

## The green study centre

My graduation project for the studio interiors, buildings and cities consists of designing a university library for the UvA and the HvA in Amsterdam. During the design process I used different tools and approaches to come to a complete proposal for my university library. I have researched different aspects of my design to get a better understanding of libraries in general, construction and climate issues, materialization but also presentation techniques.

When designing a library the question arises what the function is of a library and what does a library look like today? The library arose when people found a way to store information. It started with clay tablets, then developed into paper rolls and ended up in a book form. Over the years the library made many developments. The development of the bookcase gave the architect more freedom in designing a library. When the library became a public place, books had to be protected from stealing. Nowadays computers store every type of information, from books, newspapers, documentaries etc. This information is not only accessible from the library, but also at home. The function of the library is changing and will become more a centre for study. To me a library isn't called a library anymore, but a study centre.

To design a study centre it's very important to know what the users want. Every student is unique and asks for a different type of study space. I researched a variety of study spaces in the OBA public library of Amsterdam to learn what the requirements of the users are. By observing the study spaces I got insight into the popularity of a study space. By interviewing the students and asking them the question, why did you choose this study space? I got insight in their reason to choose a type of study space. I also got insight in whether they are aware of their surroundings and the type of study space they had chosen. For example, one student sitting in a row of study places in a large open space mentioned *'I like to sit in an open space to study. It's nice to see people do their own thing. I don't like sitting at a table opposite of each other.'* While another student sitting on a table for six surrounded by bookshelves mentioned *'I saw a free space and its quiet here.'* Most students studying are not aware of their surroundings. I think the main reason for that is the fact that there is nothing to see. I want to make students more aware of their surrounding and give them something to see. They like to study in a quiet surrounding and they find different facilities such as a coffee place very important.

Students work the majority of the day behind a computer. After a few hours many people experience some discomfort. Your eyes are starting to itch, you get a headache and you don't feel so well. This influences your performance and your productivity. Some of this discomfort can be taken away by using a good climate system. Plants can help to eliminate the discomfort. Plants have the quality to purify the air of chemicals and provide fresh air. They also mute the sound and make the space livelier. The view of plants makes people feel better. When people are surrounded by plants their stress reduces, they get a lower blood pressure and lower heart rate. Plants reduce the health complaints and therefore provides for a higher productivity.

Of the four possible locations I chose Frederiksplein. Frederiksplein is within walking distance from the UvA and the HvA and can become a center for all students. Nowadays Frederiksplein consists of a large park with many large trees split in three parts by a tram and motorway. Frederiksplein is in the northern area surrounded by little cafés, restaurants, and boutiques and in the southern area the Albert Cuypstraat is situated. A very beautiful part of Frederiksplein is the Singelgracht. Unfortunately in the current street view little is done to experience the Singelgracht to its fullest.

Frederiksplein was once the home of Paleis van Volksvlijt. The building consists of a lot of glass and was realized between 1855 and 1864, designed by Cornelis Outshoorn. The building had a public function and became an attraction point in the city of Amsterdam. The building was located in a very monumental setting. Frederiksplein is one of the few open space in Amsterdam and is surrounded by houses not more than three or four stories high. By placing one large building in this open setting it will demand all the attention. The park with large trees in front of the building emphasizes this monumental setting. Sadly the building got destroyed by a fire in 1929. Frederiksplein is now home of the National Bank. Again the National Bank is a large building that demands all the attention. The National Bank is not a public space and does not open up towards the park.

I want my design to be part of the city again just like the Paleis van Volksvlijt. I want the park and its trees to integrate with my study centre. The columns of the building are shaped in the form of trees. The building is enclosed by glass on four sides. On the north and south side the glass is placed halfway the columns to emphasize a continuous movement from the park through the building towards the Singelgracht. The square on the south side of the building slopes down towards the Singelgracht to integrate the Singelgracht even more with Frederiksplein. Floors are added to make the building more functional.

Serres and atria are added to let in more light and at the same time creates spaces to ad trees, bushes, grasses and plants inside the building. These atria and serres have a big influence on the construction. The construction consists of a grid of 8 by 8 meters. Beams are placed on top of the columns in north – south direction. Along the edge of the atria and serres extra columns are needed so that the building remains intact. At some points extra columns are not necessary, however there are columns so that the building can be read in one way. Extra columns are placed in between the columns in north - south direction. This causes the density to increase in one way and emphasizes the routing from the park through the building towards the Singelgracht even further. The columns are in the form of a tree in two directions. The 'branches' of the columns grow as you move up in the building. The building gets its stability for a large part from the columns, mainly because of the two directions of the column. However this is not enough, elevation points are necessary. These elevation points are the only closed objects inside the building. To make them part of the building they will be covered by growing plants through time.

Besides the four elevation points the building has a very open structure. The atria and serres provide more visibility between the different floors. The columns get more dens when you move up in the building. There are mainly study spaces on the top floor so that the open structure and visibility remains high. The columns are smaller and take up less space on the lower floors. This allows other furniture such as bookcases to be placed. The furniture is placed in such a way that long lines in the building are interrupted. As a user, you can find, while searching, you way through the building. Light can be found on the tables, on the bookcases and in the ceiling around the columns. There is no extra light needed in between the columns, which allows for the open structure of the build to stay intact. Lumcove and led light is used because of their low energy consumption.

An almost entirely glass facade has major influences on the climate design. The façade consists of a double skin façade that on some points on the lower floors expends into serres. A semi transparent curtain is added in front of the north and south façade. Between the single glass and the curtain heat will be removed by suction. All the heat is transferring into the double skin façade, where the heat rises and vanishes through the roof. The atria in the middle of the building work in the same way.

Growing plants are added inside the double skin in the east and west façade. They together with the trees outside protect the building from overheating. The roof that is covered with vegetation keeps the building cool. In the winter the double skin façade and the vegetation roof functions as a blanket around the building that protects the building from the cold weather outside. Heat pumps in the ground and heat pipes on the roof ensure a good energy balance of the building.

Redundant rainwater is collected and will be used for the plants inside the building. The Singelgracht provides for extra water when necessary. In the building are several areas where plants grow. The plants are carefully selected based on their properties. For example, the plants that are spread through the building have a high purifying effect while the plants in the south serres prefer a lot of sunlight.

During my design process I keep the users, the students in mind. I find it very important that a building functions in a proper way and is not just a piece of art with the name of the architect written all over it. At the same time I try to design something I believe in and represent me. I think that climate issues such as an entirely glass façade should not stop you from what you try to accomplish. Nowadays there is so much knowledge in the world that you can always find a proper solution that fits your design. I believe that the future of architecture will have two main movements, technology and sustainability. Technology already has a huge influence in general, books that are turning into computers, communication tools, machines and robots that take over the work of people. The world is getting an overload of technology. I want to be a counterpart and contribute towards a better but most of all healthier and greener life. What better way is there for me as a future architect to focus on sustainability and all that nature has to offer.