Helsinki Central Library

Synopsis

This project is developed according to the theme "Tectonic Design – Architectural Form and Structure", and it is dedicated to design the new central library building in the Töölönlahti area in Helsinki Finland. Furthermore, the library is designed with concern about user experience with both conventional and modern media. The focus is to accommodate and provide people of different generations and backgrounds with comfortable environment for knowledge and leisure.

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Introduction

The initiative to create a new modern Library began already in 1990 as a result of a public debate. City of Helsinki is lacking meaningful and suitable place of city centre scale to cultivate Finnish reading culture and the literature. Finally on September 2011 decision has been made: architectural competition for Central Library will take place as a part of World Design Capital Helsinki 2012 programme and it belongs to the global library network. The format of the contest was decided as an open two stage international competition.

The competition programme envisaged new building as a place of freedom and equity for the users. Basic functions of the library are: to transfer the knowledge and traditions upon the future generations, to create good basis for invention and culture and to provide opportunities for spiritual experiences.

Project has to consider changes that have occurred in the recent years in Finnish libraries and be adjusted to the new needs and requirements. Nowadays the value of books as psychical objects has significantly decreased. The libraries are no longer places where only storage and distribution of books take place. Information and knowledge is being delivered by various new media. Helsinki Central Library has to adapt to the changes and promote new ways of communication.

In another aspect the library has to take into the account various types of users and provide them with equal opportunities. That includes different ages, genders or user's cultural background. Library has to provide working environment for students as well as it has to support active senior citizens with literature and other forms of cultural experiences. Various types of the working spaces have to be developed both for quiet and semi-quiet conditions.
In the other hand the library is also envisaged to become a place of various cultural events as well as it will function as a place of leisure. The project will incorporate such functions as cinema and exhibition hall.

In conclusion, Central Library has to combine both new and experimental ways and purposes of media house with traditional functions of a Library.

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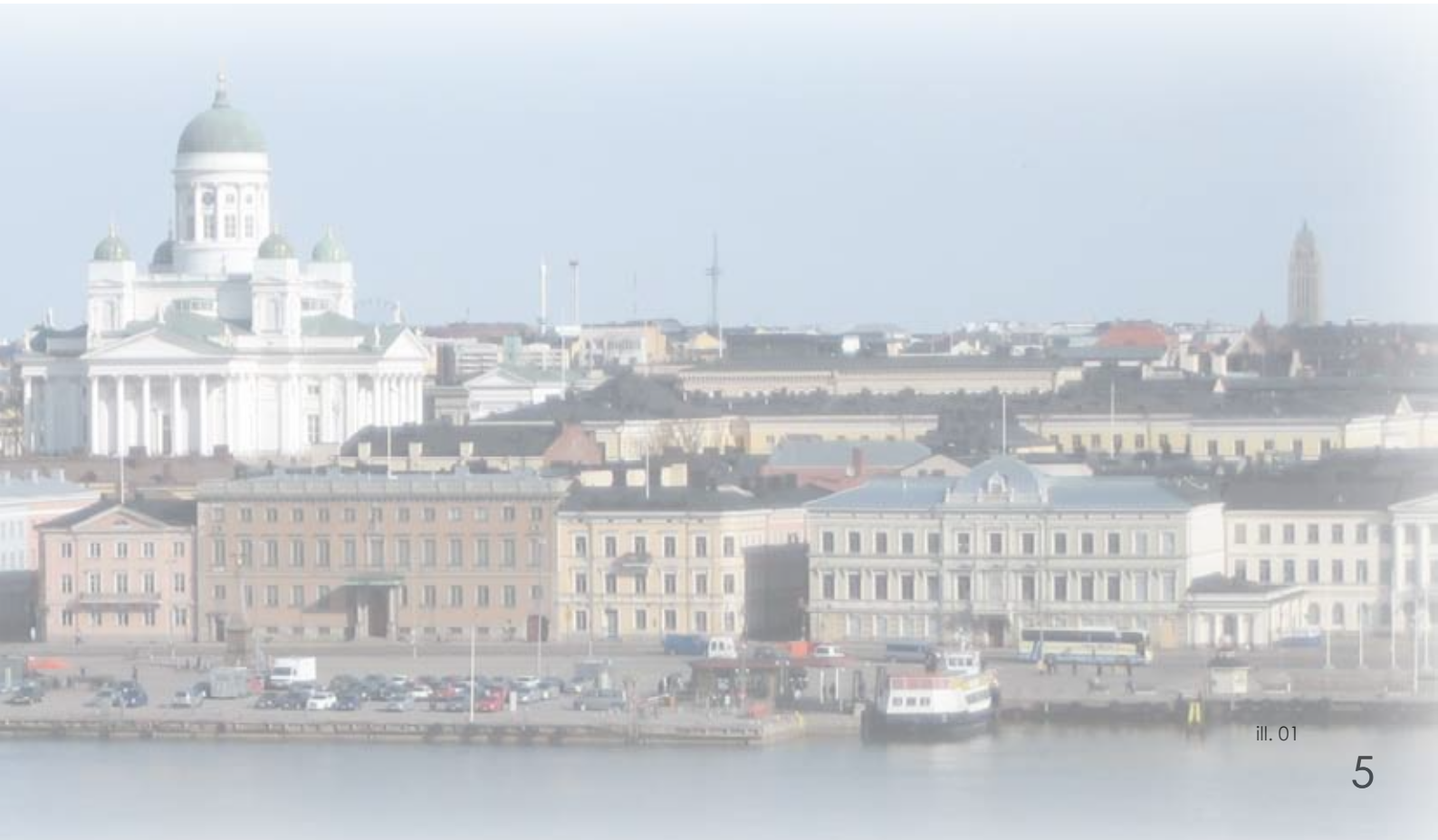

ill. 01

INVESTI-GATIONS

Finnish architecture

This chapter is an investigation into Finnish architecture which mainly during the modernism period has contributed a great amount of influence on international styles such as Nordic Architecture. The aim of this paragraph is to understand the origin of this specific style which even though was influenced by many international trends and became very unique and remarkable.

Pioneering Period

Carl Ludwig Engel, born and educated in Berlin, went abroad looking for employment. He became a City Architect of Tallinn where he discovered Empire Style of St Petersburg which he begun to admire. When Russians took over Helsinki after the war with Sweden in 1808-9,he was the leading architect in reconstructing the city. Engels vision was to establish ideals and identity of Russian Empire in the autonomous country which Finland was. Result of his work was the creation of miniature version of St Petersburg in Helsinki.

In Finland the split between engineers and architects begun in 1890 when planning became work of architects. Due to natural progression and creativity of architects, they started to become more than just designers of the facade. Nineteenth century required change of their position as they desired to become designers of the building. Encouraged by European trend in applying folk arts and building practises, Finnish architects seek their own identity by travelling to Karelia eastern region where the origin of Finnish language and culture was created.

Finnish romanticism was known for its seriousness which was result of Russification. The empire was aiming to distance autonomy from Swedish influence. Finnish romanticism didn't last very long and architects were urging avant-garde and dilettantism which was the evidence of desire for new spirit. [Connah, 2005]

Transition period

In 1917 at the brink of ending first World War, Finland reached independency. With help of German forces short civil war was won and Russian troops were defeated, Finland became a free country. New master planning was a result of technical and commercial development that through architecture demonstrated new possibilities of Helsinki. In the other hand social requirements had huge impact on design. In first years of independency Finland needed minimal living and hygiene standards therefore identity became secondary objective.

There were two major directions in architecture Nordic Classicism and Functionalism - German influence. In Finnish architecture these obviously opposite approaches found the way not to exclude each other. At that time study trips to other Nordic countries and to Italy became a strong part of architect's education. Although Finland was still under Swedish influence their response to internationalism and modernism was much more warm and intuitive. In the 1930 at the time of Stockholm exhibition which brought Nordic ideals and modernism fins were already thinking about refining and adaptations of the forms. [Connah, 2005]

White functionalism

Although the modern movement has grown to enormous scale there was still many architects who trained in classicism accepted change in more reserved manner. The parliament house which was designed in 1923-4 is the best evidence of those circumstances.
Short after monumentalism which was in contrast to the new attitudes in architecture had to give way to new trends among which 4 most characteristic were: the Bauhaus school, works and words of Le Corbusier, the Dutch De Stijl group and Russian Constructivism. While Alvar Aalto who promoted his own works in International Congress of Modern Architecture other lesser know architects were designing and shaping sensibility in the profession and contributed to the process that turned modernism to become more socially conductive. Finnish pavilion project in New York 1939 where Aalto presented Finnish architecture as responsive and humane as well as regional implications, leaded to Aalto being identified with Finland and its modern movement. [Connah, 2005]

W*ar Period*

Supported by Germany, Finland was bravely resisting Russian assault forcing Soviet Union to negotiate. As a result Finland lost a part of its territory including Karelia and Vippuri which leaded to relocation around 420,000 Fins. Nevertheless Finland remained independent. When war between Germany and Russia began, Finland was seeking ways to become neutral.
Characteristic aspects in architecture for that period were rationalising and more systematic planning. Great example of combining those two together is designed in 1938 by Elsi Borg- Children's Castle Hospital. Harsh wartime conditions forced architects to reach new and efficient technologies. Alvar Aalto has explored the American development of prefabricated elements. Aalto's intention was to bring that knowledge to Finland and establish laboratory for experimentations. His goal was to introduce more humane Modernism.
[Connah, 2005]

Helsinki railway statio *nill.02*

Kallio church *ill.03*

Artturinlinna Apartments (1932) *ill.04*

Eerikinkatu 33 Apartments (1933) *ill.05*

Children's castle hospital (1948) *ill.06*

'Snake Housing' (1951) *ill.07*

Saynatsalo Civic Centre (1952) *ill.08*

Kaivotalo (1956) *ill.09*

Expressive Modernism

After astonishing victory with Soviet Union Finland became world's centre of attention. Even though eventually part of territory had to be given up, reasons to pride were indubitable. Finland gained recognition on international scene as country of great courage. Modernism became a symbol of nation's rebirth. Finland was developing and expanding very rapidly in terms of technology and intellect. Since invention of television in 1950s numbers of books and newspaper has significantly raised. The impressive success of Nokia Company in 1990s was evidence of Finland being pioneer in broadcasting technology.

Along with the technical and economical growth architects who were very limited during the war period, now had their chance to establish new position and authority in society. While reconstructing the country demands for housing as well as public building were enormous. That situation leaded to enhance role of an architect society. Inspired by Finnish exceptional war experiences architects were encouraged to respond to that challenge in unique way and contribute much to International Architecture.

Increased demand for dwelling leaded city expansion towards the outskirts and creation of clustered city blocks that would interfere with the landscape. Finnish architects came up with sensitive and harmonious approach that resulted in various organic forms that would integrate with environment. Snake House designed by Yrjo Lindegren is ordinary housing complex putted in a snake shape form that would gently follow the landscape lines. New building methods allowed a creation of building of increased scale and iconic expression which leaded to change the image of many cities especially Helsinki. Kaivotalo designed by Paul Salomaa was one of the first big commercial buildings to have no load bearing walls and prefabricated elements used to experiment with space. Neon Sign on the facade added modernity both to the building and to the city. This kind of large scale projects had redefined the City of Helsinki turning centre into commercial, business and shopping hub.

Designed by Yrjo Lindegren and Toivo Jantti Olympic stadium was probably one of the most important developments of new chapter in Finnish history. Originally it was supposed to be constructed for Olympic Games in 1940 due to war Olympic were postponed and construction finished 1952. Stadium is in many ways link between past decades as it recalls the white functionalism and romantic desires. Tower obviously functionalistic element of the building was a symbol the young and vibrant republic.

In that period Alvar Aalto's has became recognized as international architectural master. As Sigfried Giedion would describe in his book "Space Time and Architecture": "Finnish architect with that 'inner source of energy which always flows through his maintained, Finland with him wherever he goes." Among the long list of impressive buildings Saynatsalo Civic Centre was probably one of the most characteristic projects that could demonstrate expressive intimacy of his works. [Connah, 2005]

Late modernism

Through the 60s Finnish architecture was strongly promoted by various exhibitions that took place all over the world. At this point Alvar Aalto turned into more monumental approach in his architecture examples are Finlandia Hall and far-reaching city centre plan for Helsinki. In his new project in 1962 Enso-Gutzeit Headquarter he used marble as cladding material. These attempts exposed Aalto to heavy critique and his role as leader of Finnish modernism was questioned. Architect Reima Pietila became famous for its experiments with organic forms. He's attempts to move beyond the limits and modesty of the neo-Constructivist. His works were in conflict with trends and achievements of Finnish architecture but brought him much recognition abroad.
The products of recent development in Finnish architecture were iconographic buildings of elegant appearance and technical advancement. Sanoma house and Nokia Headquarters are best examples of approach of those times. For many people what was lacking in such architecture was more poetics and soul. [Connah, 2005]

Summary

History of Finnish architecture came a long way: affected by political situations and wartime, influenced by many international sources remained exceptional and unique. Purity of given forms, honest in use of materials, careful adaptation to the landscape and humane approach to functions are reasons why it became internationally recognised and admired. Never the less recent development especially in big city areas although technology and functionally sophisticated lost some of its sensitivity. That kind of situation opened doors for foreign architects like Steven Holl to attempt for reinterpretation of Finnish modernism.
As a conclusion golden age of Finnish architecture was characterised by purity of the forms, choice of materials that creates humane atmosphere and the basis for phenomenological experience and sensitive relation to the surrounding landscape and environment. Mentioned aspects should be taken into the consideration in the Helsinki Central Library project.

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Tectonic approach

This paragraph is based on books: "Studies in Tectonic Culture" by Kenneth Frampton and chapter "The Crisis of Scale and Tectonic" of "Digital Culture in Architecture" by Antonie Picon and it is dedicated to analyse concept of tectonic approach in architecture.
The word "tectonic" was known in ancient Greece and it was referring to the art of crafting but it wasn't very common apart from those times. The term has made its return in recent decades and started to describe works of modern architects. The reason for that is the practice of some contemporary architects that by using modern technology are able to fully concentrate on architectural form and neglect structure which later is adjusted to the design. That kind of performances are considered to be atectonic and since it first became an issue various discussions and theories have been created in order to define which works can be considered tectonically correct. Those rules apply to construction in various ways and scales from buildings form to detailing of the joint.

Structure

One of most important characteristics of tectonic architecture is structural expression of the building. In nowadays we can witness many attempts to hide structural system which is neglected during the conceptual phase of the project. Building which is designed in such way may provide satisfying aesthetical experience yet tectonic architecture provides something more than that. Being able to understand how the building is put together and the load bearing system works provides common user with feeling of reflection upon the building and its architecture. Therefore significant role plays the readability of load bearing system which has to be well exposed and designed in such way that regular person could be able to figure out how it performs.
There is no better way to express that theory than quoting architect Auguste Perret:
"He who hides a column makes a blunder, he who makes false column commits a crime".
Architect Louis Kahn was opposite to suspended ceiling, in his opinion floor structure should be a manifest inside as well outside. [Frampton, 1995]

Materials

Each architect should be aware of construction materials properties. To ensure good performance it is crucial to consider which material will be the most suitable in given situation. Architect Louis Kahn in his famous speeches has attached a lot of importance for honouring the materials. Consulting the nature by analysing materials and their capabilities was very important for him.
Another important aspect of tectonic approach is honesty in presenting used materials. One should

Turku City Library ill. 26

Salk Institute ill. 27

not use renderings or materials that imitate something that they are not. Architect Jorn Utzon when dealing with large glass panels was always trying to avoid placing them in vertical position otherwise they could appear as a load bearing element. [Frampton, 1995]

Joint

According to Semper, a joint is the most significant element of construction, it is the place where all the things come together and it represents the transition between base of the building and its tectonic frame. It is very important that joint explain how the forces are being transferred from one element to another, it should tell the story in order that common person can comprehend how it works. Semper believed that careful articulation of the joint is the essence of the architecture. [Frampton, 1995]

Form

In recent development the line between the infrastructure and buildings has faded away leading to programs like giant airports or super-shopping malls. That resulted in a need of using digital technology in order achieve structural solutions. What follows is that technology which initially was supposed to help solve difficult technical challenges became a reason to create a distance between architectural imagery and building techniques. Buildings of Frank Ghery are probably the best example where spectacular architectural form takes over and there are very little considerations regarding the structure. [Picon]

"We refuse to recognize the problems of form, but only problems of building. Form is not the aim of our work, but only the result.
Form by itself, does not exist. Form as an aim is formalism; and that we reject"

That declaration of Mies van de Rohe indicates that form of the design has to be strictly related to the buildings function and the result is nothing more than tectonic expression. [Frampton, 1995]

Architects like Jorn Utzon seek inspiration in the nature, in his opinion shape of every plant and animal had a mathematical and physical basis where nature took most beneficial path in accordance to laws of physics. Furthermore Utzon argued that understanding of those principles makes us admire their harmony and beauty. [Carter]

Following the tectonic approach architect is bound to consider structural system in his project and create form that is optimal for it.

Saynatsalo Civic Centre ill. 28

Kuwait's National Assembly Building ill. 29

Evolution of library

Library of the past

First Libraries appeared already in 3rd century BC, they were mainly private collections. Usually their function was closely related with religion, many important leaders created those as a workplace for their artists and scientist. The ruins of the Library constructed by Eumenes II in 2nd century BC in the city of Pergamon were discovered in 1878. The building had the typical layout of ancient Greece. The access to the building was through numerous doors from columned portico. The library was divided into four big rooms. There is still a debate among scientists about what functions were performed in those rooms.

First Libraries in ancient Rome were created by conquering precious book collections during wars. In last years of the republic and during the empire possessing library became a fashion among wealthy citizens. Very often Library was maintained just in order to improve image of the owner as a person of knowledge and wealth. The potential of the libraries was also noticed by the government. Yet any of those Libraries were open to public. While republican system was being replaced with empire, initiatives to create public libraries begun. The erection of the first public library was planned by Julius Caesar which was unfortunately interrupted by the death of the emperor. It took five more years to open the first public library which was placed in Roman Forum in the temple of freedom. "Atrium Libertatis" was equipped with Greek and Latin literature available for public use. It was decorated with painting of famous Roman writers.

Milestone in development of public libraries was "Bibliotheca Palatina" which was created by Caesar August in Apollo's Temple in 28 year BC. It became greatest library in whole city and a role model for future libraries. At the same time book collections were placed in the public baths as those were places of gathering, discussions and reading.

First medieval libraries started to appear in 5th and 6th century. The methods of creating the library and solutions for using them that were developed in ancient world were never transferred onto medieval as the libraries at that time were under the control of church. Most of the libraries were placed in church vestry, monastery or a special church extension. Such library functioned both as book storage and a reading place. Bigger books were attached with chain to specially carved desktops as they were under the risk of theft while the smaller ones were kept in closets. All the medieval libraries had private character or they were tightly related to group of people. Finally during Renaissance, libraries were opened up for the public. The invention of book printing by Johannes Gutenberg revolutionized the accessibility of information. [Skórka]

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Library Today

Since invention of the print, books became available for everyone. Libraries would grow in every city, becoming a symbol and knowledge. In the recent decades not much has changed in the way that Library would operate. They became places to store distribute and read books. Recently more and more concern is taken to implement technological solutions within libraries. Traditional reading desks are now being replaced with computer stations.

In present times we will witness transformation of Library into something new. It is evident due to recent development that role of the book as a source of information has significantly decreased. With increasing role of technology when more and more information is available through media like internet one could say that necessity of visiting Library is no longer necessary. It is very likely that decade from now all the literatures could be available without leaving home. However range of the users of library has expanded in recent years. More and more libraries are providing spaces for children activities, libraries became favourite choice of the students who besides learning gather there for social purposes, not to forget about elder citizens who are used to visit library and spent their time there reading. All those target groups have to be taken to consideration while designing a library building today.

Although Library which still remains as a symbol of knowledge and potential of citizens, it never was just a place of gaining information. Since ancient times Library was the place where discussions and exchange of the ideas among the citizens took place, function of enriching and shaping cultural identity of society. Library became also a cultural hub where art, music and movie found their place. New libraries offer small cinemas, art exhibitions and music-listening facilities. Frequently we are able to find libraries where children are able to do various activities including: interactive learning, bard and video games.

Since Library is losing its position as a place of distributing knowledge it is possible that the role of the library will turn from a place of gaining knowledge to a place where knowledge will be produced. Therefore much more focus should be taken to improve working conditions and make them creativity friendly. Program of the Helsinki Central Library envisages places where people can work together in various flexible environments, places where common users can publish their own work. That concern not only writing, many libraries today provide users with opportunities to rehearse and record music or use video and photo workshops. [Werf]

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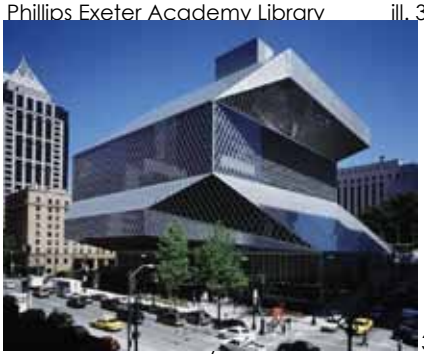
Case studies

This investigation is an attempt to analyse various aspects of library design. Basis of the studies is to evaluate different approaches and ideas that have been developed in library design of recent century. The aim is to compare relevant projects in order to find most suitable solutions.

Stockholm Central Library was chosen as an example of neoclassical project which implies monumental and iconic expression of the building which was characteristic for century. The finalist of Stockholm library extension – Delphium projects is taken in to consideration due to its humble expression and adaptation to the context of iconic building. Seattle central Library was selected to represent technologically advanced project that consider many aspects of the future use of libraries. Viipuri Library was chosen as an example of Finnish modernism movement, featuring functionalistic approach of crating working spaces and utilization of daylight. Sendai Mediatheque is project where structural solutions enabled the project to provide large open spaces with impression of lightness. Media library at Dalarna university recent competition winner in Sweden where focus on the user experience resulted in creating flexible and vibrant working areas. Jaume Fuster Library in Barcelona is the project where particular relation to the context was developed in combination with user friendly and comfortable working zones.

Phillips Exeter Academy Library ill. 30



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Media library at Dalarna university ill. 32

Stockholm Central Library ill. 33

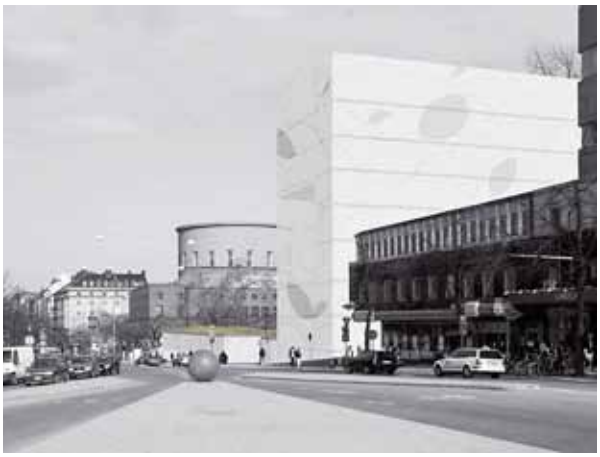
Jaume Fuster Library ill. 34

Sendai Mediatheque ill. 35

Viipuri Library ill. 36

Expression

The site of the project is surrounded with many architectural landmarks therefore it is necesary to provide humble design that will remain a background for other key establishments. Nevertheless Central Library building will be very important institution therefore it is crucial to give it interesting and intriguing appearance. The recent competition in Stockholm is a fine example on how to deal with neighbouring monumental buildings. Architects decided to distance their project from existing building by creating one story plateau covered with green roof that is connected to the nearby park. What characterise the project is sensitivity and harmony with the urban context. White colour of monolithic facade creates both mysterious and inviting impression.



Stockholm Central Library ill. 37

Sendai Mediatheque ill. 38

Typology

The typology of library building depends on various factors. Most relevant aspects are obviously site dimensions in relation to building programme and context. Huge role in defining the typology of the library is its type among which we can distinguish: national, public, university, school and specialised library.

Central Library in Stockholm which is central national library of Sweden represents monumental approach. Raised above surrounding buildings on the plateau with staircase leading to the entrance building became landmark. In the most of other examples projects are multi-storey buildings but in those cases context might play big role since they are located in the city centre and plot dimensions forced such typology.

Experience

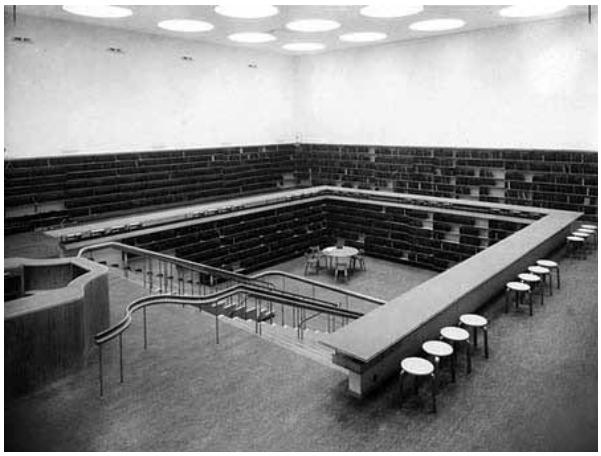
There has been a huge change in experiencing the library building in recent decades. Library as an important institution used to be very formal often cold place. Nowadays Libraries still represent place of knowledge but in more user friendly way. It became not only place to store and read books but also place for entertainment and leisure. Library today offers inviting spaces for group work, socialising and using modern media. Dalarna multimedia library is an example where lot of focus was dedicated to crate comfortable environment by providing various recreational functions and furniture. The layout of the piazza is flexible and can be adjusted to user needs.

Media library at Dalarna university ill. 39

Entrance

We can define two general types of entrance. First one is emphasized and clearly marked in the façade of the building. Those kinds of entrances are usually preceded by staircase or some kind of path that is leading to it. That kind of exaggeration is mostly common among the monumental buildings of the past like Stockholm central library. Nowadays Libraries are usually open from many directions, especially when project is located in dense urban area it is important to provide certain openness of the institution good example is Seattle Central Library. The disadvantage of such solution might be the fact that entrance is not very obvious and that could be misleading. The balanced solution might be the one presented in Jaume Fuster Library in Barcelona where entrance is very clearly pushed it into the library volume which makes it very exposed but without unnecessary exaggeration.

Jaume Fuster Library ill. 40



Viipuri Library ill. 41

Work Spaces

Project of Central Library in Helsinki requires two kind of working spaces: private (quiet) and group (semi quiet). In traditional Libraries like Stockholm Central library, work spaces are separated from main hall where silence and proper light conditions are provided. In case of Viipuri Library work spaces are surrounding the main atrium and book shelves which are on the lower levels serving as base for a reading desk.

Book Collection

The way of displaying the book collection may differ from one library to another. In many cases books are exposed towards the visitors in order to use them as a symbol and decoration. Such approach makes searching for books easier. In other examples books are stored in rows of shelves that kind of solution provides feeling of intimacy while browsing books and can be used to form quiet reading areas.

Sendai Mediatheque ill. 42

REGIS-
TRATION

Introduction to the site

The town of Helsinki needed new city centre that could represent Finland independency and democratically structure. Alvar Aalto himself investigated various possibilities to determine which site within areas of the city would be the most appropriate. The reason for no intervention in the old city centre was that it represented Finland's autonomy and was fulfilling the political requirements and functions.

Töölönlahti was favoured location due to its representational layout and possibilities that could solve the problem of city traffic. Aalvar Aalto envisaged the area as new cultural centre situated between railway station and parliament building.

In his plans he considered academy, congress hall, concert hall, opera, art museum, municipal library aligned along the main road, and to reserve four additional sites for future buildings. In his vision he would create large piazza consisted of three descending traces under which he would inhabit parking spaces for 4000 cars and convert old part of the town to a pedestrian area. [Fleig, 1975]

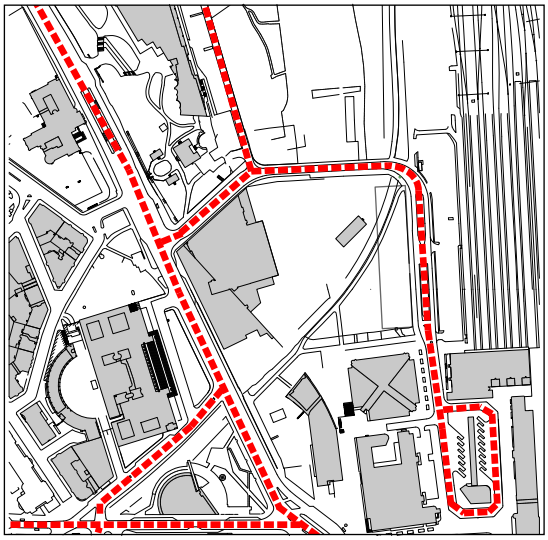
Alvar Aalto didn't live enough to whiteness the entire transformation of the new city centre, furthermore initiatives to develop that area were neglected until 1985 when the new Nordic competition was arranged. Finally, 25 years after his death, utopian plans of Aalto started to become true.

By gradually adding cultural buildings, over the years Töölönlahti has become an intellectual centre of Finland. Currently the area inhibits such great institutions like: Finlandia- Finnish national opera, Kiasma- museum of contemporary art, Helsinki music centre and Finnish parliament house. Central library project will become another important step in the realization of master plan.

ill. 11

Mapping

Mapping is a set of investigations that provide knowledge and understanding of the site. Investigations will concern important matters of the site including traffic analysis, environmental features of the site and context studies, all accompanied with pictures and diagrams. The aim of the mapping is to provide sufficient information that is needed to start design process.



Car traffic routes ***ill. 12***

Accessibility

East and North borders of the site are marked by the Tölöviksgatan Street which is the only boundary between project site and the railway and bus station which makes building very accessible. In addition there is a tram line passing in very close distance making it even easier to reach the library

Train traffic routes ***ill. 13***

Train traffic

North and east facades will be very exposed to the railway traffic. People arriving into the train station will be able to observe the Library building. That situation will change when the master plan of the area is executed as there is an additional building considered which will separate library from the railways.

Parking

As the area of Töölönlahti was developing and new cultural building were continuously added the need of parking space has arise. Fortunately enough that problem was solved and car-parking facilities are currently being constructed and will be finished in year 2012. Car-park will serve the entire area that will include the Library building.

Pedestrian main paths ***ill. 14***

Pedestrians

Due to ongoing construction works in the area the number of pedestrians in the area is low. But in the future pedestrians will play major role in the area. Expected main pedestrian paths will lead along the park area.

Green areas

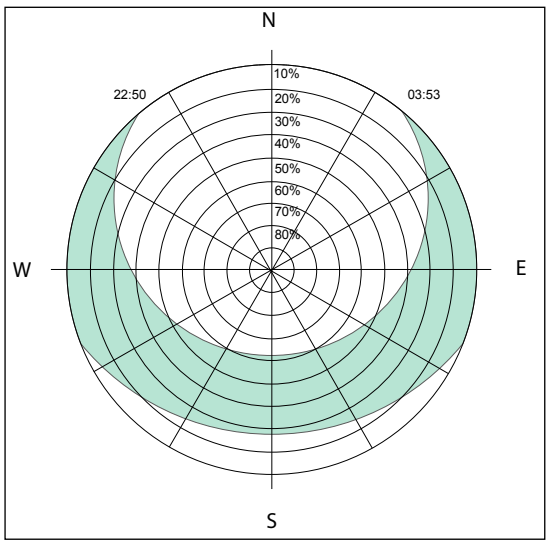
North-West façade of the project will face the green areas of Hesperia and Makasiinipuisto Park. Trees and grass fields are accompanied with waters of Töölönlahti, it creates natural buffer zone between library building and Opera hall and music centre. Displaying the views towards the park area will be important aspect of the project. The park area has to be considered to be occupied with pedestrians. Close relation to the nature and pedestrian routes give the best opportunities to crate café area in that side of the project.

Green areas ***ill. 15***

Sun and wind

In order to understand environmental factors of the site sun and wind diagrams have been developed. Sun diagram shows the path of the sun over the year, that knowledge will be helpful to understand how our project may affect surroundings by shading them.

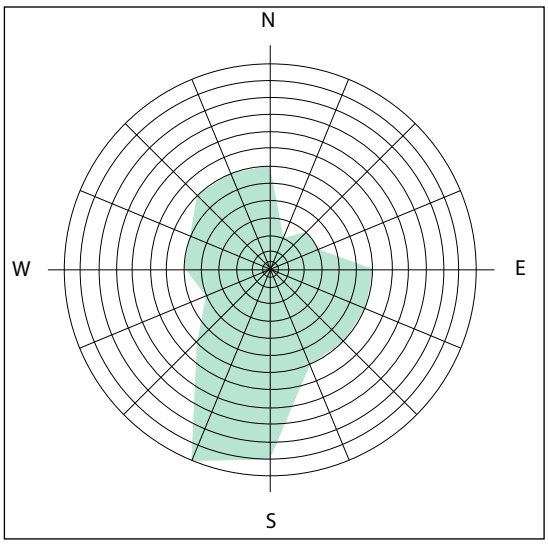
Wind is an important factor especially when it comes to creating outdoes spaces.
As diagram shows the majority of the wind comes from the south which is the direction of the sea. Fortunately that side is shielded by neighbouring buildings therefore wind is not a major issue of the project.



Sun path diagram ***ill. 16***

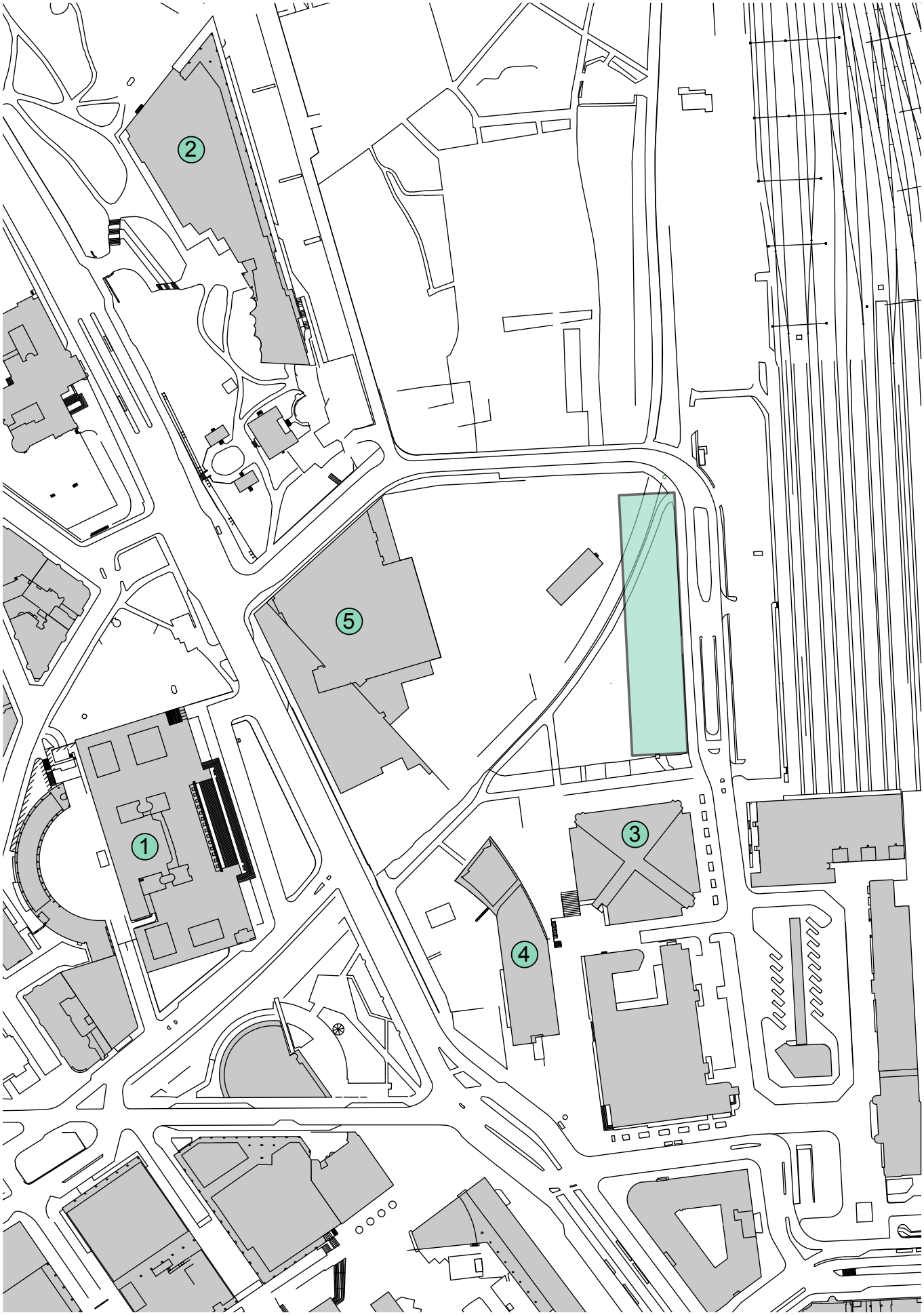
Conclusion

In conclusion project has no rare façade, every side of it shall be considered carefully in regards not only to its function but also to its appearance. Site has to offer variety of different situations, it revels great views towards the western green areas while being exposed to the traffic by the north east side.



Wind direction distribution ***ill. 17***

Landmarks



ill. 18

1 Parliament House ***ill. 19***

Project designed by J.S. Sirén in architectural competition in 1924 became a rational-classical monument, for many it was a symbol of an end of era. Project was proving that not all of Finnish architects at that time were dedicated to functionalism. As architect had freedom to focus on the beauty of the building it became 'art for sakes of art' such approach was in contrast with new modernistic trends in architecture.

New parliament building represented independency and rebirth of the Finnish nation, by the time it was constructed it was playing important role in the life of Finland. [Connah, 2005]

2 Finlandia Concert Hall ***ill. 20***

The opera hall is designed by Alvar Aalto in a commission in 1962. It's one of the last developments in his career. It represents many characteristics and values known from other works of Aalto. It's in this specific project where Aalto attempted to combine monumental expression of the building with functionalistic approach which is key in case of concert halls. As a result project does not follow strictly one architectural style. The form of the building is dictated by the practical requirements, functions and constructional solutions. In the other hand it has ornamental composition of cubistic forms yet any of those elements is purely decorative. Alvar Aalto in his functionalistic approach tried to justify each of his design decisions. Materials were playing also very important role in this project: white marble was used both on the exterior and inside of the building was as a link with Mediterranean traditions that Aalto wanted to introduce in Finland.
[Schildt]

In eyes of many this project was a sign of end of Alvar Aalto's role as leading Finnish architect. The modest and humane expression that was speaking through Aaltos projects was lost.
[Connah, 2005]

3 Sanomatalo ***ill. 21***

Designed by Prof. Jan Söderlund and Architect Antti-Matti Siikala who won the competition in 1995 organized by Sonoma- one of the leading Finnish newspapers. Like many projects constructed in late 20th century Sanomatalo was a symbol of Finnish advanced technological level. Elegant in its appearance and structurally and technically sophisticated was a good example of where Finnish modernism had leaded.

For many in profession projects like that were disappointing, there was no surprise no romanticism, all the design parameters were result of cold calculations. What was missing was the sense of humane and poetics. [Connah, 2005]

4 Kiasma Museum ***ill. 22***

Contemporary art museum designed by American architect Steven Holl who won the open competition in 1992. The project provides various spatial experiences. Spaces are designed to match different kind of requirements of the exhibited art, the general approach is to offer silent contemplation mood that favour intensive experience of art to its full extend. [Holl]

Steven Holl has become first foreigner since C.L. Engel to create project in Helsinki, his work was selected among the 516 entries. His project presented much freedom in shaped forms recalling works or Reima Pietila. Architectural award of Alvar Aalto Medal for Steven Holl has brought a lot of controversy. Many were opposed to the decision pointing recognized Finnish architects. Decision of granting the award for Kiasma has questioned future of Finnish architecture. [Connah, 2005]

5 Music centre ***ill. 23***

Latest addition to the cultural centre of Töölönlahti designed by young architect Marko Kivistö. Competition was initiated by the The Sibelius Academy and the reason for another concert hall was that acoustic properties of Finlandia main hall were not satisfying. The project aims to be humble and not to create competition for existing architectural landmarks.

A big part of the building is placed beneath the ground level in order to maintain roof line aligned with neighbouring buildings.

Conclusion

Töölönlahti is a specific area in the City centre of Helsinki which inhabits significant amount of landmarks. Each of the project symbolise not only different style and function of the building but it also represents the times where it was erected and the political situation that it was influenced by. Monumental projects like parliament building and Finlandia Concert hall are now neighbours to more recent developments like Sanoma house which stands for an Icon of technological advancement of Finland and Kiasma Museum which intended to influence the image of Finnish modernism.

Placing the project in such neighbourhood is task full of challenge, as recent music Centre competition showed good approach is to introduce humble and modest design that won't create competition towards the existing landmarks.

Architectural vision

In order to define architectural vision of the project set of different aspects were taken to consideration. Those analyses are presented in a form of various themes that were found to be important for the project.

Relation to the site

As mentioned before project is very exposed in all the directions. As important Library building will become for the area it is crucial not to create any kind of competition between project and existing landmarks. Therefore intention of the design is to be intriguing yet humble.

Experience

Project should provide different possibilities and experiences, at the entrance distinguished feeling known for institutional buildings as well as more comfortable and intimate in the working place and reading rooms. Layout of the building should imply the movement and the variety of views and places to explore should be provided.

Central gathering space

One of the most characteristic elements of Finnish libraries is centrally placed atrium area. What is very particular in those spaces is the feeling that could be compared to being outdoor experience. Project's intention is to provide contemporary reinterpretation of traditional central gathering place.

Collection

Focus on both traditional and conventional media should be equal. Books the main source of information shall be exposed as symbolic and attractive element motivating to gaining knowledge. New media platforms should be integrated in the design in the way that would create harmony and both sources of knowledge could coexist as equally important.

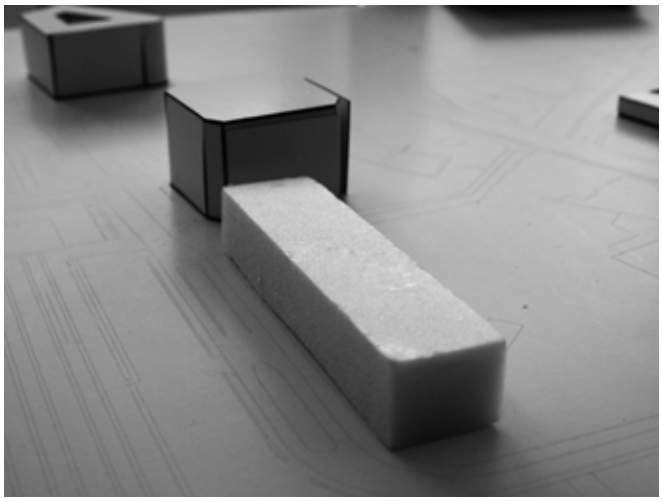
Structure

Form of the project should be defined by optimal structural principles. The performance of structural system should be clear and readable. Joints should be emphasized and articulated in a way that can help to understand connection between elements. Material should be used according to their properties in order to reach to performance.

DESIGN PHASE

Volume studies

In order to determine the shape of the project basic volume studies have been performed. The purpose of those studies was to find form most appropriate in relation to the context as well as most optimal solution for project purposes.



Urban block

This typology utilizes the majority of the site area making it possible to maintain low height of the building.

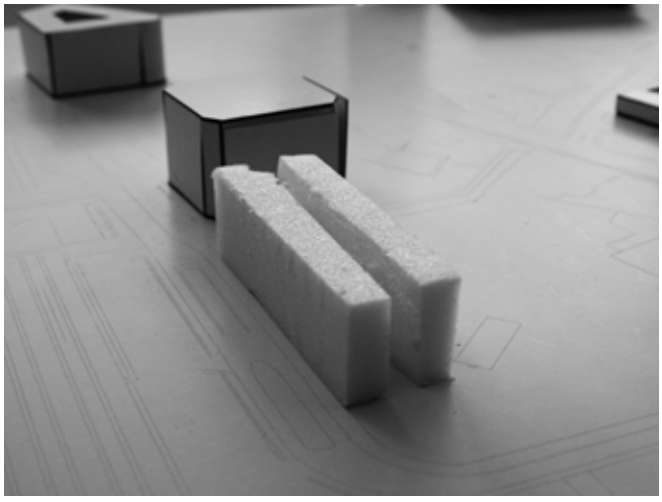
It enables to create big open spaces inside the building

It relates to the other long volumes in the area (Finlandia Hall, Kiasma museum).

It follows expression of urban fabric as it is aligned to the road.

It becomes acoustic barrier for the green areas by separating them from traffic noises.

Compact shape increases energy efficiency of the building and simplifies the installation system.



Two longitudinal volumes

It increases the amount of facades therefore the amount of daylight entering the building.

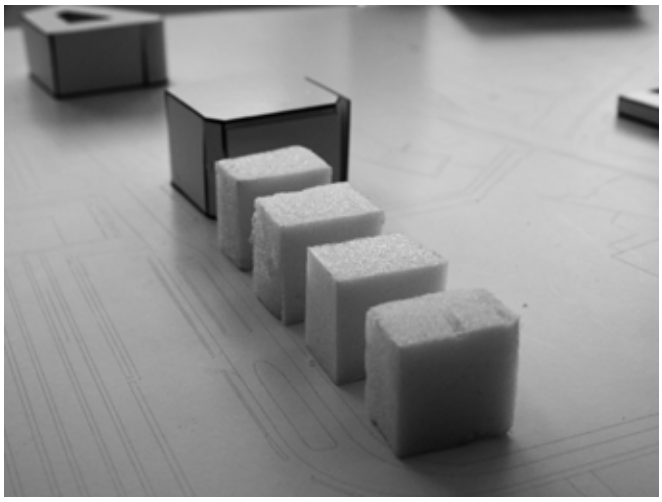
It reduces the energy efficiency and increase the number of installations.

It requires more height in order to fit fulfil the program of the site.

It creates wind flows in between the volumes.

It creates shaded inner space between the volumes.

The space in between would be unpleasant to stay for its proportions and environmental conditions.



Four volumes

It maximises the amount of the daylight that enters the building.

It requires more height in order to fit fulfil the program of the site.

It gives the possibility to separate functions.

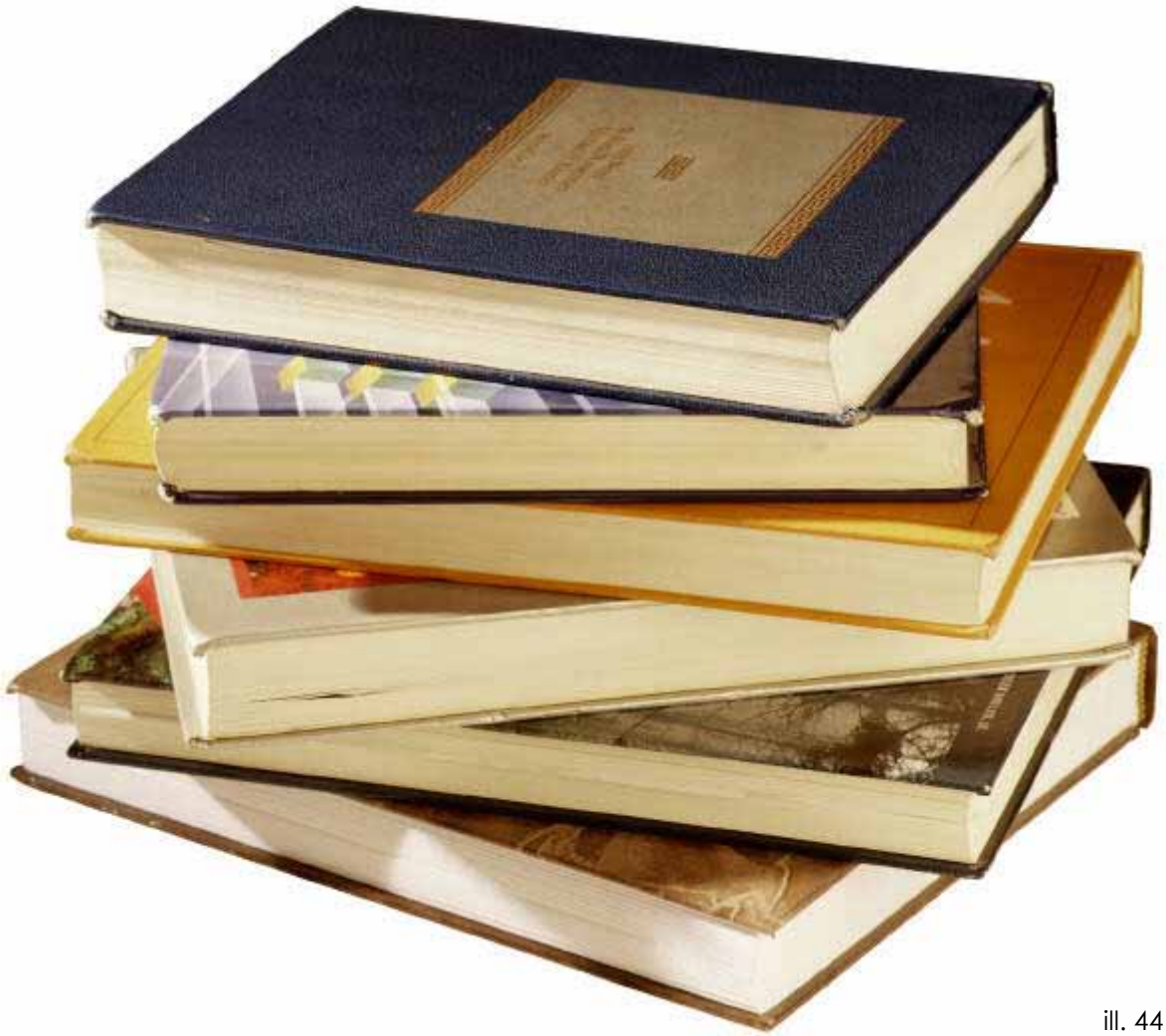
It diffuses the volume of Sanomatalo.

It multiplies the number of installations and increases energy consumption necessary for conditioning system.

Volume studies ill. 43.1-43.3

Conclusion

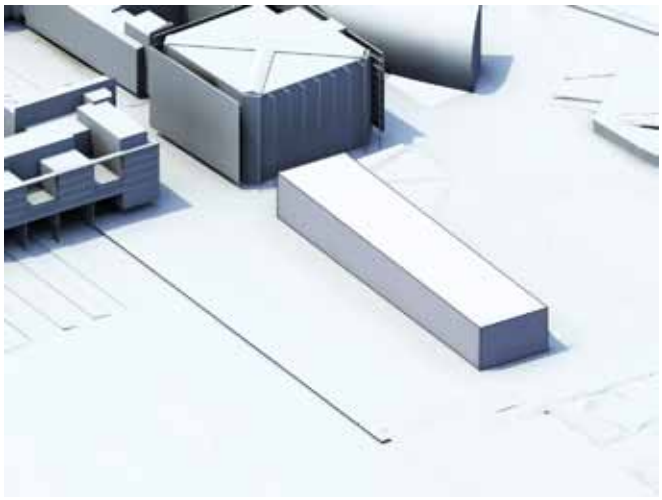
As a result of the studies urban block form was chosen for further development. Long block form suits in most favourable way both the urban demands and the requirements of library. Furthermore shape gives best possibilities of achieving humble expression mentioned in architectural vision.



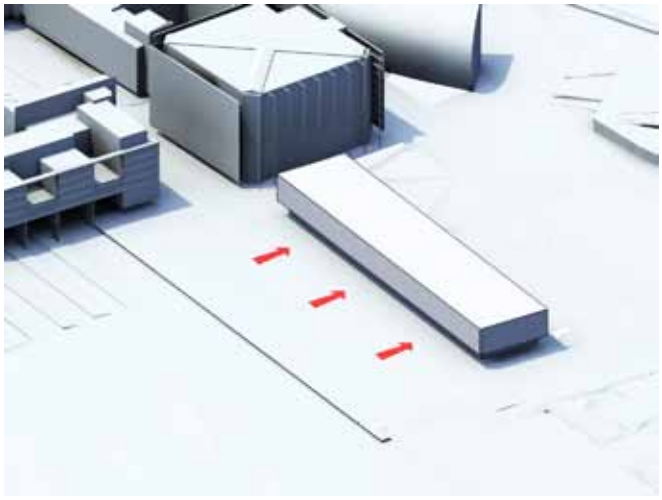
ill. 44

Concept development

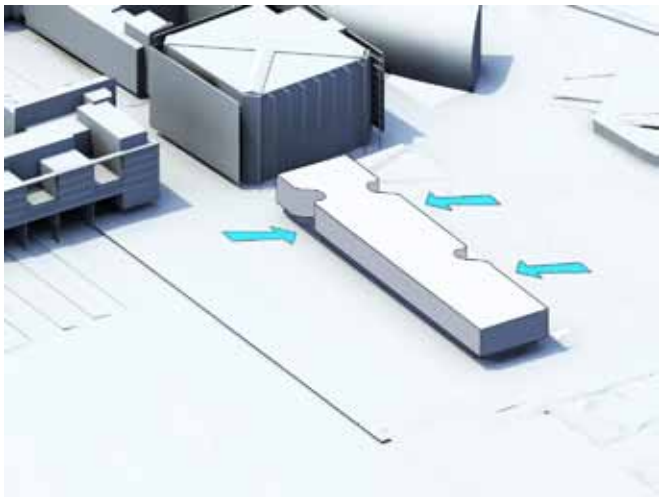
This chapter is dedicated to describe further development of the building concept.



In order to maintain low height that could correspond to the cultural buildings in the area it was decided to utilize majority of the construction site.

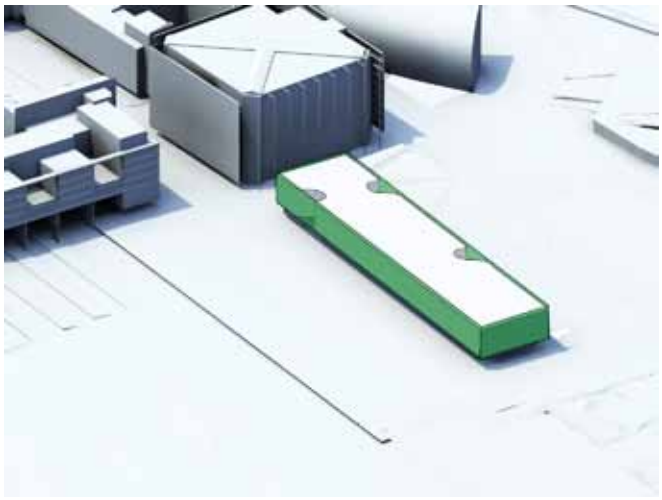


The volume is being “pushed in” on the ground level from the street side to expand pedestrian walkway

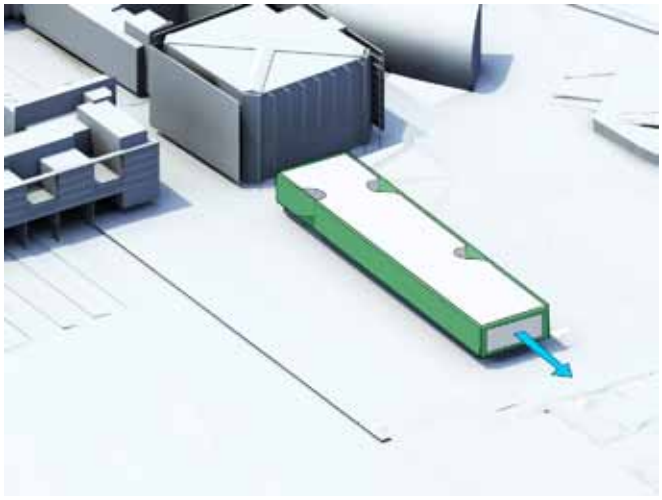


The volume is cut to mark the entrances. Entrances are provided from the street side to face the train and bus station which will promote the flow leading to the library building. Another entrance is facing the Parliament house making relation to the other buildings located in the site. Last entrance is provided to create connection with the park.

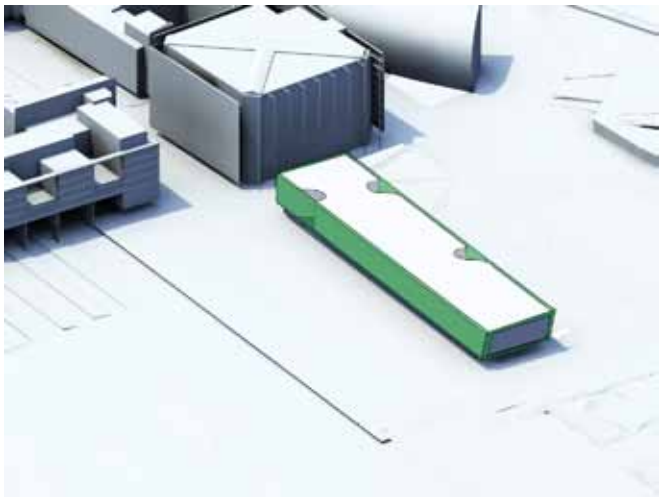
Concept development ill. 45.1-45.6



In order to maintain humble, monolithic expression of the project and at the same time control day-light factor in the building solar screen was applied to the project.



In order to frame important views openings in the solar screen are provided. North facade is opened to create screen that will face the park and trains arriving to the City.

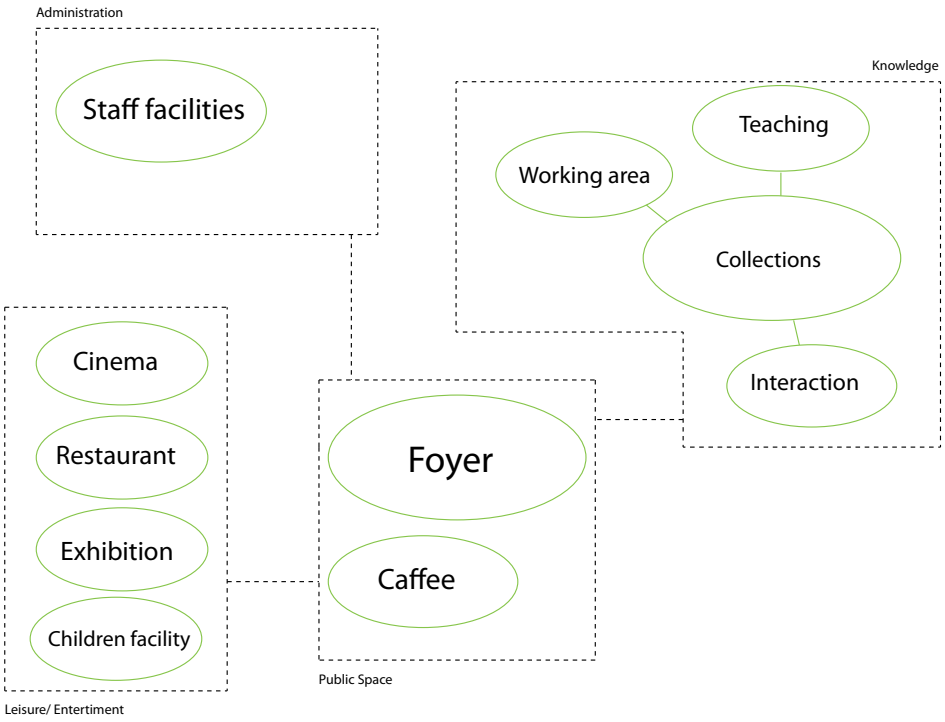


In order to avoid expression that could indicate structural value on the glass panels they are inclined in the side of the building where they are exposed.

Division of functions

In the process of organizing different functions and understanding their relations the areas of similar purpose were clustered. As a result, following categories were developed:

Public areas: the representative spaces dedicated for meetings and lobby functions
Knowledge: the collection area that is combined with working units and teaching facilities
Entertainment and leisure: the more free time functions are clustered and placed away from collections areas
Administration: all the staff facilities and related to its spaces

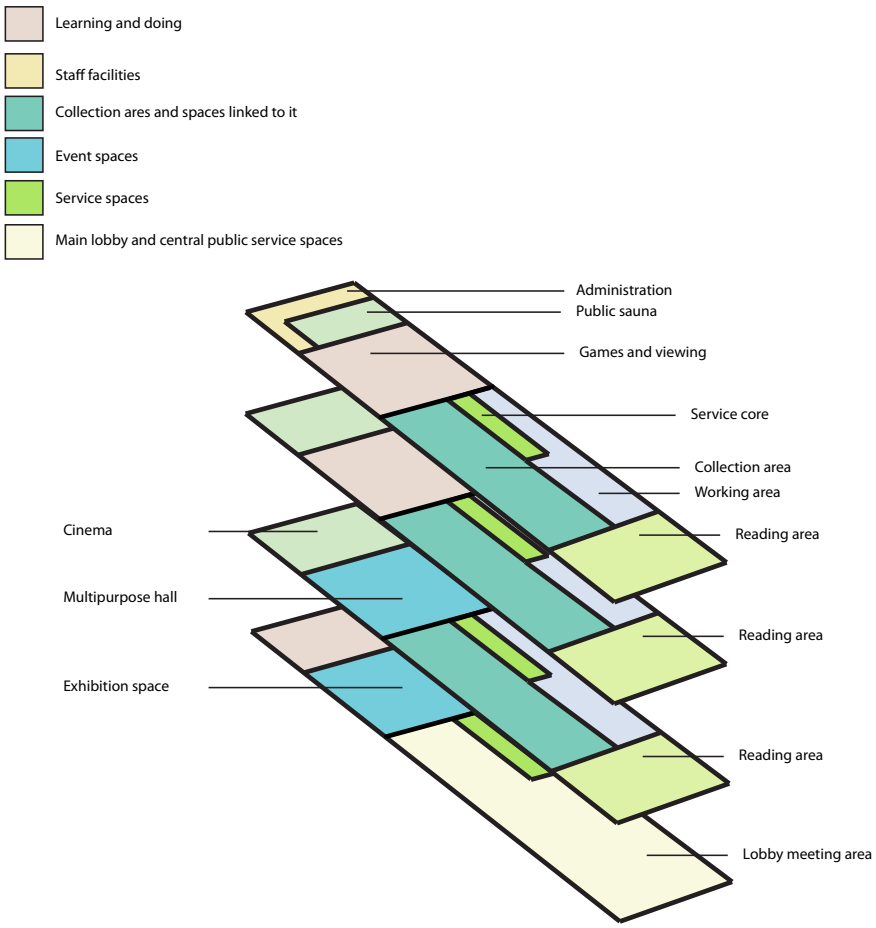


Division of function ill. 46

The foyer functions are placed in the ground floor spaces and they can be experienced upon the arrival to the library. Collection space is placed in the central part of the project in order to emphasize the symbolic value of the book. The working spaces are partly combined with collections areas and isolated in the other areas. Entertainment sector is placed away from the other functions to create a distance between work and leisure.

Division of function section ill. 47

Spatial program



Spatial program ill. 48

Spatial outline

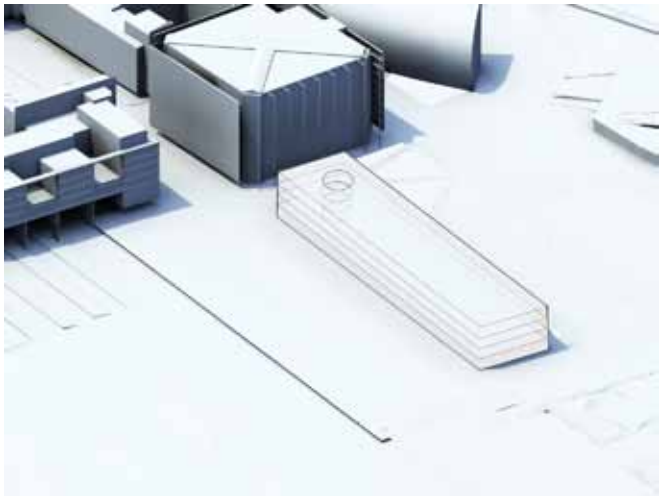
Main lobby and central public service spaces	1150	m2
Event spaces	1570	m2
Spaces for external service providers	840	m2
The collections area and spaces linked to it	2780	m2
Learning and doing	2040	m2
Staff facilities	430	m2
Library logistics and library material handling facilities	480	m2
Service spaces	710	m2
Programme floor area in total	10 000	m2

Atrium design

Atrium in Helsinki library ill. 113

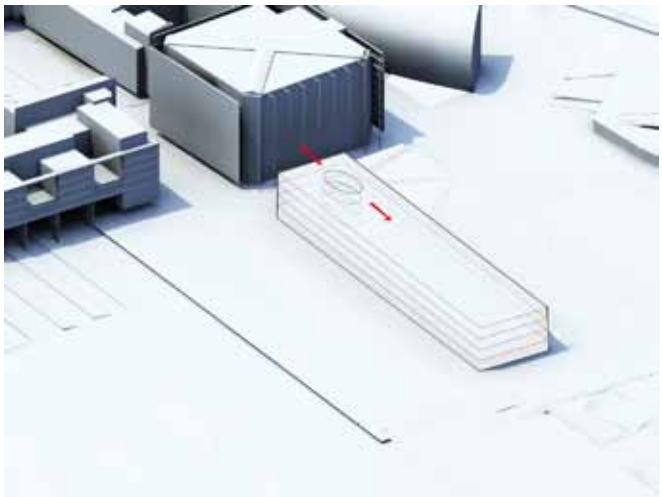
Role of atrium in Finnish architecture

One of the most characteristic elements of Finnish libraries is the Atrium.
Specific climatic conditions that are in North Europe force people to spend most of their time indoors which is in contradiction with human nature. The attempt of architects in Finland was to create indoor experiences that could be comparable to being outside. Spaces where one can benefit from daylight and have a feeling of openness were always desired in Finnish libraries.



Positioning of atrium

It has been decided to place the atrium in the south end of the building as it is the area of main lobby functions as well as the place where two entrance of the building converge. Purpose of the atrium is to give more qualities to the interior in terms of spatial scale and natural light.



Atrium design ill. 49.1-49.2

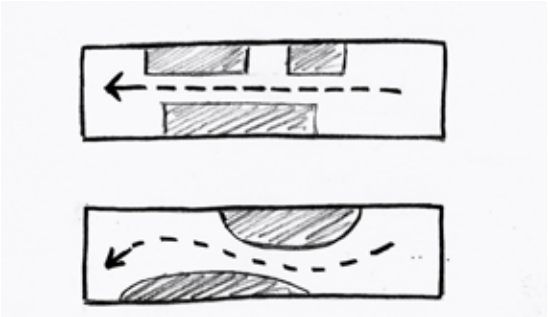
Atrium shape

Initially round shape was adopted but due to the site dimensions it was stretched forming oval shape and providing more daylight inside the building as it is covered with glazed dome.

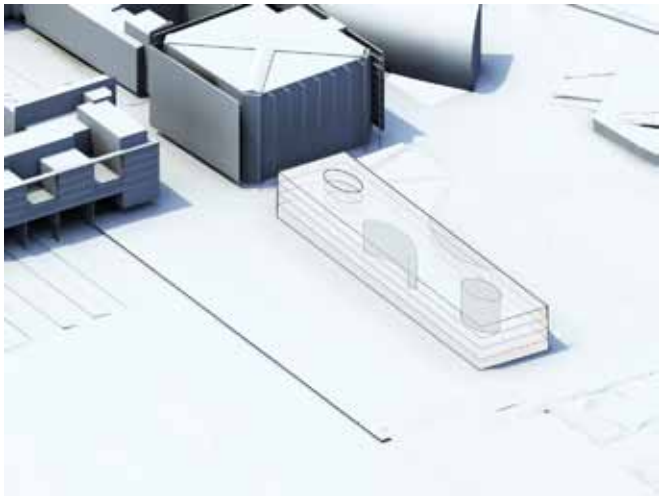
Flow through the building

Arriving to the library

The majority of the arriving people will enter the building from south east side as it is the entrance facing the public transport. Upon the arrival visitors will be welcomed with main lobby area. The ground level is very open and it easy to explore. The lockers areas as well as the cloaking room are located in central part of the floor making it equally accessible from every entrance.

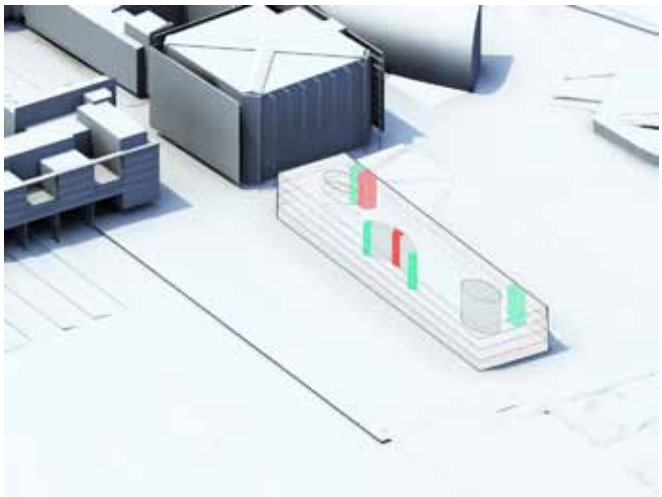


Inner flow



Although the general idea of the project is to create open layout the flow through the project should provide more dynamic experience rather than just long and straight corridors. Additional service core together with secondary atrium shape the flow that is more organic in its expression and at the same time it divide the space to accommodate more isolated functions.

Vertical circulation

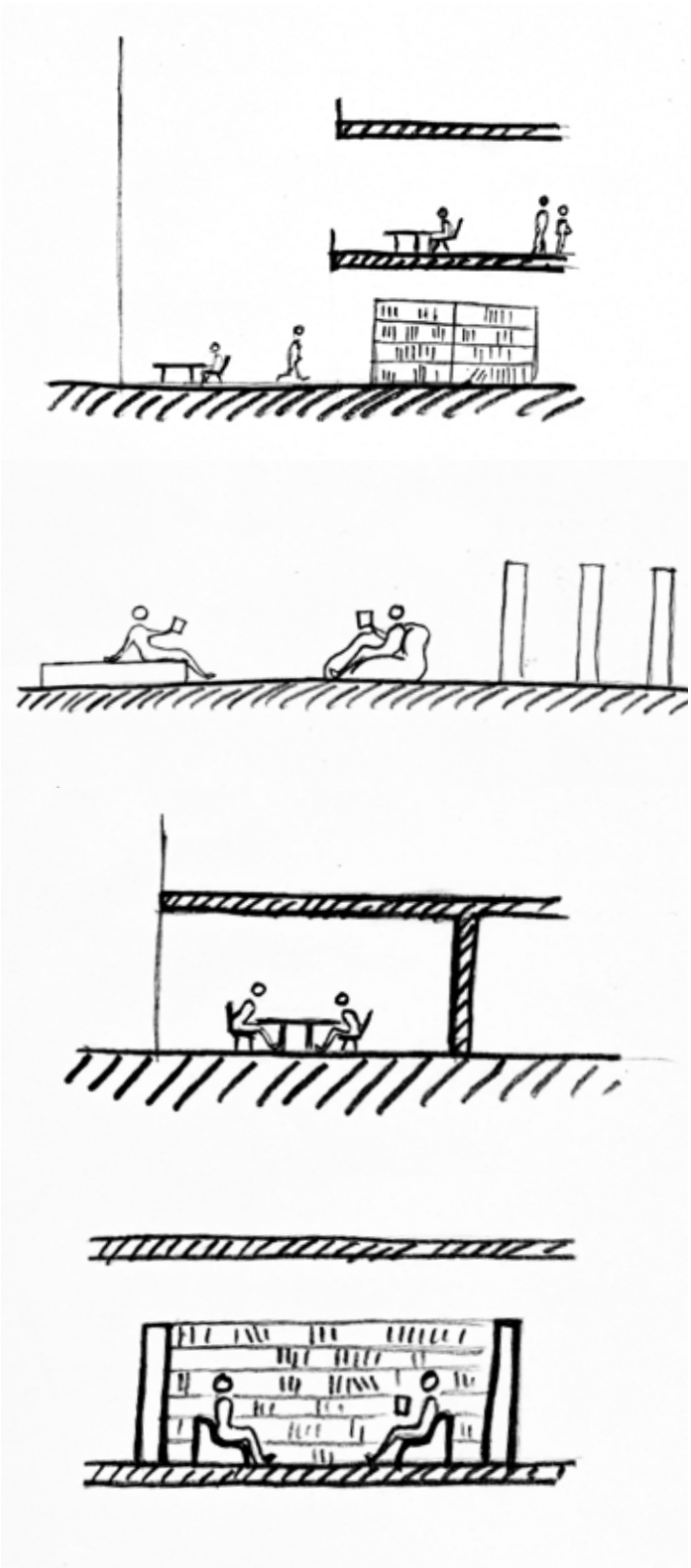


Upon arriving to the library visitors have possibility to access different levels by using main staircase that is designed to provide the continuous flow thorough the project. Secondary staircase is located in the north part of the project and it is aligned to the wall of the load bearing core. Beside main staircases project is equipped with additional 4 fire staircases distributed in all areas of the project. Alternative option is to use two elevators which are located in the centre of the project while additional elevator is in the main atrium area.

Flow diagram ill. 50.1-50.3

Working and reading areas

Library project will host various types of users and will serve different purposes therefore it is necessary to provide different working and reading areas. Projects layout in general offers a lot of open areas but in order to provide more intimacy more enclosed working and reading places are incorporated into the design.



Working units in open layout

The project is equipped with several different working places in open layout which are offering comfortable conditions both for individual and group work. In addition interesting views are provided. Working spaces are combined with collection areas which makes it easy to use book shelves while working.

Reading places in open layout

Give the opportunity for users to use various types of furniture for comfortable reading while experiencing different spaces and views. Reading places in open layout are designed to support comfortable browsing as they are very well related to collection area.

Enclosed working area

Enclosed working areas as well as the teaching facilities are designed for more focused work, they are isolated from general spaces to provide quiet atmosphere that improves working conditions.
Working area is supported by a laptop renting point and users have access to printing room.

Reading chambers

Rooms formed with book cases formed in oval shelf. Purpose of the chambers is to provide users with the space where they can isolate themselves from the surrounding and focus on the reading or working. Chambers serve the surrounding as bookshelves.

Reading and working areas ill. 51.1-51.4

Open layout in Sendai Mediatheque ill. 52

Reading areas in Free University of Berlin ill. 53

Reading areas in Sendai Mediatheque ill. 54

Working spaces in Jaume Fuster Library ill. 55

Shelves at the Amsterdam Public Library ill. 56

Infinity book shelf sculpture ill. 57

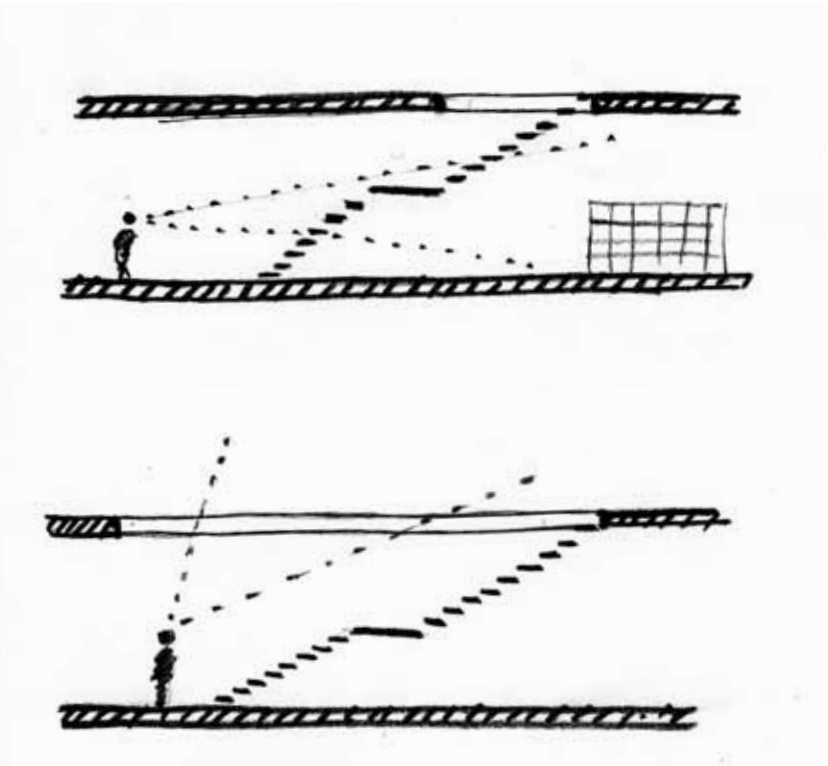
Staircase design

Stairs are an important element of library buildings as it is the main connection between different floors and can add aesthetical and spatial values to the interior of the library.

Staircase experience

In order to emphasize the presence of the main stairs and suggest people to use them they have been designed with a considerable width and the space above them with double storey height to enhance the feeling of the space while exploring the building. They have also been placed in the middle of the space to facilitate the flow and become more visible.

The path through the stairs is straight and doesn't require turning around so that it follows the longitudinal geometry of the building. In order to prevent stairs to be a massive element which could block the open layout they allow certain visual transparency between its steps.



Stair development diagram ill. 58.1-58.2

Stairs at Hanasaki house Yokohama ill. 59

Structural system

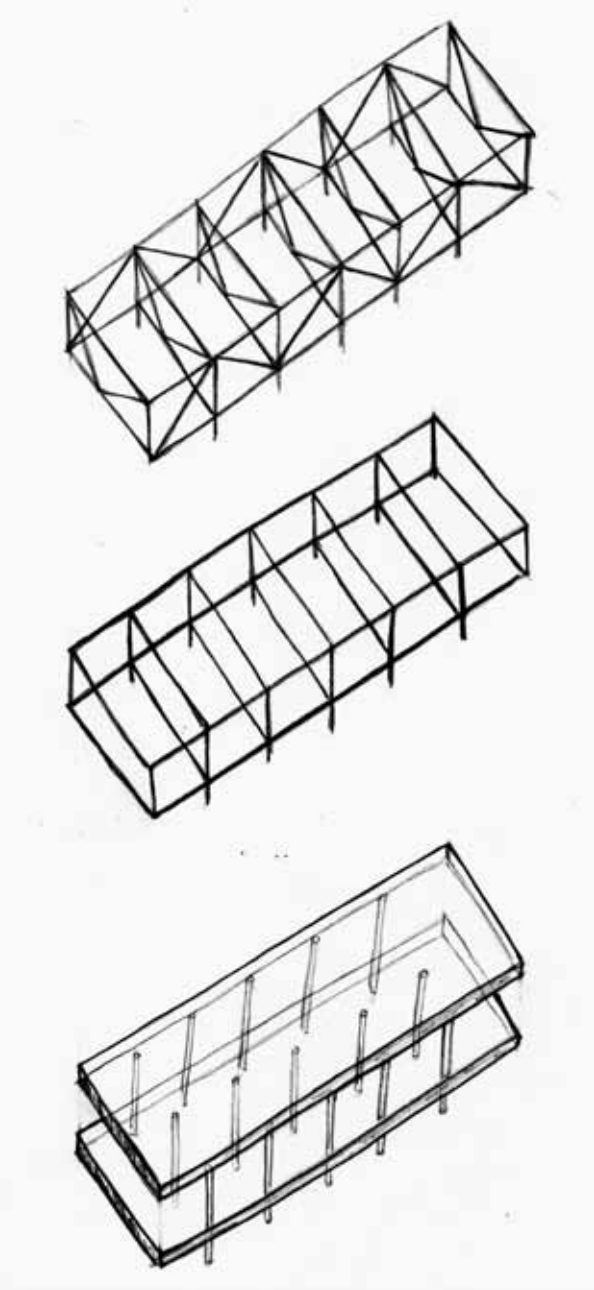
Structural considerations

The structure plays important role in the expression of the project. The initial intention was to design a system that would give possibilities to create as open as possible layout as well as maintain the expression of floating volume.

The truss system creates conflict in the general expression of the project. The inclined structural members cause the project's structure to be difficult to read. Additionally this system causes lots of limitations in forming shape as well as it divides interior in the way that would create a lot of spatial inconveniences.

Vierendeel truss system is following the box expression more accurately but still limiting the possibilities of formed shapes and spaces inside the building.

As final result, concrete column and slab system is chosen. This system is very easy to read and understand. Columns will have a great impact on the project expression and will take part in experiencing the spaces.

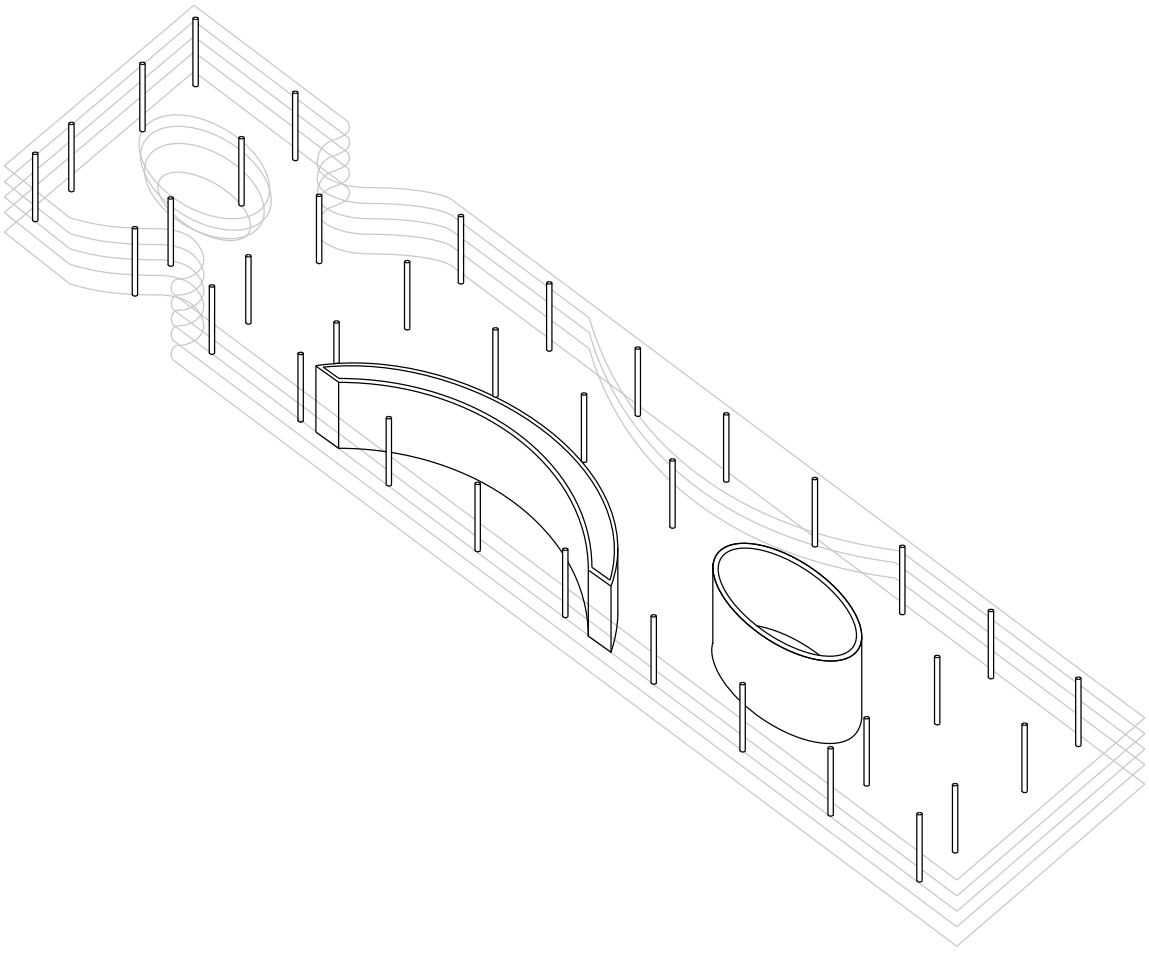


Structural considerations diagram ill. 60.1-60.3

Structural considerations

In addition to the structural system of columns and slab, concrete and brick structural cores replace the function of the columns in the areas of the project where closed spaces are needed. From one hand, vertical communications, toilets, installations and other services are placed inside the long structural core, in the other hand, multipurpose hall, exhibition room and game room are placed in the oval structural core.
These cores also work as dividing elements ,as they separate rooms from the main space, as well as defining the flow.

Project consist of 4 storeys and is 17 meters high.



Structural system ill. 60.4

Finite element analysis

Below are the loads considered in the structural analysis and the key outcomes from calculations made by Robot program. It has been checked that stresses, displacements and deflections are optimal.

Section properties: reinforced concrete column C45
Applied loads:

Wind load = 0,58 kN/m2
Snow load = 2,0 kN/m2

Dead load on the partition slab = 7,938 kN/m2
Live load on the partition slab = 10 kN/m2

Dead load on the roof slab = 8,113 kN/m2
Live load on the roof slab = 5 kN/m2

Results (global extremes):

Reactions:

	FX(kN)	FY(kN)	FZ(kN)	MX(kNm)	MY(kNm)	MZ(kNm)
MAX	83,28	12,47	4691,82	1996,00	2500,18	8,12
Node	116	116	117	170	189	246
Case	6 (C)	6 (C)	6 (C)	6 (C)	6 (C)	6 (C)
MIN	-83,27	-12,24	0,0	-1447,97	-1871,56	-6,72
Node	222	222	2	350	175	224
Case	6 (C)	6 (C)	6 (C)	6 (C)	6 (C)	6 (C)

Deflections:

	UX(cm)	UY(cm)	UZ(cm)
MAX	0,0	0,0	0,2
Bar	169	169	102
Case	1	6 (C)	6 (C)
MIN	-0,0	-0,0	-0,2
Bar	170	102	169
Case	6 (C)	6 (C)	6 (C)

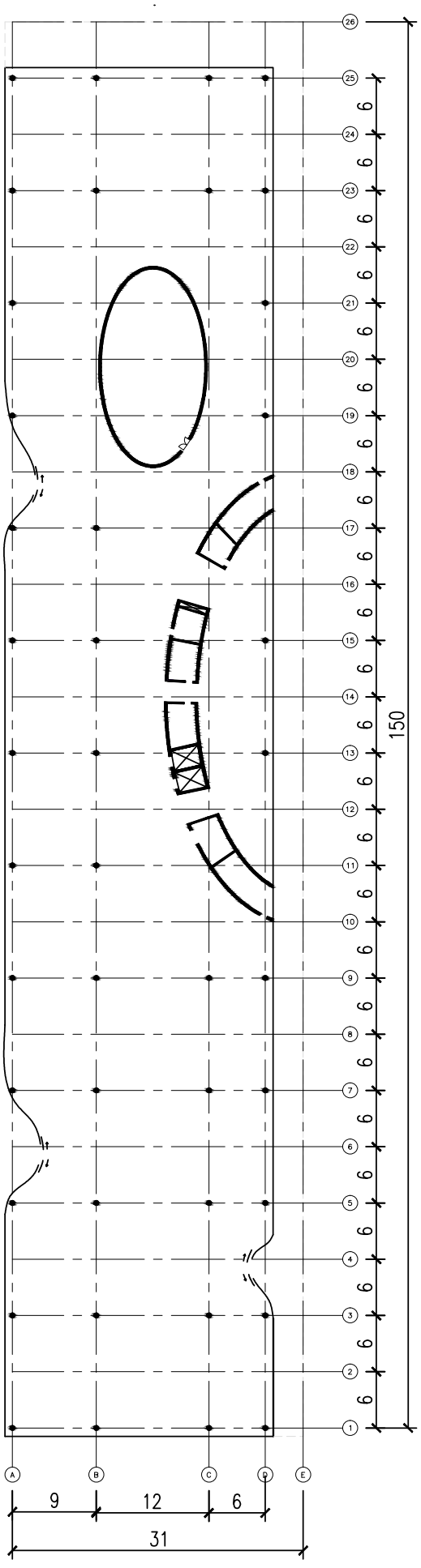
Displacements:

	UX(cm)	UY(cm)	UZ(cm)	RX (Rad)	RY(Rad)	RZ(Rad)
MAX	0,0	0,0	0,0	0,011	0,015	0,000
Node	1041	1059	1	677	927	1038
Case	6 (C)	6 (C)	6 (C)	6 (C)	6 (C)	6 (C)
MIN	-0,0	-0,0	-12,9	-0,031	-0,009	-0,000
Node	1086	1056	1326	1322	825	1040
Case	6 (C)	6 (C)	6 (C)	6 (C)	6 (C)	6 (C)

Stresses :

	Smax(MPa)	Smin(MPa) (MPa)	Smax(My) (MPa)	Smax(Mz) (MPa)	Smin(My) (MPa)	Smin(Mz)	Fx/Ax (MPa)
MAX	29,00	2,33	24,55	0,71	0,0	0,0	9,89
Node	102	110	102	170	2	2	110
Bar	152	117	152	161	3	3	117
Case	6 (C)	6 (C)	6 (C)	6 (C)	1	1	6 (C)
MIN	-2,33	-29,00	0,0	0,0	-24,55	-0,71	-9,89
Bar	170	169	2	2	102	170	170
Node	223	152	3	3	152	161	161
Case	6 (C)	6 (C)	1	1	6 (C)	6 (C)	6 (C)

Detailed calculations to be found in appendix, FEM analysis available in attached CD.

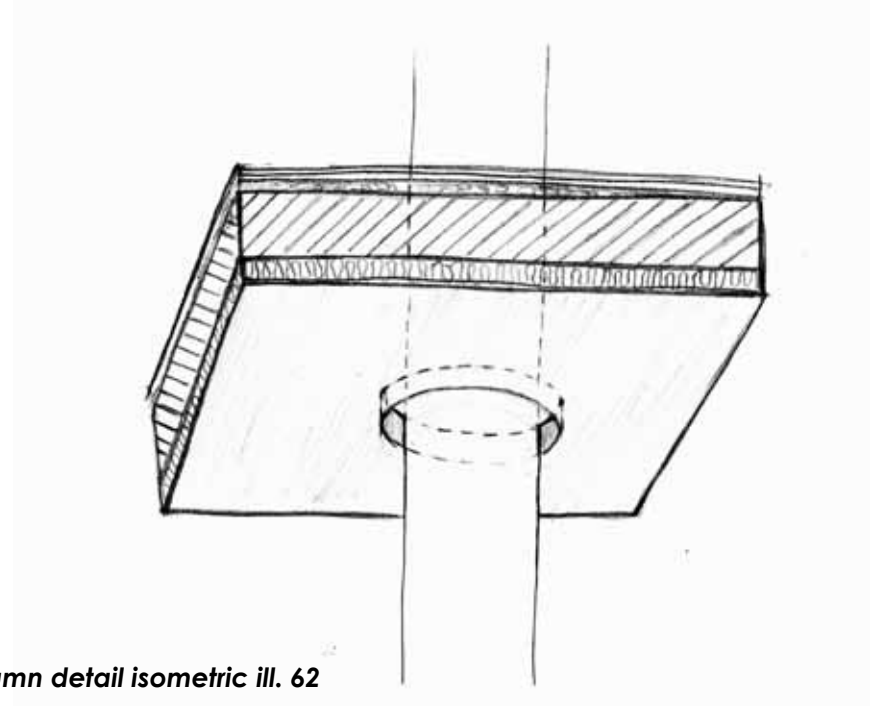


Structural system grid ill. 61

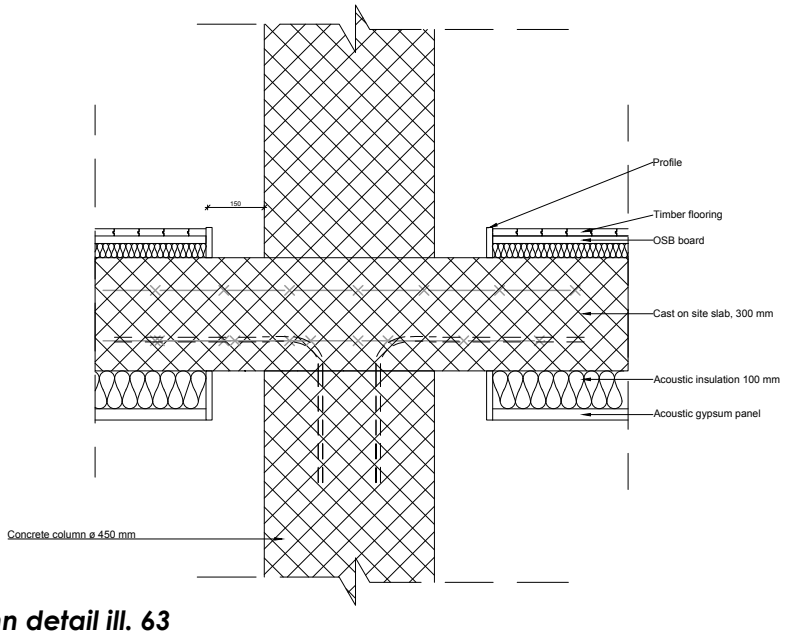
Chosen details

Column and slab connection

In order to clarify the structural understanding of connection between those members the offset from the column and the flooring or ceiling is applied. Such solution is exposing the structural elements making it easy to comprehend how the load bearing system functions. Column that appear to carving in to the partition floor indicates its vertical continuity.



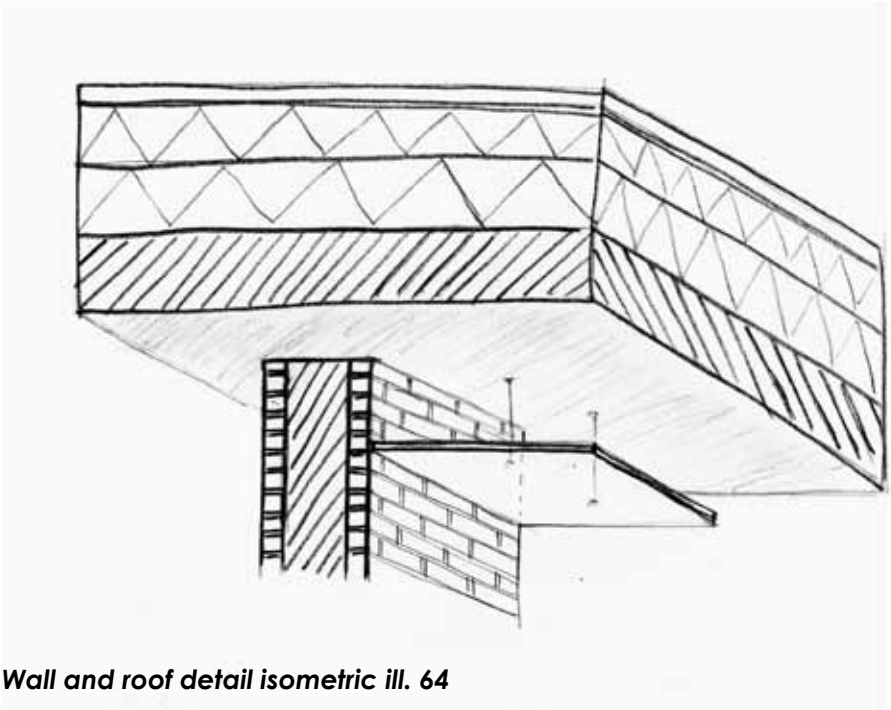
Column detail isometric ill. 62



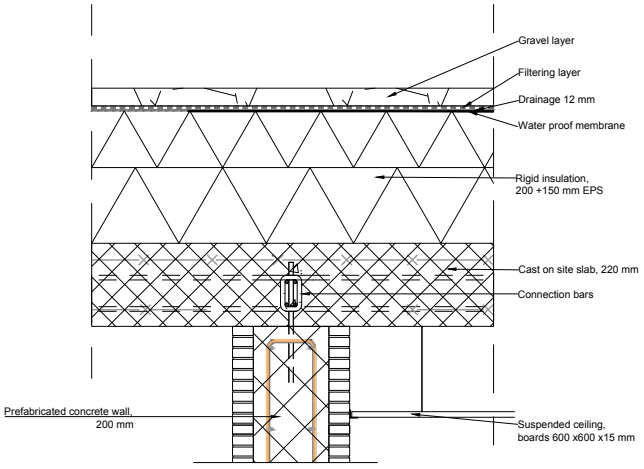
Column detail ill. 63
Scale 1:20

Load bearing wall and slab connection

Another important element in the construction of the project is wall of the service core located in the centre of the project. Within the service core installation shaft is placed, in order to provide and accommodate all of the necessary ducts and pipes suspended ceiling is installed inside the core.



Wall and roof detail isometric ill. 64



Wall and roof detail ill. 65
Scale 1:20

Facade design

Facade of the building

In order to fit the project into this particular area, the facade of the building will maintain the monolithic expression. The solar screening is adapted to the project to prevent users from excessive sunlight in those areas where too much light could be an inconvenience for reading, studying, etc. In addition, the solar screening provides a homogenous appearance thanks to its continuous pattern.

Various types of solar screening were taken into consideration during the design phase in order to find the solution that would relate to the context in the most favourable way. Furtherer investigations of the solar screening are to be found in the following chapters.

Facade design

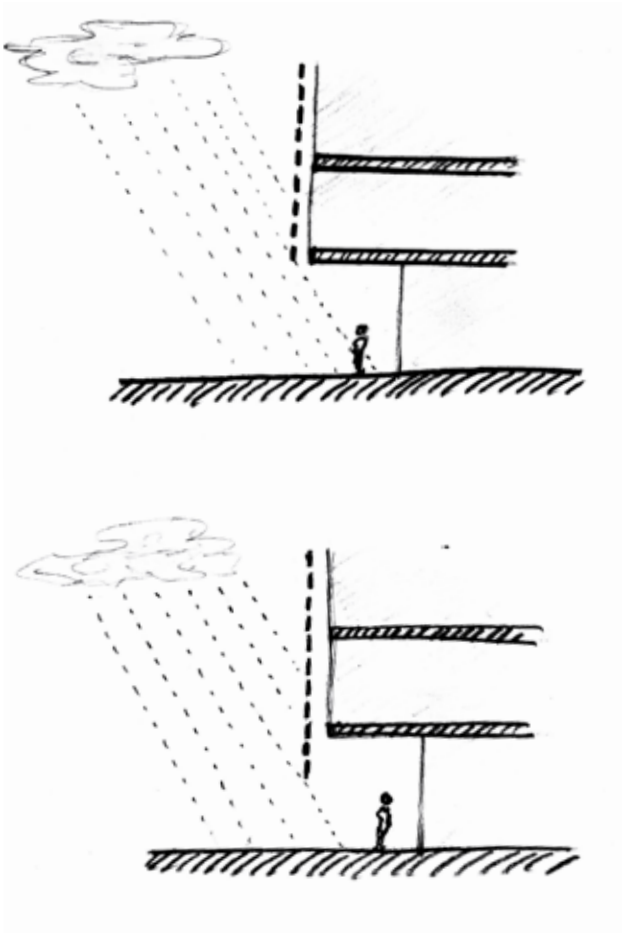
The ground level is decided to remain uncovered in order to maintain typical city centre style of having exposed façade on the ground floor as well as to open up the project both to the city and the park.

North façade is facing park areas and it is visible upon arriving to the City of Helsinki both with a car and a train. Due to the favourable daylight conditions as well as the representational aspect it was decided that glazed north façade will be exposed, serving as a screen facing arriving people. Exposed glass panels are framed with the small stripes of solar screen.

In order to avoid exposed glazed panels to appear as structural members they are inclined. The remaining facades are chosen to be covered with solar screen to maintain monolithic expression and provide optimal day light conditions.

Pedestrian walkway

On the ground floor, level east façade is "pushed in" into the building volume in order to expand and provide shelter for pedestrian walkway. Due to the height of the ground floor the space beneath the cantilever is still exposed to weather conditions so it doesn't fully protect the pedestrians. The solar screen is extended to create a shield that will stop rain and snow.



Pedestrian walkway diagram ill. 66.1-66.2

Centre of contemporary culture Barcelona ill. 67

Daylight studies

The use of daylight was always a desirable feature of a building that provides both visual and psychical comfort. In recent decades the utilization of daylight became also a sustainable aspect to be concerned about. The objective of the light design in the library is to provide optimal light level and at the same time to prevent sun glare.

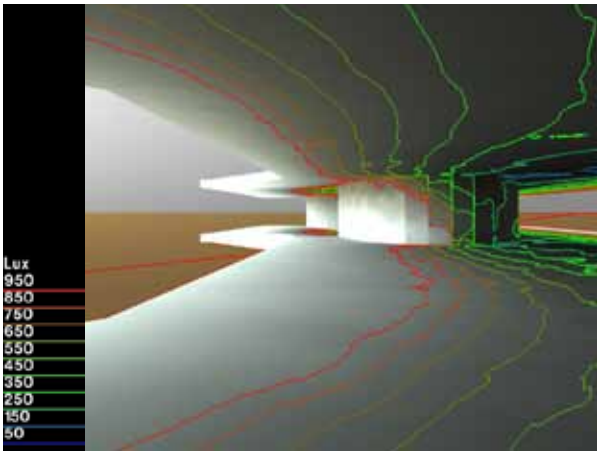
Daylight factor and illuminance levels

The shape of the project site is forcing the building to have a large façade area exposed both to the west and the east side. Such conditions are leading to problems with controlling daylight level inside of the building.

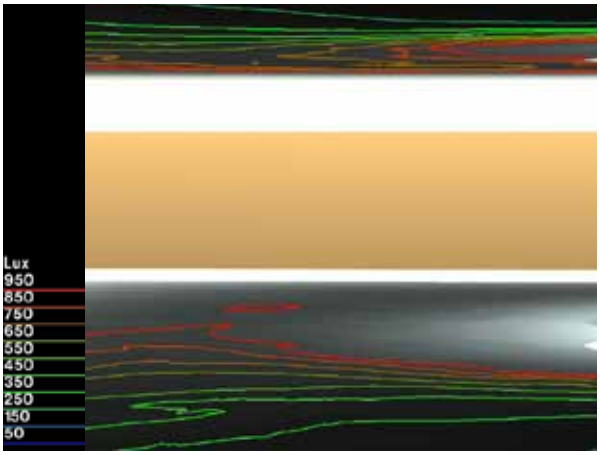
In order to verify the daylight conditions in the building Autodesk Ecotec analysis tool is used to perform daylight factor simulation. Studies were performed on simplified model of the project without any solar screening in different floors of the project. Measurements were taken on height of one meter above floor level as it is the average height where light will be used for reading or working. Illuminance level studies were performed with Radiance control panel in the most crucial areas of the building in different time of the day.

Daylight factor and illuminance level studies have proved that the amount of light that enters the building exceeds the comfortable light level. The table of the optimal illuminance levels can be found in the appendix.

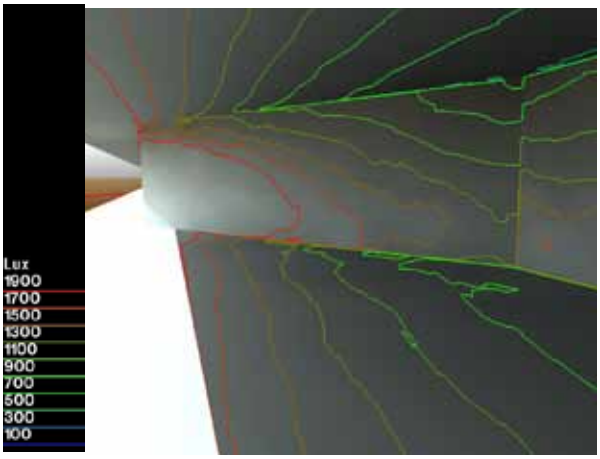
In conclusion, solar screen is required in order to reduce light intake in the building and prevent glare. Additionally, density of the openings in solar screen should be adjusted in order to meet different requirements in various spaces of the library.



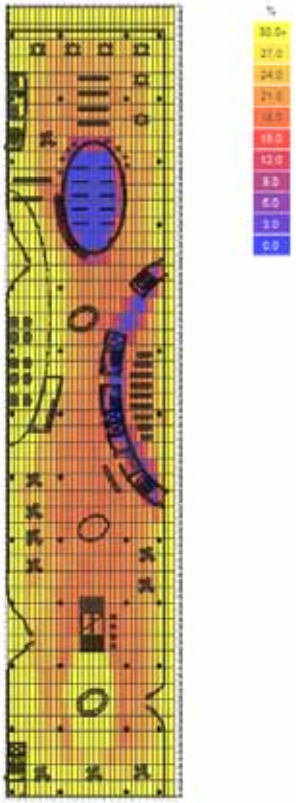
Illuminance levels: April 14:00 ill. 68.1



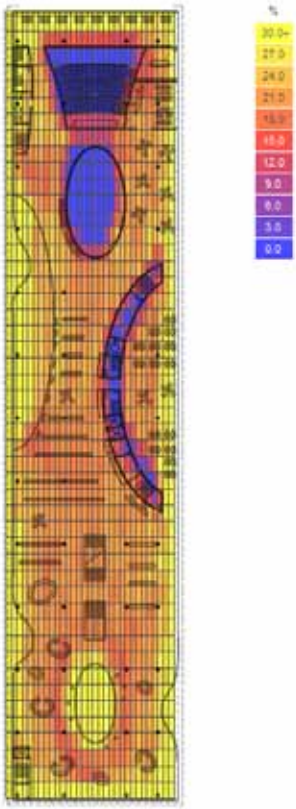
Illuminance levels: April 12:00 ill. 68.2



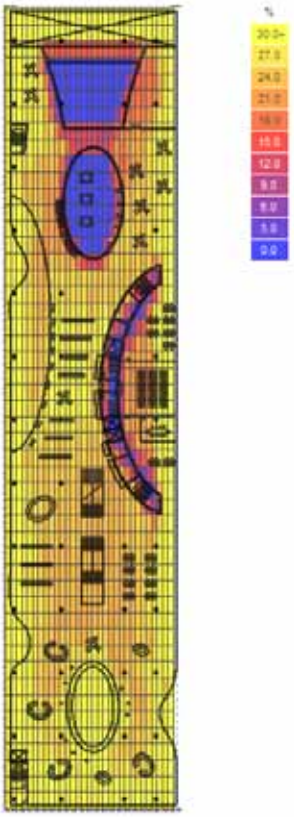
Illuminance levels: April 10:00 ill. 68.3



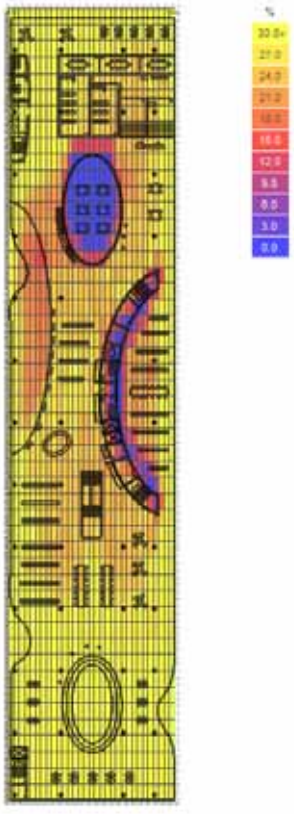
Daylight factor: ground floor ill. 69.1



Daylight factor: 1st floor ill. 69.3



Daylight factor: 2nd floor ill. 69.2



Daylight factor: 3rd floor ill. 69.3

Solar screening

In Finland as well as in the other Nordic countries daylight conditions are very specific, sun is passing on a very low level which enables the light to penetrate deeply into the building. For that reason solar screening is a crucial design element that allows controlling the amount of the light that comes in to the building and prevents from the glare. In addition solar screen will have big influence on buildings expression guarantying monolithic appearance.

In order to choose the system that creates good relation with the context various systems were taken into consideration.

Kripalu Center, Massachusetts ill. 70

Timber lamellas

System of timber lamellas is an elegant solution that provides the possibility of homogeneous expression. However the pattern created by lamellas is very uniform and makes it difficult adapt to various light conditions in different areas of the project.

Caixia forum, Madrid ill. 71

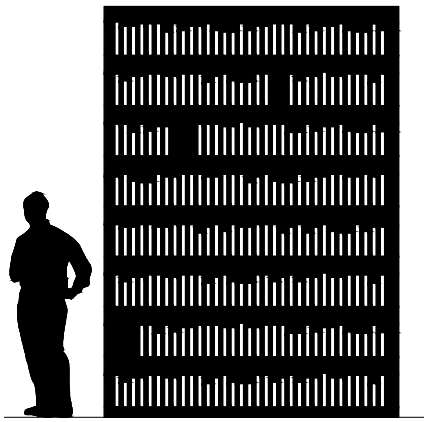
Perforated Corten steel panels

Perforated panels of Corten are an example where possibilities of creating a pattern and therefore adapting the light intake are endless. The material itself would be new to the site and it would not relate to the context in any way.

Sarphatistraat Offices, Amsterdam ill. 72

Perforated Copper panels

Perforated copper is a way to use a very common material in Helsinki in a new way. Relation to they music house as well as the rest of the city is evident.



Bookshelf ill. 73

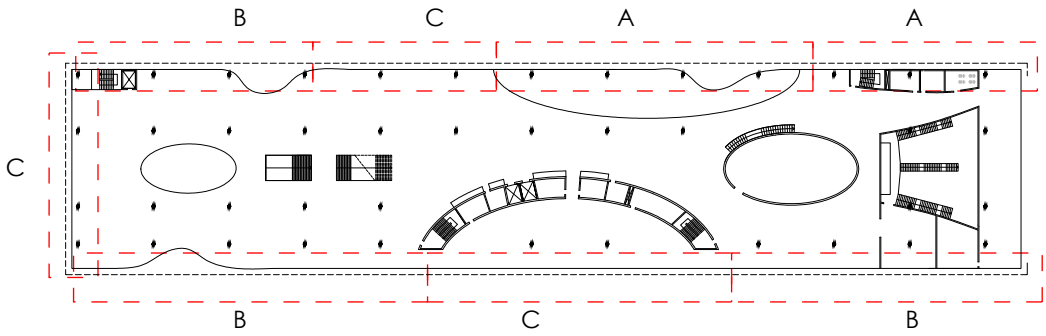
Pattern development

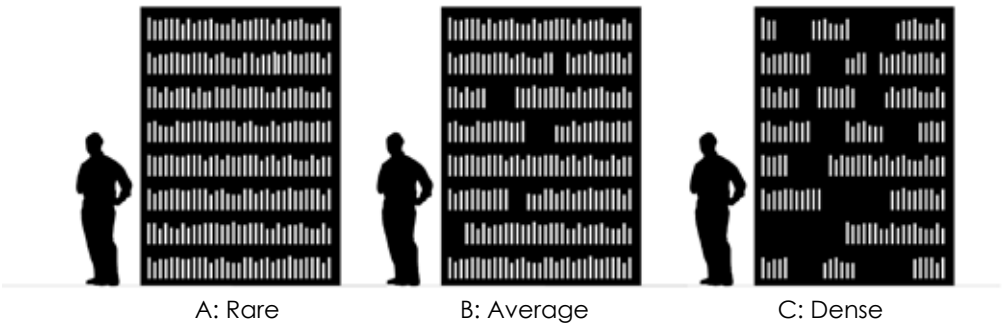
The choice of the perforated copper panels gives various possibilities of creating the pattern that allows controlling the sunlight making it more open or closed depending on the areas requirements.

Created pattern was inspired by irregularity in book sizes stacked on a shelf. Such solution allows manipulating the density of the openings creating very open areas (where shelf is full of books) or more enclosed (where the books are lacking).

Depending on the different conditions and requirements density of the pattern will vary. Application of differently perforated panels will be reflected in building facade and make it look more dynamic at the same time preserving the monolith expression.

Following diagram will present the distribution of the different solar screening.

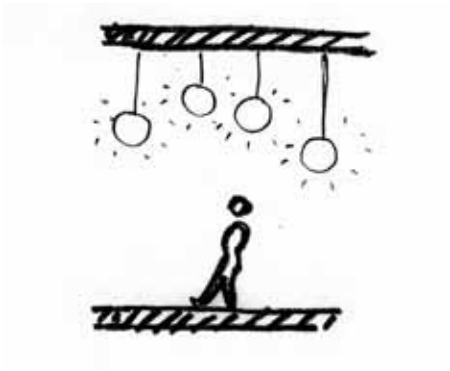




Pattern density levels ill. 74

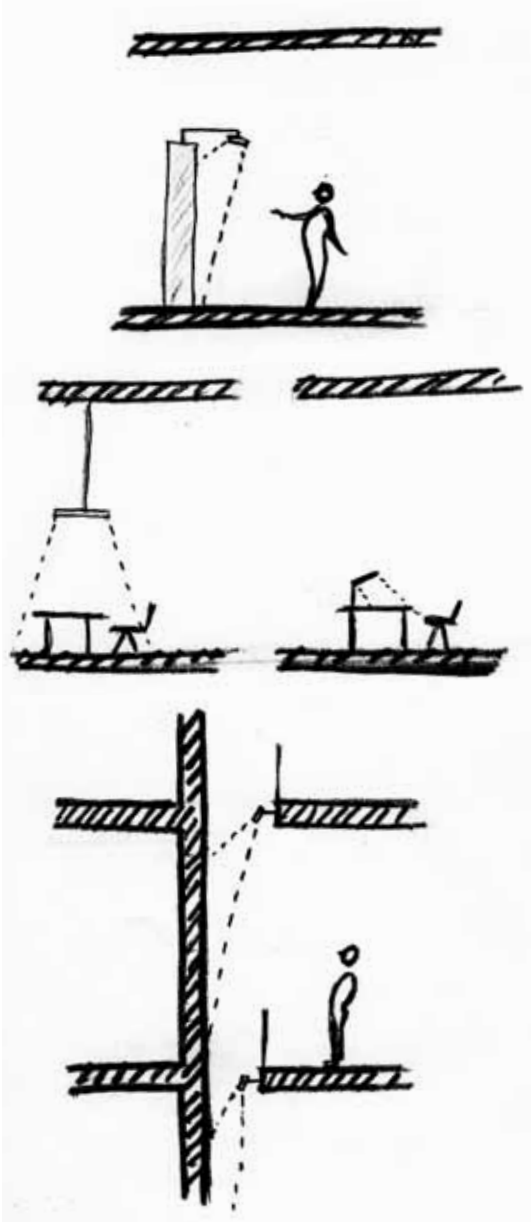
Artificial light

In library projects beside daylight lot of concern is attached to artificial lighting. The specific weather conditions in Nordic countries like Finland where days tend to be short the issue of lack of the daylight is important factor to consider. Library project should provide different light solutions depending on requirements of different spaces.



Light of common spaces

In the most of the common areas it was chosen to distribute sphere shaped lamps that will create a new line of the ceiling resembling starry sky.



Illuminating bookcases

For comfortable browsing and use of bookshelves each of them is equipped with individual light beam.

Work spaces light

There are two different types of the light systems in work areas. In the more open spaces working units are equipped with hanging lamp that projects indirect light over the table creating good conditions for various activities like reading or working with laptop. Additionally lamp provides light in the areas surrounding the table. In other cases tables are equipped with individual lamp attached to the tables that provide good reading and working conditions.

Illuminating walls

The load bearing element, a service core in the centre of the building which is illuminated by the sunlight in day time, during the evenings it will be lighten up with lamps that will be located in the slab opening which are going along the wall and penetrate building in its entire height. Light in its appearance will resemble the daylight. Thanks to that solution texture of the material will be exposed as well as the role of the wall as a load bearing element will be emphasized.

Artificial light systems ill. 75.1-75.4

Lamps in Turku library ill. 76

Lamps in Malmo library ill. 76

Illuminated book shelfs in Helsinki Library ill. 76

Individual lamps in Turku library ill. 77

Des Moines Public Library ill. 78

Illuminated brick walls in Aalto university ill. 79

Materials and atmosphere

This chapter is dedicated to describe the choice of materials used in order to provide diverse experiences within the library building.

Copper cladding in Bookshop Helsinki ill. 80

Cladding

Copper was chosen as cladding material to create relation to the context. Copper is a popular material often used as a façade element in Helsinki urban areas.

Structure in SEB bank Copenhagen ill. 81

Structure

Structure plays important role in the experience of the project. In order to strength the tectonic concept it is chosen to present bearing elements with honesty in presented materials. Load bearing walls were decided to be brick and columns are delivered in exposed concrete.

Concrete floor ill. 82

Flooring

Two different types of floor are being applied to the design. Smooth concrete floor is used in the most public and representative areas of the project like main lobby as well as in the corridors and pathways. The timber flooring is used in more intimidate spaces like work rooms and teaching facilities.

Acoustic gypsum ceiling ill. 83

Ceiling

The project consists of many hard surfaces therefore it is necessary to consider an acoustic solution. Perforated gypsum ceiling is absorbing noises and transferring them to the insulation layer. That solution provides optimal acoustic conditions in the library.

Brick walls in Stary Browar shopping centre ill. 84

PRESEN-
TATION

Site plan ill. 85

Scale : 1:2000

Basement ill. 86

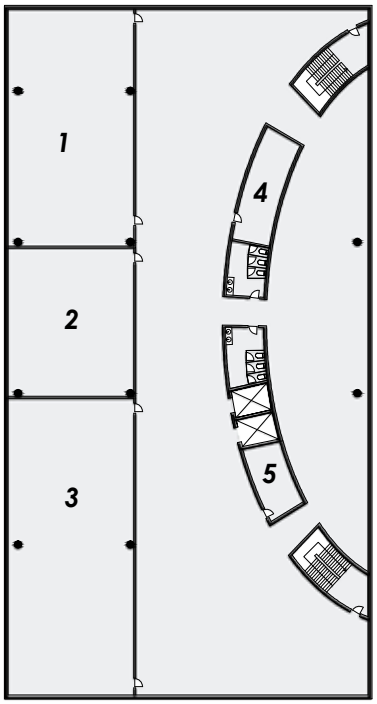
1. Library material handling

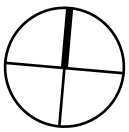
2. Building management monitoring and server room

3. Library collections storage

4. Cleaning centre

5. Building maintenance store





Scale:
1:600

Ground floor ill. 89

6. "Children World"

7. Rentable exhibition space

8. Cleaning storage

9. Customer service point

10. Cafe kitchen

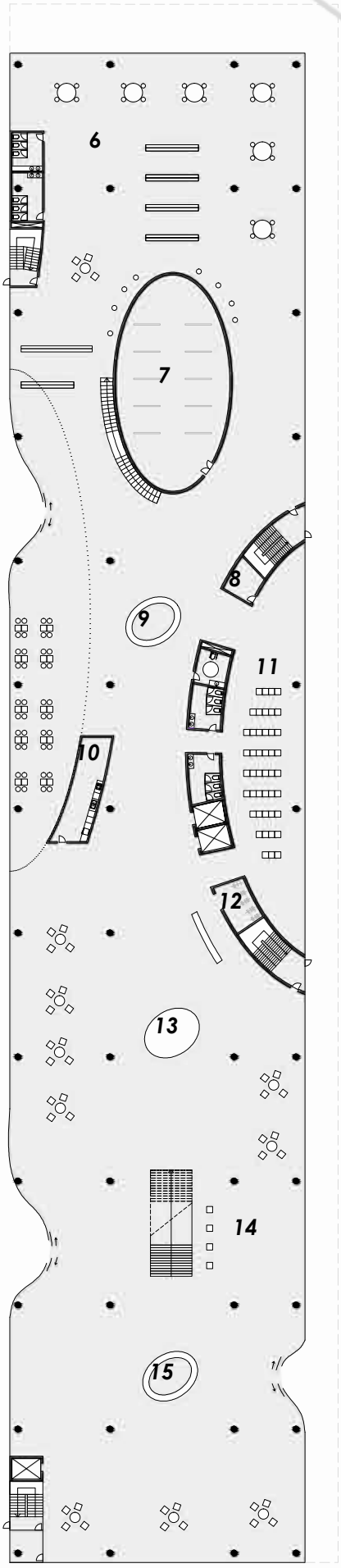
11. Locker room area

12. Cloak room

13. Stage

14. Return automat area

15. Customer service point



Scale:
1:600

First floor ill. 90

15. Restaurant

16. Kitchen

17. Multipurpose hall

18. TV and radio studio

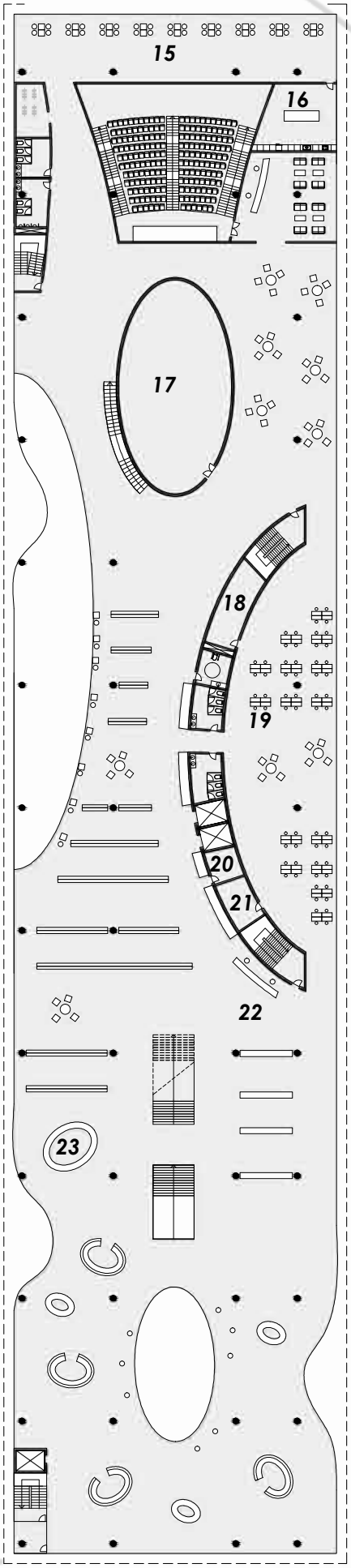
19. Personal office area

20. Cleaning storage

21. Laptop lending point

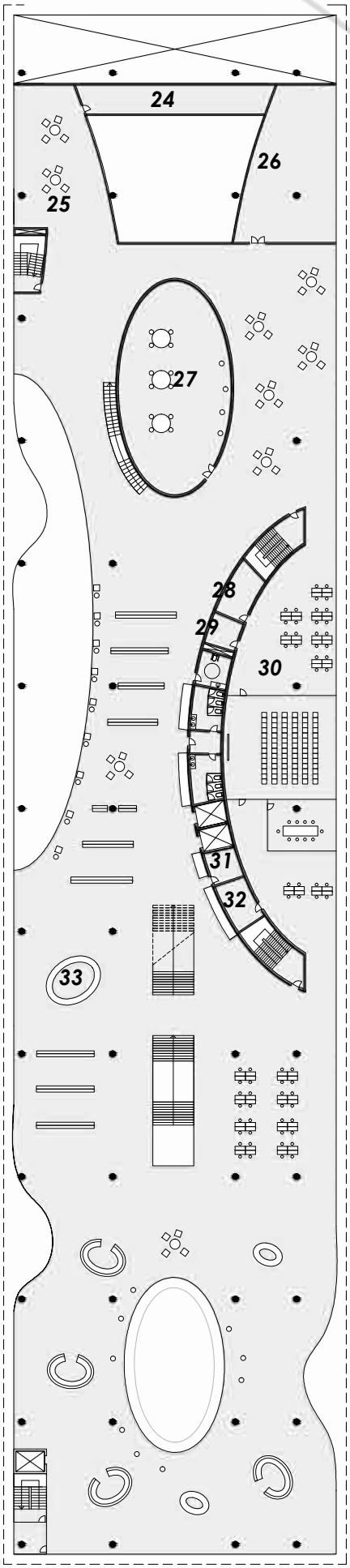
22. Book store

23. Customer service point



Scale:
1:600

Second floor ill. 91



24. Projection room

25. Vip lounge

26. Music, recording and video studio

27. Living lab

28. Photocopying, printing and scanning room

29. IT room

30. Teaching and group work facilities

31. Cleaning storage

32. Communal kitchen

33. Customer service point

Scale:
1:600

Third floor ill. 92

34. Administration

35. Public sauna

36. Listening, viewing and games room

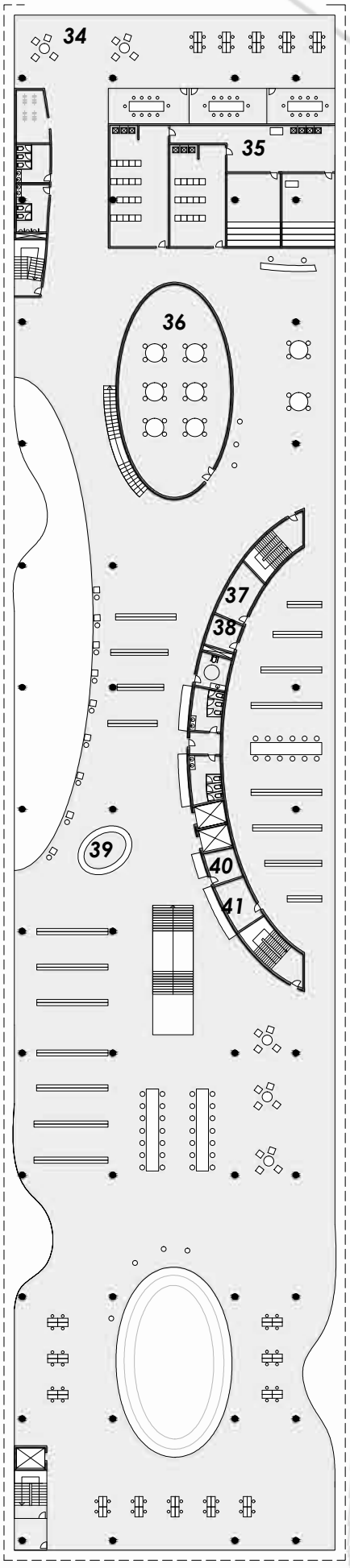
37. Photocopying, printing and scanning room

38. IT room

39. Customer service point

40. Cleaning storage

41. Video conference room



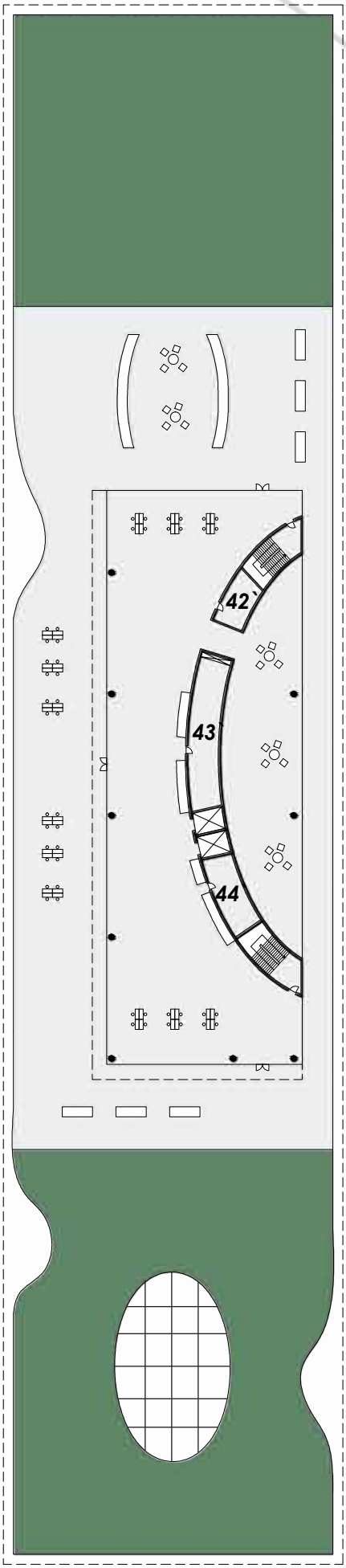
Scale:
1:600

Roof terrace ill. 93

42. Storage

43. Technical room

44. Technical room



Scale:
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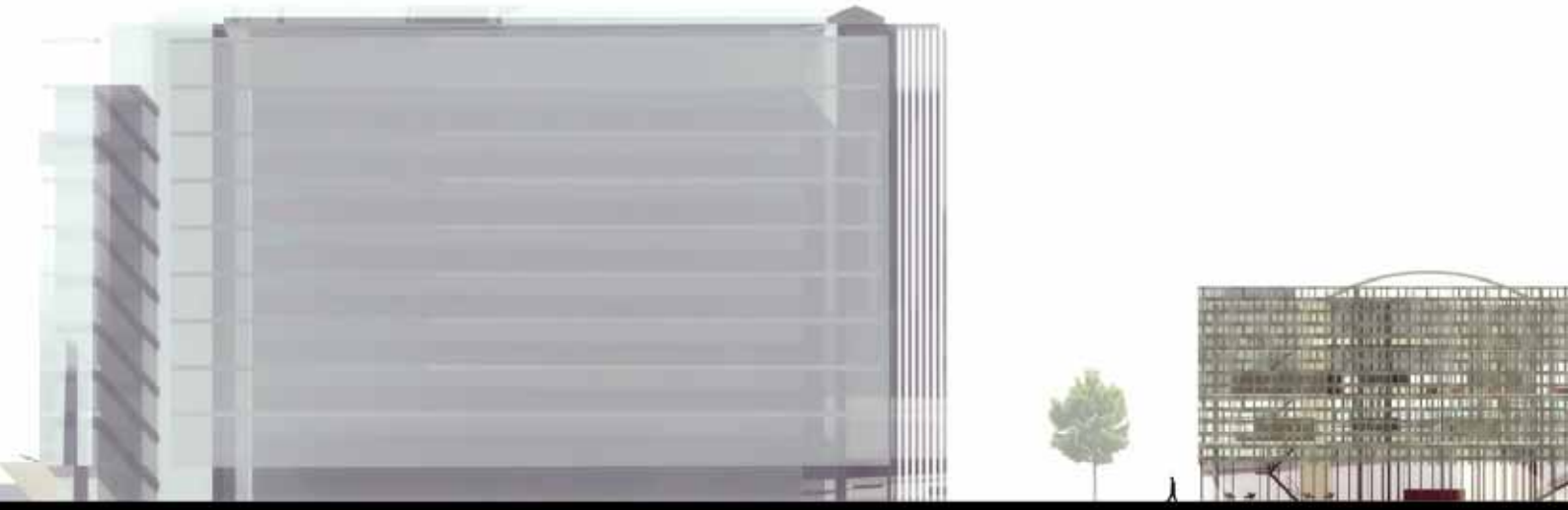
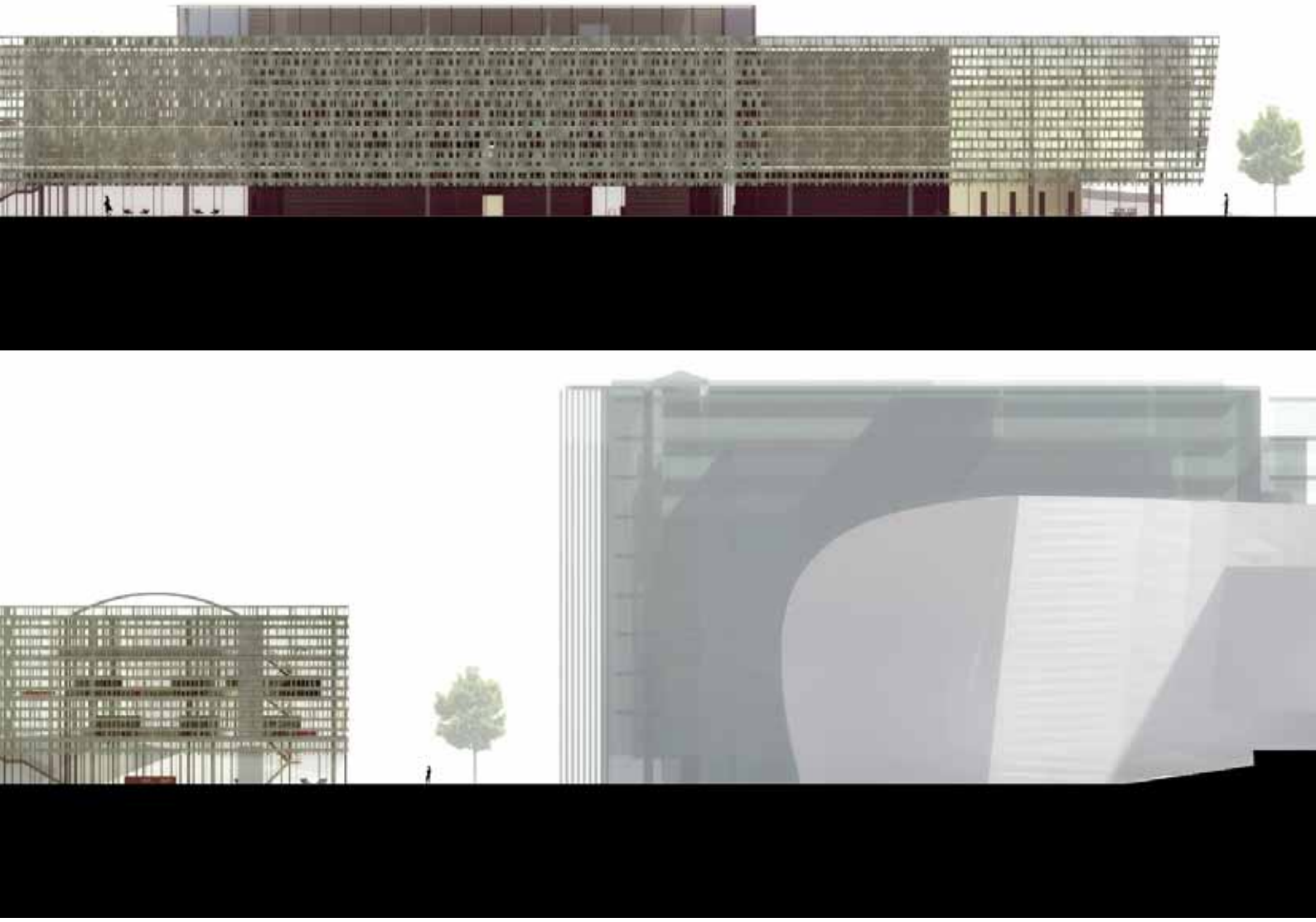
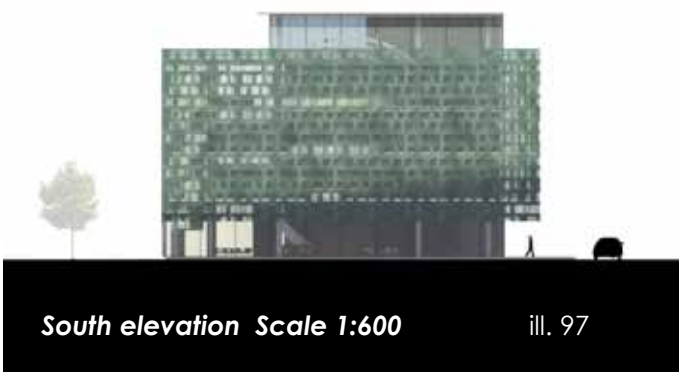


East elevation Scale 1:600 ill. 94

West elevation Scale 1:600 ill. 95

North elevation Scale 1:600 ill. 96

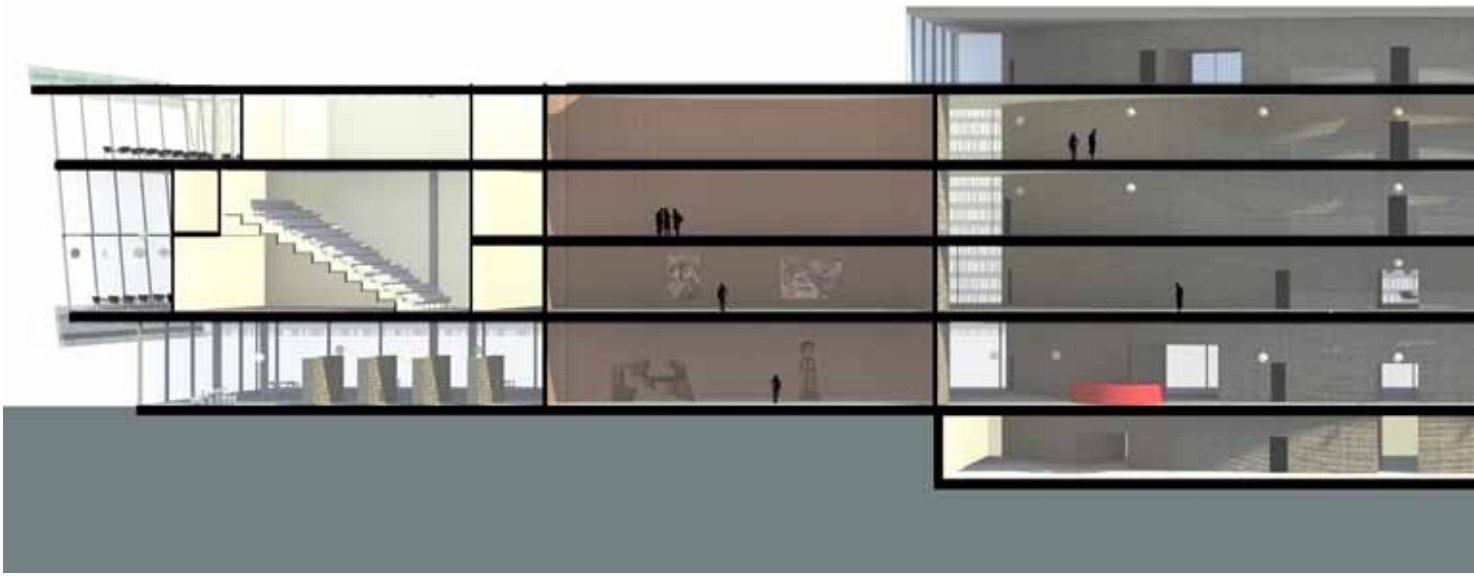




South elevation Scale 1:600 ill. 97

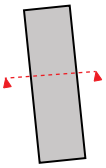
Section A-A ill. 98

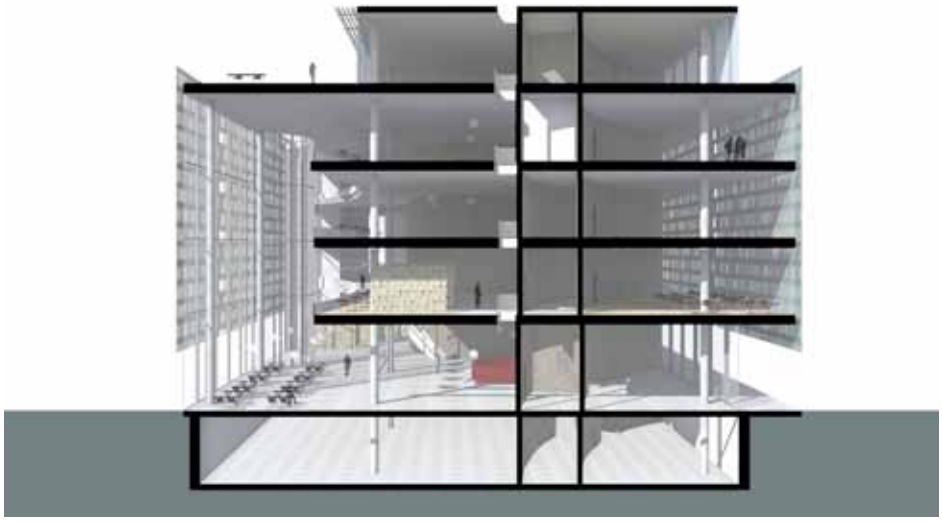
Scale: 1:400

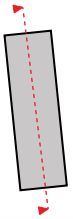


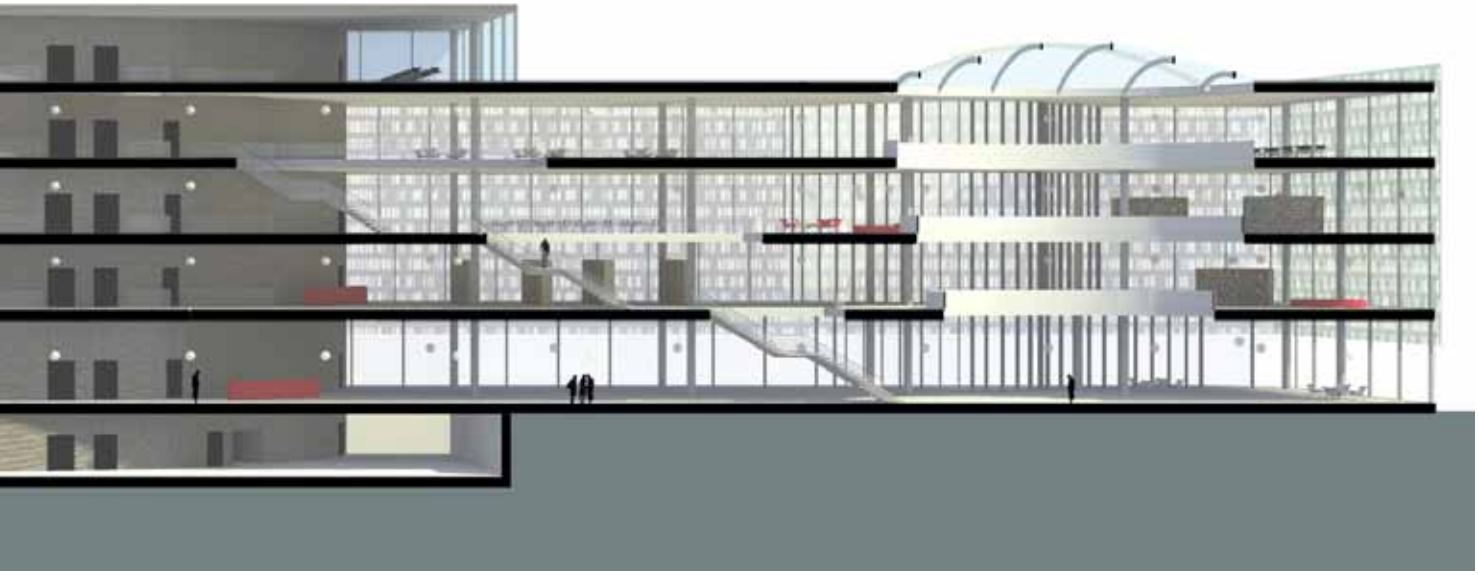
Section B-B ill. 99

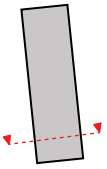
Scale: 1:400







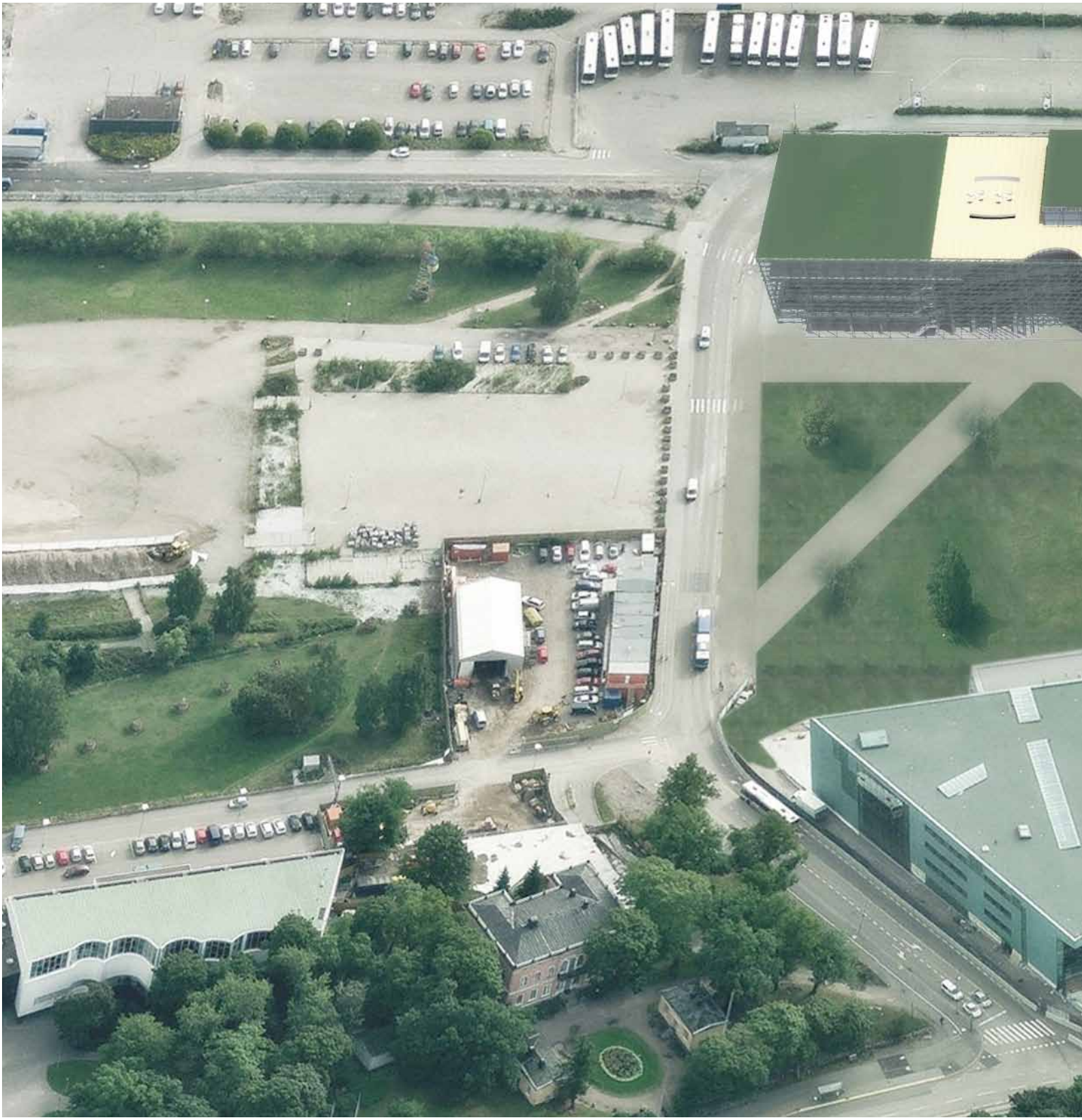


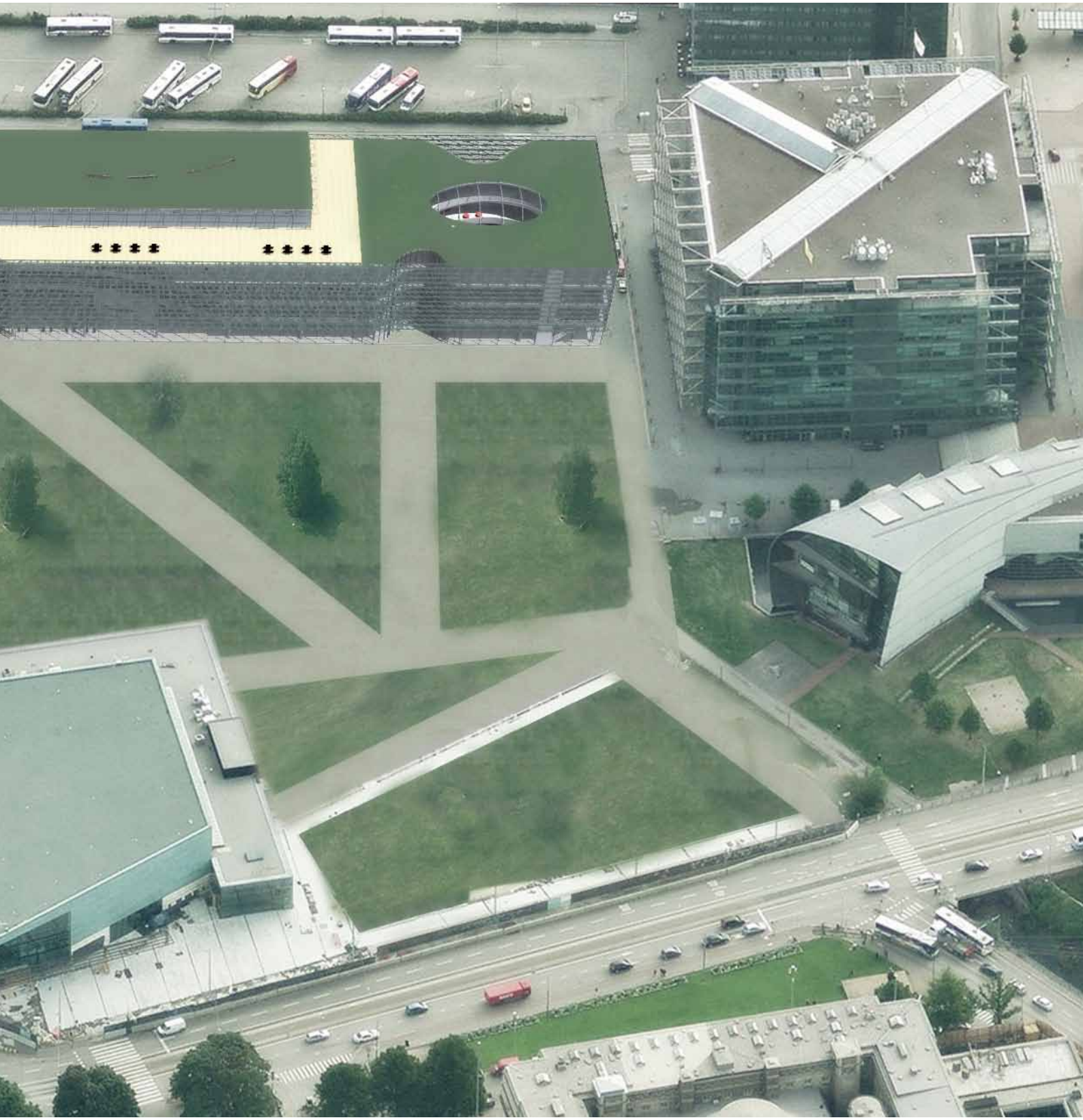


Section C-C ill. 100

Scale: 1:400

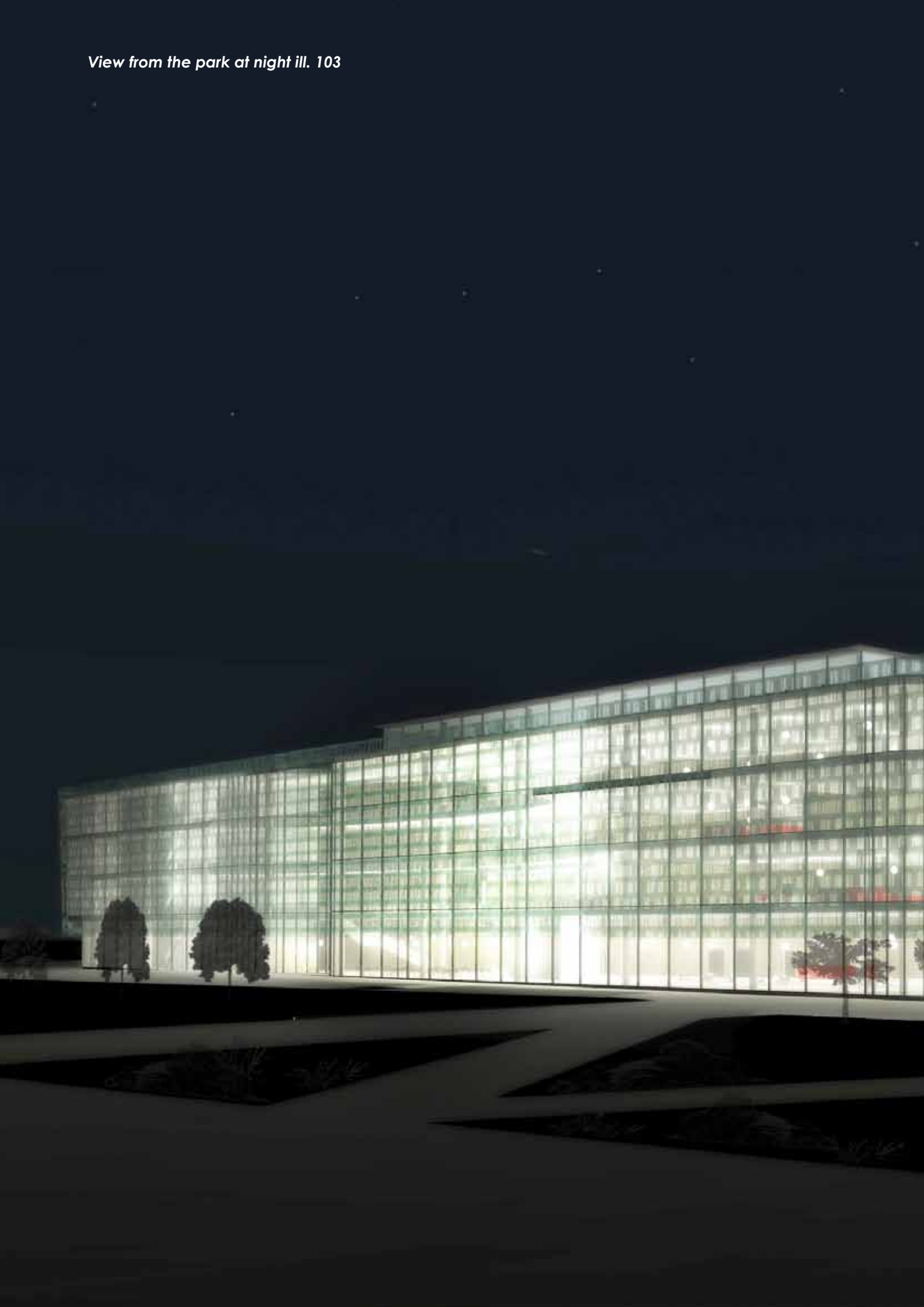
Aerial view ill. 101

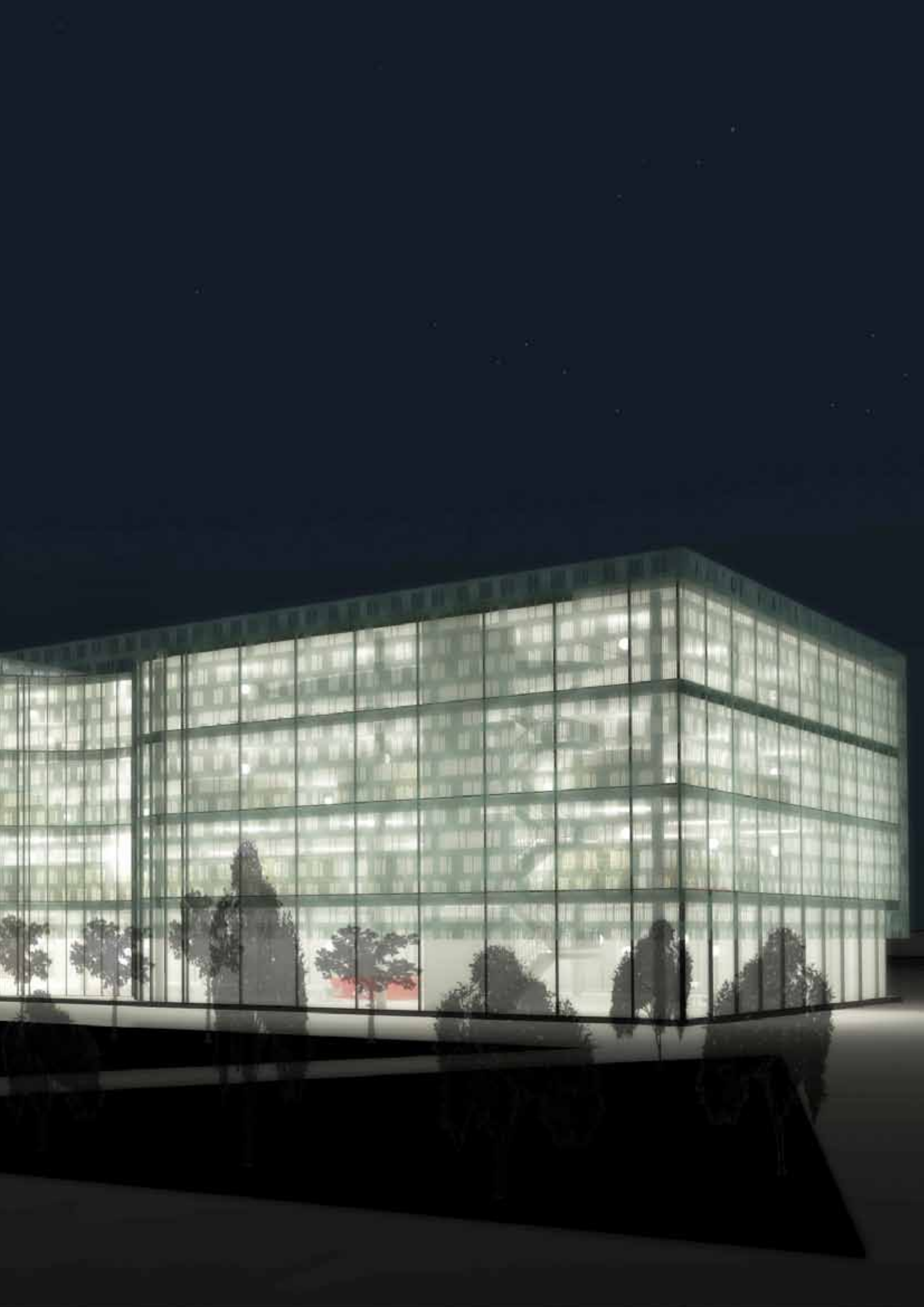




View from the park ill. 102

View from the park at night ill. 103





View from the Töölönlahdenkatu street, east entrance ill. 104

Staircase, first floor ill. 105

Cafe, North-West entrance ill. 106

Atrium area second floor ill. 107

Work room first floor ill. 108

Interactive spaces third floor ill. 109

SUMMARY

Summary

The vision of the project was to design modern library building, offering comfortable working and reading spaces for various types of users. Summary will be divided into different chapters in relation to the parameters that could be found in the vision.

Relation to the site

The project is located in a very specific area which is becoming a cultural centre of Finland where many landmarks have been constructed ranging from parliament building to contemporary art museum. Central library project is an important institution and it is necessary to emphasize its position in the hierarchy. However, due to very unique context, the intention of the project was to create a design that would remain humble yet intriguing.

Solar screen provides monolithic expression of the project which thanks to the copper makes the building very well composed in the site, as it is a very common material in the city of Helsinki. While approaching to the library, pure geometry of the inner volumes is revealed, which is especially visible in the night time. In such way the building remains modest in its appearance but at the same time it encourages to visit and explore it.

Experience

In present times the role of libraries as places of distributing knowledge has been decreased therefore the new role of libraries as places for working and producing knowledge has increased. The intention of the project was to accommodate both traditional and modern ways of using the library in the best possible way.

The building offers variety of spaces that are dedicated for working and reading. Users can choose between units located in open layout that benefit from great views and spatial experiences provided by atrium areas, or more enclosed rooms that favour focused work or reading without any distractions.

Furthermore the library is a place that encourages cultural recreational activities. The project creates atmosphere that invites users to spend their time in various possible ways.

Layout of the project is enabling users to experience open spaces but at the same time inner volumes are shaping the flow to be dynamic making exploring the building much more interesting and exciting.

Structure

The structure is an important part of the project, from the very first sketches a lot of attention was dedicated to combine function, structure and aesthetics.

In order to emphasize and make it more understandable, the structural elements are represented in strong expressive materials. The columns are left in concrete and the load bearing walls are presented in brick. In order to distinguish the elements that have no structural meaning all non bearing walls are presented in white. The use of suspended ceiling was avoided in order to present structure of the floors in most clear way.

A lot of concern was dedicated to the connection between elements so that it was chosen to expose the connection of the columns and slabs in most readable way.

Conclusion

This chapter is dedicated for conclusions regarding most vital aspects of the project. Most important considerations and impact on the design process had tectonic approach, finish architecture and role of the library in modern society.

Tectonic design

In present times when possibilities that come from computer aided design bring the possibilities to achieve structural solutions to solve most difficult challenges in constructions it is important not to neglect the structural system in the early phases of the project. Design involving sculptural forms and thrilling spatial experiences may end up with aesthetical satisfaction but the feeling of comprehension of how the things work and are put together brings spiritual experiences that are much more valuable.

Finnish architecture

Finland is a country where strong traditions of functional design have overcome Romantic desire for decorations and ornament. Purity of the forms, attention to the detail and appreciation for the materials were always symbol of Nordic architecture.

Project taking the modesty and humble approach as a guidance is aiming to become integrated part of the area rather than become icon. Spaces and objects crated in the interior of the project are the result of applying simple geometry used in rational way in order to create interesting and comfortable spaces.

Role of library

In recent decades libraries went through major changes but the real transformation from places solely dedicated to distribute the books and provide reading places to modern mediatheques is taking place right now.

Aim of the project was to fulfil requirements of wide range of users, scaling from children to elderly citizens. Library building became a multifunctional cultural centre accommodating various facilities like cinema, exhibition spaces or recording studios.

Open layout gives possibilities and flexibility for the building to change and adapt to new requirements. The free standing furniture enables the project to be easily rearranged and adjusted to new requirements. As time pass bookshelves might be replaced with new media or removed to expand the working areas.

APPENDIX

Finite element analysis

This chapter is dedicated to describe process of creating 3d model in Robot analysis tool and using it for structural analysis.

Creating grid

The initial step in creating working model is setting up grid that will be used as guidance in the process of assembling structural elements. It is important to create a grid that underlines the composition of structural elements. Following step is to arrange storey settings in accordance to dimensions of the project.

Adding structural members

In order to add structural members it is necessary to choose appropriate section type and choose its dimensions. After adding structural member it is important to choose and add of the joints between different structural elements.

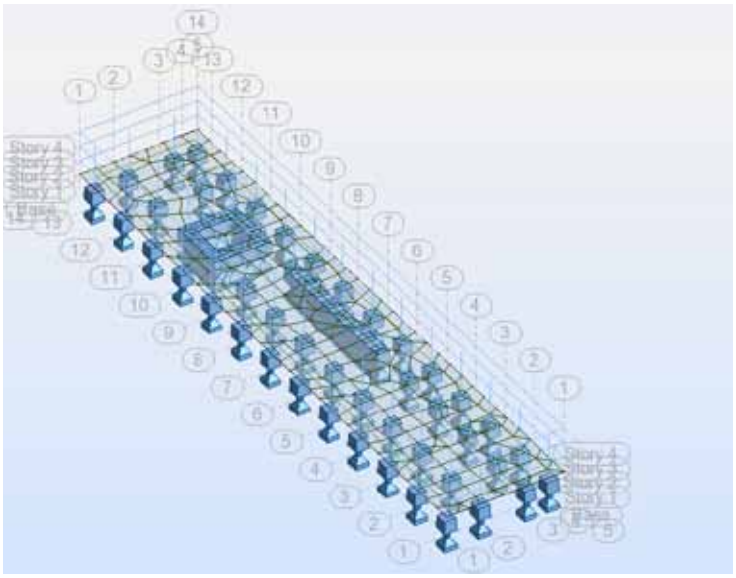
Applying loads

After calculating loads it is possible to apply them onto the model, it is important to add loads separately to each horizontal structural member.

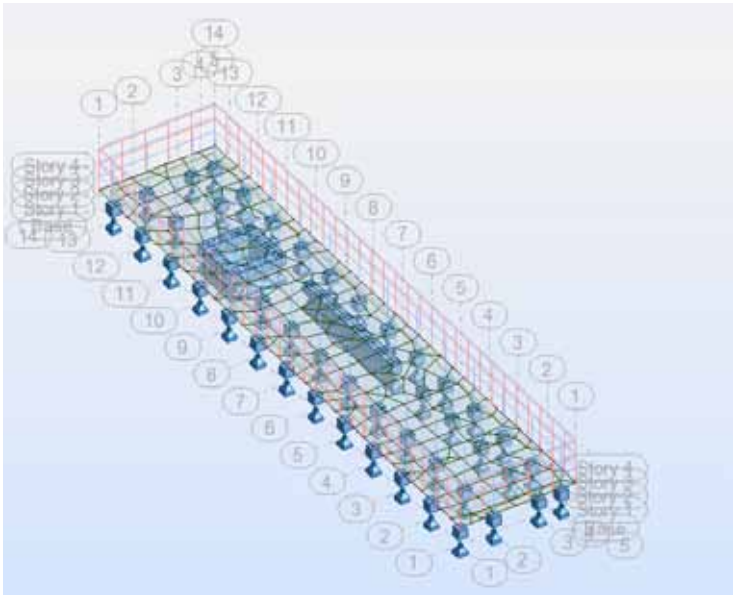
After defining the load combinations it is possible to run calculations.

FE analysis

Finite element analysis is available on attached CD



Structural model in Robot ill. 110



Structural model with applied loads ill. 111

Structural calculations

Degree of safety: Library = CC3 (high risk class)
Variable Loads

Wind load:
Terrain category: IV
Basic wind speed: vb=24 m/s
Building exposed to wind height h = z = 17 m
Peak velocity pressure of wind above the characteristic value of z qp0 (z) = q p (z) = 0.58 kN/m2

Snow load:

Terrain characteristic value	sk = 2.5 kN/m2
Exposing factor	Ce = 1.0
Shape factor	μi = 0,8
Thermal factor	Ct = 1,0

s = μiCeCtsk

s=2.5*1*0.8*1

Snow load on the roof: s = 2,0 kN/m2

Reinforced Concrete partition slab calculation:
The storey partition is constructed as follows:
- 22 mm parquet on timber joists.
- 100 mm insulation
- 300mm hollow core slab
- 2 layers of 13 mm gypsum boards

Pay load on the storey partition is 4,0 kN/m2.
Material control: Normal
Material: Concrete 35 MPa.

Calculation of loads:

Dead load:	22 mm parquet	= 0,022m* 7kN/m3	=	0,154 kN/m2
	100 mm insulation	= 0,1m*0,5kN/m3	=	0,050 kN/m2
	300mm hollow core slab	=0,18m*25kN/m3	=	7,500 kN/m2
	2*13 mm gypsum boards	= 0,026m*9kN/m3	=	0,234 kN/m2
	Total dead load gk	=7,938 kN/m2		

Pay load= 4,00 kN/m2

Book load estimation 600kg/m2 = 6kN/m2

Live load: qk = 4,00 kN/m2 + 6kN/m2 = 10 kN/m2

Reinforced Concrete roof slab calculation:
The storey partition is constructed as follows:
- 22 mm parquet on timber joists.
- 350 mm insulation
- 300mm hollow core slab
- 2 layers of 13 mm gypsum boards

Pay load on the roof is 5,0 kN/m2.
Material control: Normal
Material: Concrete 35 MPa.

Calculation of loads:

Dead load:	22 mm timber terrace	= 0,022m* 7kN/m3	=	0,154 kN/m2
	5 mm Asphalt roof cover	= 0,05 kN/m2		
	350 mm insulation	= 0,35m*0,5kN/m3	=	0,175 kN/m2
	300mm hollow core slab	= 0,18m*25kN/m3	=	7,500 kN/m2
	2*13 mm gypsum boards	= 0,026m*9kN/m3	=	0,234 kN/m2
	Total dead load gk	= 8,113 kN/m2		

Pay load= 5,00 kN/m2 (roof terrace)

Live load: qk = 5 kN/m2

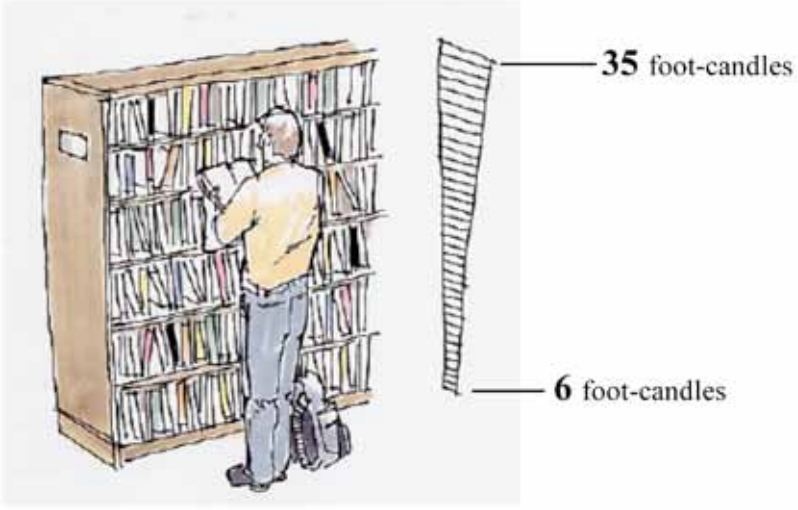
Light levels

Space	Recommended Illuminance (Foot-candle Level)		
Active (occupied) Book Stacks	See table footnote a below		
Inactive Book Stacks	5b	= ~53, 7	lux
Book Repair and Binding	30	= ~322, 92	lux
Cataloging	30	= ~322, 92	lux
Circulation Desk and Reference Desk	30c	= ~322, 92	lux
Computer Areas	30	= ~322, 92	lux
Audiovisual Areas	30	= ~322, 92	lux
Audio Listening Areas	30	= ~322, 92	lux
Reading (normal size and contrast: newsprint, magazines, keyboard)	30	= ~322,92	lux
Reading (very small size and low contrast: fine detail items, small print)	50d	= ~538,2	lux

aFor book stacks, use vertical foot-candle levels. See the discussion immediately below.
b At 30 inches above the finished floor level.
c Although this is the IES standard, lighting designers typically prefer 40-50 foot candles at these desks.
d This should not be used as an excuse to light the whole library to 50 foot candles, just because there are always some low contrast tasks interspersed throughout the library. The higher light level would apply only in specific areas, such as collections of phone books.

Book Stack Illumination

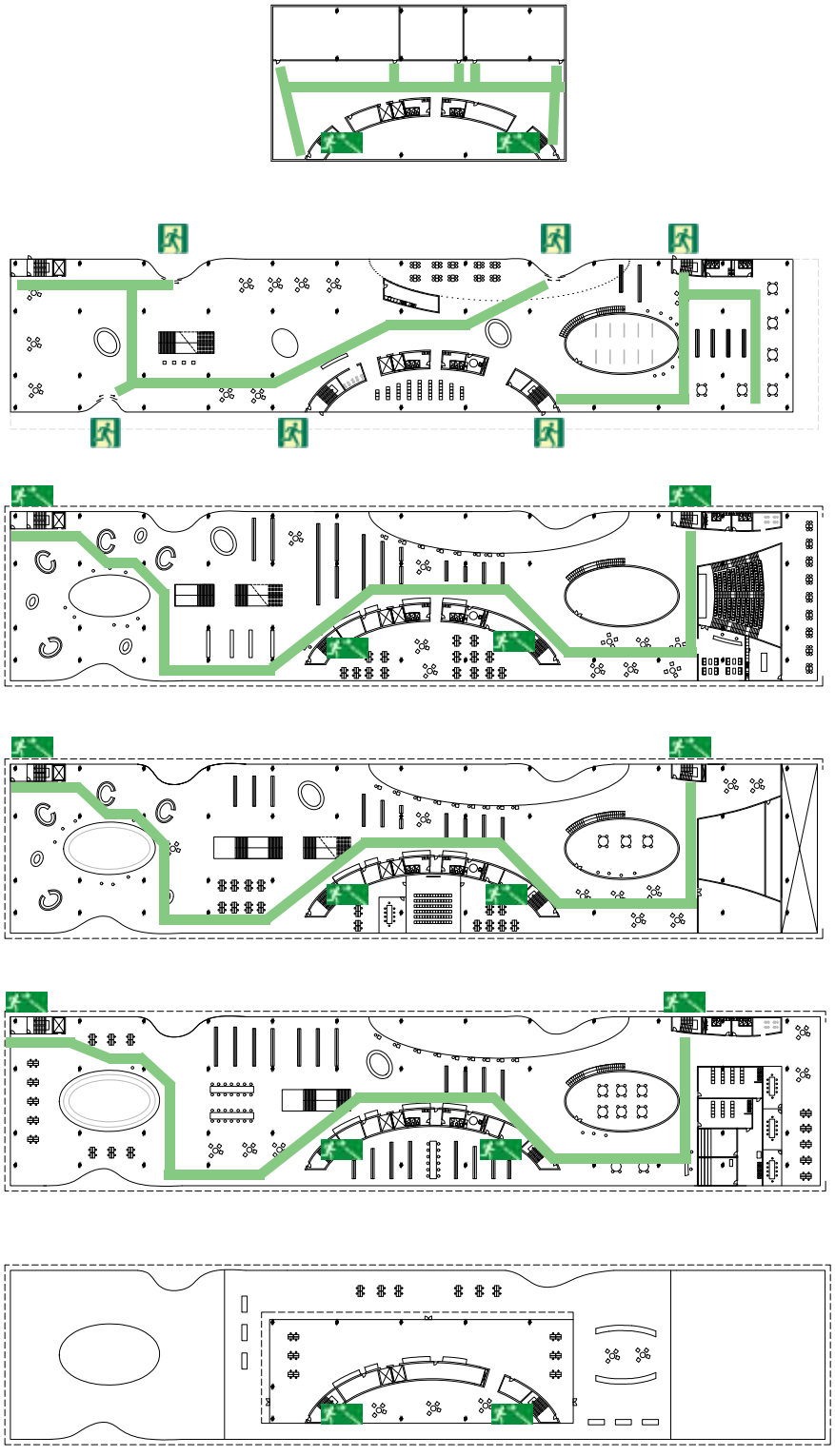
Book stacks must be lit evenly across the stack face so that titles and call numbers can be easily found and read. The lighting level should be a minimum of 6 foot-candles measured vertically on the face of the book spine at a height of 12 inches above the floor, and a maximum of 35 foot-candles at any height, so that no more than a 6:1 ratio results across the entire vertical face of the book stack. Daylight should be introduced above and behind the patron so that book titles are illuminated without glare. See Figure 4 for a diagram and Figure 18 for an example in a built project.



[Source: Daylighting Design in Libraries. 2005. by Edward T. Dean, AIA]

Fire escape routes

Access to the fire staircase is in range smaller than 25m at any given place within the building.



Fire escape routes ill. 112

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