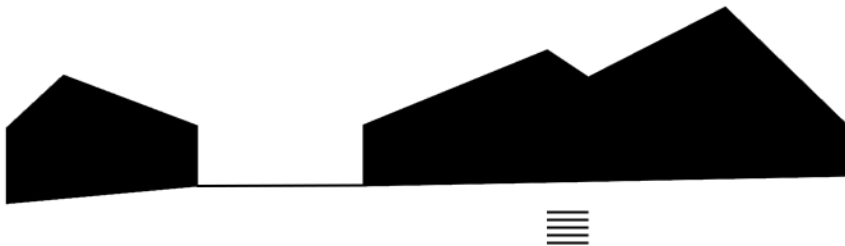


# STOCKHOLM TRÄMUSEUM



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*Master's Thesis in Architecture and Urban Design*

Politecnico di Milano  
Scuola di Architettura Urbanistica Ingegneria delle Costruzioni - MI  
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*Stockholm Trämuseum*

Professor: Camillo Magni



Trämuseum: “Wood Museum” in Swedish

## contents

<b>01. Introduction</b>	<b>6</b>
<b>02. Interpretative reading</b>	<b>10</b>
<i>2.1 Gamla Stan</i>	
<i>2.2.1 Kornhamnstorg Plan Analysis</i>	
<i>2.2.2 Kornhamnstorg Façades Analysis</i>	
<b>03. Project</b>	<b>22</b>
<i>3.1 The Waterfront</i>	
<i>3.2 The Museum</i>	
<i>3.3 Constructive Elements</i>	
<i>3.4 The Materiality</i>	
<b>04. Architectural references</b>	<b>56</b>
<i>4.1 Ragnar Östberg</i>	
<i>4.2 Erik Gunnar Asplund</i>	
<i>4.3 Sigurd Lewerentz</i>	
<i>4.4 Alvar Aalto</i>	
<b>05. Bibliography</b>	<b>74</b>
<i>5.1 Books</i>	
<i>5.2 Magazines</i>	
<b>06. Webliography</b>	<b>82</b>

## IMAGES INDEX

1. Stockholm	14
2. Infrastructures	18
3. Main streets	18
4. Open areas	19
5. Historical and modern landscapes	19
6. Kornhamnstorg	20
7. City walls	21
8. Wooden structure buildings	21
9. Different areas	21
10. Kornhamnstorg	22
11. Torgdragargränd	23
12. Kornhamnstorg 6	24
13. Kornhamnstorg 2-4	25
14. Kornhamnstorg 49	26
15. Kornhamnstorg 53	27
16. Axonometry	31
17. Urban section	30-31
18. Urban section	30.31
19. Urban strategy	32
20. Urban strategy	32
21. Urban strategy	32
22. Urban strategy	32
23. Masterplan	33
24. Ground floor plan	34
25. Concept	35
26. Concept	35
27. Concept	35
28. Concept	35
29. Ground floor plan	36
30. Underground floor plan	37
31. Mezzanine floor plan	38
32. -2 Undergorund floor plan	39
33. Section a-a'	40
34. South facade	40
35. Section b-b'	40
36. Section c-c'	41
37. West facade	41
38. East facade	41
39. Section d-d'	42
40. Section e-e'	42
41. North facade	42
42. Functional distribution	43
43. Functional distribution	43
44. Functional distribution	43
45. Functional distribution	43

46. Perspective section	44
47. View	45
48. View	46
49. View	47
50. View	48
51. View	48
52. View	49
53. View	49
54. Structure roof plan	50
55. Structure inter-floor slab 0/-1	51
56. Structure inter-floor slab -1/-2	51
57. Structure section a-a'	51
58. Structure section b-b'	51
59. Structure detail	53
60. Structure detail	55
61. Materials	56
62. Axonometry	57
63. Titanium zinc metal sheet drawing	58
64. Titanium zinc metal sheet texture	58
65. Wood junction drawing	59
66. Wood norway spruce and scots pine	59
67. Double-leaf masonry drawing	60
68. Brick wall texture	60
69. Concrete wall detail drawing	61
70. Concrete wall texture	61
71. Atelier Carl Eldh	64
72. Atelier Carl Eldh elevation	65
73. Atelier Carl Eldh sections	65
74. Atelier Carl Eldh plan	65
75. Atelier Carl Eldh south-eastern façade	66
76. Atelier Carl Eldh northern façade	67
77. Atelier Carl Eldh internal corridor	67
78. Skogskapellet external view	67
79. Skogskapellet section	68
80. Skogskapellet external view	69
81. Skogskapellet internal view	69
82. Skogskapellet external view	70
83. Markuskyrkan plan	71
84. Markuskyrkan external view	72
85. Markuskyrkan external view	73
86. Markuskyrkan internal view	73
87. Markuskyrkan external view	74
88. Kunsten Museum sections	75
89. Kunsten Museum internal view	76
90. Kunsten Museum internal view	77
91. Kunsten Museum detailed section	77
92. Kunsten Museum internal view	79

## *BOARDS INDEX*

1. The Manifesto
2. Urban analysis of Stockholm and Gamla Stan
3. Analysis of Kornhamnstorg
4. Urban axonometry
5. Masterplan and urban sections
6. Ground floor plan and design concept
7. Museum and restaurant floor plan
8. Workshop and conference room floor plan
9. Elevations and sections
10. Elevations and sections
11. Elevations and sections
12. Mezzanine floor plan and parking floor plan
13. Materiality's design concept
14. Constructive elements - section A
15. Constructive elements - section B
16. Structure
17. Perspective section and distribution design concept
18. Internal views
19. External views
20. The city market







# TRÄMUSEUM

## Museo del legno di Stoccolma

Il nuovo progetto urbano di Gamla Stan offre l'opportunità di bilanciare l'equilibrio tra strade per veicoli, pedoni e ciclisti, riqualificando l'intera area pubblica.

Questo moderno angolo di città ha come fine quello di presentare una nuova promenade urbana e architettonica, composta da edifici di nuova costruzione che dialoghino con il contesto storico e tradizionale svedese.

La griglia del nuovo masterplan preserva deliberatamente il carattere della città, per far risaltare i meravigliosi paesaggi offerti dalla città vecchia.

Sono stati progettati una serie di spazi verdi, nuovi spazi pubblici, un molo accessibile con servizi dedicati allo sport e nuovi percorsi ciclo-pedonali. Il fine ultimo è la celebrazione del lungolago, la rigenerazione di un quartiere storico con una spiccata tradizione architettonica.

Il progetto urbano verte principalmente sulla costruzione di un edificio con funzione culturale: un museo del legno, del suo tradizionale utilizzo, con un atelier e un'area ristoro. L'edificio in mattoni è composto da due volumi di solo due piani, per far sì

che non vengano celate le splendide facciate alle spalle del museo, nella piazza di Kornhamnstorg. Sfruttando quindi il dislivello offerto dal terreno, il prospetto nord è composto da solo un piano, mentre sul prospetto sud la facciata si raddoppia.

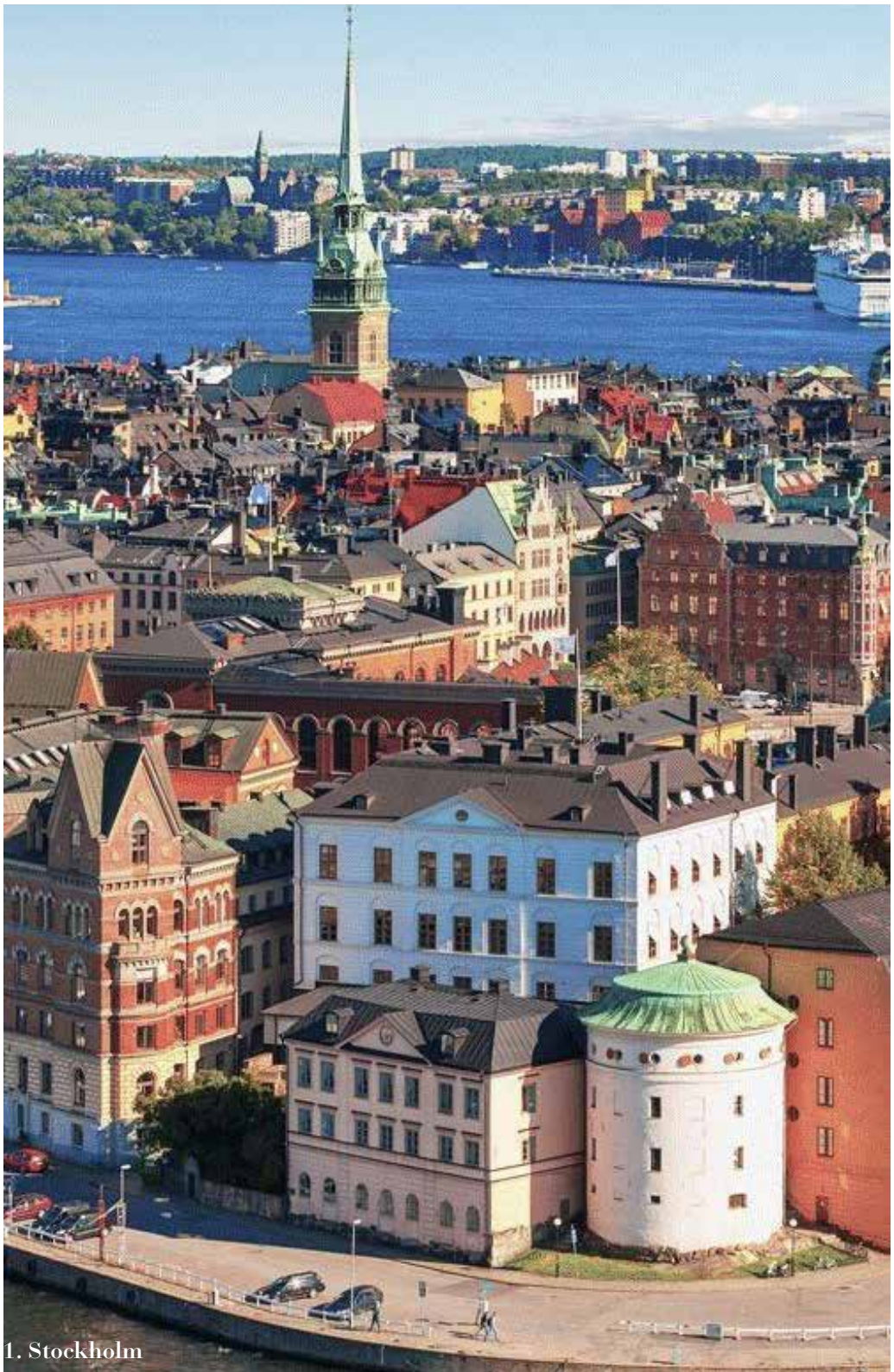
La copertura segue le inclinazioni e le falde dei tradizionali tetti nordici, mentre il colmo è influenzato dalla stretta stradina di Västerlånggatan, nonché l'asse principale di tutto il museo. In copertura la presenza di lucernari permette una forte luce zenitale al piano museale, diffusa poi anche al piano sottostante, quello dei laboratori, grazie al patio centrale.

I due volumi esterni sono collegati da un terrazzo con vista panoramica verso la città a sud, dall'altra parte del lago Mälaren.

Un'altra piazza pubblica, più intima, si trova di fronte ai laboratori. Quest'ultima trae vantaggio dal dislivello del terreno creando dei gradoni a scomparsa. La sfida più grande per questo progetto è dunque quella di trasformare quest'angolo di città da luogo di passaggio per via della rotatoria stradale, a grande punto di riferimento per famiglie e turisti.

01.

# INTRODUCTION



1. Stockholm

# TRÄMUSEUM

## Stockholm Wood Museum

The new Gamla Stan's masterplan offers an opportunity to readdress balance between road vehicles, pedestrians and cyclists while enhancing the public realm.

A new civic district for all will make possible the connection between these new important public buildings, animated by new commercial services and cultural places.

The grid of the new urban plan deliberately preserve the city's character and precious landscapes offered by the compact historical centre. A series of new green areas and new public spaces, an accessible quayside with sport facilities, pedestrian and cycle routes have been designed. The area is thought to encourage activities all day long, all year round for the people of Stockholm. We want to celebrate water and regenerate a historic city district of great value.

The aim of the project is the construction of a cultural building: a Craft Museum, with workshops and a refreshment area. The brick building is composed by two volumes only two floors high, in order to avoid hiding the historical façades in Kornhamnstorg.

Taking advantage of the slope of the square, on the North elevation only one floor will be visible, while on the Southern one we can see both of them. The roof follows the division of the historical façades, and it takes the cue from the narrow alley which connects Kornhamnstorg to the main street, Västerlånggatan, with a high staircase that will be winded up inside the Museum. On the roof the presence of regular rectangular openings lets zenithal light enter the exposition floor. Volumes are connected in the underground part and it allows the creation of a terrace which provides panoramic views over the newly liberated water front. Another public square is placed in front of the workshop's area; it emphasizes and exploits the slope thanks to particular steps and allows the entrance of light on the underground floor.

The challenge at Gamla Stan is to transform it from an urban problem to a popular destination that stitches together two untapped parts of the city. The masterplan heals this urban 'wound' by establishing a clearly defined green frontage to give the island a new face.

02.

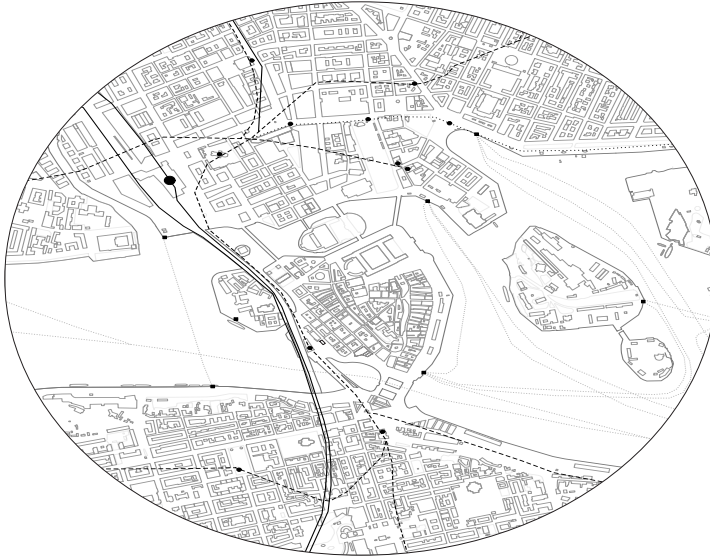


# INTERPRETATIVE READING

# Analysis

## 2.1 Stockholm and Gamla Stan

### 2. infrastructures



- ..... water ways
- train line
- - - - tram line
- - - - underground line
- underground line station
- boat decks
- train line station

### 3. main streets\_ pedestrian areas



- ..... pedestrian area
- new streets
- - - - new underground streets
- main streets
- - - - main underground streets

#### 4. open areas



- ▨ green areas
- public squares
- new waterfront
- ▤ old waterfront

#### 5. historical and modern landscapes



- ⊕ religious places
- ◆ historical places
- museums
- ▲ cultural places

### 2.2.1 KORNHAMNSTORG PLAN ANALYSIS

The square [1] is named after the harbour Kornhamn where corn was delivered to the city by ships coming from the Lake Mälaren [2] area which was embarked in the Middle Ages, the corn was then stored on an open space called Korntorget (“Grain Square”).

The square was probably a product of the city plan created for the western part of the old town in the 1620s. Both historically and in modern times the names Kornhamn and Kornhamnstorg have been used for the square, the port and the quay. Now the waterfront is just an abandoned place. In the middle of the square there is the statue [3] of a man drawing a bow, it was inaugurated in 1916 as an homage to Engelbrekt Engelbrektsson, leader of the Engelbrekt rebellion (1434–1436) against the German-dominated government of Eric of Pomerania.

Because of the presence of scales made to weigh metals, the former Korntorget (“Grain Square”), has been later called Järntorget [4] (Swedish for “The Iron Square”). Södra Bankohuset [5] is the oldest national bank building in the world. Its architecture was inspired by Italian Renaissance. The portal is a direct reference of Vignola’s portal at Villa Farnese in Caprarola.

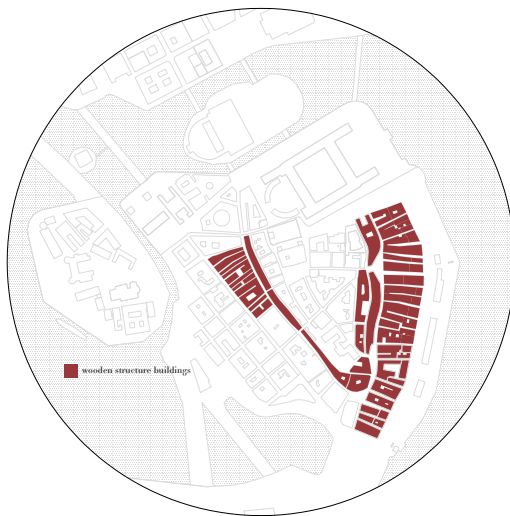
Mälaren means Lake Malar in English. It covers the West part of the island, it has been fundamental since the era of the Vikings for trade. On the East coast of Gamla Stan there is the Baltic Sea.



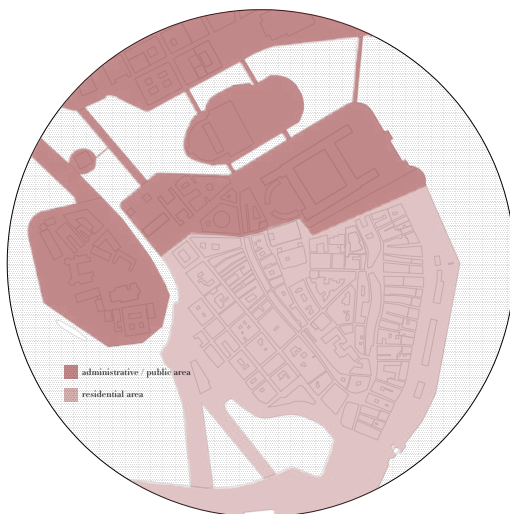
6. Kornhamnstorg *plan analysis*



**7. city walls** *the shape of Gamla Stan, the historical center of Stockholm has been made in the XIII century, when walls of 7 meters high were built. The walls were made by stone and wood. At the end of the XIV century people started building outside the walls, enlarging them and in the XVIII century they decided to remove them all.*



**8. wooden structure buildings** *historically the buildings were built with wood. Sweden had experienced over 30 devastating fires which had destroyed many cities and villages. The most dangerous was the Great Stockholm Fire in 1759. The same year a severe drought struck Stockholm. As both buildings and vegetation dried out, the fire hazard grew. In addition, the water supply was on the verge of running dry (except near Mälaren), which meant that any fire would be harder to fight.*



**9. different areas** *the historical center of Stockholm has a clear diversity between the administrative/public buildings and the residential ones. The typology of the construction is different, as the materials and the courtyard. Residential buildings have more similar shapes and they develop on a regular grid. Now the historical center is almost completely populated by tourists.*

## 2.2.2 KORNHAMNSTORG FAÇADES ANALYSIS

The practicality and the austerity of Swedish architecture has also been extended to its people: they are solitary lumberjacks who have lived in isolation for generations before experiencing a rapid and late industrialization.

The modernist logic of stripping away color never caught on in Stockholm: the most common color found on buildings is yellow, from the copper mines; green mint and pink are inspired by the natural landscape of Sweden.

In the face of the modernist monochrome, color persisted in Stockholm: “the historical center is like a cluster of matchbox buildings with gabled roofs painted red, yellow and green”. The Swedes continued to adhere to the tradition in their choice of painting, but now colors are completely detached from their previous imitation purpose.

For much of Stockholm’s history, the city was too remote to significantly contribute to Western European culture. Swedes chose to believe they had always been modern. The legend said that the photos of modern architecture which came from Western Europe were black and white, therefore people could not understand that those buildings were actually white or painted in light colors. Far from being artificial, the candy-colored buildings of Stockholm evoke the rich mineral colors of the countryside, perhaps acting as a sort of comfort for all the lonely lumberjacks crammed uncomfortably in the city.





11. Torgdragargränd\_  
*connection to the project*

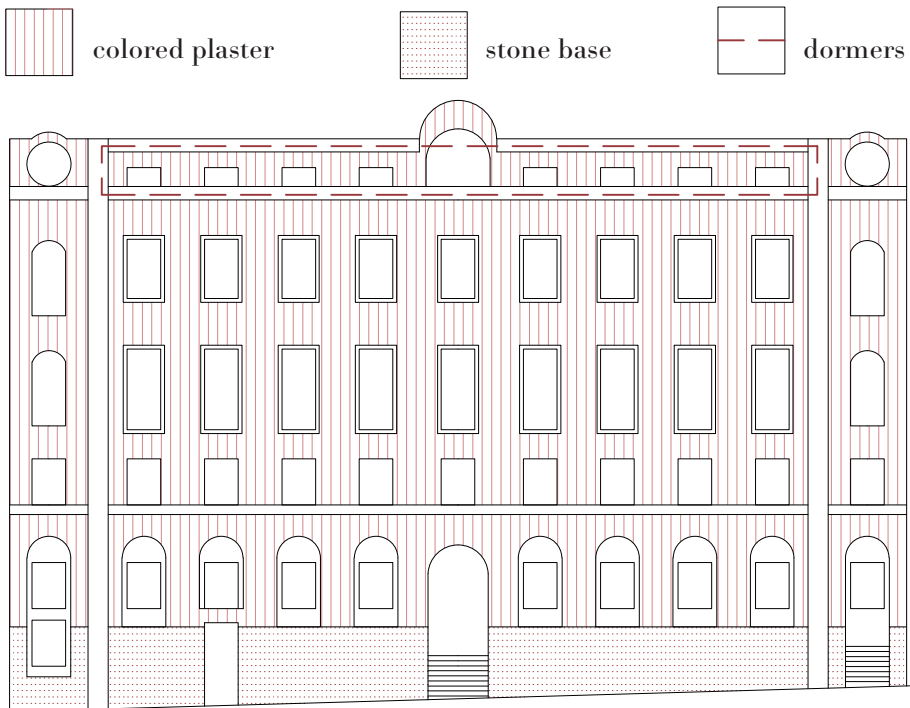
### *The Charon neighborhood*

Almost all the names of the blocks of the Old City were added in the last part of the XVII century and they are inspired by Greek and Roman mythology. In Greek and Roman mythology Charon was the immortal ferryman of the underworld who carried the souls of the dead across the Acheron river.

### *Kornhamnstorg 6*

The oldest settlement in the neighborhood dates back to 1790 and 1801. In the mid-1850s, all houses and the current building were demolished to be re-designed by architect Johan Fredrik Åbom for the wine and spirits importer Johan Cederlund.

In 1880, the house was acquired by silk producer Knut Almgren, who had the Almgren requirements factory here until 1963. The advertising sign for Almgren was on the facade against Kornhamnstorg. In 1917, a branch of the New Bank opened in the corner of Kornhamnstorg 6 / Lilla Nygatan 22. In the 1930s and 1960s, a branch of Gothenburg Bank was located in the same room. The decorations of the facade against Kornhamnstorg have been modified and simplified over time, while the original furnishings pointing towards the streets in the neighborhood are almost intact. Today there are mainly offices in the house.



**12. Kornhamnstorg 6**



### *The Cerberus neighborhood*

Cerberus was, in Greek mythology, the three-headed dog guarding entry into the realm of death where Hades reigned.

### *Kornhamnstorg 2*

The Cerberus 1 property (Stora Nygatan 46 / Kornhamnstorg 2) consisted of two houses of the mid-17th century. During the 18th century, they were brought together creating seven entrances, giving rise to the designation “Seven Gates of Hell”.

### *Kornhamnstorg 4*

The Buckauska House, built in 1750, was named after the builder, the wholesaler Jacob Buckau (1687-1755).

In 1871, the commercial bank of Stockholm began (later Svenska Handelsbanken) its operations with the shipping office on the upper floor. The premises were enlarged and in 1884 it also included rooms on the upper floors, while there was a small exhibition hall on the ground floor. The main office moved to Gustavo Adolfo square in 1894, but the bank maintained the shipping room in the house until 1915. To date, the house has retained numerous interior details since the early XIX century, such as the door covers with carved mercury heads and centaurs, but also the bank-era cash deposit with the Chubb manufacturing signature.



colored plaster



stone base



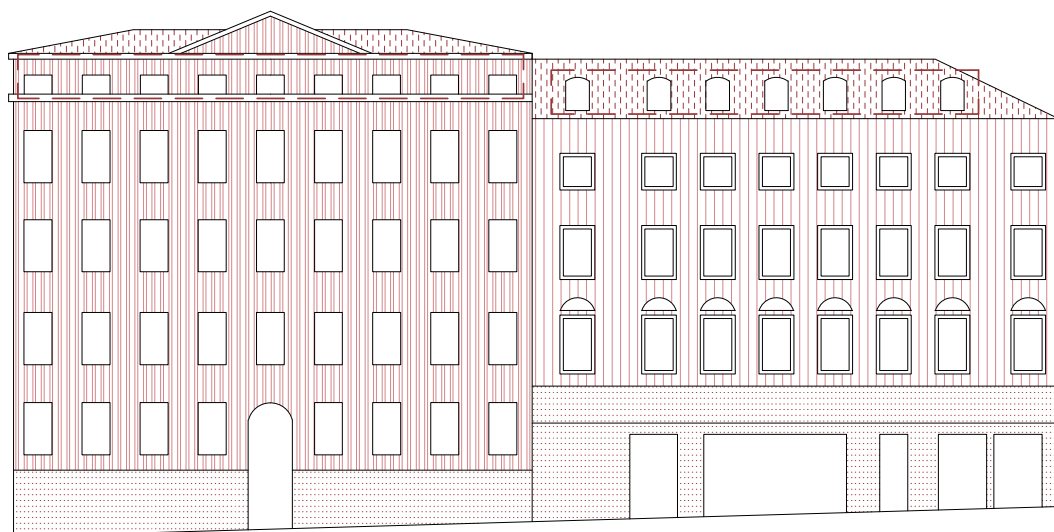
dormers



white plaster



slate tiles roof



13. Kornhamnstorg 2-4

### *The Typhon neighborhood*

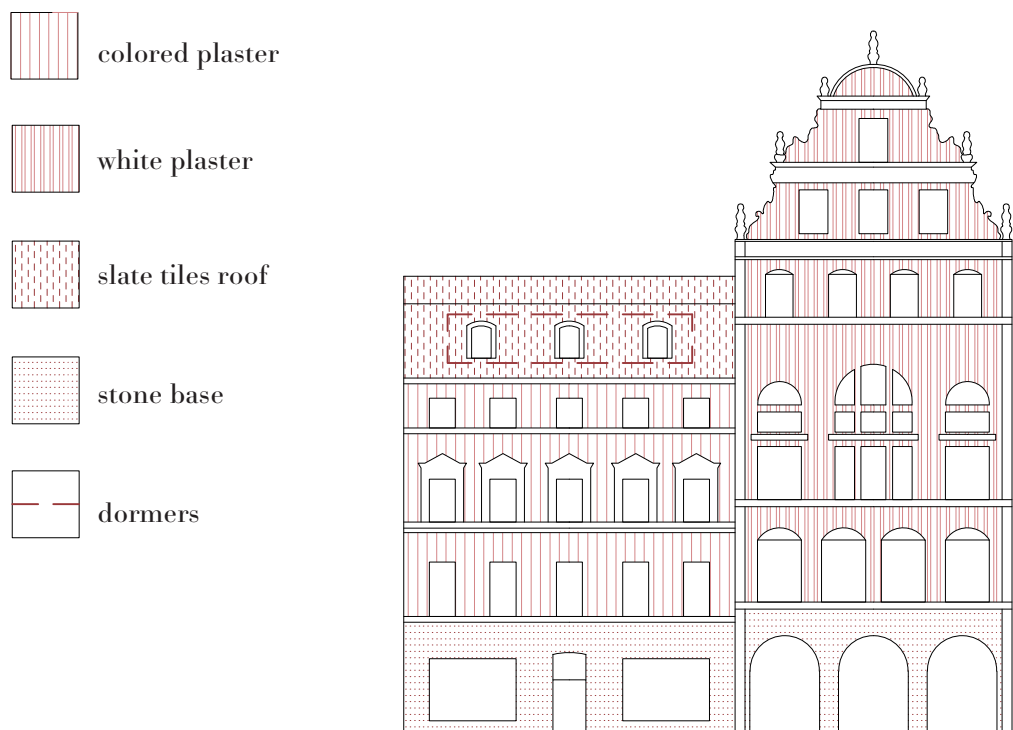
Typhon (from the mythological creature Tyfon) is a block in the Old Town, which is bounded by Västerlånggatan, the German brink, Stora Nygatan, Kornhamnstorg and Funkens alley. The neighborhood is crossed by Torgdragargränd. Here it is possible to find, among others, the Von der Lindeska house, the Funckska house and the building Typhon 16.

Through an archaeological survey in 1998 in the property Typhon 9 (towards Västerlånggatan and the German brink), a wall was found, which probably belonged to a building in the Southwest part of the current property.

### *Kornhamnstorg 49*

Typhon 16 is a property in the Typhon block in the Old Town in central Stockholm. The building was also called Modehuset 66 after the address Västerlånggatan 66.

A house already existed in Västerlånggatan since 1647, while the building towards Kornhamnstorg was erected in 1906 according to the design of the architect Edward Ohlsson. Old and new houses were therefore combined. The new home was designed as a commercial home with multi-level stores. A passage through the property was created in connection with the new building.



**14. Kornhamnstorg 49**

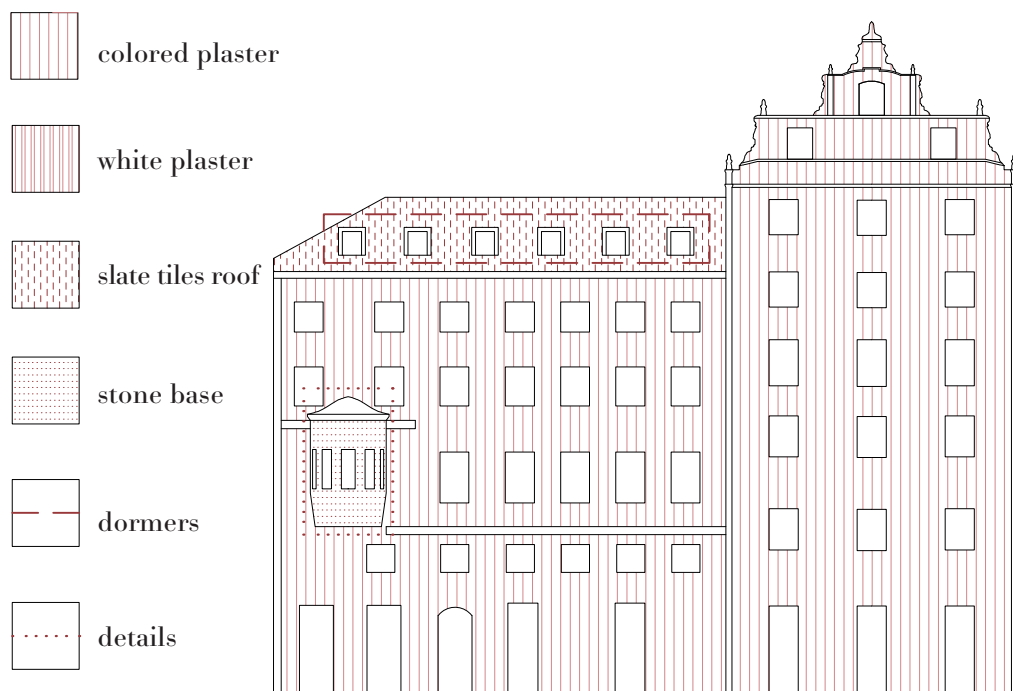
### *Kornhamnstorg 51*

Von der Lindeska huset it is a building in the Typhon block. On the facade on Kornhamnstorg there is Stockholm's oldest preserved bay tongue. The house has a medieval frame, the facade dates back to the XVII century, it was rebuilt in 1763 and in 1908, led by Gustaf Lindgren. The facade of the building is modeled in the Dutch Renaissance style.

At Kornhamnstorg 51 there is a strange stock exchange language. This bay tongue is the only one that has remained in Stockholm since the 17th century. It is sometimes called the cage tongue of the Scharenbegska house. It is a five sided tongue of the bay built in limestone which is supported by four figures, two men and two women. They are carved in oak, originally they were polychrome painted and very similar to the decorative embellishments of the royal ship Vasa from the 20s of the XX century.

### *Kornhamnstorg 53*

Funckska House is a building in the Typhon block. The building was originally erected in 1640 for the patron Tomas Funck, that is why it is also called the Funckska house. In 1908, the house was restored, based on the designs of Ferdinando Boberg. During the reconstruction it was raised to two floors, the new roof was recreated and the windows on the ground floor took on the current and arched shape.



### **15. Kornhamnstorg 53**

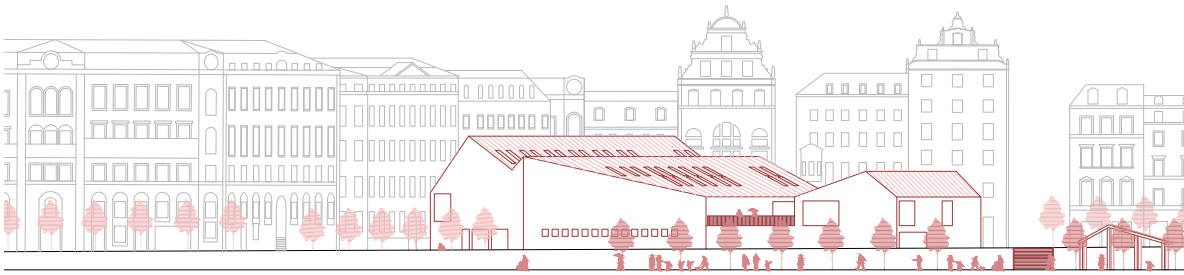
03.

# PROJECT

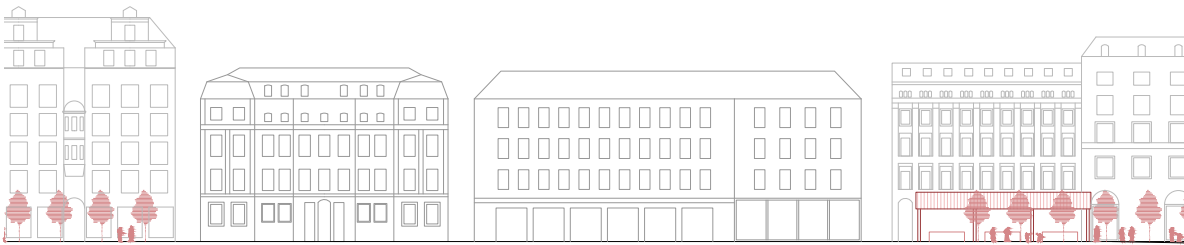
# Trämuseum

## 3.1 THE WATERFRONT

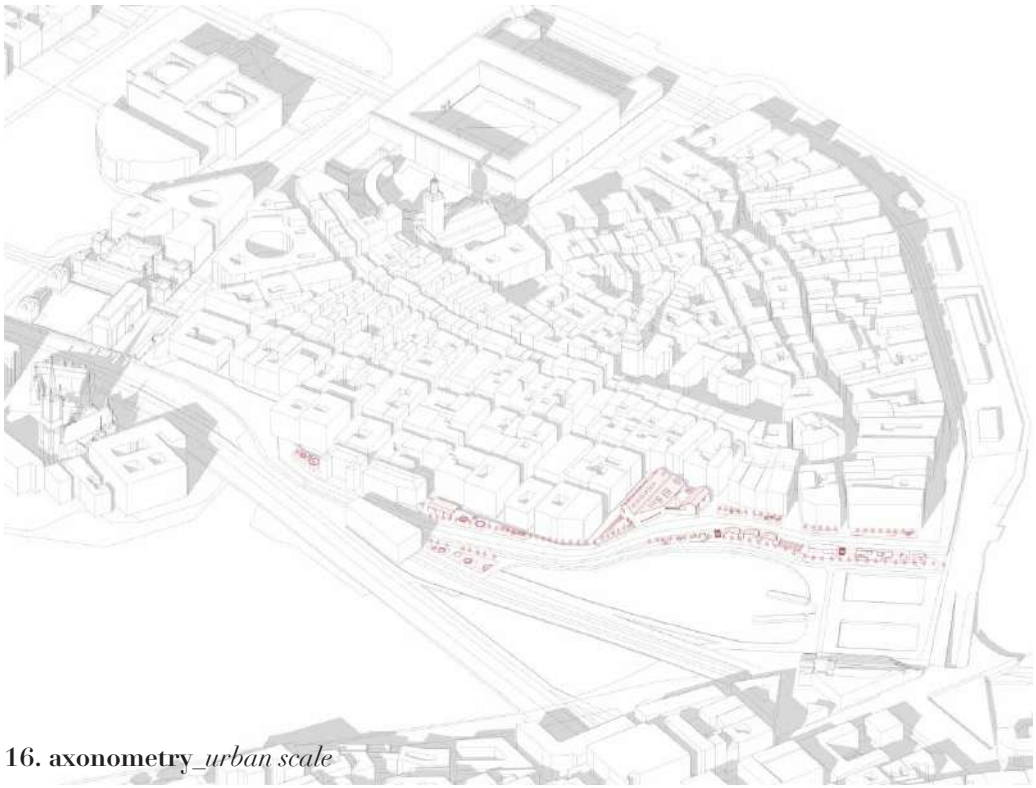
The historical center of Stockholm is characterized by a high density of buildings, all very compact with each other. It is a residential island, which today, thanks to Airbnb, it's mainly exploited for tourism. The urban plan which modified it in this way dates back to the early XVII century. The buildings are tall and very close to each other (some alleys do not reach 1 meter in width). Now the area is mainly pedestrian. The idea of the project is to redevelop the southern belt of the sea front. A museum has been designed with an adjacent refreshment area, the two buildings have designed two public spaces: a square that is 1 meter below street level, which allows visitors to exit the museum's underground floor; and a panoramic terrace on the same level of the entrances of the museum and the restaurant. There is a scarce presence of greenery on the island and it is located in private areas, so the idea is to redesign the waterfront with green areas alternating in between seats and flower beds, which are connected by rows of trees. The southernmost quay is newly built, the aim is to create a space that people could use daily thank to sport facilities, playgrounds for children and areas for the market.



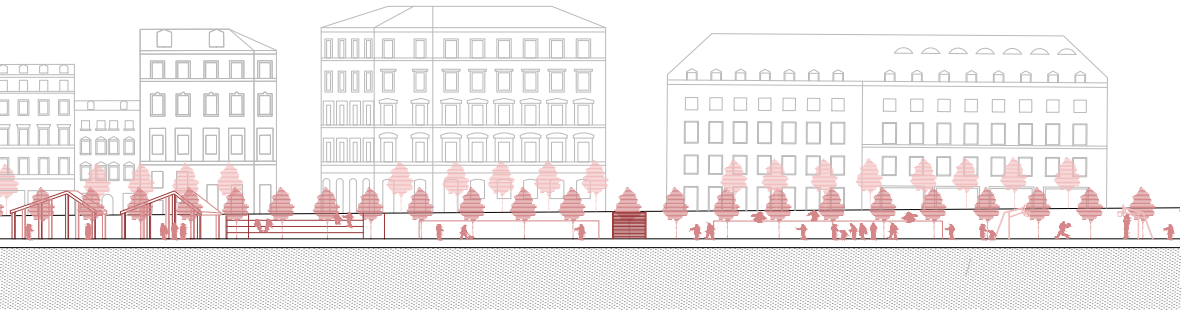
17. urban section *\_east urban strategy*



18. urban section *\_west urban strategy*



16. axonometry\_urban scale





19.



20.



21.



22.

- 19. urban strategy *\_project area*
- 20. urban strategy *\_museum+piazza*
- 21. urban strategy *\_green area*
- 22. urban strategy *\_public facilities*
- 23. masterplan *\_urban development*





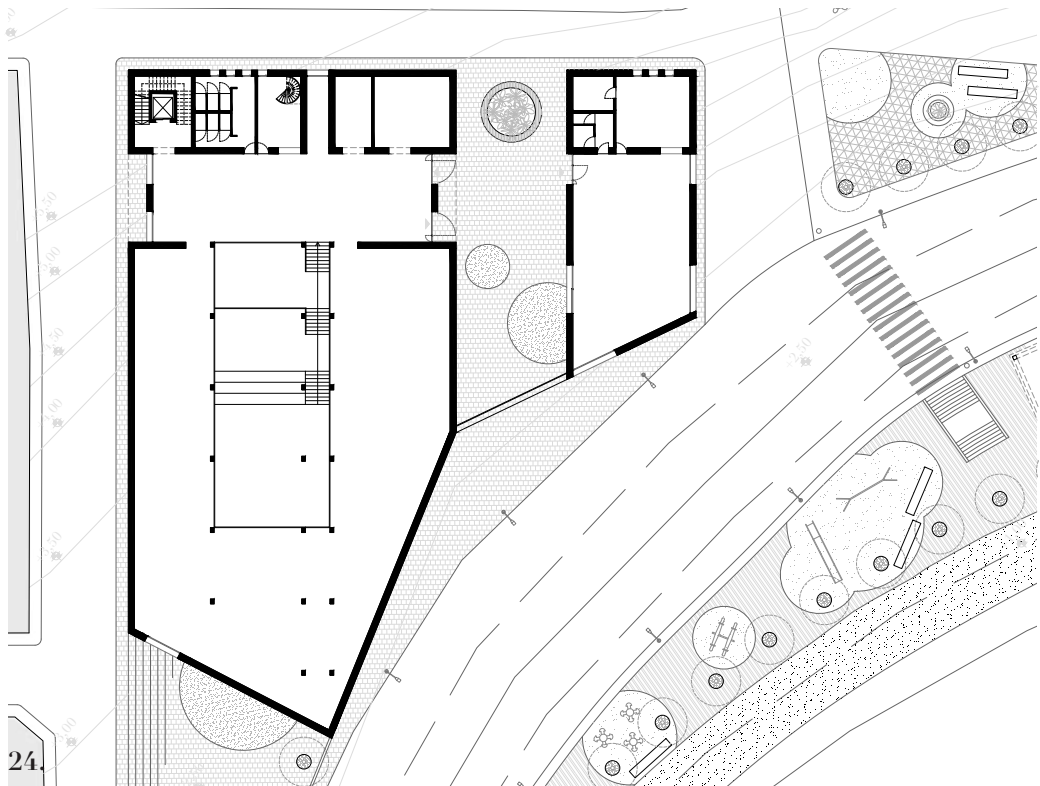
### 3.2 THE MUSEUM

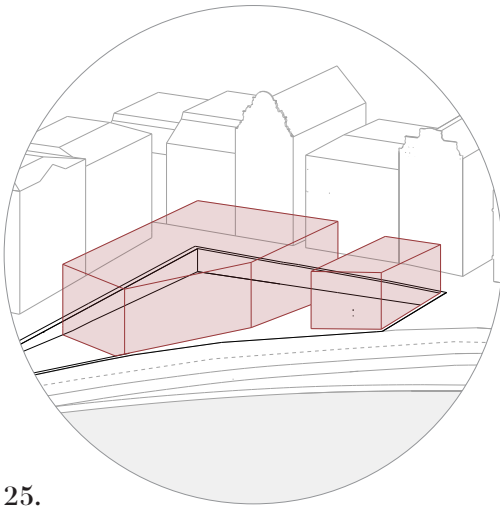
Kornhamnstorg is a square on the south coast of Gamla Stan and it has been a harbour for decades. Here there is the statue of Engelbrekt Engelbrektsson and two small cabins where they sell herring sandwich, a typical Swedish dish. Thanks to the guidelines made by the existing buildings, the creation of two main volumes: one for the museum workshop, and the other one for the restaurant.

The two volumes are connected thanks to the underground floor and this allows the creation of a conference/cinema room and, on the top, a panoramic public terrace, which has also entrances of the museum and the restaurant.

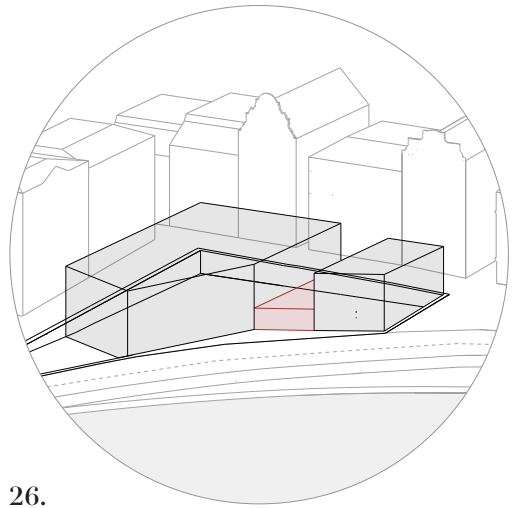
Due to the geographical position of the project, with recurring snowfalls during winter, it has metal sheet pitched roofs.

On the ground floor there is the museum so there are roof openings for zenithal light; in the underground floor there is the workshop which has big openings that face out on the main public square. The courtyard in the middle of the building allows the passage of the roof light. The restaurant also has big openings in order to let visitors appreciate the panorama on Slussen. On the floor -2 there is a parking area for museum workers, it is connected with a service staircase.

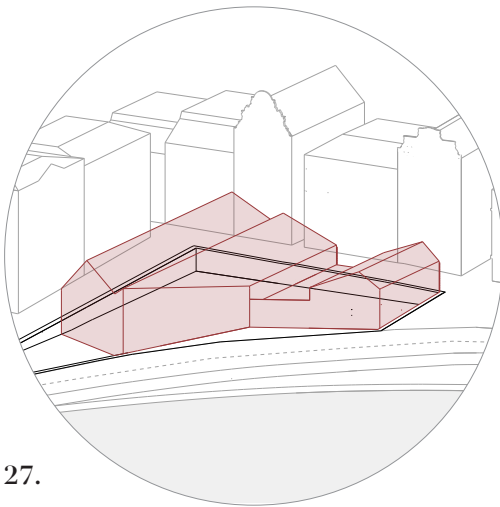




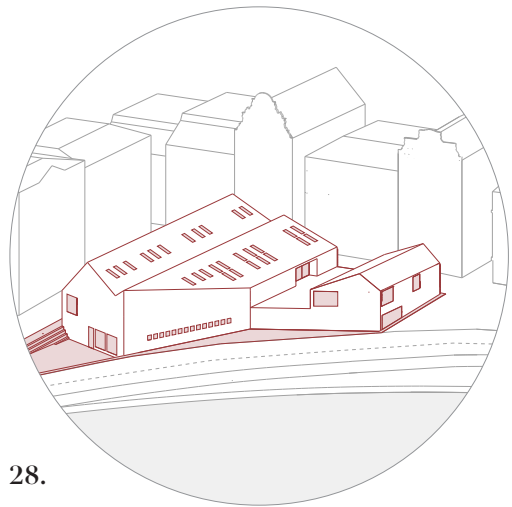
25.



26.



27.



28.

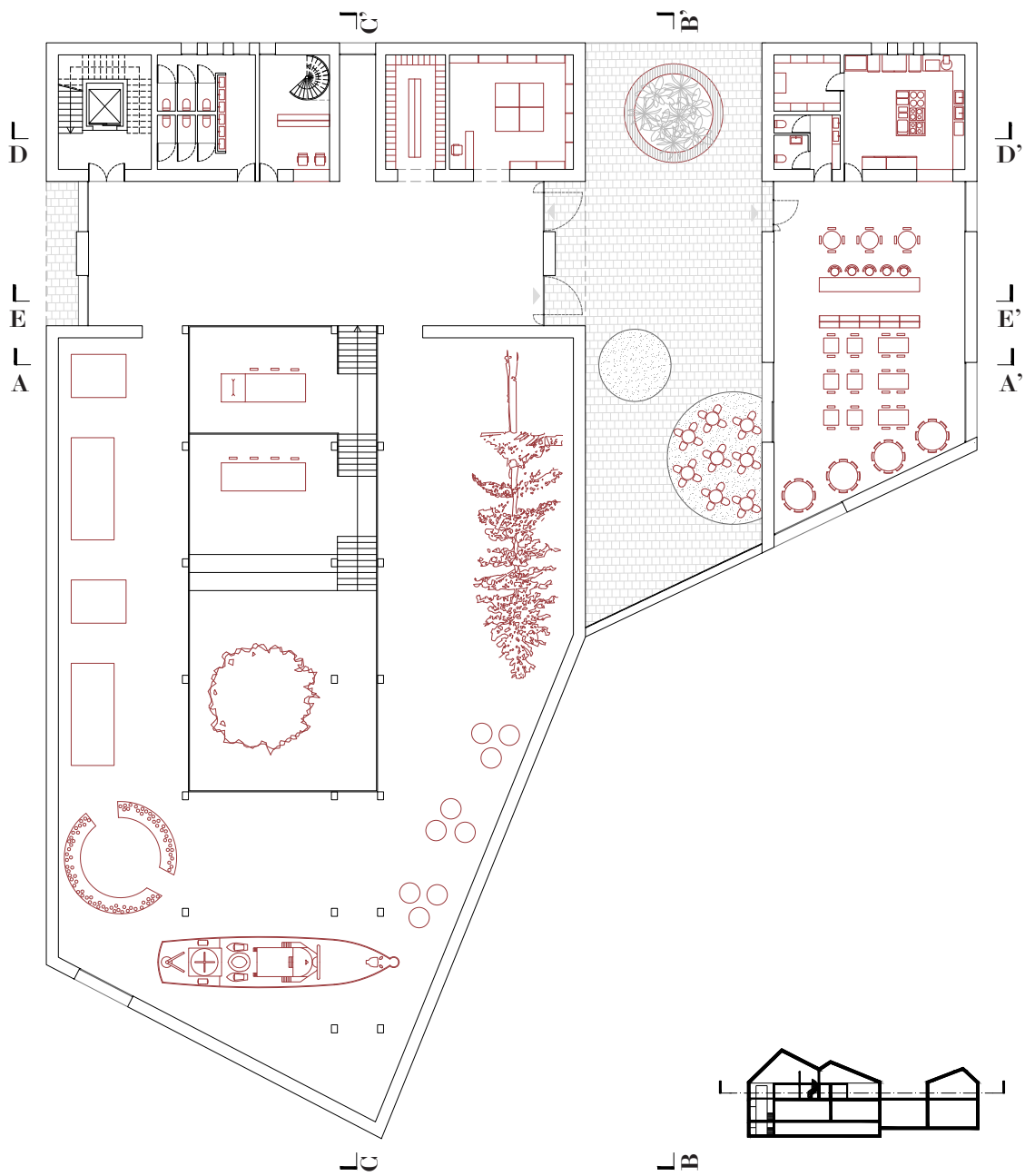
24. **ground floor plan** *background*

25. **concept** *volumes*

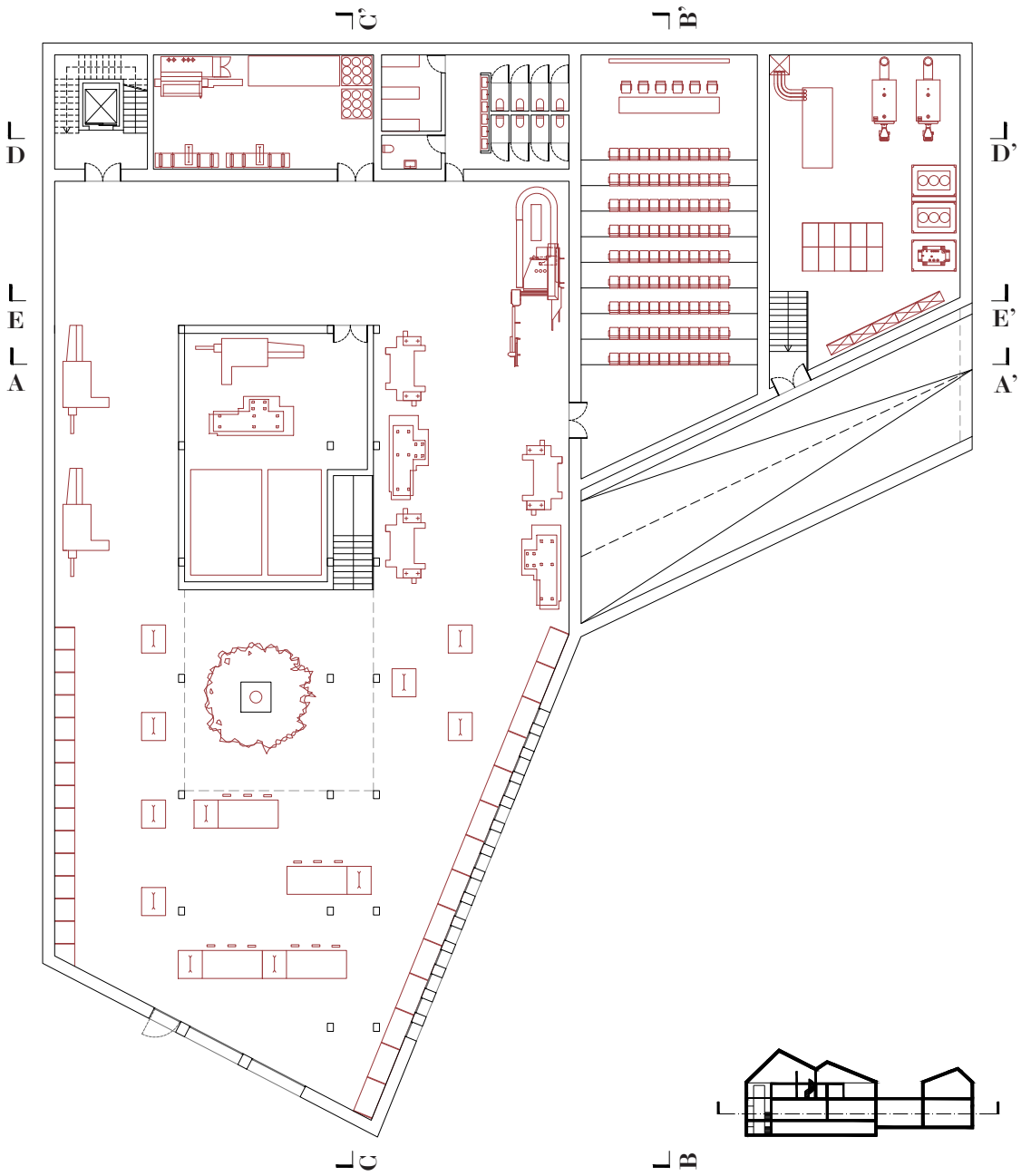
26. **concept** *connection of volumes*

27. **concept** *pitched roofs*

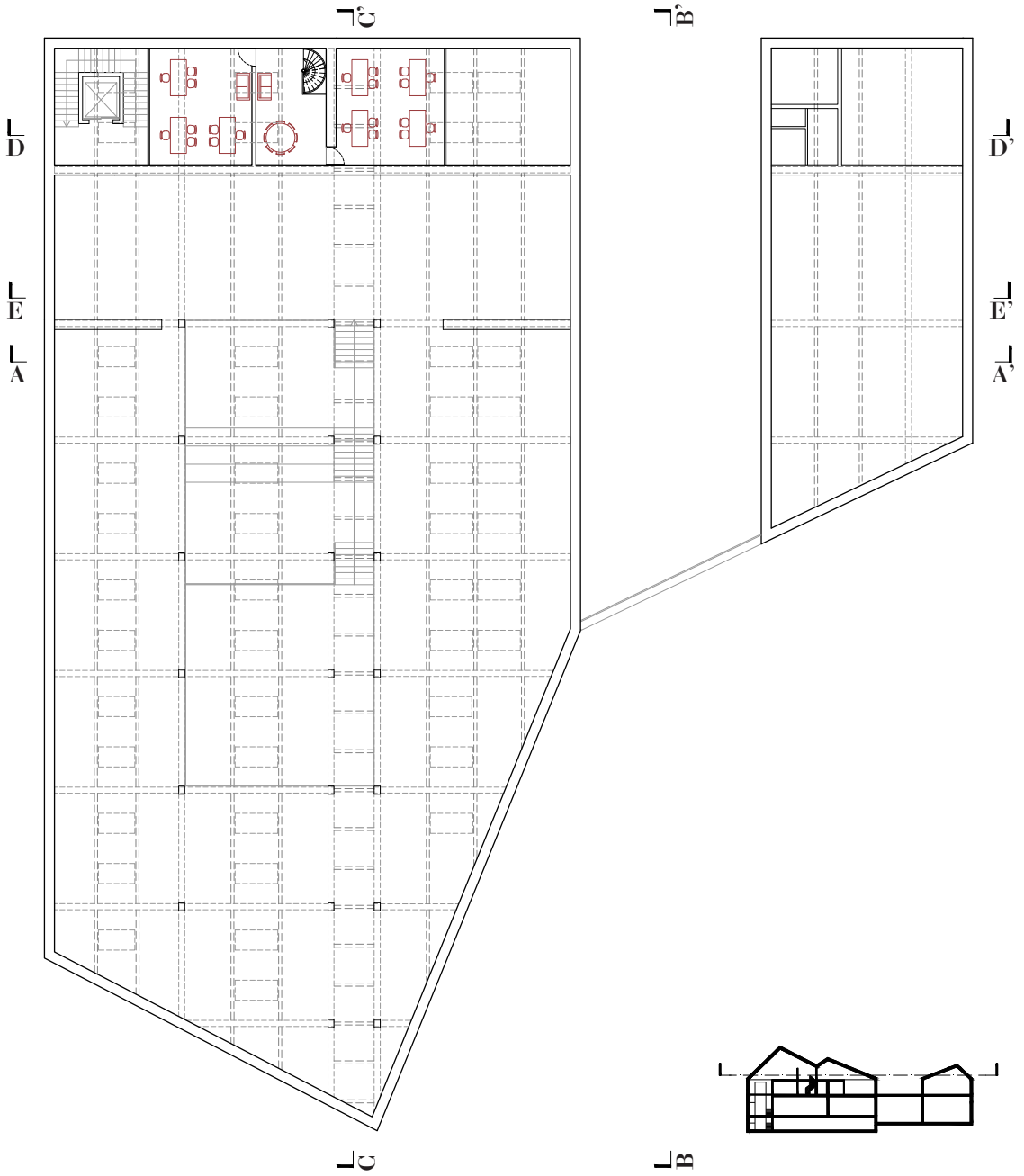
28. **concept** *openings*



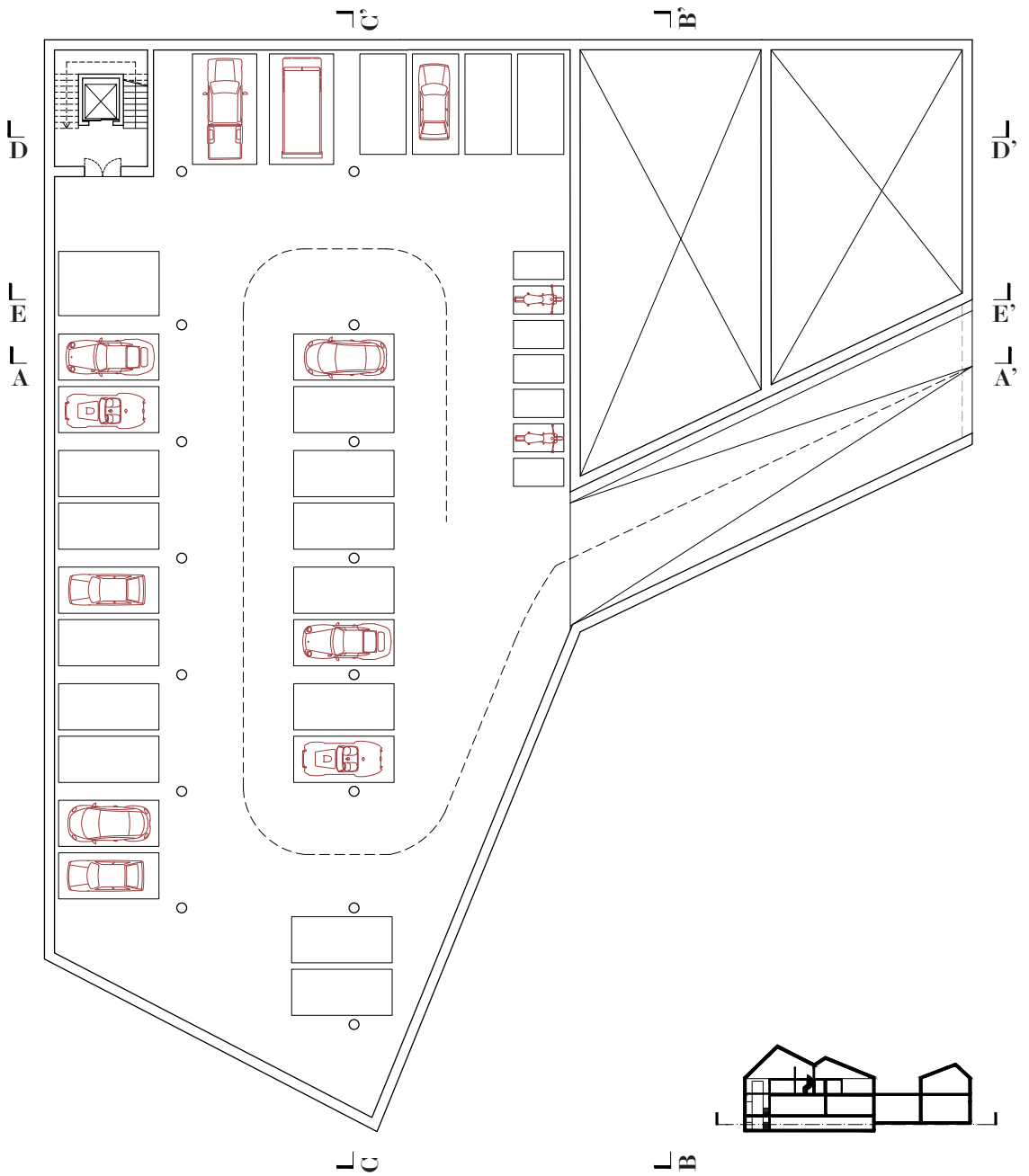
29. ground floor plan\_museum



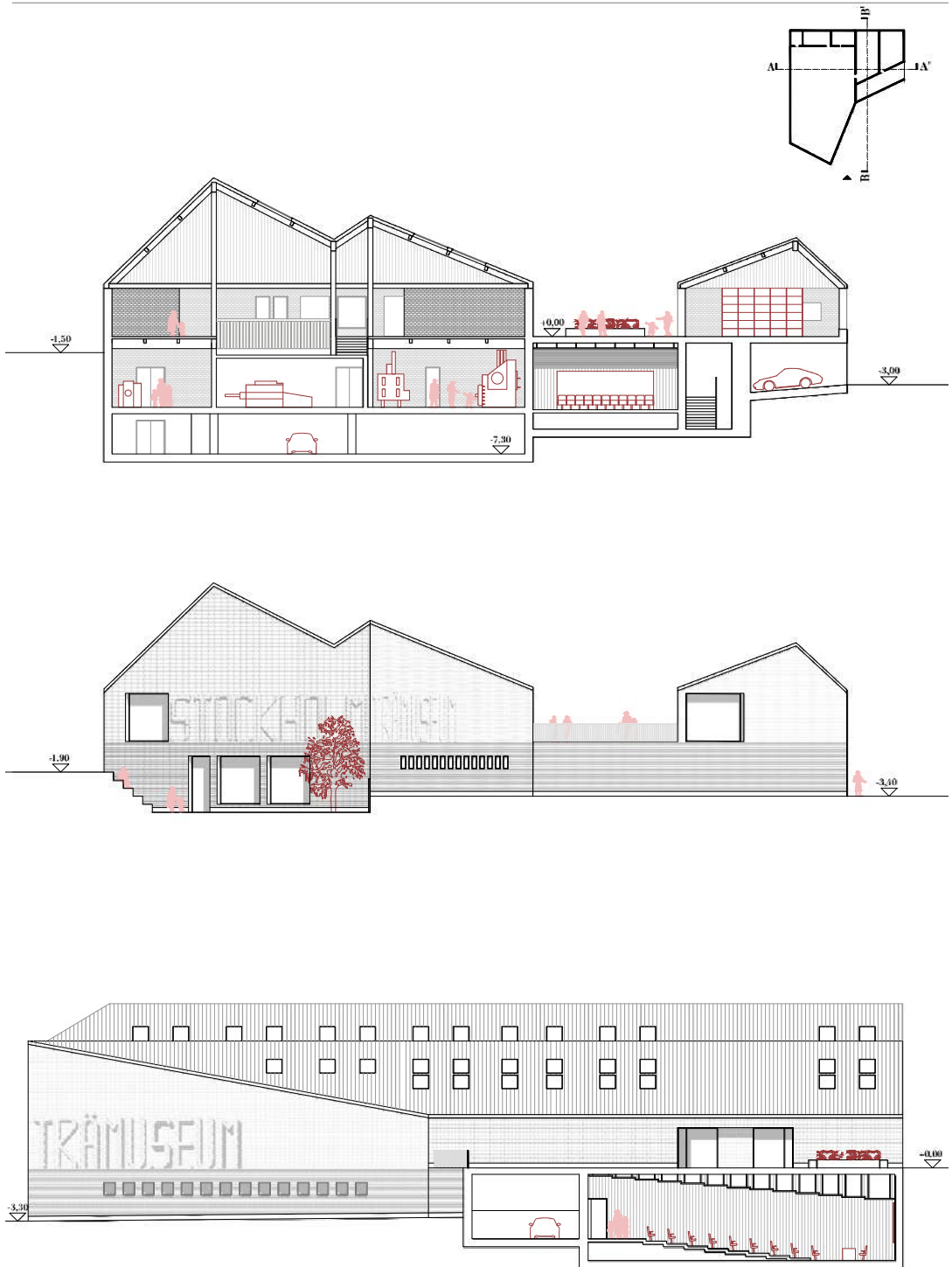
30. underground floor plan\_workshop



31. mezzanine floor plan\_offices

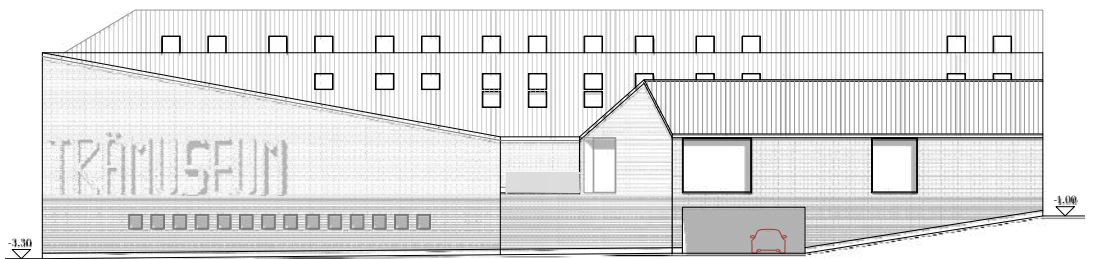
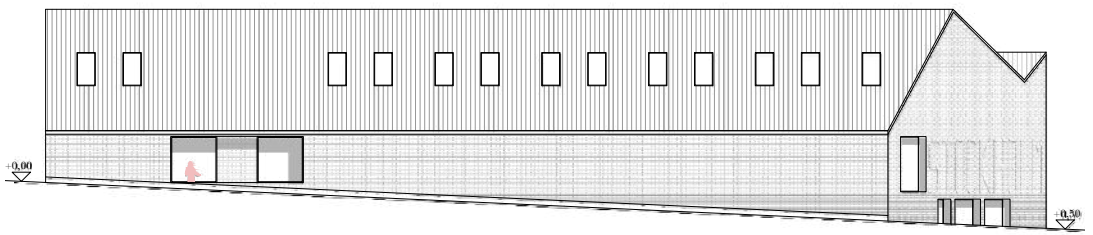
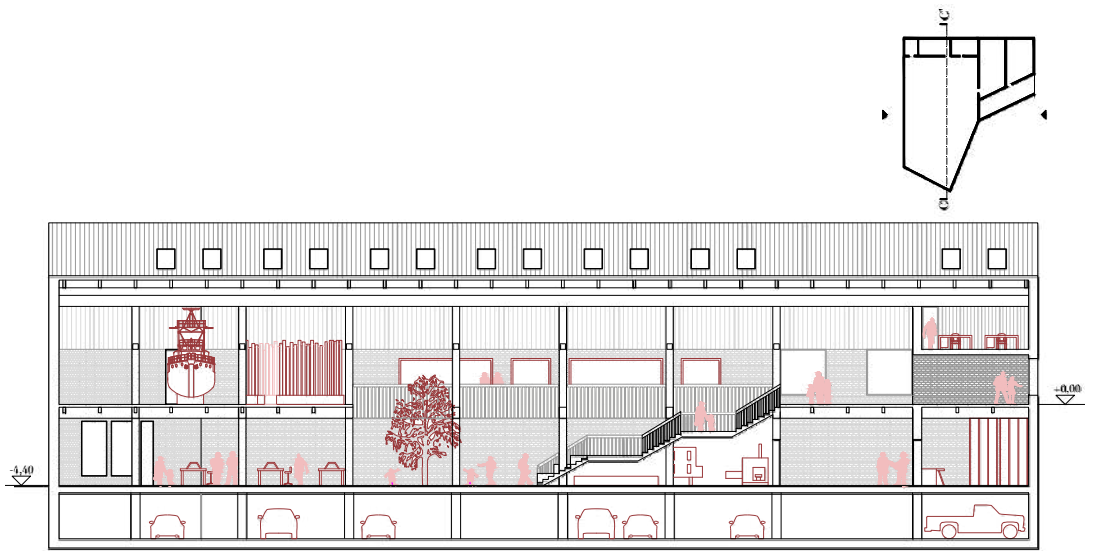


32. -2 underground floor plan\_parking



33. section A-A'  
 34. south facade  
 35. section B-B'

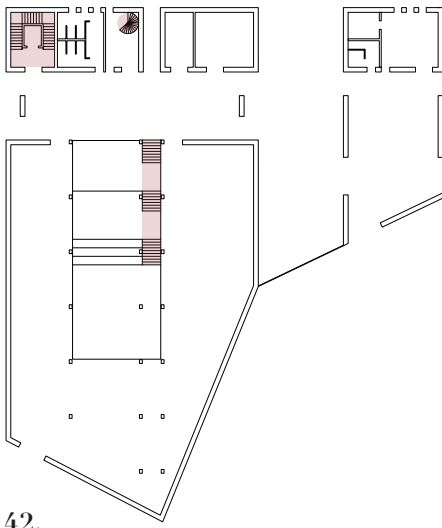




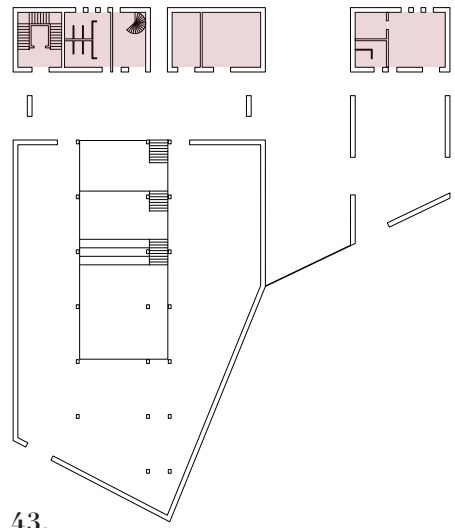
- 36. section C-C'
- 37. west facade
- 38. east facade



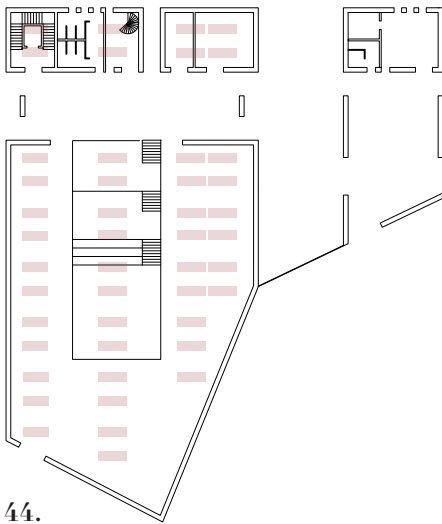
39. section D-D'  
 40. section E-E'  
 41. north facade



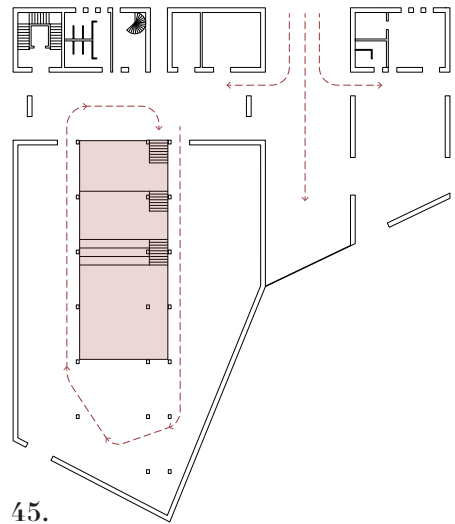
42.



43.



44.



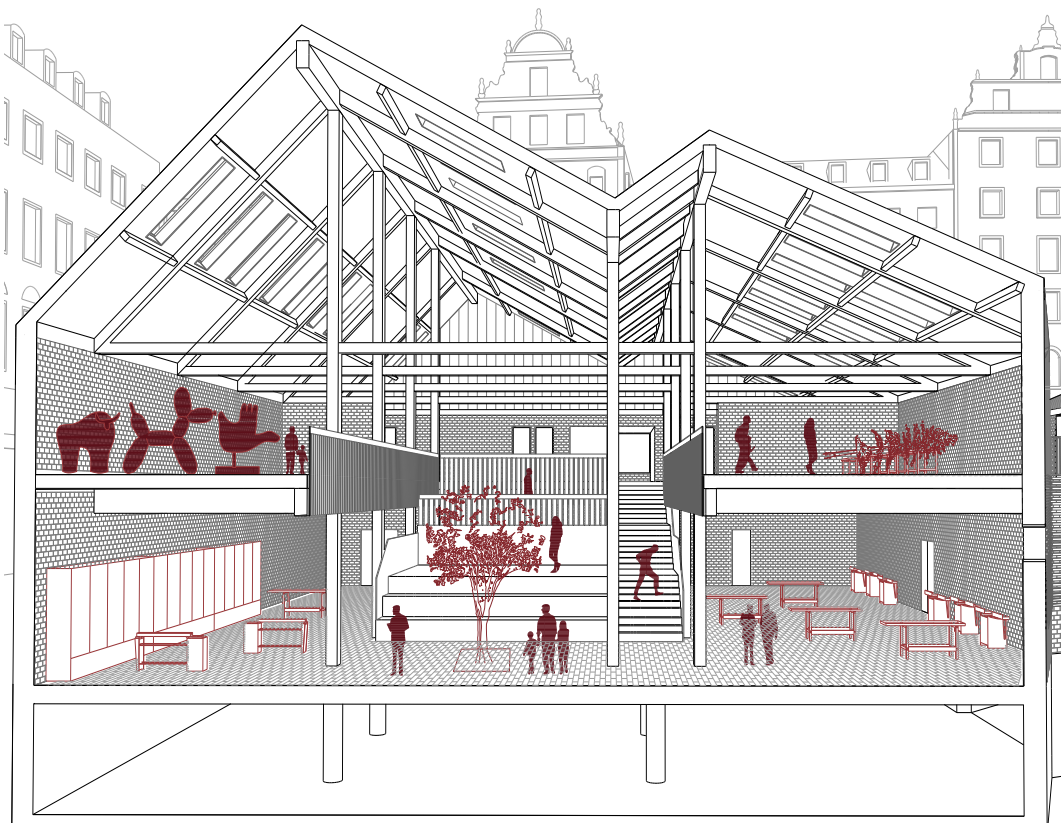
45.

42. functional distribution\_ *vertical distribution*

43. functional distribution\_ *services*

44. functional distribution\_ *skylights*

45. functional distribution\_ *inner courtyard*



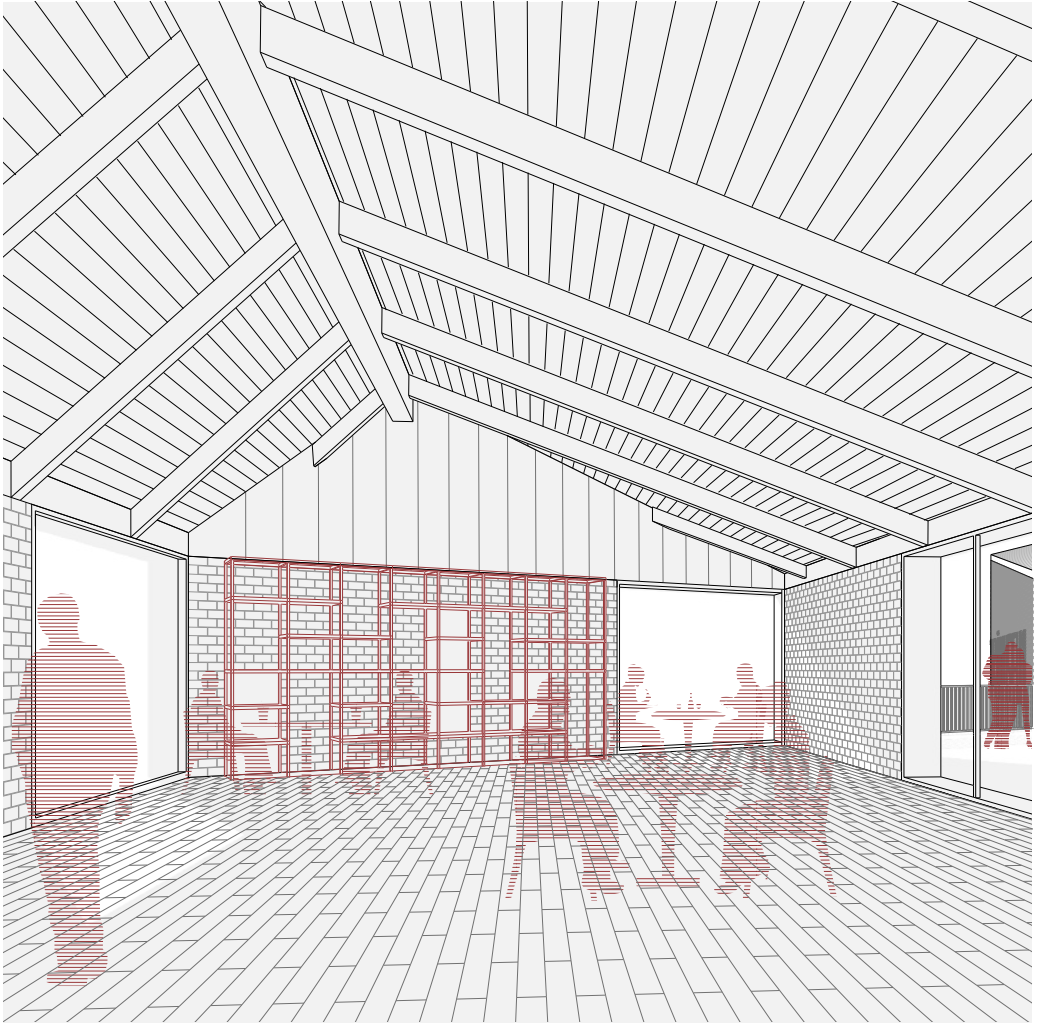
46. perspective section\_ museum, workshop and patio



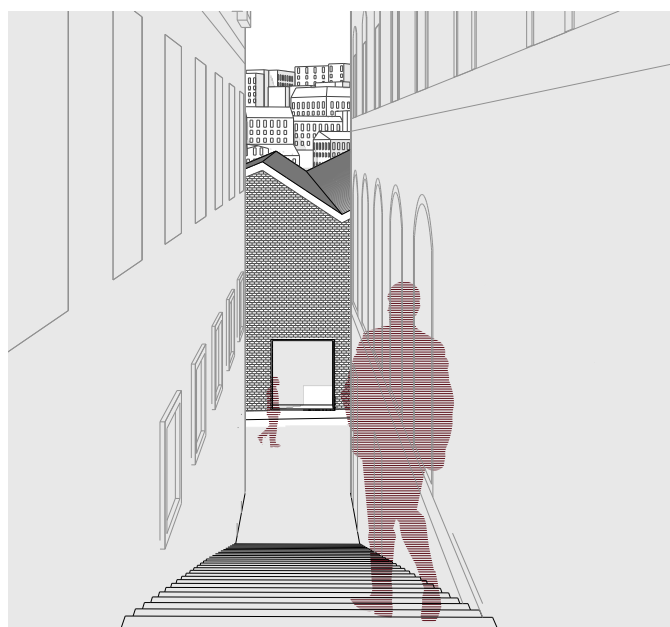
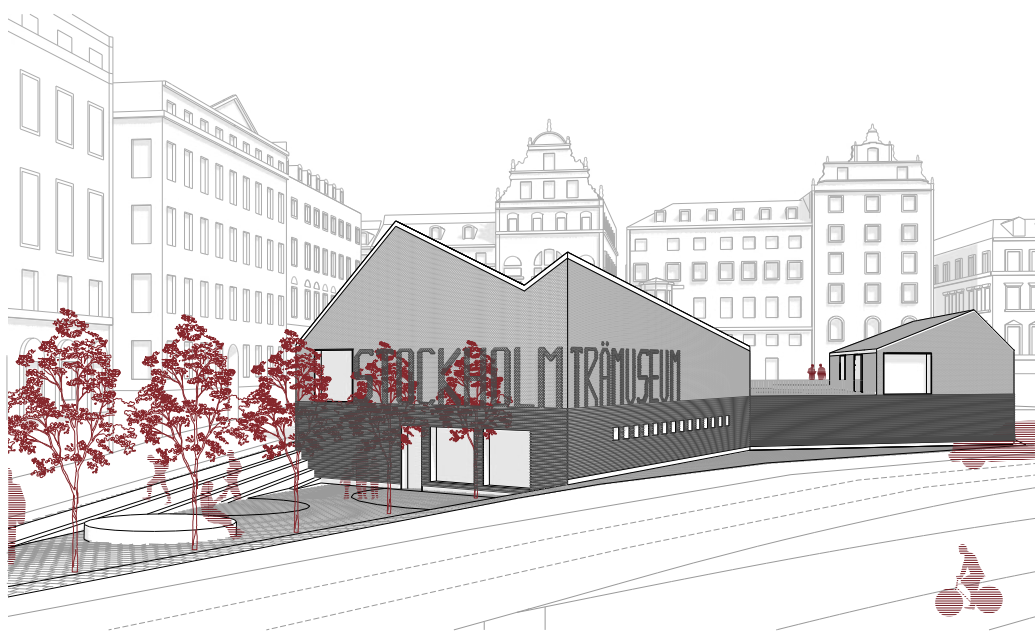
47. view\_patio



48. view\_ skylights



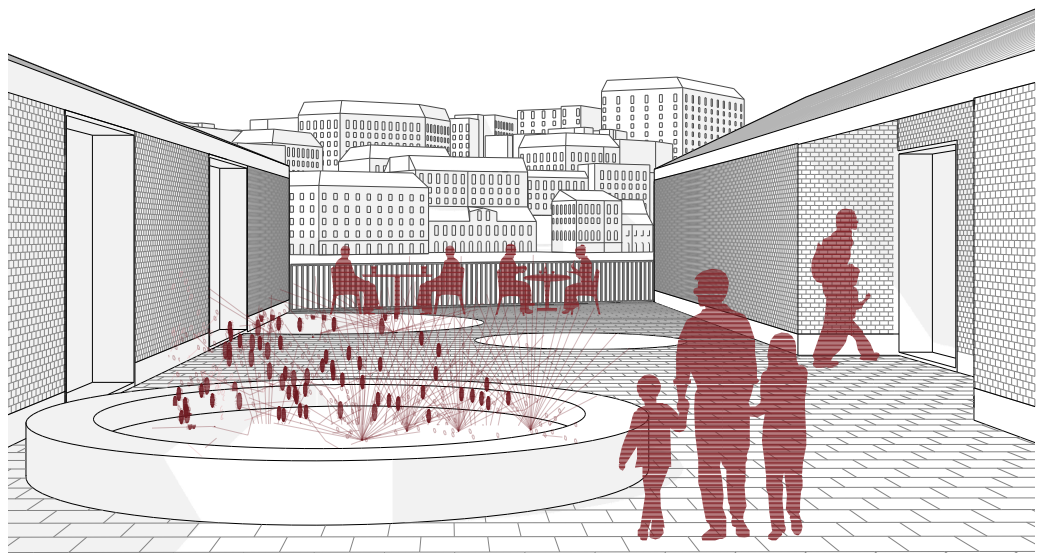
49. view\_restaurant



50. view\_museum and square

51. view\_from the narrow Torgdragargränd



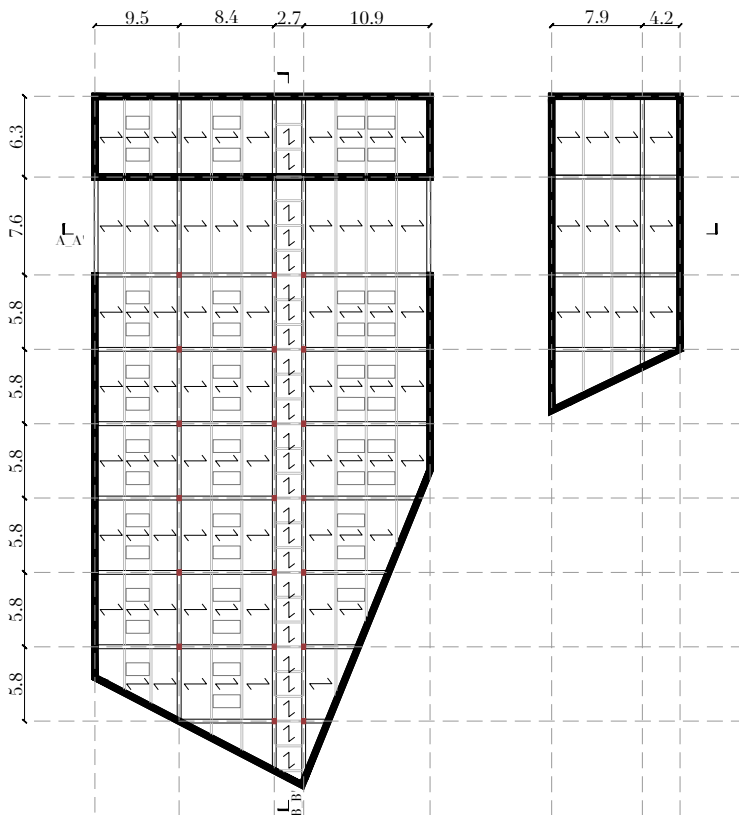


52. view\_public space in Mälartorget square

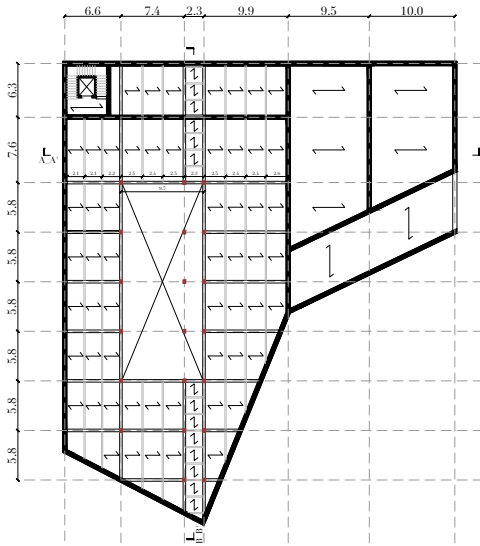
53. view\_terrace

### 3.3 CONSTRUCTIVE ELEMENTS

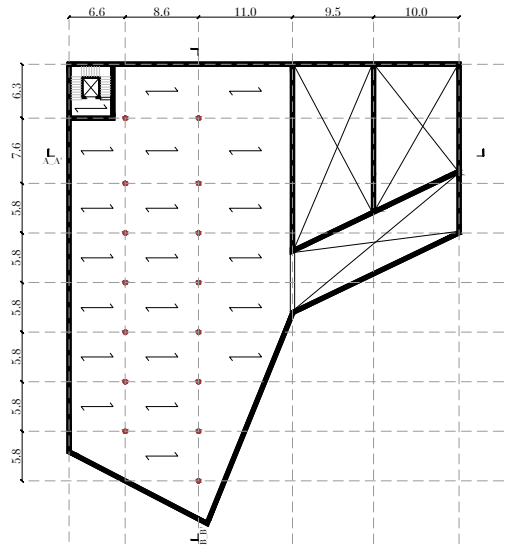
The volume is based on a structural brick wall along the perimeter, and a wooden point-shaped structure in the interior. The main purpose is to highlight those materials and their schemes: outside the heavyweight masonry and inside the lightness of the wood. When the masonry meets the ground, due to the weight of the soil, it becomes concrete, with a 40 cm structural thickness. Two floors and the roof are based on a wooden system of beams and pillars, which allow the building to have interior spaces with a length of 10 meters. The skeleton is based on primary beams along two different directions, and the secondary ones mainly follow the longitudinal axe. Other spaces follow different rules, like the auditorium and the technical room: they have concrete slab supported by concrete walls. The auditorium has a special ceiling in order to preserve the right acoustic comfort and the technical room does not need any particular ceiling based on a wooden structure. The parking, due to long distance between the pillars and the weight of the other floors, needs a concrete structure. The main focus is to save much free area as possible, in order to have a higher number of parkings.



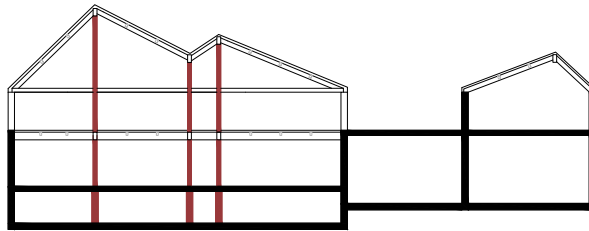
54. structure\_roof plan



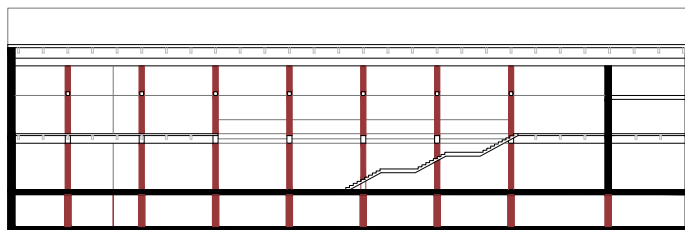
55.



56.



57.



58.

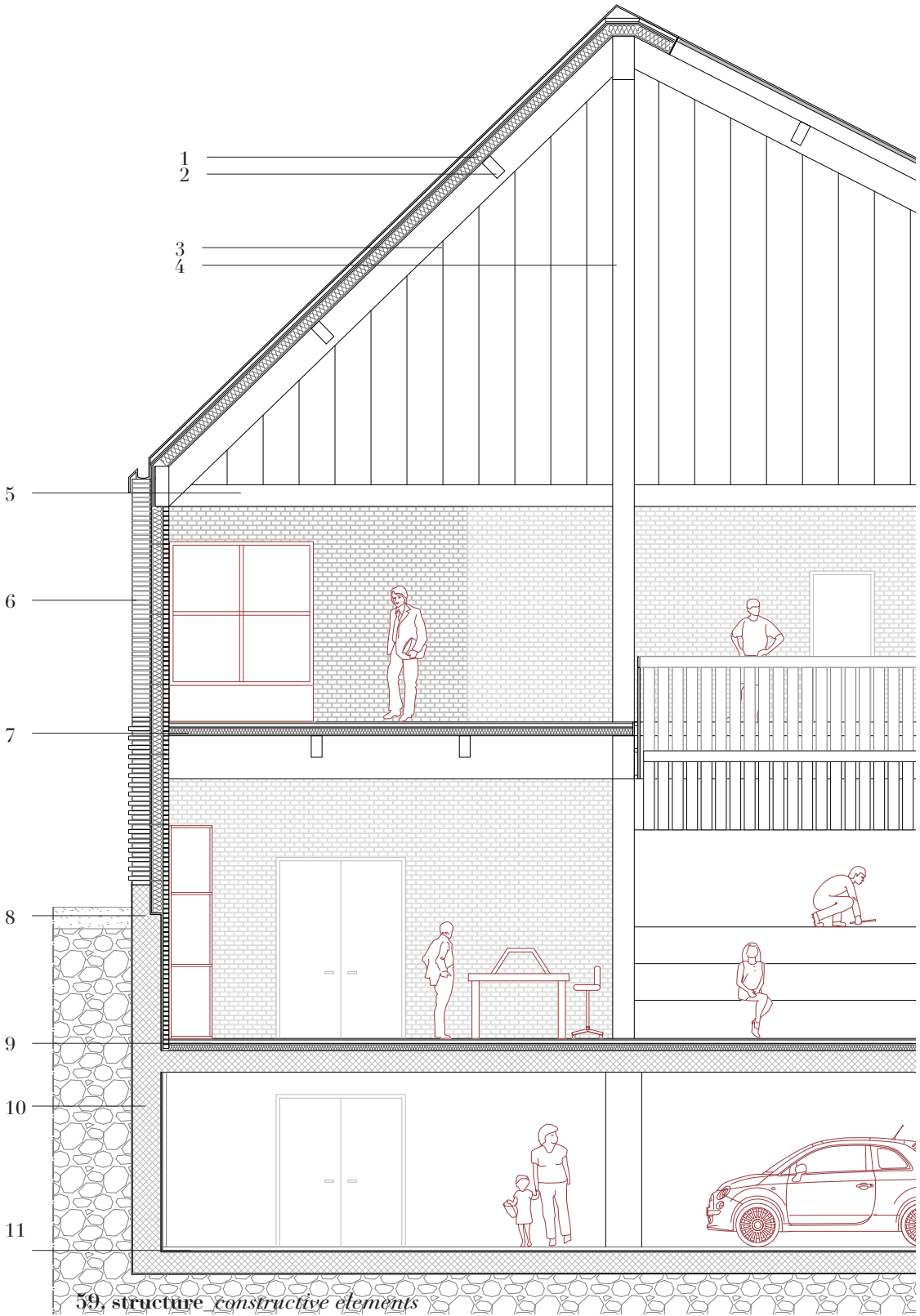
55. structure\_inter-floor slab 0/-1

56. structure\_inter-floor slab -1/-2

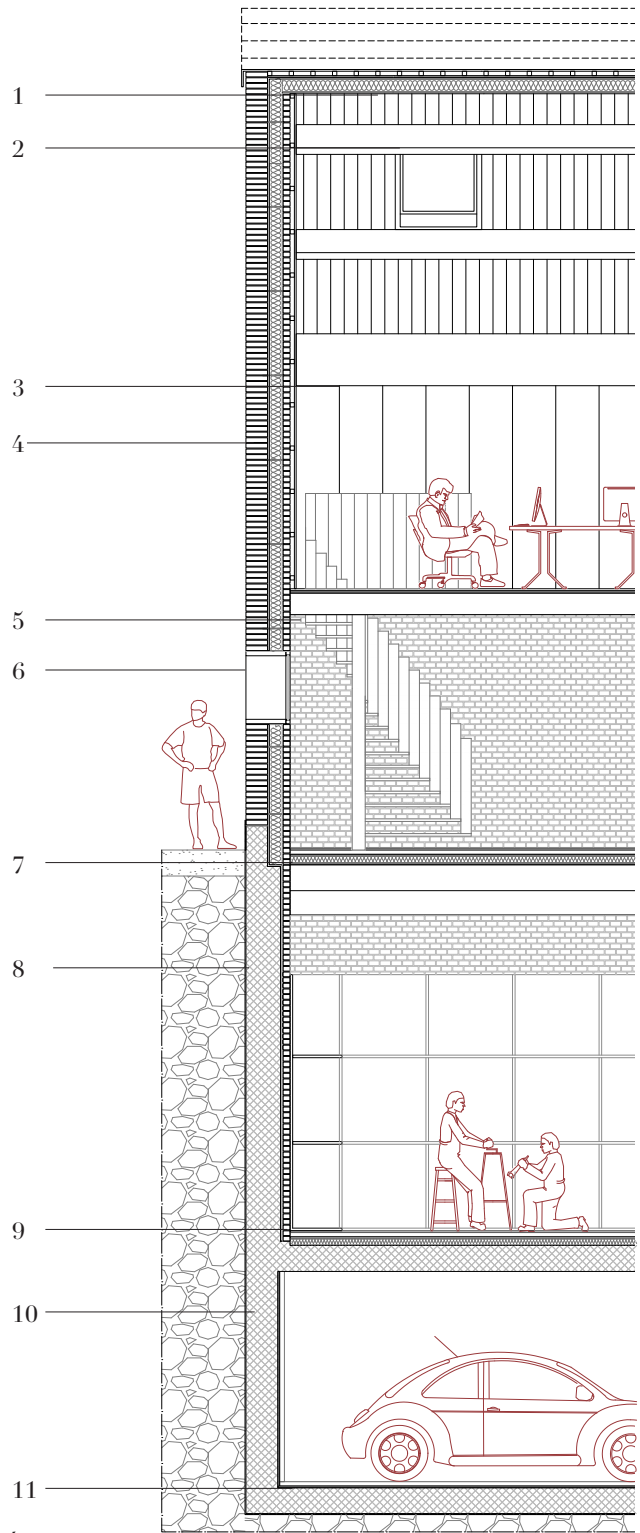
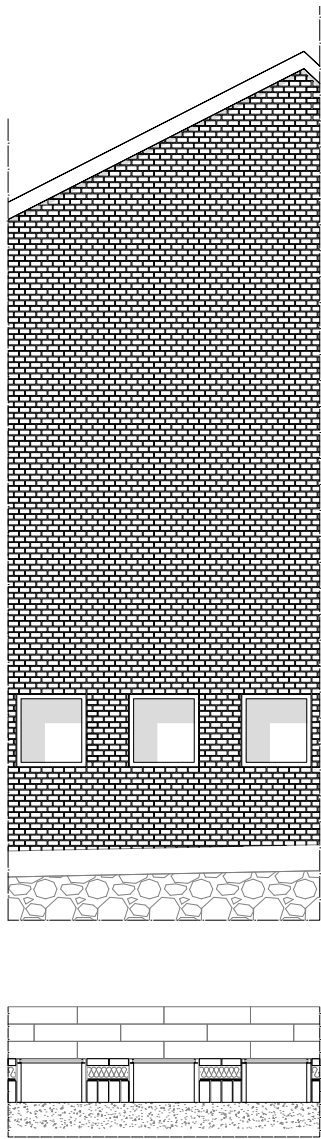
57. structure\_section A\_A'

58. structure\_section B\_B'

- 1 Titanium zinc roof (2 cm)  
 Wooden joist (5 cm)  
 Wooden panels (2 cm)  
 Waterproof membrane  
 Vapour barrier (1 cm)  
 Thermal and sound insulation (15 cm)  
 Wooden panels, Scots pine (2 cm)
- 2 Wooden panels, Scots pine (15x2x200 cm)  
 Wooden secondary beam, Norway spruce (25x15 cm)
- 3 Wooden primary beam, Norway spruce (40x30 cm)  
 Wooden panels, Scots pine (15x2x200 cm)
- 4 Wooden pillar, Norway spruce (40x30 cm)
- 5 Wooden primary beam, Norway spruce (30x30 cm)
- 6 Two-headed bricks (25 cm)  
 Waterproof membrane (1 cm)  
 Vapour barrier (1 cm)  
 Insulation (15 cm)  
 Single brick (8 cm)
- 7 Parquet, Scots pine (2 cm)  
 Screed (5 cm)  
 Vapour barrier (1 cm)  
 Sound insulation (8 cm)  
 Wooden panels, Scots pine (2 cm)  
 Secondary beam (30x15 cm)  
 Primary beams (60x30 cm)
- 8 Waterproof membrane (1 cm)  
 Retaining concrete wall (40 cm)  
 Vapour barrier (2 cm)  
 Single brick (5,5 cm)
- 9 Parquet, Scots pine (2 cm)  
 Screed (5 cm)  
 Vapour barrier (1 cm)  
 Sound insulation (8 cm)  
 Concrete slab (40 cm)
- 10 Waterproof membrane (1 cm)  
 Retaining concrete wall (40 cm)  
 Vapour barrier (2 cm)  
 Gypsum (5,5 cm)
- 11 Screed (5 cm)  
 Vapour barrier (1 cm)  
 Concrete slab (40 cm)  
 Waterproof membrane (1 cm)



- 1 Titanium zinc roof (2 cm)  
 Wooden joist (5 cm)  
 Wooden panels (2 cm)  
 Waterproof membrane  
 Vapour barrier (1 cm)  
 Thermal and sound insulation (15 cm)  
 Wooden panels, Scots pine (2 cm)
- 2 Wooden panels, Scots pine (15x200 cm)  
 Wooden secondary beam, Norway spruce (25x15 cm)
- 3 Wooden primary beam, Norway spruce (60x30 cm)
- 4 Two-headed bricks (25 cm)  
 Waterproof membrane (1 cm)  
 Vapour barrier (1 cm)  
 Insulation (15 cm)  
 Single brick (8 cm)  
 Wood trim, Scots pine (2 cm)
- 5 Wooden plank (2+2 cm)  
 Wooden beam (0,15x0,1 cm)
- 6 Wooden frame (5 cm)  
 Glass (70x70 cm)
- 7 Parquet, Scots pine (2 cm)  
 Screed (5 cm)  
 Vapour barrier (1 cm)  
 Sound insulation (8 cm)  
 Wooden panels, Scots pine (2 cm)  
 Secondary beam, Norway spruce (30x15 cm)  
 Primary beam, Norway spruce (60x30 cm)
- 8 Waterproof membrane (1 cm)  
 Retaining concrete wall (40 cm)  
 Vapour barrier (2 cm)  
 Single brick (8 cm)
- 9 Parquet, Scots pine (2 cm)  
 Screed (5 cm)  
 Vapour barrier (1 cm)  
 Sound insulation (8 cm)  
 Concrete slab (40 cm)
- 10 Waterproof membrane (1 cm)  
 Retaining concrete wall (40 cm)  
 Vapour barrier (2 cm)  
 Gypsum (5,5 cm)
- 11 Screed (5 cm)  
 Vapour barrier (1 cm)  
 Concrete slab (40 cm)  
 Waterproof membrane (1 cm)



60. structure\_constructive elements

### 3.4 THE MATERIALITY

It seems that the modernist logic of stripping away color never quite caught on in Stockholm and that architects here were content to continue with their pastel palette on newer forms.

Instead of modernist monochrome, color persisted in Stockholm. The simple reason for this is that Swedes continued to adhere to tradition in their choice of paint, colors are now fully detached from their earlier purpose of imitation. For much of Stockholm's history, the city was too remote to contribute meaningfully to the culture of Western Europe. Feeling this lack in the early twentieth century, along with the rise of national identity, Swedes chose to believe that they had always been modern.

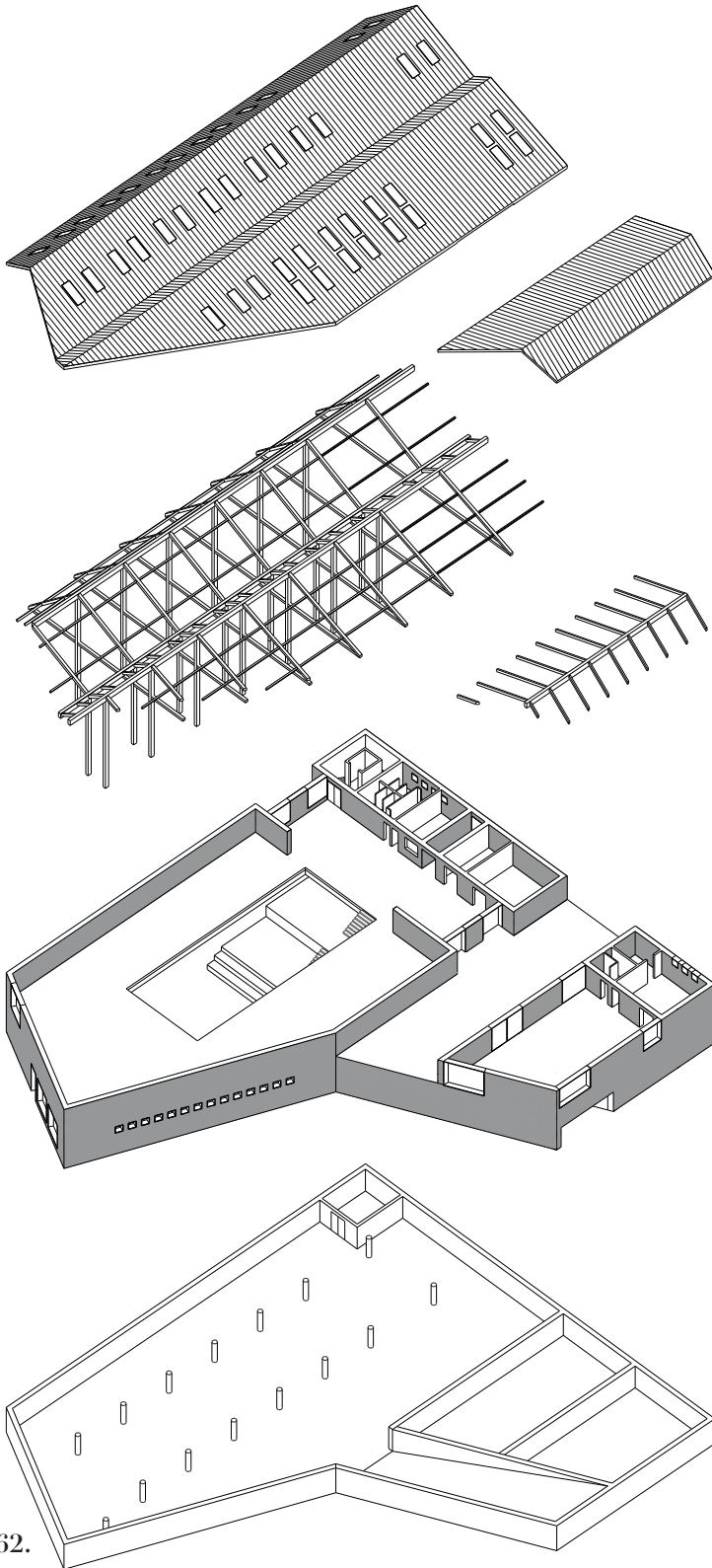
An apocryphal story on the rationale for the color of Stockholm's buildings says that black and white photographs of modernist buildings which arrived in Sweden have been the basis for Swedish Functionalism. From these pictures, Swedes could learn from the building styles of Western Europe. The one catch was that, since photos were in black and white, poor, remote, backwards Swedes would not have been able to tell if those buildings were actually white or painted in light-colors and so they carried on in the way they always had.



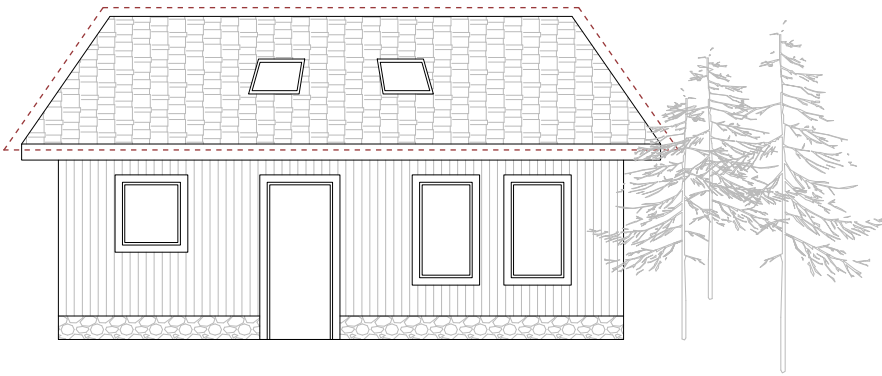


61. materials\_  
*example*

62. axonometry\_  
*project materials*



62.

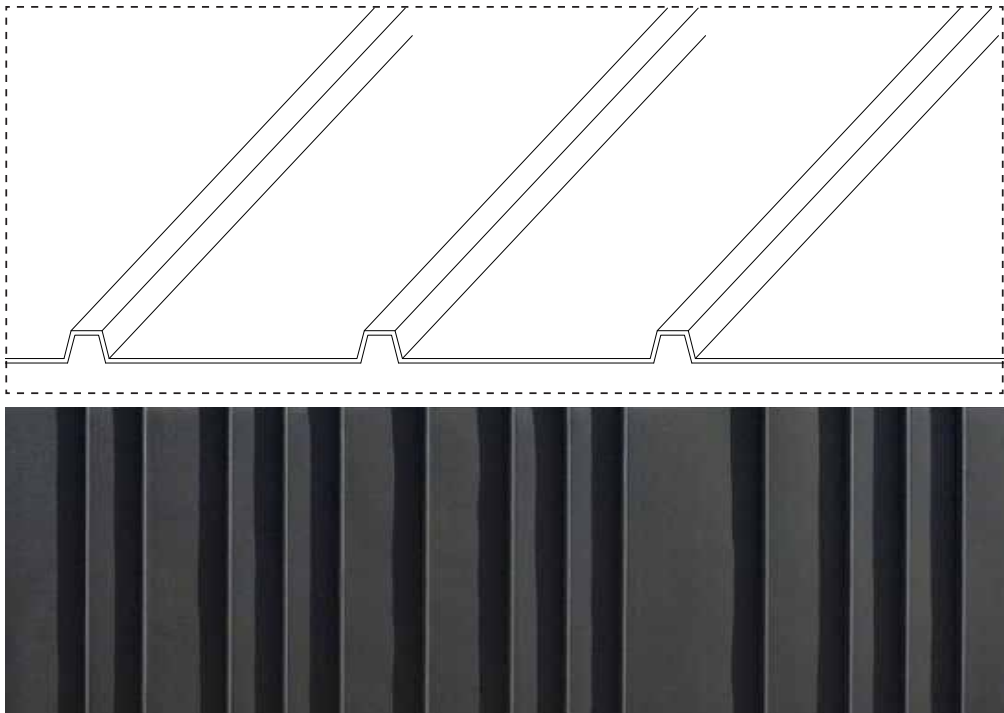


### 3.4.1 TRADITIONAL SWEDISH HOUSE - Black slate roof

Typical Swedish houses have black slate or either sheet metal roofs. By combining these features the project has a Titanium Zinc roof.

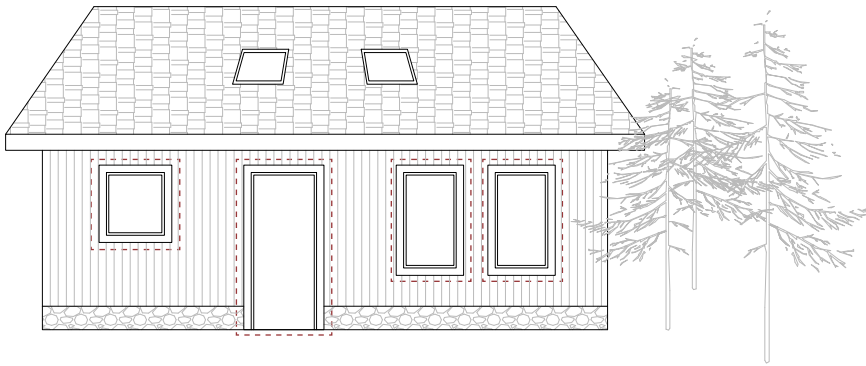
Titanium Zinc is a high quality material made by a Zinc-Copper-Titanium alloy. Its composition guarantees to this material good corrosion resistance and durability. In fact, the alloy is composed of titanium which gives resistance to deformation over time while copper improves its tensile strength. This material moreover has great flexibility.

Virtually all of the titanium zinc used can be recycled, an infinite amount of times, with low energy consumption and without producing any polluting residue.



63. titanium zinc metal sheet *\_drawing*

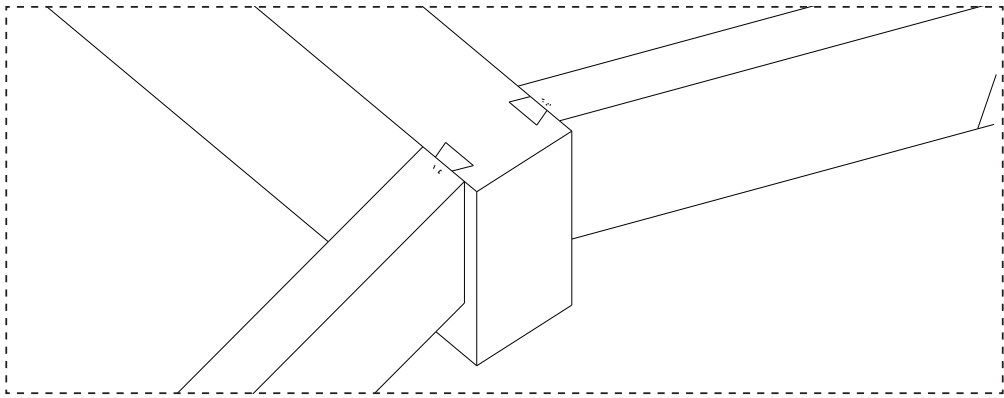
64. titanium zinc metal sheet *\_texture*



### 3.4.2 TRADITIONAL SWEDISH HOUSE - *Wooden structure - Wooden openings*

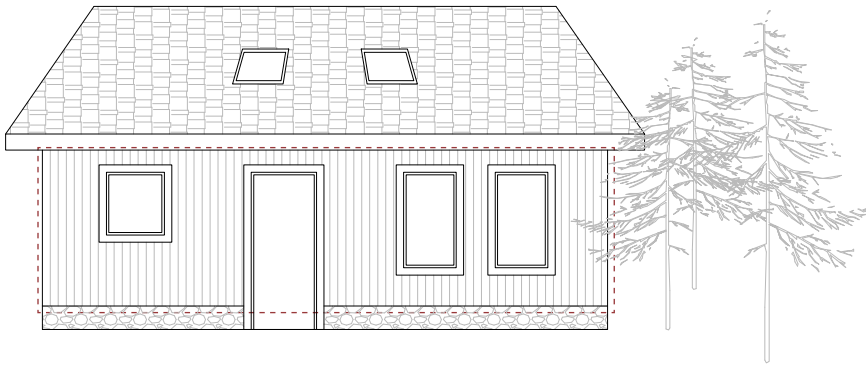
Typical Swedish houses have wooden structures and wooden fixtures. By combining these features the project has two typical woods: Norway Spruce and Scots Pine. This softwood has a medium density and a straight grain with a regular thin texture. Although it is not the strongest of woods, once treated, it is a lightweight and extremely durable wood. In fact, Swedish Norway spruce lumber is used as structural lumber in external joinery, interior construction and flooring.

The Scots pine is another lightweight wood that is valuable to the building and construction industry. The timber is commonly used also for the furniture industry. To connect the main and the secondary beams it has been used a dovetail joint with nails, in order to hide the metal plate.



65. wood\_junction\_drawing

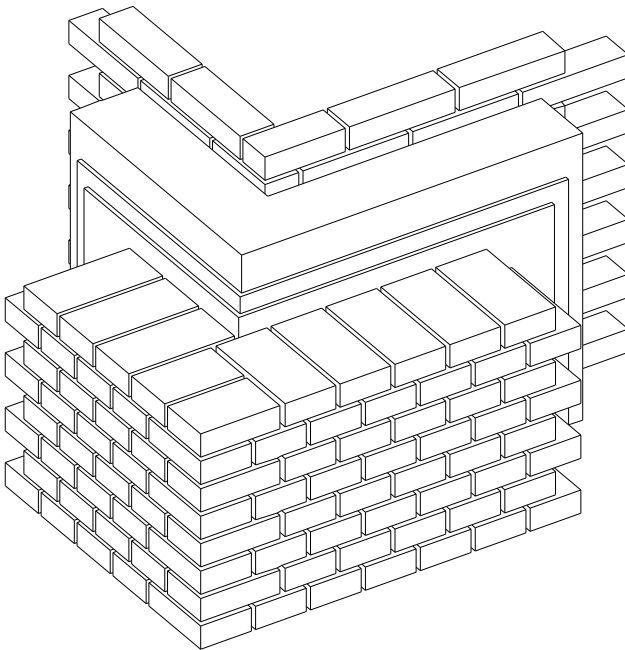
66. wood\_Norway Spruce and Scots Pine



### 3.4.3 TRADITIONAL SWEDISH HOUSE - Falun red dye

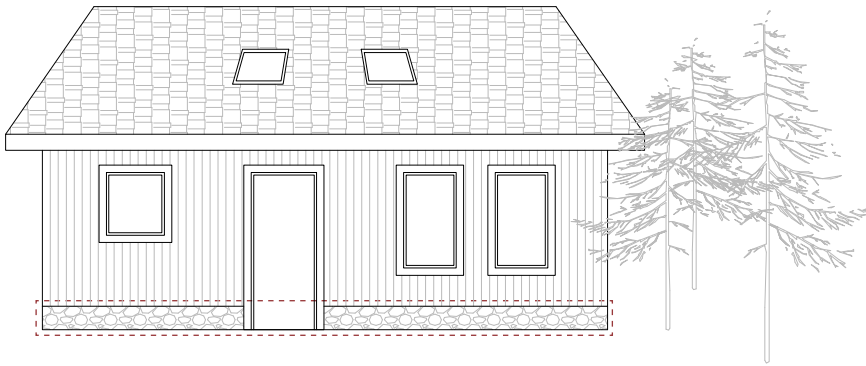
Typical Swedish houses have either brick walls or wooden walls. The houses are famous for their red paint (red Falu, a pigment that comes from the copper mines of Falun), it was used to protect and preserve the wooden structure from the frigid winter climate.

By combining these features the project has a double-leaf masonry with a 8 cm single brick in the interior part. The corner is made cutting  $\frac{3}{4}$  of brick. The choice of a red brick is to recall the red Falu paint. Double-leaf masonry walls have several distinct layers strictly separated according to function and this optimizes the performance of individual aspects, e.g. improved insulation and sealing, more slender leaves and better economy.



67. double-leaf masonry\_drawing

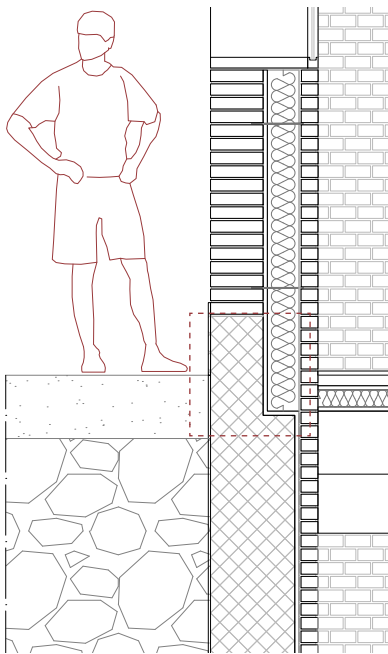
68. brick wall\_texture



### 3.4.4 TRADITIONAL SWEDISH HOUSE - Stone base

Typical Swedish houses have a stone base. Inspired by this feature the project has a concrete base, which is the underground wall that comes out from the terrain for some centimeters.

The volume is surrounded by concrete underground walls to increase strength and durability. To create the floor of the parking area a ribbed concrete has been used, so the thicknesses were contained. On the parking level, the pillars also will be made of concrete and with a round section (differently from the wooden ones which have a rectangular section) to emphasize the change of the material. The typical Swedish stone has been used for external pavements.



69. concrete wall detail *drawing*

70. concrete wall *texture*

04.

# ARCHITECTURAL REFERENCES

# RAGNAR ÖSTBERG

## 4.1 CARL ELDH'S HOUSE (Stockholm, Sweden, 1919)

Carl Eldh (Östhammar, May 1873 - Stockholm, January 1954) represents the typical Swedish artist of his period. He designed several sculptures for the Stockholms Stadshus (City hall of Stockholm, 1911-1923), located in the garden in front of the water, and collaborated with Ragnar Östberg (Stockholm July 1866 - February 1945) for the monumental fountain at the Östra Reals gymnasium (1906-1910).

Due to this great partnership between those two characters, the artist asked Östberg to design his atelier, which was not just an exhibition gallery but a real place where he could work.

In this project the large use of wood is clear, but the main element to be highlighted is the mix between Swedish romanticism (the vernacular architecture) and classic imaginary. Two elements, apparently so different, are perfectly balanced surrounded by this natural environment.

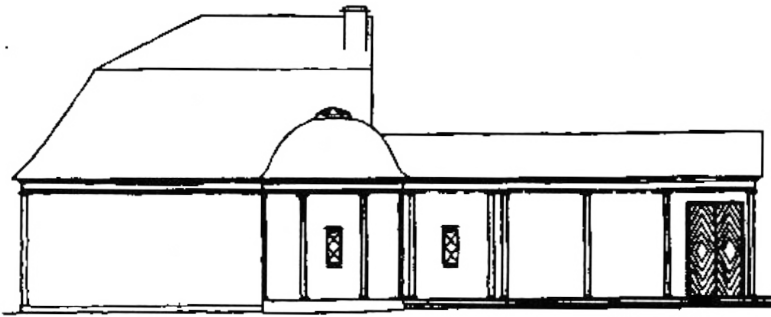
The largest room is the working space, with a surface of 80 square meters and a height of 7 meters.

71. atelier\_picture  
of the glass wall



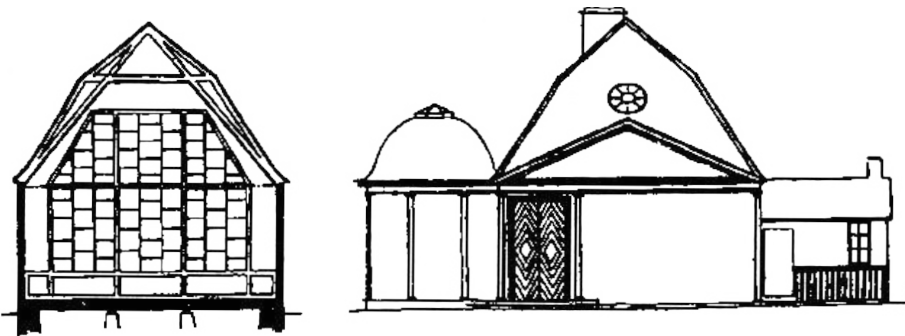


72. Atelier Carl  
Eldh elevation *original drawing*



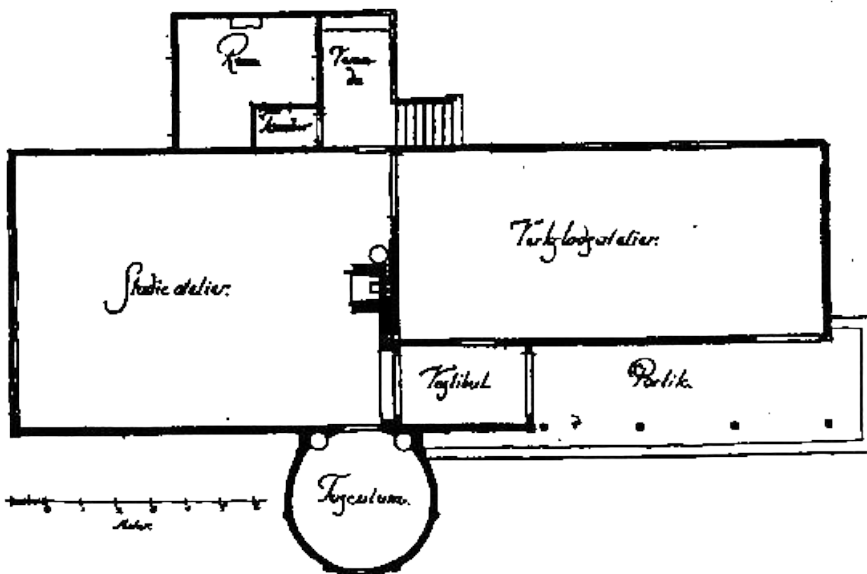
72.

73. Atelier Carl  
Eldh sections *original drawing*



73.

74. Atelier Carl  
Eldh plan *original drawing*



74.

CARL ELDHS ATELJËBYGGNAD

Then, the main volume is followed by the artist's bedroom, a veranda thought as a small independent house, and a cylindrical volume, covered by a dome, where he may receive visitors.

For the workplace a great quantity of light was requested. That is why Östberg had the idea of providing great openings in South and East façade. Those may be considered as skylights, due to the fact that he did not cut just the walls but also the roof. On the contrary, the other two sides are completely different: with small and regular windows.

Looking at the section, the vertical structure and the tympanum on the façade, recall clearly a Doric Temple.



75.



75. Atelier Carl Eldh  
south-eastern façade\_  
*from the outside  
garden*

76. Atelier Carl  
Eldh Northern  
façade\_ *the tympanum  
and the pillars  
are visible*

77. Atelier Carl  
Eldh internal cor-  
ridor\_  
*gallery with skylights  
on top*



# ERIK GUNNAR ASPLUND

## 4.2 SKOGSKAPELLET (*Stockholm, Sweden, 1920*)

Stockholm has held an architectural competition in 1915 to design the expansion of South Stockholm cemetery. Erik Gunnar Asplund and Sigurd Lewerentz, two of the most important Swedish architects, won the competition. This work kept them busy for their entire career, since this project lasted for at least 25 years.

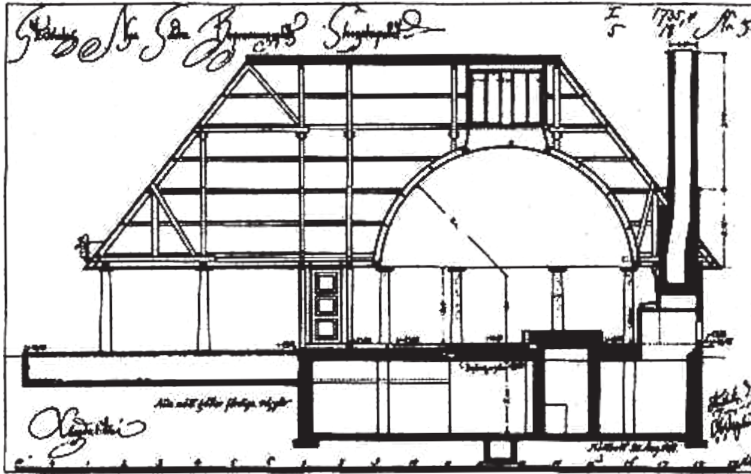
The masterpiece of this World heritage site is certainly the famous Asplund's Woodland Chapel.

The architect has been incredibly influenced by one of the most important movements of his period: the Swedish Romanticism. The main topic is basically having to deal with a space hidden in a forest, completely surrounded by nature.

A path that leads through the wood to the entrance, where the dominant form is a steeply pitched shingle roof, a massive shape like a truncated pyramid. The material of the roof resembles the soul of the place, as if the architect would like to camouflage his chapel with the context.

78. Skogskapellet external view\_ from the path in the wood





79. Skogskapellet  
 section\_the dome  
 structure and the  
 pronaos are visible  
 80. Skogskapellet  
 external view\_pic-  
 ture taken from the  
 entry

79.



80.

There is a sort of link with the roman Pantheon, for the presence of a patio supported by columns at the entrance, with a massive dome inside.

The twelve columns organized on three lines clearly look like the tree's trunk, where people may gather and wait before entering. The deep portico continues the darkness of the forest.

Inside, the dome is the main character. Its overhead light is traditional in Northern countries, for the smooth atmosphere it can provide. Above all, this is the Chapel where mourning your beloved who passed away, so it must be as intimate as possible.

This project should not be seen as a simple example of a chapel into a wild nature, but more as a symbol, an abstract place where you can isolate yourself from all the rest.



81.



82.

81. Skogskapellet  
internal view\_ the  
circular space pro-  
vided by the dome
82. Skogskapellet  
external view\_ in  
order to show the  
similarity between  
the columns and the  
trunk

# SIGURD LEWERENTZ

## 4.3 MARKUSKYRKAN (Stockholm, Sweden, 1960)

This project is the result of an architectural competition held in 1956. Two buildings are organized around a narrow open courtyard oriented through the North/South axis.

On one side, a 'L' shape volume (characterized by strongly asymmetrical roofs) contains the sanctuary, the congress hall, services, a young club room; on the other side a long and tight one-story building with a barrel vault has administrative offices. At the bottom of this second volume there is the bell tower, two-stories high.

The entire complex has been constructed with the dark Helsingborg bricks, with a strong line of mortar mixed with slate. The texture has been designed carefully, it is not the typical masonry construction.

According to the architect, the thickness of the wall may be different sometimes: this strange effect is due to the strict guideline expressed by Lewerentz: nothing must be cut.

This rough image, so brutal, is the real intention of the architect: when someone is looking at it, it expresses the idea of a hand-made job.

### 83. Markuskyr- kan plan\_ two volumes



83.





84. Markuskyr-  
kan external view\_  
detail of the mason-  
ry and the window

85. Markuskyr-  
kan external  
view\_the thickness  
of the masonry at  
certain point



The brick makes this complex a unique piece, and it interposes itself between several elements: between the train line and the wood; between the wood and the village, thanks to a smart game of solid and voids, compact volumes and broken ones.

The architect is not trying to resume a synthesis of all the elements but, on the contrary, to highlight and reinforce those contradictions.



86.

86. Markuskyrkan internal view\_  
*the main hall*

87. Markuskyrkan external view\_  
*the main entry*



# ALVAR AALTO

## 4.4 NORDJYLLANDS ART MUSEUM (Aalborg, Denmark, 1972)

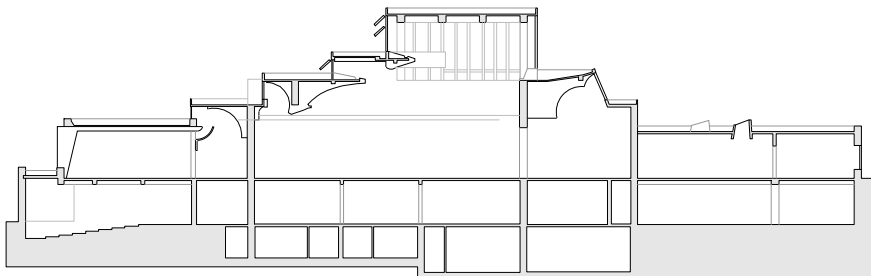
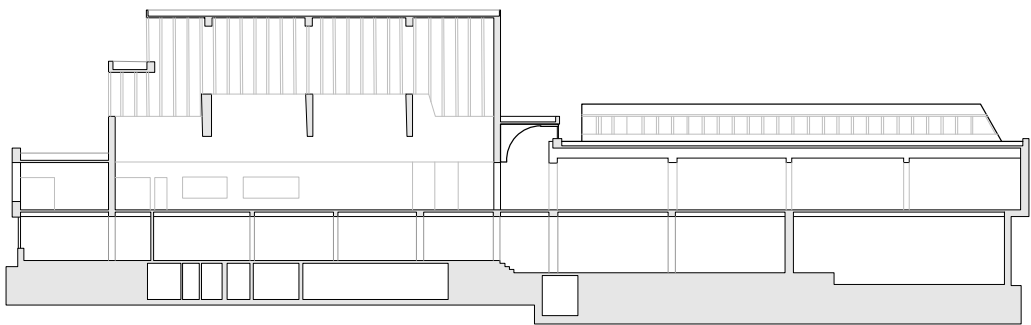
The Kunsten Museum in Aalborg has been the only museum designed by the Finnish architect Alvar Aalto.

From the outside it is possible to immediately recognize the pyramid which counterbalances the steep slopes of the valley around. Those different levels provide a reasonable amount of natural light inside, for the facade.

The internal distribution is flexible, since there is a smart system of moveable walls than can be used according to the requests of the exhibition.

Due to the fact that it has a peculiar function, the architect studied carefully how to provide the light inside.

White paint covers most of the walls and ceilings, as well as scoops and blades of skylights that direct illumination, imparting a full gamut of shadows to the diverse curvatures and planes. Getting inside the room it is possible to immediately notice the main character of the space: the skylights themselves. Their massive structures provide a smooth, indirect, overhead light. His main task was not to let the light coming inside directly, there must be always some element to filter it.



88.

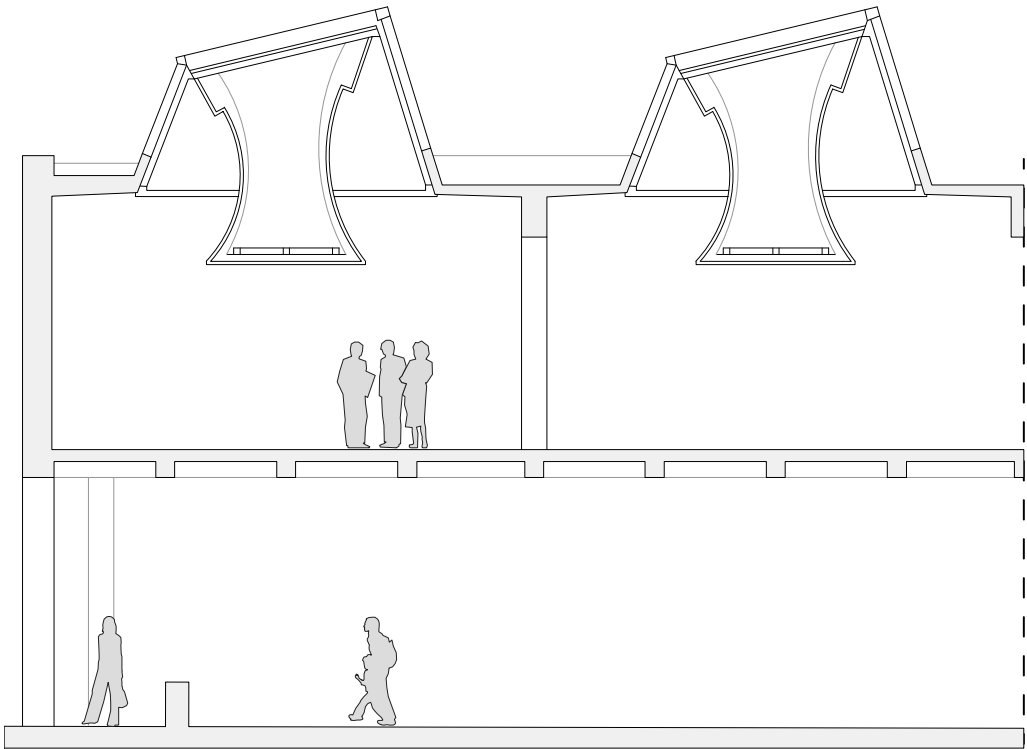


**88. Kunsthaus Museum sections\_**  
*longitudinal and*  
*transversal*

**89. Kunsthaus Museum internal**  
*view\_ successive*  
*light-scoops over*  
*east galleries*

**90. Kunsthaus Museum internal**  
*view\_ upward view*  
*in the central hall*  
*for temporary exhibitions*





91.



**91. Kunsten  
Museum detailed  
section\_ particular  
skylights**

**92. Kunsten  
Museum internal  
view\_ partitioned  
east gallery**

92.

05.



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06.



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