

A LIBRARY IN LINNÉ

EXPLORING THE INTERSECTION OF A WOODEN CONSTRUCTION AND A LIBRARY F. FORKMAN & A. SAHLÉN, SUPERVISOR: MIKAEL EKEGREN EXAMINER: BJÖRN GROSS



EXPLORING THE INTERSECTION OF A WOODEN CONSTRUCTION AND A LIBRARY

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ABSTRACT

How do one imagine a library? Many of us have probably entered reading rooms with light flooding in through an open roof or high windows. Libraries similar to the chapel in the way the sequence of spaces are strengthened through light and materiality, buildings which provides a peaceful environment.

For centuries libraries have been a hallmark for cities, buildings representing knowledge and learning. In the last 500 years the library has evolved from being a private exclusive building to become a symbol for community and democracy.

Today the library of Linnéstaden is located on the first floor in an office building along Första Långgatan, a hidden site in relation to the public function. In this thesis a new location is proposed next to the landmark Hagabion, with a visible spot from one of Gothenburg's most active boulevards. This to lift and emphasize the public function since the library have been and still is one of our most recognizable institutions.

The proposal strives to be sustainable and therefore a wooden construction is investigated as the basis of the architectural expression. The design has been centred around how the construction of the building can be readable and space defining. Another aim has been to explore how architecture can present a building where learning and focus is important. This resulted in finding an intersection between a wooden construction and the experience of a library.

The thesis departs from an analysis of projects where the architects have been working with construction as a tool to create a certain architectural language. Libraries with a stricter geometry, by architects such as Louis Kahn and Max Dudler, have inspired the design both in terms of floor plan layout and light inlet. The studies have guided the project in terms of how to express materials and construction both in the interior and the exterior. The design strives to create an intimate relation between the user, the materiality and the book. A place in contrast from the daily stress where ideas and knowledge can thrive.

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INTRODUCTION

Aim

The thesis aims to investigate how a wooden construction can be used as an architectural language. That is, how we a wooden construction can be used as an element defining space and atmosphere in the library as well as bring forward the tactility and warmth of the material. The aim has been to highlight the structure to create an understanding and a robustness to a wooden building both internally and externally to relate to the surrounding.

Thesis question

How can a library be designed by exploring the intersection of a wooden construction, books and the reading space?

Sub question:

How can a public wooden building relate to the context at Linnégatan?

Delimetations

This thesis will not investigate a reproduction of wooden structures which is applicable everywhere in Gothenburg but is focused on a particular site which it corresponds to.

The project reflects upon the role the library plays today in relation to its past and will be designed not only as a provider of a certain function but also as a place worth visiting on its own. This thesis will though not go deep into analyses about the future usages of the library.

The spaces provided for Linnéstaden Library today could be seen as problematic, the new spot is a suggestion from our side. Investigation in terms costs and if this

Method

As a starting point study visits together with interviews with staff in libraries in Gothenburg have been done. It has been used as a guide to understand how Linnéstaden Library can function today on the new spot next to Hagabion in terms of flow of people and the spaces required.

The project then departed from an analyses of projects where the focus has been placed on highlighting functions such as bookshelves and study areas together with the construction. By this analysis the design has explored the intersection between the material of the construction, the inlet of light and the identity of the library where the bookshelf play an important role.

The investigation method is a research by design process where different constructions are tested in sketches and models. The aim with this investigation has been to explore different spatial composition of rooms and how to put the construction in presence as an obvious part of the room.

To respect the site and Hagabion, we have done volume sketches to analyse how our structure will affect the sightline to Hagabaion moving along Linnégatan. Facades of Hagabion and surrounding buildings have been studied in terms of proportions, window settings and weight.

Reading instructions

The thesis is divided into two main parts where the first one, theory, consist of examples of projects that has inspired our design project. Part two consists of our design proposal starting with a site analysis. Followed by that we present drawings of the proposed building.

Motive

Times are changing and we are going towards an era where information is available online, despite that the physical book and the public library in the urban fabric still has a great value. To lift the library as an important function in the city the thesis proposes a site that is a landmark in Gothenburg today. The design focus on how architecture can present a building were learning and focus is important.

In historical research one find references where the architecture promotes and emphasizes the act of reading as well as displaying knowledge. A place in contrast from the daily stress where ideas and knowledge could flourish.

As we read the book we can read buildings if they let us. Karl Friedrich Schinkel states that; "Architecture is construction. In architecture everything must be true, and any masking or concealing of the construction is an error (Schwartz, 2016, p.37)." Gypsum boards, panels or installation is not seldom hiding the construction which are fighting gravity and makes the building stand. The relation between the activity happening in the building and the construction supporting it is investigated within this thesis.

ACADEMIC FRAMEWORK

Part 1, structure as architectural expression

Exposed structures

"The library is one of our oldest and most distinctive architectural types in history" (Worpole, 2013, p32). The architectural language has during a long time been defined by a formal language and great structures. The column is one of the architectural elements that has been used through all times and it connected to both decorative, space defining and structural needs as to certain expressions. The column has been a symbol for various architectural expression such as Strength, Wisdom and Beauty. In Greece the temples, recognized with their columns, where representing the finest buildings and greatest structures.

Until the time of modern materials and construction methods, structure has been a part of the architectural expression (Shafiq, 2013, p19). The nineteenth century architect Karl Friedrich Schinkel stated that: "Architecture is construction. In architecture everything must be true, and any masking or concealing of the construction is an error. The real task here is to make every part of the construction beautiful within its character." (Schwartz, 2016, p.37). By engineering one can solve the minimum requirements of the construction of a building, but as an architect one can also integrate the structure in the architectural concept. In Schinkel's Bauakademie he uses a strict language to embody the relation between the state, society and culture. His intention was to make a functional building civilized and beautiful. He therefore used tectonic as an architectural language in fusion with the functional mill and a red brick that was unusual in that context. (Toews, 2004) He uses a language based on the roots of the Greek architects where construction, function and beauty intersect. He emphasises the construction in the facade and lets the interior grid be a defining factor in the expression.



Figure 1, Parthenon temple in Greece. A historical symbol for a public building where the columns create the architectural expression. (Dimboukas 2011)



Figure 2. Bauakademy in Berlin 1832. The building combines the strict geometries from the ancient Greek with the factories building of that time. (Eloquence 2005)

Wood Craft

It is natural that the material wood has been the main construction material in Swedish building history since a large area of Sweden is covered with forest. It is and have been a cheap material to build with and therefore seen as less exclusive. To dignify a wooden building in a public setting there have been an attempt to make these structures look like stone or brick buildings. For example, colouring these in red.

In this thesis a wooden building is explored and the attempt is to find a common language between the public building and wood. Today there are possibilities to create long span structures using glue laminated wood and the constructions of wood do more and more become similar to the steel and concrete buildings. In the search for a construction reflecting upon the historical wooden buildings and create a structure which corresponds more to our initial idea of a wooden building and scale, the structure and span of traditional wooden buildings, log houses has been investigated. Already in the iron ages we started to build post and plank buildings in Scandinavia using oak and beech and build up frames filled with horizontal planks. These first structures would later be developed to the traditional log-houses, a construction method which would be the most recognizable in the more forest dense parts in Sweden. (Lundgren) Some more common log house typologies in Sweden are the single cottage and the double cottage. The span of log houses did not usually exceed 4.5 meters since this was the dimensions of the timber members available. (Deplazed, 2008, p.98) Looking into performability in wood one can see that the material has a strong capacity of carrying loads in relation to its weight in comparison to other materials. (Träguiden) Today wood has got a revelation in the building industry. It is a sustainable choice and our building regulations and new development of techniques allows us to build higher. In this thesis we therefore propose a wooden building where the aim is to get a strong connection the wooden construction and its materiality.



Figure 3. Example of floorplan of Single cottage "Enkelstugan" from 1773. (Handkraft-Timmerhus) Reprinted with permission.

ACADEMIC FRAMEWORK

Part 2, The book, light and structure

The origin of the Library

When we think of the contemporary library we picture glassed walls and big open space that are furnished with bookshelves tables and soft seating. When we think of the historical library we picture heavy walls built up by books, a gradient of light and discrete reading spaces that are light up by soft daylight, architecture that gives emphasis to the books representation of knowledge. We think of architecture in which the book is centred within great structures and together defining both space and atmosphere.

The library origins from finding ways to organize and store knowledge as well as exchange information. The library and its function as we know it today has a long history of development and is now more than ever under change. The basic function of collecting information is though reaching back to the first half of the 3rd millennium BC, in a temple in the Babylonian empire and 2nd in Tell el Amarna, Egypt, where found clay tablets indicates great archives. (Britannica, 2019)

In the west the function has its roots in the classical period as archives in the Greek temples. The word library comes from "book collecting" and originates from the Greek "bibliothē'kē", "biblio" that means book and "thē'kē" from storage room (NE encyclopaedia). Around the 4th century BC, along with the philosophical movements institutional libraries arose in Athens but the most famous one and often said to be the first one was founded in Alexandria, Egypt.



Figure 4. An illustration of Alexandria library in Egypt where parchment rolls and columns are eminent. (Oak Knoll Press, 2001)

The typical Library

During the Enlightenment new ideas of the worldview arose. Questioning the ideas concerning reason and God lead to development within philosophy and politics, a rational humanity were the humans understood the power of one's own condition and freedom. The ideas of the natural laws and order came to flourish. (Duignan, 2019)

During this time a new revelation of the library occurred. A transition went from the religious church into the library as the new sacred place for reasoning. The aspiration to spread knowledge to the general society made the civic library to a symbol of the time. "For many thinkers and writers, public libraries were the new cathedrals of the city. From their formation they were regarded as safe and quite places, distinct and separate from the pressures of daily life, where self-improvement and study could flourish" (Worpole, 2013, p.32). The library became a great recognizable building type in the eighteenth century. It evolved from being attached to other functions such as museums and monasteries and became its own typology of forms and functions.

The first and an early example of a library to be a free-standing building was the Wolfenbüttel Library in Berlin (Bodleian, 2019). The architecture of the library influenced the design of many others. The typical plan contained an oval shaped rotunda centred in a rectangle of the golden ratio. "It had the authority of formal composition which marked the presence of the library in countess cities for two centuries". (Edwards, p.3). The large dome served as the great reading hall and the sides to accommodate books. Highly placed windows around the ellipse allowed for light inlet to the reader who "…could also ponder upon their material within a volume designed for intellectual reflection" (Ibid. p 3). The larguage of libraries until the end of the nineteenth century.



Figure 5. An oil painting of the interior in the Wolfenbüttel library. (Herzog August Bibliothek). Reprinted with permission.



Figure 6. The rotunda creates reading room enclosed by with book lined walls. (Herzog August Bibliothek). Reprinted with permission.

The book, light and structure

In the late nineteenth and early twentieth century the forum for culture and discussion was became centred to the library. As a result, the libraries had now become the new sacred spaces. The architecture was still often connected to old cathedrals by monumental entrances, great structures and large atria and domes with soft light inlet through clerestory lightning (Worpole, 2013, p.34,).

In Louis Kahn's Exeter library, built 1972 he works with the idea of creating a sacral feeling in the architecture to give emphasis to the knowledge and learning that the library represents. He had the intention to create a space with respect to the book where one could focus on learning and decided to resemble the church or the temple within his design. He was studying precedents such as the library Durham library in England and the Maria monastery cloister of Bramante's S. Maria della Pace in Rome that he had visited. One can see similarities with the calmness of the courtyard and the promenade along enclosing structure, the strict and classical forms, but also the individual seating next to edge of the yard where natural light comes down. In Kahn's library he used a load bearing brick structure to create convent-like silence and mystery. He refers to monasteries designing his central calm atrium with a natural light inlet. He based his library on the idea of how light, structure, the book and human works together. "Kahn proposed the idea that "a man with a book goes to the light. A library begins that way" (Shih, 2010, p32). Kahn used the structure and light as the defining elements for the atmosphere and layout. His saw the light attracting the human but he also used it in a way to emphasize the constructing and making it present in the building. (Ibid)



Figure 7. Etching of a monk reading by the colonnade in the courtyard of Bramante's Santa Ma-ria della Pace.



Figure 8. Plan of S. Maria della Pace. (Letarouille, 1845)

The Exeter Library - Louis Kahn



Figure 9. Exeter library by Louis Kahn (Ponce Leonell 2010) CC BY 2.0

In Exeter library by Louis Kahn there is a clear attempt from the architect to raise the construction, the wide brick piers. These brick piers are telling a story of the function taking place within the building, dividing the façade into smaller areas suitable for a study table where the user get in direct contact with the brick element. View over double height study areas.



Figure 10. Section showing reading rooms in facade, Exeter Library



Figure 11. Floorplan, Exeter Library

Humboldt University Library - Max Dudler



Figure 12. View reading room, Humboldt University Library (Rentex GmbH, 2009)

Humboldt University Library by Max Dudler is located in Berlin and build 2009. The building is a column structure where the grid is denser in relation to the storage of the bookshelves. The grid is tailored for the purpose of providing space for the physical book and the columns providing this space is cladded with wooden panels. One can see similarities in the classical architecture not only in the way he clearly defines where the different functions takes place within the library but as well using the column to emphasize the importance of the book. In the centre one finds the atrium where reading under the sky was one driving design idea (Lushington, Rudorf, Wong, 2016).

Both Humboldt Library and Exeter Library are two examples where defined spaces, controlled light inlet and using the column as space defining element have been developed.



Figure 13. Floorplan, Humboldt University Library



Figure 14. Section over reading room, Humboldt University Library

SITE ANALYSIS

Linnéstaden Library today





2016 the library in Linnéstaden moved from Tredje Långgatan 16 to Första Långgatan 28A since the former place did not reach the accessibility standards.

Analysing the new library, we found problem areas regarding the site and location for a public library. It has a central location but is hidden from the liveliest streets of the area. The library can therefore be a place that is still unknown for many people. It is located in a former office building with views towards a busy road. Other public functions in the area are located along streets well used by pedestrians or connected to a square. Our intention is therefore to move the library to a more attractive and public site.

After an interview with a staff member, the number of visitor has increased after moving the library to Första Långgatan, which is more visible than the first location. This indicates that the site for the public library is of great importance. We were also informed that the library is in need of larger space for archive, bookshelves and study areas. The Site



Facades towards Linnégatan



Section of the Plot



Photos of surroundings



Color palette



Hagabion (Victoriaskolan)


Neighbouring building



Facade analysis of Hagabion



openings in contrast to the volume



main division of the facade

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secondary division



organization of windows



Facade analysis of Nordhemsgatan



openings in contrast to the volume

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main division of the facade



organization of windows

PROCESS

Light studies



20th of June 12 am



20th of June 4 pm



20th of Mars 12 am

Analysis of the Site



connecting to citygrid

١

36

connecting square

١

Volume studies



How the placement towards Linnégatan affects the view of Hagabion is investigated.

DESIGN PROPOSAL

Project proposal

In the same way as the traditional timber constructions, the library strives to show its structural components to make the building more readable but also to use the warm and tactile feelings we get from wood. The grid within the library relate to old log-construction where spans were limited to dimensions of 4x4 meters. This makes a colonnade of columns within the outer rooms which acts as a space defining element as well as creating a more relatable scale to the construction. Generous space for storying books within each floor have been valued since this was lacking in the existing library today and that we personally see the importance of providing.

The Library is designed to break line with Hagabion and creates an entrance clearly visible from both directions moving along Linnégatan. The functions within the library is divided on four story plus basement and the structure of the floorplans is defined by the central atrium in the middle, providing the vertical circulation. An intermediate wall separates the atrium from outer rooms and creates spaces along the facade. Some outer rooms are pierced with openings to allow for a visual connection between the floors and to let in more light into the building.

The ground floor is designed to attract the regular library visitors as well as the strollers along Linnégatan and is therefore more open with larger windows in façade. In the outer rooms one finds a café towards Hagabion and reading space for magazines towards the boulevard, Linnégatan. Books and reading space for families with smaller children is placed in the outer rooms towards Plantagegatan. The central atrium is framed by timber columns and in the middle a three is placed next to the stair illuminated by natural light coming in through the roof. The central atrium in the floors above have the same layout. It is from the atrium one access each room and it therefore the spine of the building. With 3 m high build in bookshelves the feeling of a library and the value of the physical book is strengthen in this room. Above the bookshelves on each floor there are space for the main ventilation pipes. The outer rooms are provided with study seats towards façade and bookshelves towards the center. On the western side of the building the functions for the staff is provided on each floor.

Program

Lobby/Foajé

Reception	15
Loan stations	10
Wc	1,8
Rwc	4,8
open space	50
Wardrobe	15

Cafe/restaurang

Counter 20	20
Seating area	70
Kitchen	50
Storage	10

Admin Storage/ gods

Storage/ gods	
Godsmottagning (packning/logistik/verksatd)	10
Recycling room	15

Basement

100
400
50
100
100
200

Staff

office	100
toilets	10
rom for resting	10
staff/break room	40
storage	10
meeting room	15
chaning room incl. Shower, wc	25
print/copy room	10

General

group rooms large	20
group rooms	9
computer lab	40
reading hall	80
cataloge brows station + info desk	10
print copy room	10

Children

books	150
reading room	20
atelier / play room	20
open space	100

Youth

books	200
open space	100
study seats	100

Adults

books	
reading space/ study seats	500
study seats	500
magazines, newspapers	100
	200

Auditorium

auditorium	70
assembly space	10
storage	10

Estimated area: 3600 m²



Site plan



42



Entering from south

FLOOR PLANS/SECTIONS

Floorplan - beam grid





10 m

Ground floor



Scale 1:250



1 entrance and reception

2 café

3 kitchen 4 staff entrance

5 kids department

6 magazines

7 flexible space (exhibition)

46



The entrance





Scale 1:250

10 m _

1 book hall

2 adult department

3 Staff office and paus room 4 Computer lab



The atrium and book walls looking towards Hagabion

Second floor



Scale 1:250

10 m

1 book hall 2 adult department 3 Staff office 4 group rooms



Entering underneath double height





Scale 1:250

10 m ____

1 book hall

2 youth department 3 conference room staff

4 atelier

5 lecture hall

6 conference room

Basement



1 exhibition 2,3 exhibition/screening 4 book archive 5 kitchen storage

6 recycling 7 changing room 8 cleaning storage 9 technical space



Section through entrance





10 m



Section through atrium





10 m



The open stair in the atrium

ELEVATIONS

The library is slightly elevated to reach the level of the common square with Hagabion and connects the pathway on Linnégatan by a large stair. Inspiration from Hagabion have resulted in some of the design decisions for the façades. The façade of Hagabion, is characterized by the typical rectangular windows in a wall with a balance of vertical and horizontal lines. The façade of the library mirrors the construction on the inside to make the building more prominent. The grid of glue-laminated pillar strives to give an understanding of how the construction and organization of the building work. To give the building a uniform expression in the façade, core functions are placed to the center of the building which also makes it more flexible. Glue-laminated timber boards are used in the façade for a heavier and more public expression of the building, this also creates another division in the façade.

Elevation along Linnégatan



HH	

East, Linnégatan





10 m







West, Nordhemsgatan





10 m

North, Plantagegatan









1

- sedum layer 40 veg-tech dirt 40 water holding layer 11 drainage layer & root protecting layer

11 water resistant sheet 20 wood planks

22 nailing battens
70 x 220 joists + isolation vapour layer
200 x 405 glulam beams
70 joist + isolation
20 sound absorbation
30 wood joists

Scale 1:10
Intermediate floor



22 terazzo, mortar 13 gypsum board 22 osb board 20 acoustic mat 80 washed gravel

22 osb board 70 x 220 wood joist & isolation 20 sound absorbation 30 wood joists 200 x 405 loadbearing beam

Scale 1:10

2

Ground/Basement



3 60 concrete 200 isolation 300 concrete Horizontal



21 CLT-panel 34 x 70 nailing battens 19 x 50 nailing battens & airgap 13 gypsum board 45 x 220 wood joist & isolation vapour layer 45 x 45 wood joists & isolation 21 CLT- panel 4

Scale 1:25

DISCUSSION

Within this thesis we strived to answer the following questions:

How can a library be designed by exploring the intersection of wooden construction, books and the reading space?

While deciding to choose wood as a load bearing construction material we wanted to design a building which distinguish from the steel and concrete structures defined by their capacity of long spans. Our aim was to find a connection between the functions and enhance the wooden construction and the materiality. To find the dimensions that could relate to the interpretation one have of wooden houses, we looked into old log-construction. Their spans are limited to dimensions of 4x4 meters which gave us the framework for the raster of the building. The raster creates a colonnade of columns within the rooms and works as space defining elements. The placement of reading areas is towards openings, a place where the wooden construction becomes highlighted by both light and airy space.

Our thesis is as mentioned in the beginning inspired by the historical libraries, grand buildings which emphasised the act of reading by giving the visitor generous reading areas enlightened by openings in the roof. Looking into the interior of the building it provides an atrium in the centre filled with high bookshelves and study areas enlightened from the skylight. This atrium, the heart of the building is placed to strengthen the feeling of a library and the value of the physical book.

How can a public wooden building relate to the context at Linnégatan?

We see the public library as a building that should represent both public space and be a valuable place for learning and democracy. Looking at the façade analysis of existing buildings, there is the typical rectangular windows in a wall with a balance of vertical and horizontal lines. This is something that sets out the basis of the façade. Except for Hagabion that was a former school, most of the buildings are housing. In our façade expression we wanted to indicate that the building held something different from the surroundings, a public function. We therefore worked with a building that would differentiate in form to be its own solitaire, why we take a step away from Hagabion as well as creating an expression that is more strict than adjacent buildings. We mostly relate to Hagabion that is another public building on the site. In our façade we use a similar expression by showing the construction by horizontal and vertical elements that frames the windows but also rises the wooden construction. We saw the construction as an architectural tool to highlight and indicate that the building is public and a way to make the wooden buildings look more robust and the material more exclusive. Even though the grid in the façade is not loadbearing we wanted to mediate how the construction and organization of the building work, which gave us the strict façade grid. Something that we think works well with the public building as it has been used as an expression to highlight importance and beauty since the geek temples. The ground floor is more connected to other surrounding buildings that holds a public first floor since we wanted to open up the building to the public. To get the same impression of the building along all streets we worked with cores separated from the façade.

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