is often less complete than was assumed until now. We are therefore studying ways to improve the technical knowledge without losing sight on our main objectives (techniques as a part of the architecture, not as an 'independent thing').

## Virtual Reforms

The main objective is to teach the students ways to design constructions that enrich their architectural designs. They should be able to 'play' with the constructions; the constructions are an important architectural tool. The students should be able to start discussions with the building engineers on how the constructions should be integrated in their designs. Architecture, constructions, building physics, installations should become an inextricable entity.

Of course, this can only be achieved when students are really interested in techniques. During the course the student should discover that techniques are not a threat or something that is 'done' by someone else but that techniques have enormous architectural potential. The future architects should be able to challenge the building engineers.

Therefore teaching techniques is always related to the design assignments. Techniques are drawn into the design process, as should be done in a 'normal' architectural practice as well.

## Projects

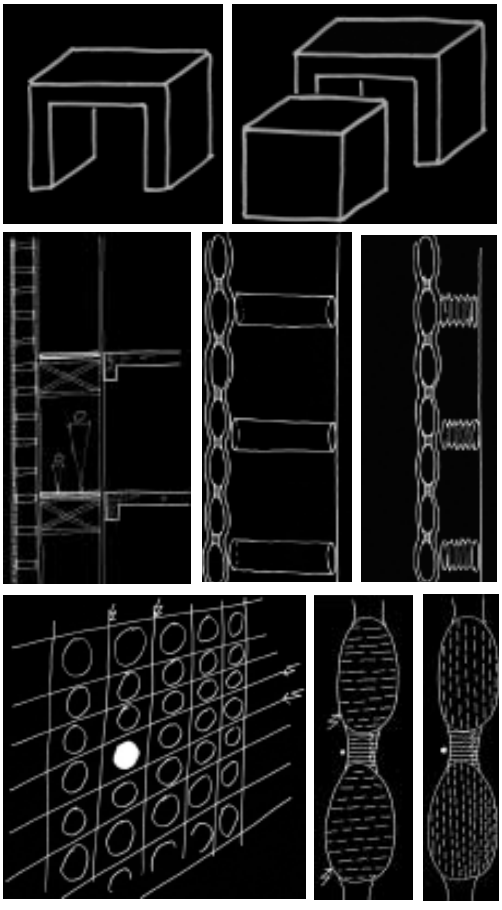
Last year we asked the students to design the Total Skin. This skin is virtually everything. Of course it is a façade, but it can contain the mechanics and the infrastructure of the building, it controls the inner climate by keeping the warmth of the sun out, but letting the daylight in, it generates energy, it communicates with the surroundings, but also with the users of

the building, it has of course esthetic functions, et cetera. One of the most important features this facade should have was a capacity to change. With this facade it has to become possible to adapt the features of the facades to the (new) functions of the building.

We defined two phases in this very short (only eight afternoons) study on the Total Skin. In the first phase the students were requested to do a general study on the functions a façade can have (in a way, they had to write the brief for the Total Skins), on the techniques available in the building industries but also outside the building industries, they had to study the techniques which are used in nature, et cetera.

In the second phase they had to come up with their design of the Total skin. Three examples will be published here, which above all shows the pleasure the students had in designing this skin, in playing with techniques. As can be seen by these examples the techniques are used in a more conceptual way.

Of course the facades are not technically sound, but that was not the main goal. The main goal was the students to discover the technical possibilities and difficulties in designing a façade.



By the way, these three examples were published in the Dutch magazine Sustainable Building.

*1. The Clip-Off building*

The idea of this facade was that it had to be so flexible that the building should be able to contain all different kinds of functions (school, church, office, et cetera).

The climate of the building was supposed to be controlled by a breathing facade. Mechanical parts and pumps were introduced to act like the human heart. Through small holes in the outer layer fresh air will be sucked in.

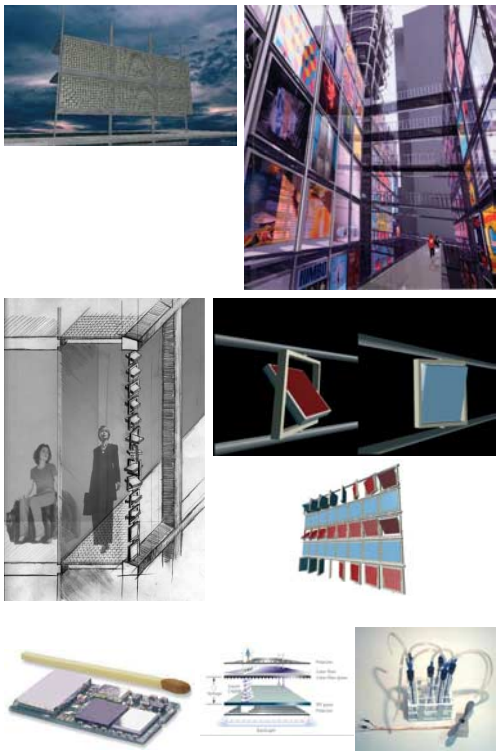
The outer layer of the facade was made out of a plastic foil comparable to the plastic bags that can be used to make ice-cubs. Instead of water the bags were to contain electrochromatic gas that would enable the users to make the facade transparent or translucent. The gas-molecules can be directed in such a way that the facade is translucent (right) or transparent (middle).

*2. The personal power zone*

In this study the emphasis lies on communication. The facade acts in a way as a normal double skin. The space between the two layers is used for transportation, as a meeting place, but it is also possible to work in this semi-outer part of the building.

The outer layer of the facade is built up out of hundreds of small LCD-screens. The screens can be turned and twisted in all directions. Thanks to this mode the screens can be used to communicate to the users of the building but also to the city. By turning the LCD-screens 180 degrees they can also be used as normal computer-screens. However, the screens function also as a (expensive) sort of sunblind. The amount of wind coming into the cavity between the outer and the inner facade is controlled by turning the LCD-screens too.

The newest techniques are used to make this facade feasible. The latest family of ultra-small microchips and thin LCD-screens are used. The screens are powered by fuel cells.



*3. A box full of surprises*

The facade-design 'A box full of surprises' is the simplest one. And we think it was the most interesting one as well. In order to make the facade flexible a box containing a couple of different facade-fillings was integrated in the facade as a sort of parapet, by letting a filling down the function of the facade changes.

The users can define the contents of the boxes themselves and off course the content can be changed. A nice aspect of the concept is that every individual user defines his/hers own facade.

The students came up with an enormous amount of different fillings - which show that techniques are humorous as well. Bizarre in a way are the filling with geraniums, with clothesline and with stress-cushions on which the users give free rein to their frustrations.

The students suggested more traditional fillings too. Like the facades with whiteboards and even with a normal window.