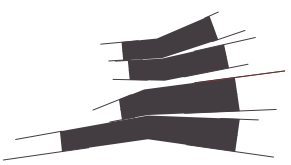

Stavanger East

Multipurpose sport centre

ad10-ark25

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Engineering consultant: Poul Henning Kirkegaard

Preface

This report is a result of a 10th semester architectural project, developed at the department of Architecture and Design at Aalborg University. It describes the basis for the project, as well as the process toward the design of the multipurpose sport centre. The design proposal is also presented in this booklet.

The booklet consists of six main chapters: Assignment, analysis context, analysis inspiration, strategy, presentation and process. The presentation of the design of the multipurpose sport centre provides a good description of the design, but to get a deeper understanding of the design development and architectural concept the process is a good supplement. The process is presented more or less chronological with some selected sketches and model pictures.

Sketching and modeling have been important for the project and its development. It has been the main media, and therefore fills a large part of the report. The illustration texts are placed at the last pages of each chapter, in addition explanatory illustration text is placed under or over the illustrations.

Each chapter starts with a short introduction; each sub chapter has its own headline.

I would like to thank the following for their help and encouragement in acquiring knowledge, making this project possible and bringing it together: Claus Bonderup, Poul Henning Kirkegaard, Kristin Gustavson, Chris Thurlbourne and Ole Brændgaard.

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Introduction
Multipurpose sport centre

The offset for the assignment is an ongoing process in urban development in an area of Stavanger East.
In dialogue with the developing company, Urban Sjøfront, the assignment has been established. The municipality of Stavanger has developed a functional diagram and Urban Sjøfront has suggested different areas for location of the project.

The location for the Multipurpose Sports Centre (MSC) was chosen because of the site's landscape qualities and potential for involvement of the surrounding park and harbor area. Also the site has a potential for reuse of existing building typologies.

The interest in the project was first and foremost the possibilities to work within the design and an actual problem description involving the aspect of the changing sporting habits' influence on the architectural design development.

Stavanger has an aim to become a city of sport, and the main goal is to get more citizens to do physical activities. The changing sporting habits are therefore important in analysis.

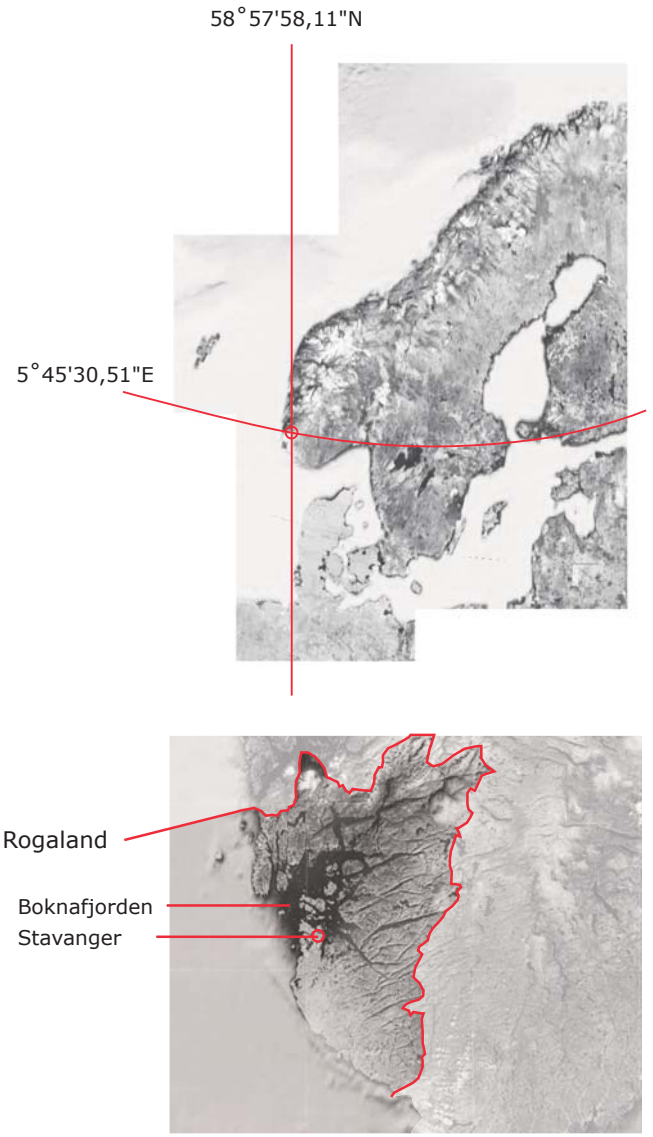
The location of the MSC provides a potential to involve the city in a more active way. The MSC will provide an active urban space that promotes sport, motion and other cultural actives; the core values and credibility of sport as a driver of social, cultural and educational progress.

Stavanger East is one of the most challenging building development areas in Stavanger at the moment.
The company Urban Sjøfront defines strategies for the development area and is an active promoter and coordinator for the urban development in Stavanger East.

The common denominators they use to revive city life is to create activity- and meeting places, to represent innovation, anchoring and create peculiarity.

Stavanger East is a compound urban area with many historical marks; it has a special identity and Urban Sjøfront has worked on developing this identity for 10 years. A sharp harbor front is an important part of this identity.

Stavanger's new Multipurpose Sport Centre should have interaction between the proximate facilities as well as the surrounding landscape.


58°57'58,11"N
5°45'30,51"E
Rogaland
Boknafjorden
Stavanger

Assignment
Introduction

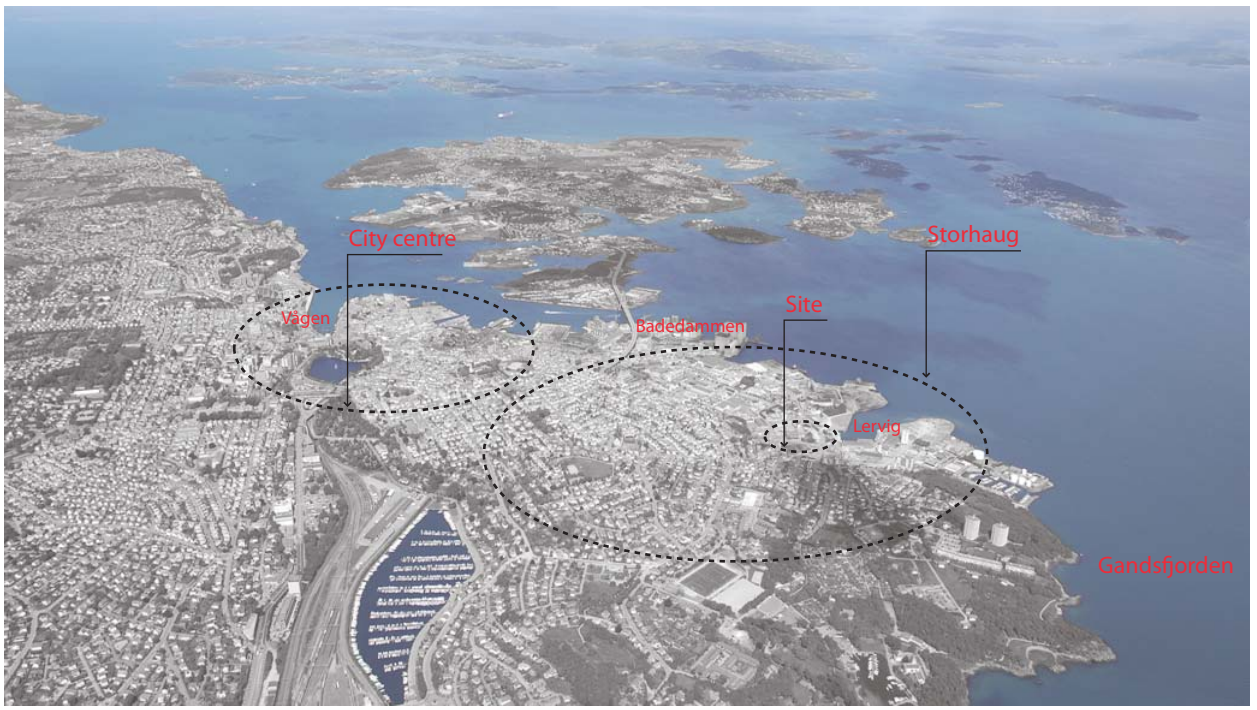
This chapter provides an introduction to the town of Stavanger and the expansive and site adjusted urban regeneration project "Urban Sjøfront". The area is in constant change, and to get an understanding of the phases of the larger urban development a short presentation of the history along with the visions from the municipality of Stavanger are presented.

Meeting the director of "Urban Sjøfront" and participating in a conference about the development in Stavanger East have played a major part of the planning of this assignment. The history and visions for both the city and the district of Storhaug are important for the background of the design and the development of the new multipurpose sport centre.

Furthermore the site's location and characteristics are presented along with the functions for the new MSC which results in the initiating challenges.

Assignment
Stavanger

Stavanger is a coastal city in the western part of Norway, in the county of Rogaland. Stavanger was established as a municipality January 1st 1838 and it's the 4th largest city in Norway with a population of 120,800. The city is a combination of new and old influences. There is a significant foreign influence with the foreign oil interests.
For many years Stavanger was an industrial- and harbor-city, but this changed along with the offshore activity in the North Sea from around 1970, and the city became international along with a large growth in the population and building activity. The city has in time with the developing oil production experienced a large growth, and is now reaching a large 25 km along the Gandsfjord.
The oldest part of the city is in the south and east from the little bay, Vågen, in the city centre with many narrow streets and dense buildings of small wooden houses. The overall urban structure can be described as a cluster town consisting of a historical centre and different functional enclaves.
In the early 19th century, and the start of the 20th, the canning industry blossomed in the Lervig area (the official name for the site of the new MSC), and brought with it the workers residential area of Storhaug, east of Lervig.
Storhaug is a district which now comprises the earlier eastern district, part of the city islands and part of the city centre of Stavanger. The population in the eastern district was in 1950 about 20 000, and in 1984 it was reduced to the half. At the same time the age of the population changed and fewer families with children were living in the area, also the amount of local stores was reduced. These changes transformed the area from an active industrial and living area to a district which has been seen upon as the cities backyard.
The municipality of Stavanger has for a long time worked on a revitalization of the district and many of the suggestions have had an environmental-profile, both when it comes to preserve old environmental-qualities and to provide the district new qualities which can strengthen its values both as living- and industrial-area.
In later years the municipality and private owners have been especially interested in developing the area close to the harbor, the industrial areas from Badedammen to Lervig. Comments have been strong and many, but they have been important for the process in developing the area and have increased the interest in the district. The land reclamation of the harbor front has both at Badedammen and at Sirikjær expanded the district's building areas significant. (Johnsen 2001)
The new MSC is located in one of the last remaining transformation areas near the city centre, placed in 60 hectares of former port- and industrial area, which now is under an expansive and site adjusted urban regeneration project "Urban Sjøfront".


City centre
Storhaug
Site
Vågen
Badedammen
Lervig
Gandsfjorden

Assignment
"Urban Sjøfront"

"Urban S jøfront" (US) is the geographical name the urban development area and the company dealing with its development; a close private-public collaboration, with local council representatives on the boards. The company was founded in June 2002 to carry on the venture of the cooperation project under the same name. The company is owned by 21 private property owners in the area and has a non-profit philosophy.
For the entire area, the development plan outlines the possible development of 610,000 m2 and the aim is a 50/50 mix between housing and commercial use. This will constitute approximately 4000 dwellings and 7000 workplaces combined through new buildings and rehabilitation.
US is in a continuous development. It is a collective cooperation that aims on developing the area more as a coherent entity, than it would be if the individual property owner did develop its own property isolated from the whole area. There is a wish to generate new urban life and create activity and meeting places, to represent innovation and give individuality and character to the area. In October 2008 the process and work in creating different scenarios for an area called "Sentrumsaksen" started. The area is between Haugesundsgata and Ryfylkegata from Storhaugstunnelen to Kjelvene. Currently the project is defined as an "opportunity study" where the aim is to research different programs through scenarios trying to find the answers for the following questions: What does the city need in the coming years? How should this axis be developed for better benefit of the area, the district and the city?

The project is a cooperation between the property owners in "Sentrumsaksen" and Stavanger municipality, US works as a coordinator and KAP (office for architecture and planning) as consultants. The development of this "opportunity study" involves among many other projects the new MSC and has been the offset to this specific project.
At this moment there are two suggestions to the MSC, this project will investigate the possibilities and qualities in one of these locations; the south end of "Sentrumsaksen".
The ongoing studies in this area are about change, both physically and mentally where the aim is that "Sentrumsaksen" should create a link between the city centre and Stavanger East; a rich urban area in good interaction with today's city centre and the promenade along the water.


City centre
Urban Sjøfront
Kjelvene
Storhaugstunnelen
Site
Sentrumsaksen

Site today

Future plan

Assignment
Site

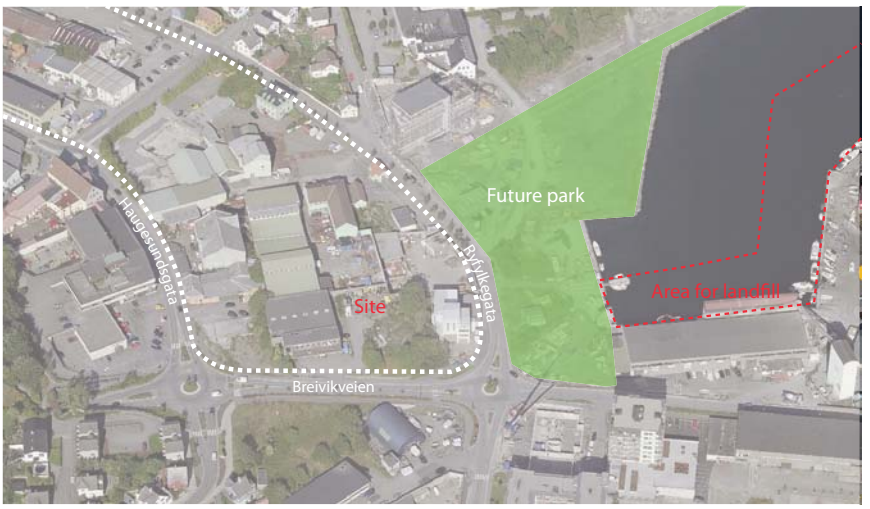
The site for the new MSC is in close location to the bay Lervig and Storhaugstunnelen. The site is outlined by two main roads Haugesundsgata in West, and Ryfylkegata in East; it ends with Breivikveien in the South.

The area around the site is a composite urban area, with much history embedded in the existing buildings. There is a mixture of small wooden houses and large industrial buildings, which create an interesting contrast in the building typologies.

Lervig has a history of a very concentrated industrial environment, with a lot of canned food, fabrics, mechanical workshops, a cement factory, and a tin factory (Johnsen 2001: 95), this history makes out an important part of this area's identity.

Around the site new buildings are already built and some are under development, the city life is starting to awake again, and there is a positive interest in establishing companies as well as a positive trend in the dwelling development. Among them Tou scene, an old brewery transformed into a cultural stage, creates a good supplement and link to the MSC.

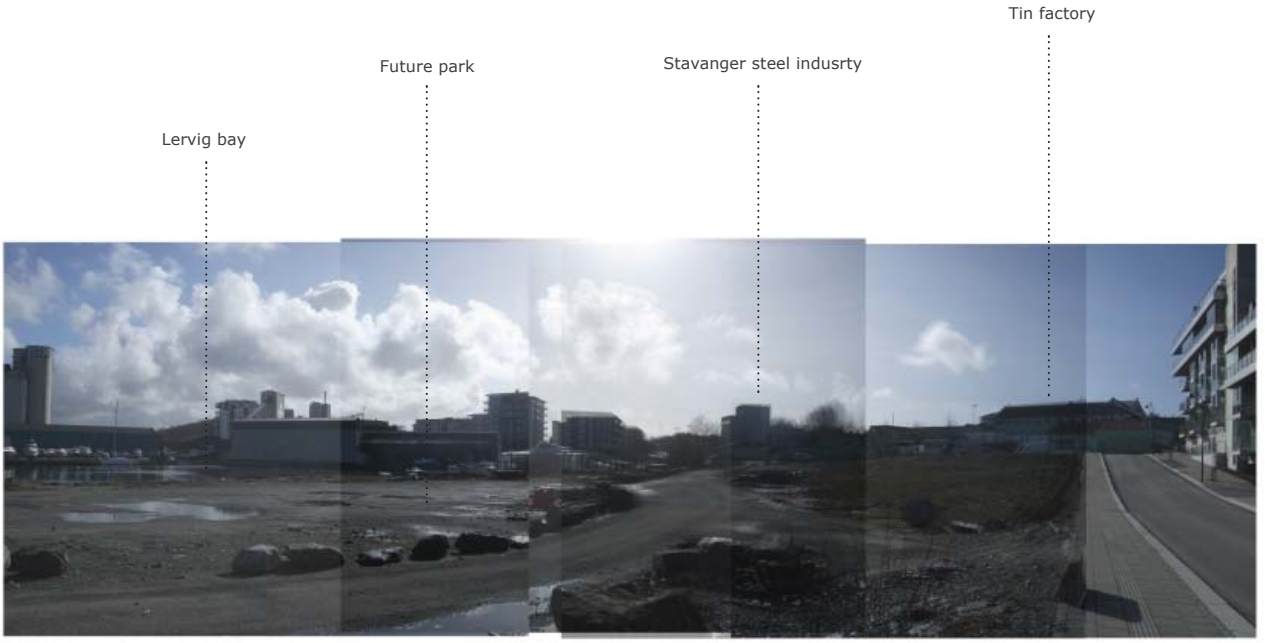
The proximity to the harbor and the park which is planned as a part of the promenade along the water is an important parameter for the building layout. There is planned a landfill in the Lervig bay which will narrow the harbor basin with dwellings and park areas, this will transform Lervig bay from a grey an empty platform to a green and lively place.



View to North

View to West

View to East from Storhaugstunnelen



View to West from harbor front

Assignment
Functions

This project takes offset in the functions and distribution of square meters, developed of the municipality of Stavanger and the KAP office.

The functions requested by the municipality are still in development and therefore they are only acting as guidelines for the project.
The functions for the new multipurpose sport centre contain the following sports areas: A multipurpose hall, martial art, skate hall, fitness centre, squash and a swimming hall.
The swimming hall and the multipurpose hall should be available for the schools and sport-clubs in this part of town. Today there is only one sports hall for a population of about 10 000. In addition to the different sport centers there is an aim from the municipality to give the smaller sports, such as table tennis, badminton and basketball a better offer.
The fitness centre is a good supplement to the other sport facilities in the new multipurpose sport centre, and the municipality of Stavanger sees the fitness centre as private owned part of the complex.
The municipality has suggested other activities than just traditional sports; they want an area for more social activities. This gives the hall a new dimension as a meeting place in the district. There is a suggestion from the municipality to have an independent meeting and concert hall for presentations and concerts. The common functions could also have a shop and possible areas for other business.
Another important angel to the development of the new multipurpose sport centre and the organization of the functions is sport and outdoor life. In the municipality plan for sport and outdoor life for 2004-2014 the main goal is to create "more physical activity for more people". The largest challenge is how to motivate and create the desire to do physical activity. One important thing in this matter in terms of the municipality of Stavanger is to give the citizens the possibility to do physical activity at their own terms. The aim is to create a local sense of belonging and social integration through sports and physical activity. A central point in the possibility of physical activity is nature experiences. The area close to the sea should be organized for outdoor activities such as bathing, fishing and more sport related activities like kayak, canoe and sailing.
Many public baths today are very traditional and the main focus is on the young user group. If the wish is to reach new user groups and especially the ones, that are less active, there is a need to think new. The municipality wishes to have sport parks were people in all ages can come and have a varied offer for everyone, also the ones that aren't doing physical activity should feel welcome.

Sport facilities

Multipurpose hall	23x44m	1012m2
Swimming pool	15,5x25m	400m2 (Depth: 2m + 3-4m)
Skate hall		1000m2
Skate hall, bicycle		500m2
Squase		8x 63m2 (private)
Martial art		4x150m2
Work out		150m2
Fitness center		1000m2 (commercial)

Common functions

12 groups of following functions: Wardrobe 20m2, WC 3,8m2, shower 15m2

2 groups of following functions: Warderobe 40m2, WC 3,8m2, shower 15m2

Wardrobe for judges and teachers 10m2 x 5

10 x Material room 25m2 for each hall unit

5 x Office 20m2

10 x clubrooms 20m2

Tribune 220m2 – 500 spectator

Foyer 150m2

Reception 20m2

Meeting/social room 25m2 x 4

H.WC 4,5m2 x 2

WC 3,8m2 x 6

Store room

Other functions: 1000m2

Store

Café/restaurant

Meeting and conference room

Scene

Assignment
Initiating challenges

Filtering of the material supplied by the company "Urban Sjøfont", KAP and the municipality's of Stavanger led to these initiating challenges:

Today many sports halls in Stavanger are very introvert, how can this new MSC interact with the surroundings, and create spaces that move and invite to spontaneous activity for a larger user groups? How can it motivate and create desire for physical activity and become a part of the city life?

Furthermore the size of the new MSC and the content of it lead to some questions in how to combine the functions, and how to organize them in the falling terrain from Haugesundsgata to Lervig bay. The interaction between the functions, the common areas and access to the surroundings are important issues, also the potential in the existing buildings need to be considered.

The size of the project leads to a more detailed description of the initiating challenges in a subdivision of the project. The project is divided into three different phases:

First to create a strategy for the overall area, next the plan layout and the design of the main volume and last there will be a focus on a part of the main volume for more detailed work of some selected rooms and functions.

p.007
Own illustrations

p.011
Photo collage, own illustration

p.013
Photo collage, own illustration

p.014-015
Photo of model at Urban Sjøfront office, own photos

p.017
Photo collage, own illustration

p.018-019
Photo collage, photo from site, own photos

p.021
Functions from the municipality, own illustration

Analysis context
Introduction

The main objective of the assignment is to get an understanding of the special identity of the place, and being able to use this in the development of the new building design. It's important that the design should bring something new to the area, but at the same time respect the history and traditions from this specific place.

The analysis involves conceptual guidelines from the municipality and registrations from the site visit, where the first potential strategies to the design development were drawn. The following chapter provides an introduction to the surrounding area's development and future plans, as well as the characteristic landscape and climate.

Analysis context
Registrations

The area around the site is in constant development. The land reclamation of the waterfront areas is in progress and the regulation plan proposes a continuous green promenade along the water. The city asks for interesting solutions for the waterfront along the site, and new means of public transports are included in the future plans for the area. The diagrams on the next page show an overview of the infrastructure, the green structure and the social infrastructure close to the site for the new MSC. These connections are conceptual guidelines for the development area in general. The relationships between parks, buildings and streets are important issues to consider. The physical connecting space and its strategy for the area, the interface between built areas and park areas.

Infrastructure: Traffic to Hundvåg Island and the city centre runs through the area. Most of this traffic uses the street of Haugesundsgata. Both current and future public transport are separated from the rest of the traffic and is using Ryfylkegata, a parallel street one block closer to the water. This street is also used by bicyclists and pedestrians.

Green structure: For recreational walks through the area the promenade along the water will probably be the most attractive alternative. A secondary route or supplemented route to the promenade along the water is planned in Ryfylkegata. The future plans with a new subway and a green promenade for pedestrians and cyclist are part of the green structure planned for the area. The keyword for the green structure is: promenades, parks and lungs. This means that the aim is diversity between the elements in the green structure. The green lungs are spaces in between the building volumes.

Social infrastructure: Social infrastructure: The former industrial area contains fragments of housing, offices and retail. A slow transformation process has been ongoing since the decline of the canning industries. The transformation process is now accelerating with upcoming cultural and educatory institutions, including a cultural stage, a school of management, and a learning centre, as well as small-scale enterprises of various kinds. Pictures showing these buildings and other activities in the area are presented on the following pages.

The mixture between new and old building volumes has created an interesting typology in the way the masses have been developed. It creates a very dense area with a lot of diversity and interesting meetings between new and old, as well as different materiality and building techniques. The contrasting building scale is evident in the area with its small wooden houses and large industrial buildings.
The first signal that Stavanger east started an urban development was the building of the new private college BI at Kjelvene, located in North end of "sentrumsaksen". The change from canned packaging to competence business has been very successful. The center is an important hub of the activity in the area, with its teaching both day

Private college - BI

Kjelvene

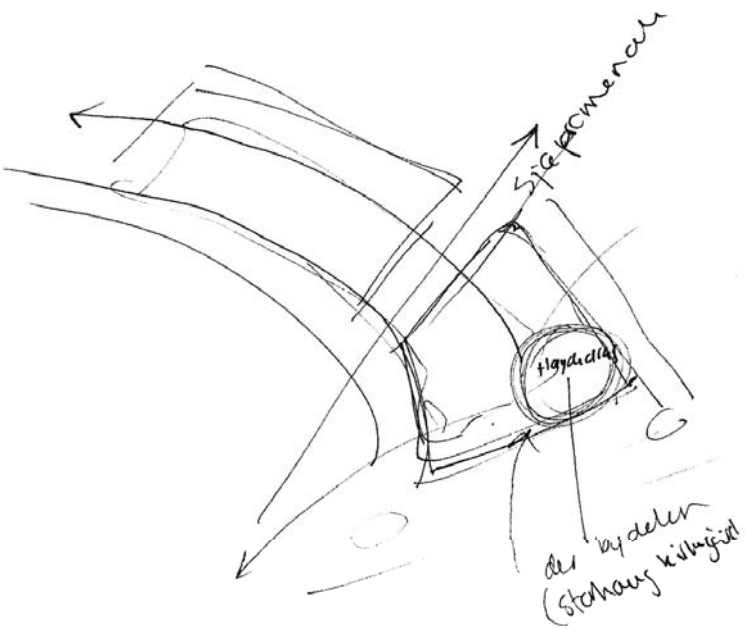
Tou Scene

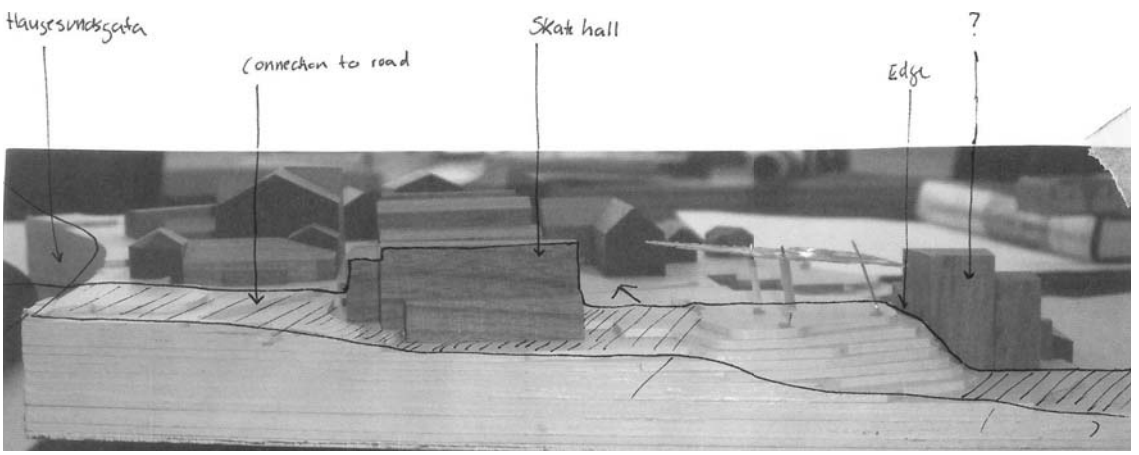
and night as well as a student bar. The BI-building is a good example of reuse of exciting building masses in combination with modern contemporary architecture. Other important activities in close connection to the site are the old Tou Brewery. Today Tou Scene is a creative place where new meetings and connections happens. The center produces most of the program itself, based on an active network of artists. Among the activities are children's programs, Sunday markets, concerts, theater and performance art. Tou Scene is the most independent arena in the district. There is a café, Tou café, which has given the area a meeting place, it also represents reuse of existing building masses, which contributes to a special urban environment.

Analysis context
Potensial

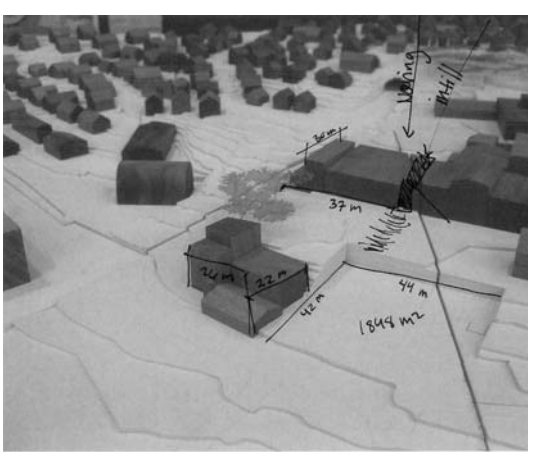
The first registration during provided a great understanding of the typology and important elements at the site and the surroundings. Edges and sharp cuts in the landscape created by the existing buildings and functionality at the site today create a potential to build in-between the existing buildings and re-use some of the existing building typology. The factory buildings on the site are not restricted by preservation, but some of them have substantial qualities. The fragmented building structure has some resemblance to the Tou Brewery complex.

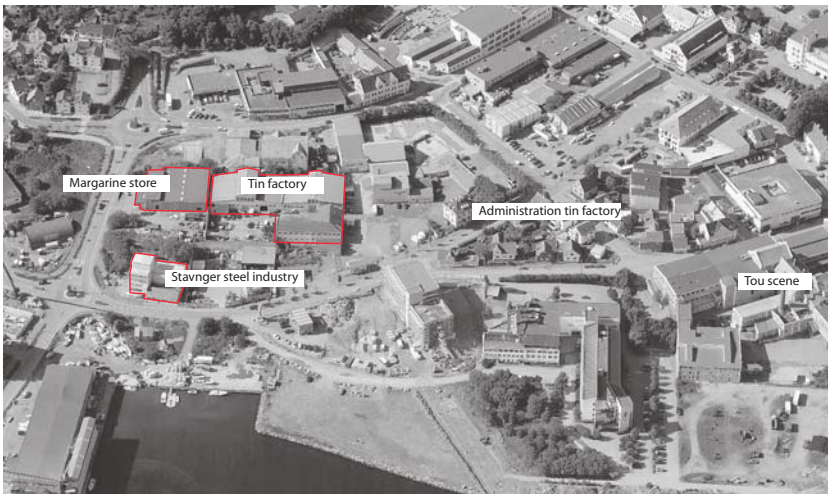
There is a potential in distributing the different functions in some of the existing buildings. The margarine store already fulfills the 1000m2 planned for skateboarding by the municipality. Following the different existing buildings are presented in addition to the potential areas for the new building volumes and green areas.

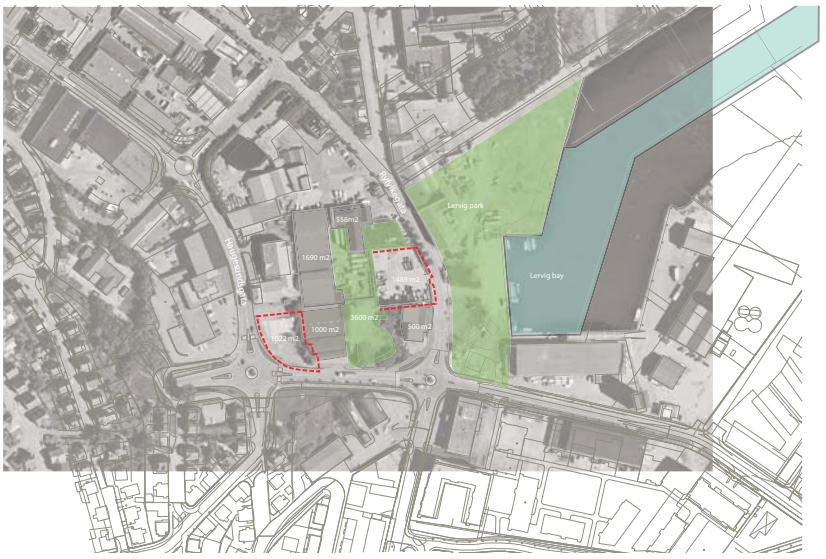



Connection to road
Skate hall
Edge
?


ACCESS
access
PARK


37 m
24 m
32 m
42 m
44 m
1849 m2


Margarine store
Tin factory
Administration tin factory
Stavnger steel industry
Tou scene


Lervig park
Lervig bay
556m2
1690 m2
1459 m2
3600 m2
1000 m2
500 m2
323 m2

Tin factory





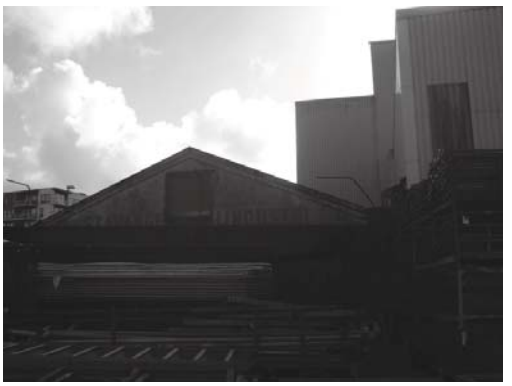


Administration building restricted by preservation

Margarine store, the development of an new indoor skate hall March 2009





Stavanger steel industry

Analysis context
Landscape and climate

Stavanger is situated in the south-western corner of Norway by the fjord, Boknafjorden. The climate is a typical Atlantic Ocean climate with mild winters and somewhat cooler summers than what is found further south in the country. Wind is common in Stavanger, and the most predominant wind direction through the year comes from the southeast. At summertime winds from the North, northwest or wind directly from the south are dominating.

The city is open and surrounded by sea skies. Low pressure is common and it brings a shallow ceiling of clouds and rain which becomes drizzle and after that clearing up often appears. These constant variations between light and dark atmospheres add a certain character to the landscape.

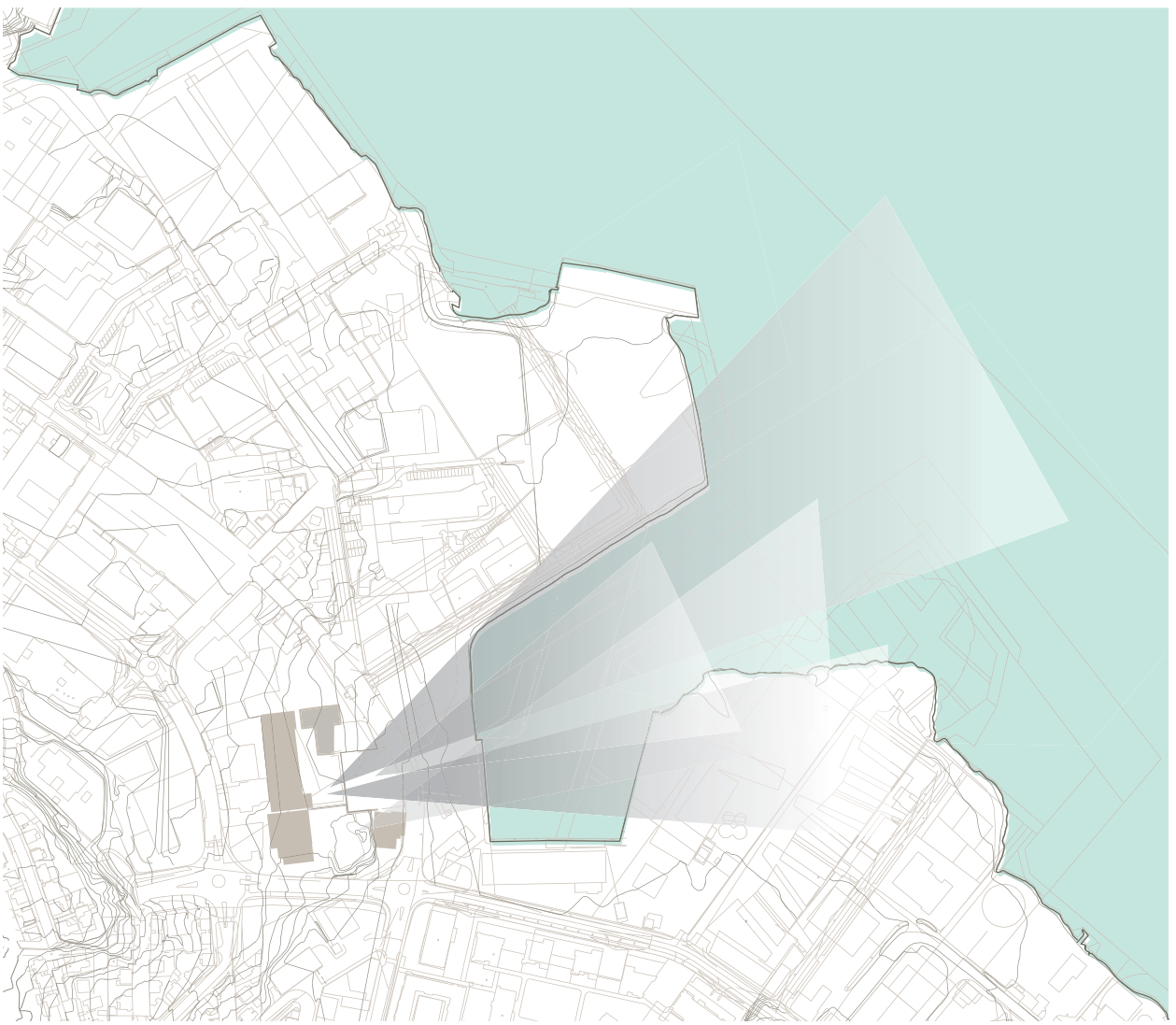
The landscape in Stavanger is a coastal landscape with most of the area lying between 0 – 50 meters above sea level. The city is in good contact with the sea and water which shape the characteristic landscape space and outline the city with great recreational values.

The falling terrain from Haugesundsgata down to the water front is the dominant landscape feature at the site. The terrain is falling with 10 meters from Haugesundsgata to Ryfylkegata and from the site's highest point there is a pronounced view to the surroundings; the new park and dwelling complexes, old industrial buildings, the fjord and finally the landscape of Ryfylke painted in the background.

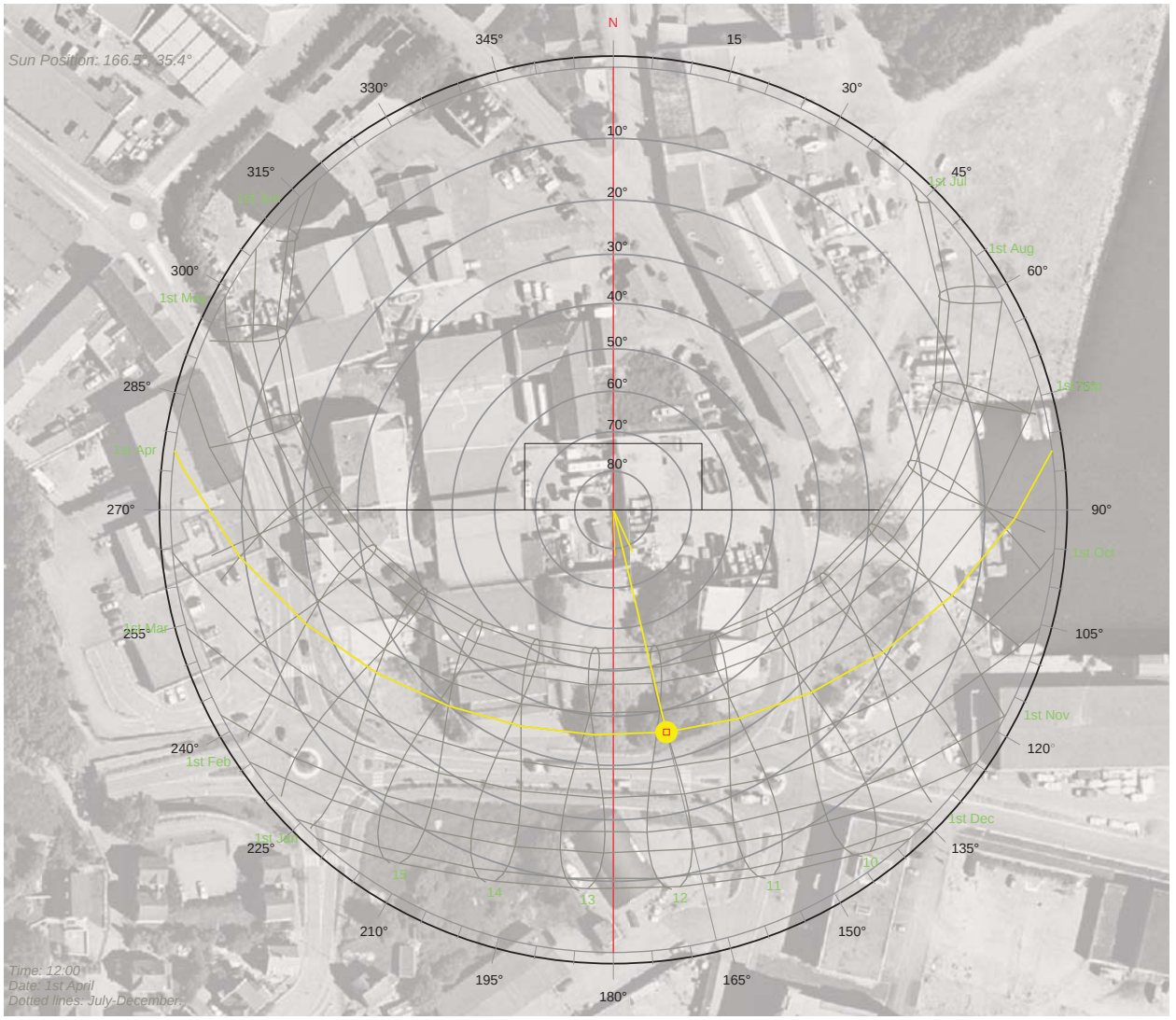
View from hill top

View from front of the tin factory

View from Ryfylkegata



Important views from site



Sundiagram from Ecotect

p.027
Registration diagram made with offset in “Urban Sjøfront” information, own illustrations

p.028-029
Photos from Stavanger East, own photos

p.030-031
Registrations on site, own illustrations

p.032
Photo collages, own illustrations

p.033-037
Photo from site, own photo

p.038
View from site and waterfront, own illustration

p.39
Sundigram above photo of site, own illustration

Analysis inspiration
Introduction

The Stavanger region is characterized to a large degree by its wooden buildings and there is a wish to promote the use of wood in Stavanger. They want the new MSC to be an iconic building and a part of the new image as the city of sports. These objectives are the background for the following analysis.

The analysis involves the theme of the changing sport habits and facilities. The wooden cities and wooden structures were tradition and local style of building are important aspects.

The interest for timber construction and timber as a material, are also an important background. One way to approach the question of sustainable buildings is through the innovative use of sustainable building materials. Stavanger has been a research arena for this for four years in the Norwegian wood project with the aim to become Europe's largest wooden city and a showcase for innovative wooden buildings.

Visiting the Norwegian wood exhibition in Oslo, Hedemark Museum in Hamar and the Olympic arenas in Lillehammer has been the main sources for inspiration to theme of wooden construction. Most of the investigation when it comes to sport facilities was gained through a participation in a conference in Frederikshavn.

The following chapter provides a presentation of the different aspects which have been inspiration and a valuable background through the design development.

Analysis
Wood city

One of the most important characteristics of Stavanger is the wooden house buildings. Wood architecture is part of the Norwegian architectonic identity.
Norwegian cities are in general marked by high building activity and large development. It's about business, urbanization and taking attractive areas at the harbor front back. Many of the largest cities in Norway such as Bergen, Stavanger and Trondheim, are in the original setting wood cities. They all wish partially to present themselves as "Norway's largest wood city".
The reason for this is first and foremost historical conditions, but now there is a new trend or movement which point in the direction of a renaissance of the wood city, "the modern wood city". Many of the big cities have ambitions to be developed into modern wood cities in basis of their own identity and wishes of a sustainable development. (Trefokus 2009)
For four years Stavanger region has been a research arena for timber architecture through the project "Norwegian wood" which finished in 2008. The Norwegian wood project places modern and environmentally efficient timber architecture on the agenda, and works with the aim of making the Stavanger region and Rogaland, both a national and international showcase, for innovative timber architecture.
The idea behind the project Norwegian Wood is to develop Stavanger's old, wooden architecture further with urban, modern and sustainable wooden architecture interacting with the historical parts of town.

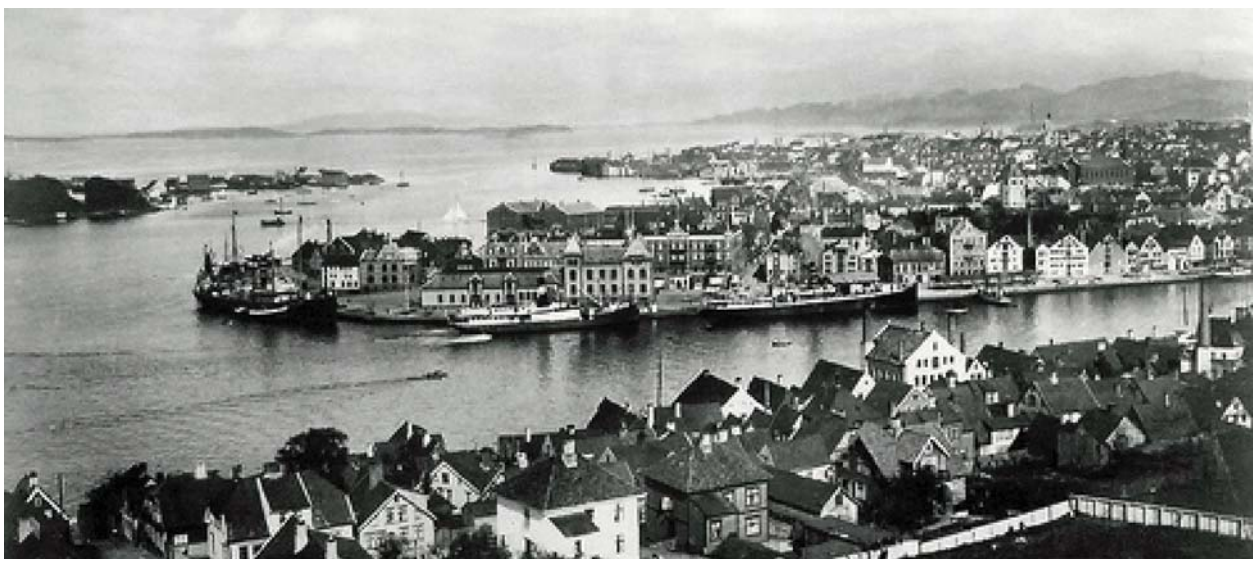
The Norwegian wood works within four main criteria:

Architecture – innovative use of timber; rational production methods together with a rich new architecture, rooted in local conditions.
Use of environmentally friendly materials and timber should be the main materials.

Energy consumption; the energy solutions should be simple, robust and durable.

Universal design; The Norwegian wood buildings should offer universal access and equal terms for all.

(Stavanger2008 2009)

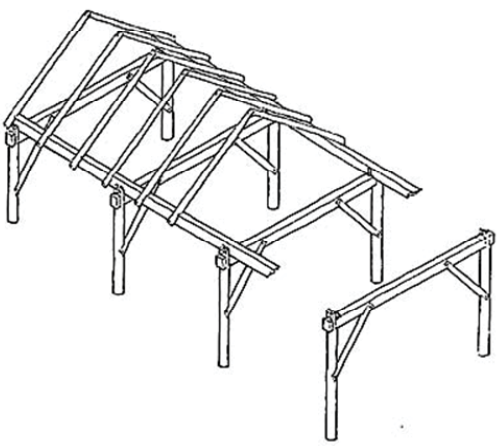


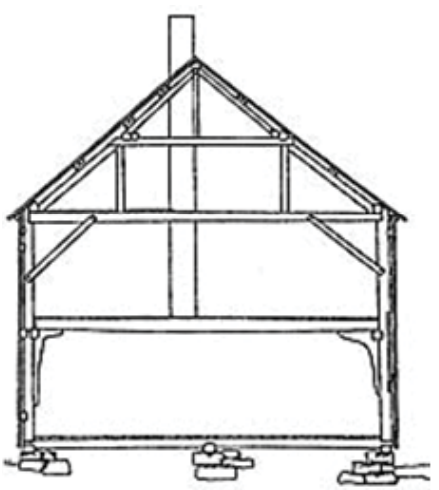
Stavanger 1921

Analysis
Local style of building

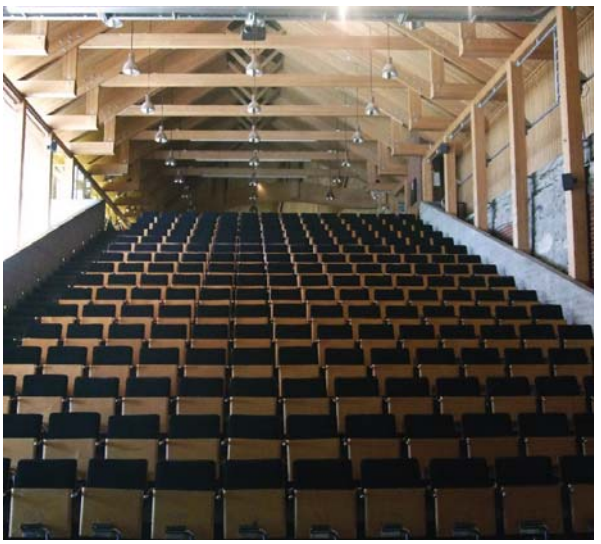
Local style of building is the way a special style has been developed in specific area. Different styles of buildings can be seen in old farms and among small houses in the city streets of Stavanger. Similar to other cities, Stavanger holds traces from how the buildings have been developed and changed over time. Near the coast line the boathouses and "grindverkskonstruksjon" represent a local style of building. The time line can goes way back and the building styles are often adjusted to climate, accession to material and economical conditions. The boathouses in Stavanger harbor have been evaluated to have a national culture- and building historic value.

"Grindkonstruksjon" is a historical building characteristic in the littoral. The oldest traces of "grindverksbygg" are from longhouses from Ryfylke which are 3600 years old.
In the coast areas at the west coast the "grinverkskonstruksjon" lasted longer than in the rest of the country. The reason for this can be lack of building material. This is also why there often is used old "grinder" in new buildings. The construction had also technical advantages: The load bearing structure was protected from weather and wind by wooden panels which easily could be removed.





Norwegian wood architecture is first and foremost related to smaller buildings where the main material is wood. But there is a long tradition in brave and imaginational roof constructions in the old Stave churches.
Sverre Fehn has developed this old tradition from the Stave churches in a modern roof construction in the museum of Storhamar-låven in Hamar. The construction leads back to the beams in Værnes church. The glue laminated timber's static and aesthetic possibilities are expressed and combined with skylights in the roof surface.
The architectural layer he added to the barn is a series of ramps that form a continuous spatial sequence. The ramps form a variety of horizons and ground is the fixed point that confirms the user's position between heaven and earth.



"He doesn't go to hell or heaven; he is in the architecture. Now, he wants to be with that object. You as the architect, create the horizon."

(Yvenes 2008:28)

Analysis
Timber structure

"When designing buildings with wide structural spans, the dead weight of the structure is of great importance. The ratio between strength and specific weight is crucial. This is most easily illustrated by a suspended bar of even thickness – by asking how long a bar can carry its own weight. The tensile strength of birch compared to its specific weight is higher than that of ordinary steel and, of course, far superior in comparison to concrete. You can build a longer bar of birch than of steel. This justifies the following conclusion: timber is an excellent material for long-span structures."

(Paloheimo 2005:25)

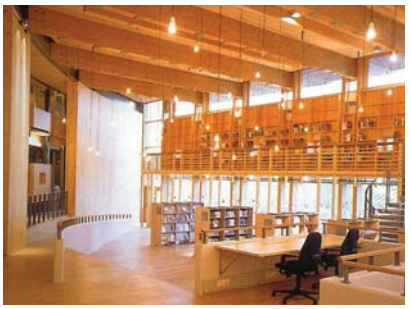
At the Olympic Games in Lillehammer the Norwegian national and cultural character was in focus. Wood as a material was the dominating visual picture. Around 75% of the complex was made out of timber construction. (Trefokus 2009)
In wooden construction joints and transfer of forces are central aspects both when it comes to the buildings and constructions design and functionality. A well thought-out cross-sectional geometry can satisfy not only structural but also fire protection, acoustic and thermal performance requirements. The wide range of surface finishes: natural, rough sawn, planned or sanded as well as the coloring and nuances of various types of wood, the design possibilities are infinite.

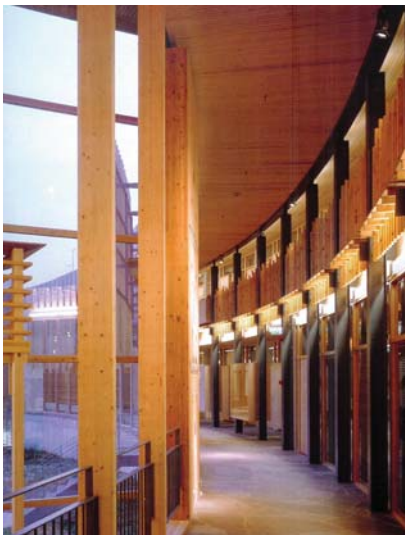
The interaction between form and function are important to create an entirety with the right quality. Different types of joints and mechanical connections have different qualities and bring different character to the building and the construction. The essential detail of load bearing timber structures are the connectors.

Structural design in timber differs from design in other materials, due to the anisotropic nature of the material and the great variation in the material properties. Its properties depend on its annual rings – it differs along its length and width as well as in the vertical direction, this problem does not exist with steel or concrete. Wood has to be transformed into plywood in order to have achieved the same result in at least two directions. The design of concrete and steel structures is guided by changes in temperature, as movement joints are needed. In timber structures, temperature changes can usually be ignored.

"The stiffness depends essentially on the load bearing member. The efficiency of the form of a structural system can be modified by the shape of the cross section, ties, struts, truss arrangements, joints and cantilevers. High bending and lateral actions should be avoided to reduce the amount of material. The three dimensional arrangement of the structural system is very important for the stability in particular and for the overall safety. All structural systems can be optimized through stiffness modeling, matched to the bending moments diagram by adjusting the depth of the construction or by altering supports, joints and spans. The space available for the structure determines the type of load bearing elements"

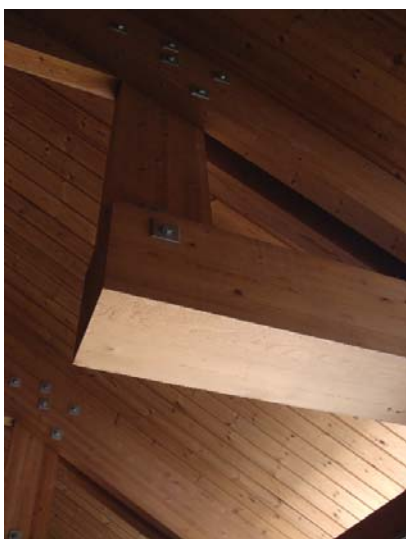
(Herzog 2004:81)

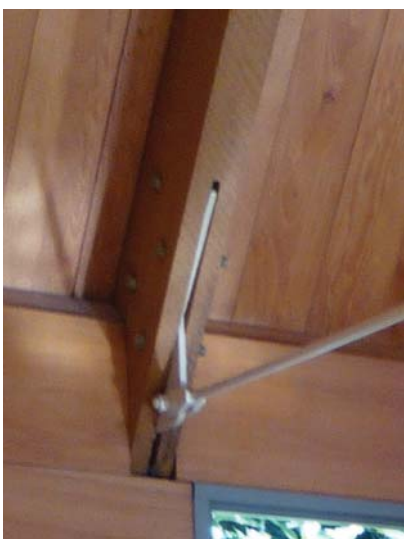




"..the design must merge and blend with the constructional and formal structure of the finished building. Form and construction, appearance and function are no longer separate. They belong together and form a whole."

(Zumthor 2006:26)





"Details, when they are successful are not mere decoration. They do not distract or entertain. They lead to an understanding of the whole of which they are inherent part."

(Zumthor 2006:15)

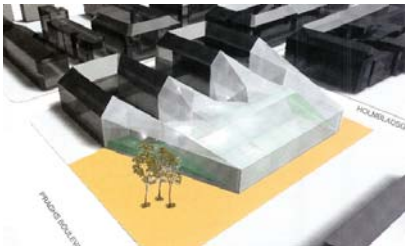
Analysis
Changing sport habits

As a starting point in understanding the changing habits within sport I attended a conference in Arena Nord in Frederikshavn February 09, "Idrettens rum og rammer". Political as well as aesthetical aspect to the development that has occurred within the changing sport facilities was discussed. Along with the population's needs and habits. Many projects were exhibit showing a new way of thinking sports halls and sport facilities. Important aspects as synergies, meeting places and connection to the surroundings are very common for the all of them. In Denmark many years of research and experience has resulted in many interesting and new projects within sport facilities. Following some of these projects will be represented along with the discussion of how the changing sporting habits involve a rethinking of the architectural language and composition of rooms for the design of new sports centers.

At the conference in Frederikshavn the result from the research of Danish sporting habits was presented. These show that most children are used to the traditional sport facilities, mostly in connection with school. Adults prefer outdoor, often on their own or in modern fitness facilities. Because of the changing sports image, where many prefer walking, jogging, water sport, Nordic walking and bicycle; access to nature, parks and urban space or arrangement of new urban spaces is an important aspect. Sport in an urban context requires special conditions. The space is limited and if there should be created facilities and space for movement, the city would need to be staged in another more active way than just to make room for the sport centre. The sport centre should invite to physical activity and use the activity as an exciting part of the public space. The sporting space as a part of the public space carries with it possibilities for a more secure streetscape in the surrounding urban area.

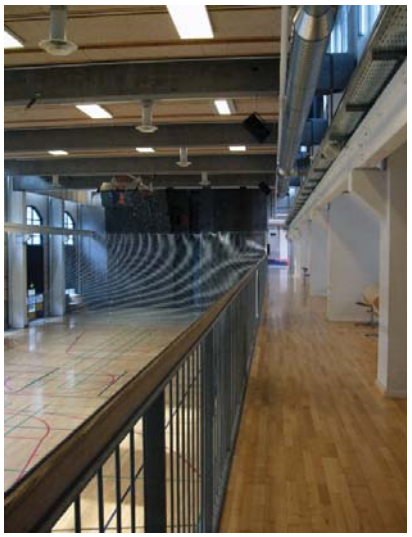
Laban dance institute: The large glass surfaces from the center`s main room strengthen the connection between city life and sport and makes the ones active inside and outside play together in a active city image.

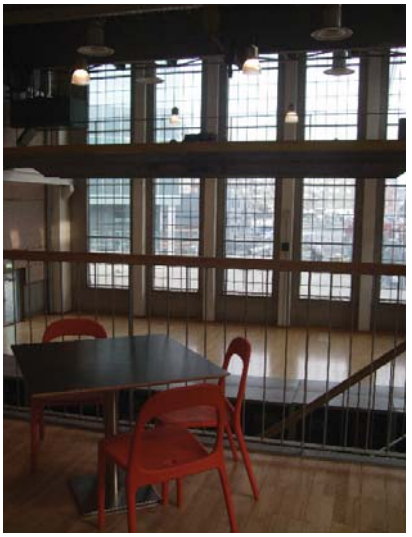
The activities in the building are used to bring life into the city



Sports activities in the city are bodily experiences, a social experience as well as an urban experience. It's a quality for health, social life and the city life and gives quality when it comes to flexibility and diversity to create an activating urban area.
The thought of a multipurpose centre or a Centrum – presuppose a performance of a special sport hierarchy. A variation of sports that both attach to the traditional sports centre as well as new kinds of facilities. Sports should provide human sense of community and a precondition for this is that the activity takes place locally and has a clear and transparent connection. This means that sport facilities should be visible from street level and invite to bodily unfolding – between, inside or on top of the building volumes.
The way people are active today has changed, many are active on their own or organized private with friends. Demands of openness and flexibility in the approach of sports unfolding possibilities are a consequence of the changing sporting habits in the population. There should be a balance between the organized and the more spontaneous self organized activity. The access to the facilities should be more open, the opportunities more flexible and connected to the local life. There should be a focus on the facilities where the access for other than only the association is important.
DGI –Huset in Århus is a good example of this, the meeting between organization, flexibility and individualism is reflected in a wide user group, which both represent members of an association and self organized. The associations and the self organized are the main user group of the place, but institutions and business are part of the user group as well.
An evaluation of DGI-huset shows that 57% were active in sports before they started at DGI-huset, 23% were active in fitness centers and 39% were self organized. 11% of the users were not active in any sports before they started. Common for all the users are that they are active because of the fun and healthy part of it.
The special qualities in the old industrial buildings were DGI-huset is located; show how sports facilities can have different atmosphere compared to traditional sports facilities. The placement of windows and an industrial look brings a different character into the room.
The visibility between the different rooms is conscious idea to the plan layout and with open mezzanines the traffic is lead above the floor areas and makes room for different activities.


uset
huset





Different facilities are best suited in different types of rooms, also the changing room's need to have a connection to the different facilities; sport facilities also involve the infrastructure in the building. To feel safe and the issue of visibility are important notes from the conference. Some activities are not disturbed of openness and visibility, while other more soft activities such as pilates and yoga need more privacy.
Attempts to link sports facilities to centers of other cultural institutions have been tested the latest years, first and foremost the link between sports and library. Haraldslund water and culture center in Aalborg is a successful link between sports and culture. The library has visual contact both to the outdoor and to the swimming pool.
Other cultural institutions such as theaters and concert halls have also been adapted to new centes, but not so successfully because the spatial norms for a handball field for example work against the needs the of the stage and acoustic demands from other cultural categories.
The link between pedagogical institutions and leisure – and sports centers create a connection for children and youth, it is also an advantage in what is considered common use of the facilities for school and leisure.
The location of cultural institutions and sports facilities under the same roof gives a lively place; it creates a running advantage in terms of many service functions as well as it invites to a variation of experiences and confrontations. The challenge is to create attractive meeting places with high intensity and variation in the public domain.
Public domain and public space are two different things. Public space is a space where everyone has access. A public domain is where people share experience and meets others with

different backgrounds etc. These places can also be collective which means it is not necessarily a public space; it can also be a privately owned but still function as a public domain. (Hajer 2001:11)
Social relations and history creates the identity of a space. A square is not automatically a public domain. The use of classical elements does not necessarily create vitality, excitement or openness in the design. The creation of public domain demands a new approach to the relationship between form and meaning. Centre Pompidou brings life to the surroundings instead of only consuming amounts of people and spews them out again. It brings life to the forecourt. The square is like a theatre and the circulation around this building in fact fills the public space with activity. The centre demonstrates how the private world can be relevant to the public world of the city and urban field. (Hajer 2001:125)
Public domains not only appear at the usual places in the city, but often develop in and around the in-between spaces in the urban area surrounded by different social, economical and cultural groups. These places often have the character of `liminal spaces`: they are border crossing places where different worlds of inhabitants of the urban field touch each other. (Hajer 2001:128)

"…leads to a general conclusion that we must focus much more on the design of the transitions, the crossings, the connections and the in-between spaces than in the past. It is here we can imagine public domain experiences (confrontation with otherness, a change of perspective, an exchange)."

Analysis
Changing sport facilities

The changing in the space requirement architecture has reacted can be seen in both schools and office facilities.
New pedagogical wishes for social and professional relations can be seen in the way the common area has a clear centre. Division's area gradually closes off the private zones.
The changing sporting habits also need a reaction in the architecture. A spatial consistency with the outdoor area and a superior composition with rooms and niches as a whole can make it possible for new activities to come up. In this way the divisions between the activities are broken and it is possible for movement across the activity zones and also new rooms appear.
It's important to seek new directions with new activities, new architecture and the organization of the facilities. There should be a focus on a flexible access and use of the facilities. To plan and build for today's needs and futures challenges.

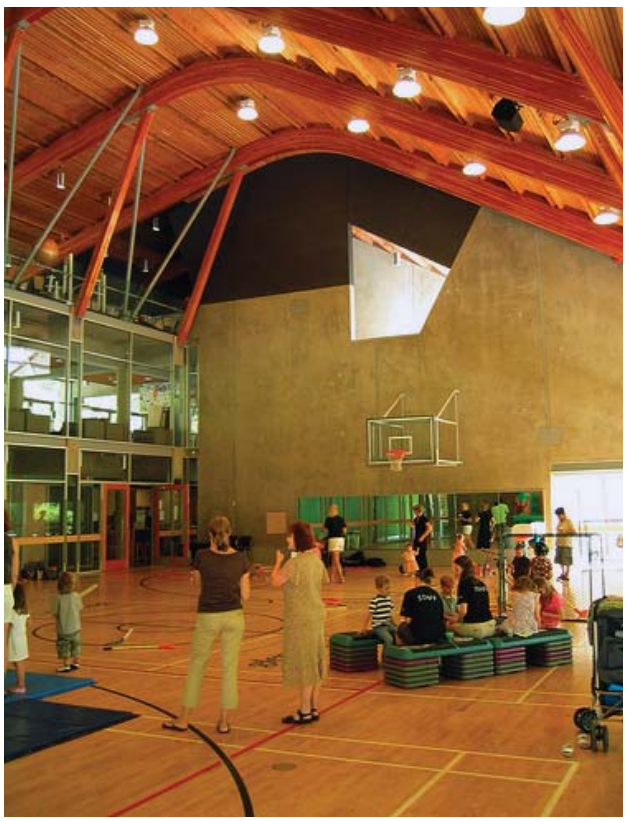
Today's sports centre, which lives up to the richness of challenges, the development of the new sport image invites to:

Appeal to the family, the youth, the training addictive, the retired, the physically handicapped, the ball artist, the kid, all at the same time.

Invite to ball play, fitness, play, martial art, gymnastic and dance.
Invite to both organized and self organized unfolding

A variation of activities.
(Mogensen 2005)

Gleneagles community center has open mezzanines and large glass surfaces to the sports hall, both from fitness and café area. This brings adults and children together with a visual and transparent connection.



The traditional core in many sporting halls is ball play: handball, indoor football, badminton, volleyball and basketball. These should still be an important part of the sports center.
In the design of the future sporting halls good visual connections between inside and outside are important. This could be openings in the façade or covered areas for training practice, stretching, warm-up and rest.
There should be a hierarchy between the different activities and they should have an independent spatial identity. The work with light and views to the surroundings brings different atmospheres into the activities. The possibility in staging the room to each activity can be of permanent or temporary character, created by materials, colors, light, sound and indoor climate.
In the activity zones the use of niches, and mezzanines and spaces between, supplies the traditional ball play with spontaneous sporting activity.
In addition to the activity zones there are the living areas such as café, foyer, and clubrooms, changing rooms, depots, hallways and terraces. There is a tendency that these areas are furnished without any special considerations over the purpose of the facilities, but just a repetition of familiar sizes and shapes. There is a potential that the foyer can make room for spontaneous activity, movement and life.
Meeting areas could also be furnished so it was suitable to other activities, and be an activity room for other user groups as well, where meeting and experiences are central aspects.
The clubroom, where people stay and talk before and after training, could be furnished in such a way that the room is a part of the hall's area, and by different levels make them active. They could be divided by a transparent net or glass.
Furthermore changing rooms should also be a part of the experience and visit at the sports centre, where stay and connections to a garden could bring quality to this part of the building complex.Also the exaggerated parking lots could utilize for activity purposes and in this way strengthen the connection to the surrounding urban society.
There is a challenge in the facilities in how to improve the access, the functionality and the comfort. The flexibility is both important when it comes to time and the offer as well accessibility and individual needs.
Simultaneous with the increased focus on an improved access to nature, green areas and urban spaces, the sports facilities are still a crucial basis to the association activities and for the sports ability to create time together and human community, especially among children.
The arrangement of the traditional or typical sports hall no longer matches the pattern in adult's participation. The

result from the research in Denmark presented at the conference, is that there is a need for more individual training activities in the hall environment, like the women want more appropriate room for gymnastics and softer activities, as well as safe and inviting surroundings. Furthermore the halls often lack places which create attractive social scope for teenagers.
The sports center should be the core values and credibility of sport as a driver of social, cultural and educational progress. It should accommodate that sports have changed the way we build and give room for today's sports activities. The central institution should not be eliminated but supplemented, so that the new building typology not only involves the big volume for ball play, but also makes room for the many new activities.

p.043
Photo from Stavanger 1921, www.flickr.com.

p.045
Right: Principal diagram of traditional construction, www.trefokus.com

Left top: Plan drawing boathouses (Bergsgard 1994:29)

p.046-047
From study trip: Sverre Fehn "Storhamar låven", Hedmark Museum, own photo

p.049
From study trip: Håkons Hallen in Lillehammer and Vikingeskipet in Hamar, own photo

p.050
Left: Sverre Fehn, Aukrust Centre, meeting with concrete and wood.(Yvenes 2008:104)

Top Centre: Hiroshi Naito Ass, Botanical museum, Japan. (Herzog 2004:285)

Bottom centre and right: Stein Halvorsen, Parliament building Karasjok, The corridor on the inner side of the curved block is also a place for social interaction.(Slavid 2005)

p.051
Left: Sverre Fehn, "Storhamar låven", construction detail, own photo

Right: Glenn Murcutt, Jamberoo House, construction detail, own photo

p.053
Laban Dance institute, London (Mogensen 2005:67)

p.054
Left: Aranda Pigem Vilalta Arquitectes, Athletics Stadium Tussols-Basil (Broto 2005:150)

Centre: Dorte Mandrup arkitekter, Holmebladsgade(Mogensen 2005:37)

Top right: BBP arkitekter, Nørrebro(Mogensen 2005:34)

Bottom right: Dorte Mandrup og b&k+brandlhuber gmbh&co, Nørrebro (Mogensen 2005:75)

p.055
DGI-Huset , Århus, own photo

p.056
Haraldslund Water and Cultur centre, Aalborg, own photo

p.057
Renzo Piano, Centre Pompidou, www.flickr.com

p.59
Patkau architects, Gleneagles community centre, www.flickr.com

p.61
Entrance are with table tennis and spontaneous activity. (Mogensen 2005:28-29)

Strategy
Introduction

"The city, sport and architecture influence reciprocal each other. When there happens changing's in the cities structural conditions it will also have an effect on the sport".

(Wikke 2007:7)

The previous analysis has led to a strategy for the future sports life in Stavanger city. The strategy is divided in three thematic goals:
City and diversity,
Architecture, identity and landscape
Transition and infrastructure

Each theme is shortly present by an introduction and the aim within the specific theme. Together they shape the frames and strategy for the project which leads to the vision and focus for the design development.

Strategy
Themes

City and diversity

The clear harbor front and the composite urban area, with the mixture of large and small scale buildings and historical marks, are a familiar image and an important identity. There is a wish for a lively and diverse part of town. A dense environment combined with open urban spaces, parks and promenades along the water. There is a great potential to use culture and sports as a driver for this part of town and create a link between pedagogical institutions and leisure. An urban life with activity and meeting places and strengthened values for both the living and industrial area.

Architecture, identity & landscape

The architectural pattern communicates the identity of a project. Characteristics for the city of Stavanger are the dense buildings and the spaces created between them, such as the narrow street from "Gamle Stavanger" and the shape of the boathouses along the harbor front. Buildings and the urban space therefore constitute an important connection both aesthetical and functional to make the area coherent.

The characteristic landscape expanse, slope and fjord are evident at the site and should by a simple gesture effect the building layout.

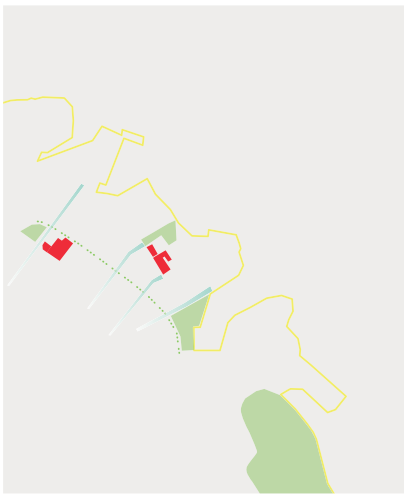
The project makes it possible to introduce a positive transformation and reuse of the existing buildings. To work with the contrasts in the meeting between new and old, different materials and scale. Reuse contributes to a special urban environment.

The area is dominated by industrial buildings and therefore the work with wood as the main material will add a new layer to the area and accommodate Stavanger's aim as a wood city.

Transition and infrastructure

A good connection through the area is key for a positive development. A future subway to increase the public transport through the area is planned. Together with the green promenade and the promenade along the water there is established a good connection for cars, pedestrian and bicycles.
Along with the changing sporting habits, alternative and self organized different types of movement has been developed. One has realized the healthy qualities of sports and the city image is now full of people that exercise and youths on skateboards, roller skates or bicycles.
The transition or movement from local to the district or the more regional is gradual – depending on the urban area and infrastructure. Special about the more district or regional dimensions are the needs to include facilities that have a more unique character which can represent the larger surrounding areas. The paths for exercise, skating and bicycle are functioning both local and regional. They connect and link together building and city.
The location of the MSC requires implicating the urban space, the bodily unfolding and social possibilities. The sport can capture streets and roads, lawns and parks.
Motion paths can connect different facilities in the municipality or surrounding nature, they can have different themes and experience routes. The large building volume can connect to these routes and become a natural starting point for the exercise.
Therefore the connection between the building volume and the surrounding infrastructure such as the promenades and parks are important. The transitions through the building and motion paths can give spatial and sensuous experiences and inspire the citizens to move from one area to another.
The project involves building volumes with different characters and should connect to nature, fjord and city.

Strategy
Aim

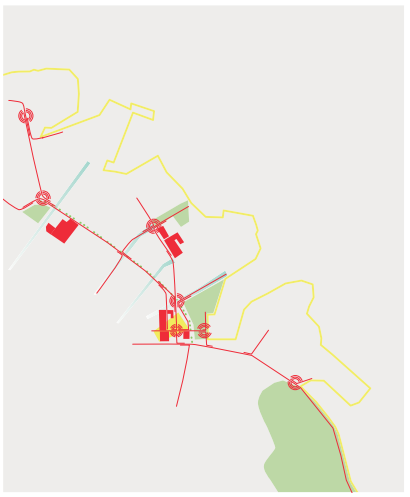


City and diversity

Modern cities are building densely because dense places are normally experienced as more lively. The new building volume should brings life to the surroundings. It should become part of the entire green structure, such as streets and parks and brings life to this part of town.
The aim is to give experiences and evoke curiosity for the citizens and the visitors through diversity in architecture and the surroundings.

Architecture, identity & landscape

The architecture and landscaping should reflect the identity of the area, by relating to local identity such as water and the special landscape characteristic and historical traditions.
The aim is to secure architectonic connections between the new building volume and the historical city.
An extrovert building which invites people in and with indoor and outdoor areas connected in such way that the seasons and the weather can be a part of the architecture.

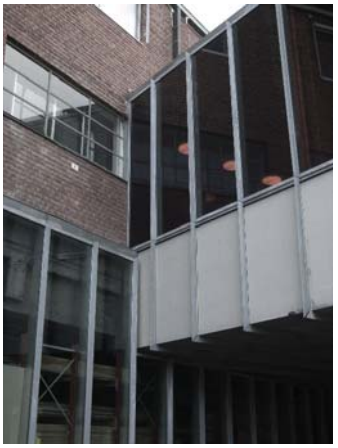


Transition and infrastructure

To create the transition between the different volumes, a membrane between spaces of different character. To let the building volume connects with the surroundings and be a generator for sport in the city of Stavanger.

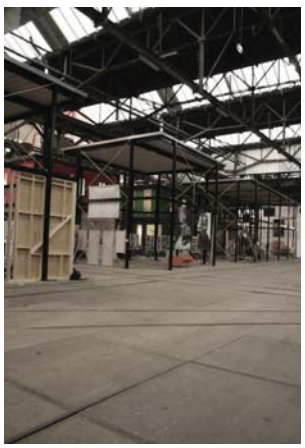
Strategy plan

The strategy plan for the new multipurpose centre involves axis' of motions which connect the exerciser to nature, parks and outdoor life.
One important axis is the connection between Haugesundsgata and Lervig bay. This axis could end in a sea bath at the harbor front with attractive outdoor areas for exercise and social experiences. By reuse of some of the existing buildings the multipurpose sport centre will have special urban environment and create spaces of many different characters for the sport facilities. The environment in and around the centre will be a natural starting point for the exerciser and future sporting life in Stavanger.

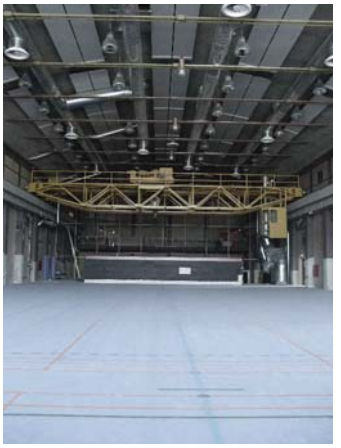


School of Architeture, Oslo

NSDM-shipyard, Rotterdam



NSDM-shipyard, Rotterdam



Nordkraft, Aalborg

Strategy
Vision and focus

Vision

To design a building that is in connection to nature experiences and outdoor life. A combination of sports and other cultural activities with the new MSC a as local meeting place in the district. It should be a house of experiences that with flexibility and a clear concept creates good experiences for the users. A building anchored in the local identity and traditions. A spatial experience from outside to inside where there is a mixed offer for everyone, even those who are not active in sports, a place where people can have physical activity on their own conditions.

Focus

The focus for this project lays in the new building volume its shape in-between the existing buildings. There is also focus on the roof structure as the connecting element between the different spaces, and on the spaces in between the functions and the connection to the surroundings.


Existing
Meeting
New building
Multipurpose sport centre
Cleaner
Re-invent
Transition
Connection
Impact
Contrast
Wood
Tradtion

p.066-067
Strategy plan, own illustrations

p.068-069
Photo of industrial building with new functions,
own photo

p.071
Illustration of focus area, the red mark the most
important focus, own illustration

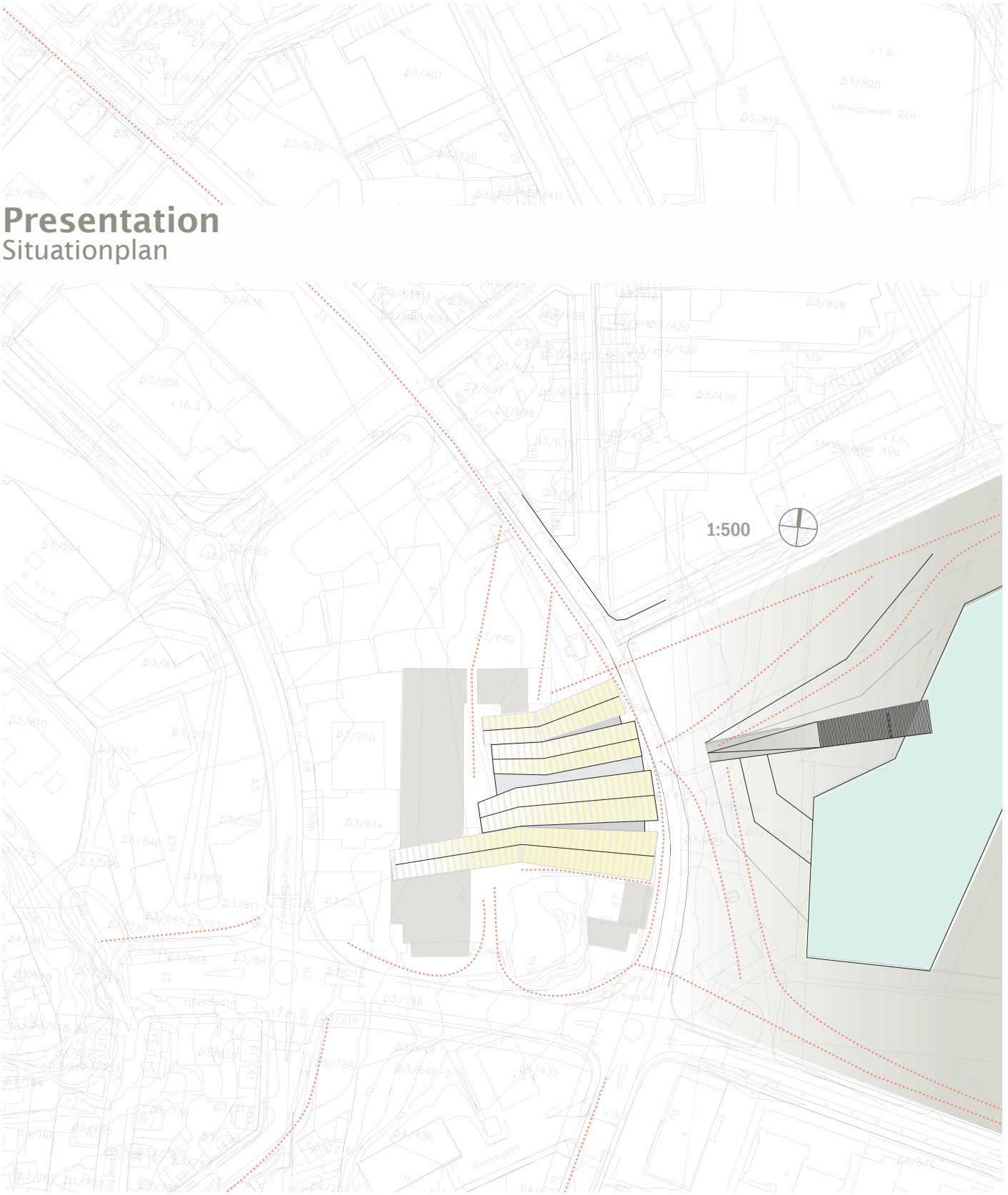
Presentation
Introduction

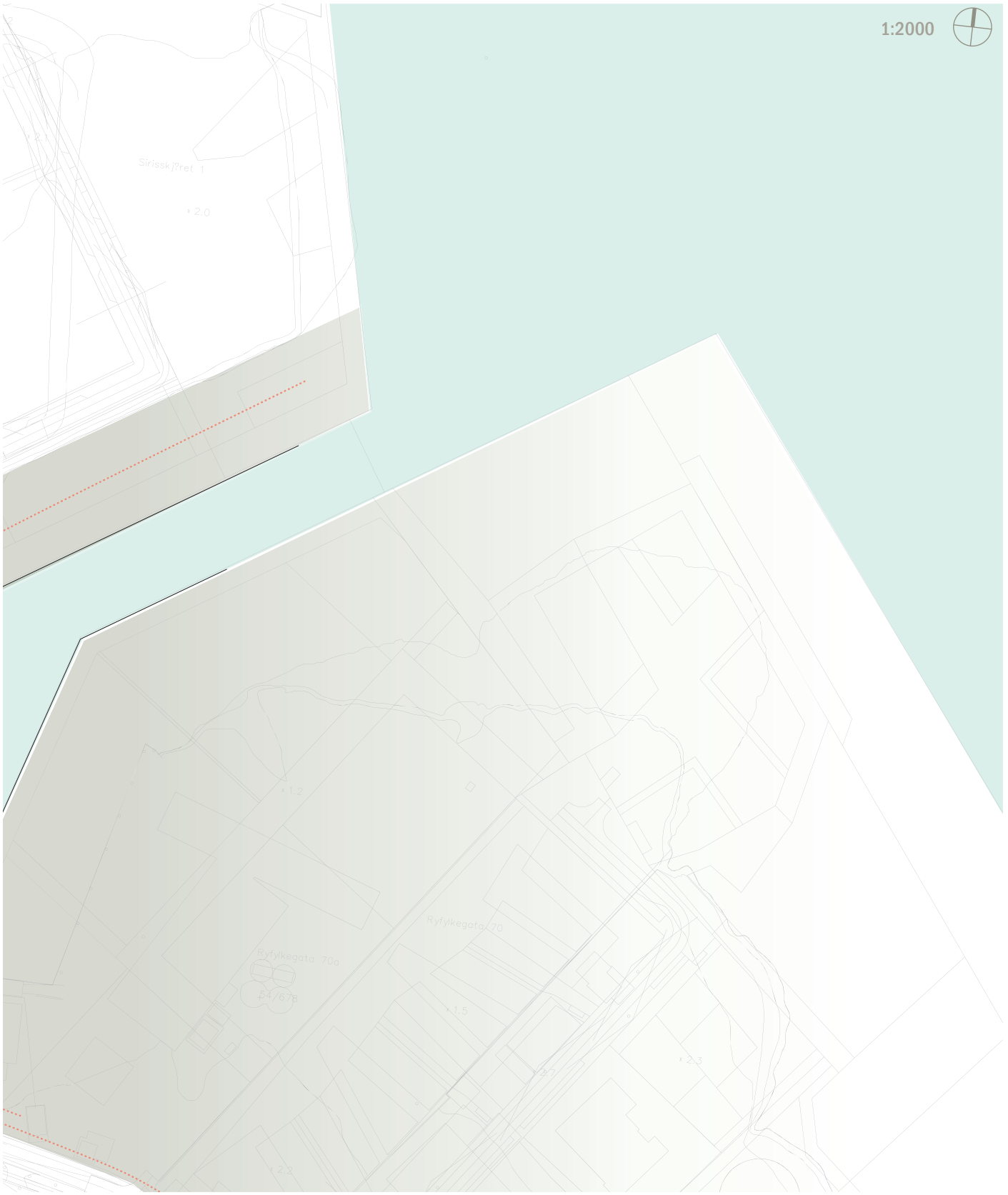
Stavanger Multipurpose sport centre is a place where many types of users have access, a mixture between facilities for the association and the individual.
Paths lead you to the centre from all directions and it has good contact to the green promenade along Ryfylkegata, were the shape of the building follows the curved street, inspired by the fan shaped plan layout from the characteristic boathouses. The building complex also consists of old industrial buildings, were activities such as skate, martial art and fitness are the main functions.

The design of the multipurpose sport centre is inspired by the vernacular language of the characteristic shapes of boathouses; the structure aspires to give architectural form and let the structure merge with the plan layout.
Four levels containing sports facilities, café and media centre are layered in the falling terrain. The three highest levels provide balconies with views to the activities inside the building with the pronounced view to Ryfylke in the back. The bottom level is lowered into the ground and has an underground connection to a sea bath in Lervig Bay Park.

The new building volume consists of four shapes merging in between the existing building and terrain. The building takes advantage of the falling terrain by letting the levels and motion through the building follow the slope and landscape characteristic at site. To create a spatial consistency with the outdoor area a circulation spine is created in the middle of the building volumes. The circulation spine creates a variety of non-programmed spaces which support sporty and social interaction both spontaneous and planned, thereby providing an architectural basis for the community within the sport centre.

Presentation
Situationplan




1:2000
Sirisskj?ret 1
Ryfylkegata 70
Ryfylkegata 70a
54/678

Presentation
Build up

Skin

The skin of the building should emphasize the four main shapes by a clear and continuous translucent material, which offers diffuse natural light into the building.

Structure

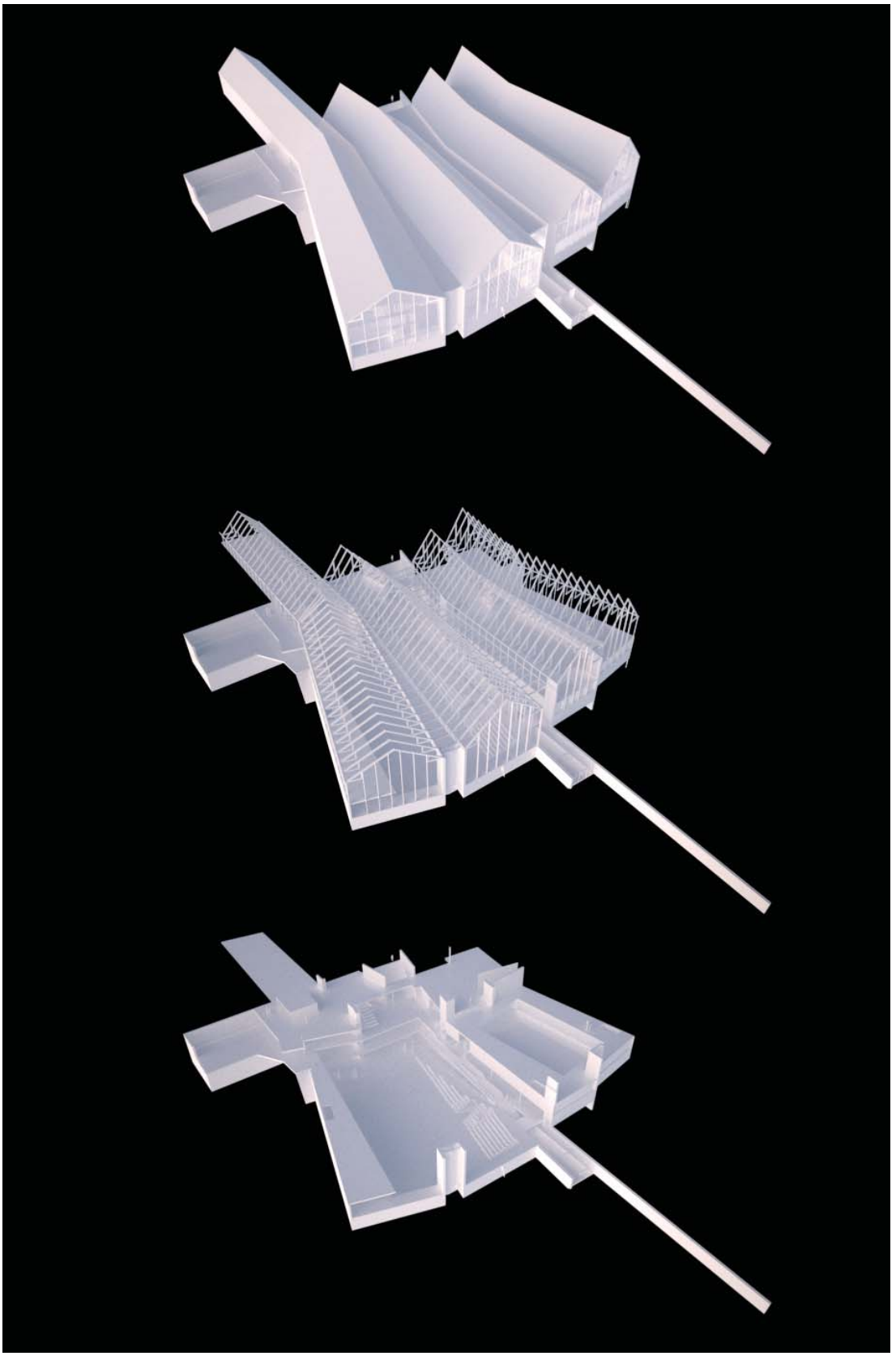
Walls and roof are framed with wood inspired by the traditional building techniques at the west coast. In a constant rhythm of 2,4 meter the structure creates the shapes of the buildings four volumes. The timber frame is from solid wood of Douglas spruce, and each frame is supported by a wire in tension across the short span. To support the beams carrying the wide span between the roofs shapes two concrete shapes are introduced.

Dimension of the wood structure:

Columns:	200x200 mm
Beams:	200x300 mm
Frames:	2x 300x100mm
Widespan beams:	200x1000mm
	200x300mm

Levels

Foundations and floors are in reinforced concrete. And a massive concrete core provides area for wardrobes and the swimming pool.
The levels are connected to each other by the circulation spine in the middle. An elevator and a staircase create a vertical access in the centre of the building. From each level there is a visual connection to the multipurpose hall.



Level 4

1. Media centre 280 m2
2. Multiroom 1 70 m2
3. Multiroom 2 70 m2
4. Green café 95 m2
5. Kitchen 34 m2
6. WC 2x3 m2
7. HC WC 4,8 m2
8. Depot 3 m2

1 meter below:

9. Swimming pool 25x15,5 m

Level 3

1. Reception and office 70 m2
2. Conference room 170 m2
3. Mezzanine 170 m2
4. WC 3x3 m2
5. HC WC 4,8 m2

1 meter below:

6. Wardrobe men 165m2
7. Wardrobe women 165m2

Level 2

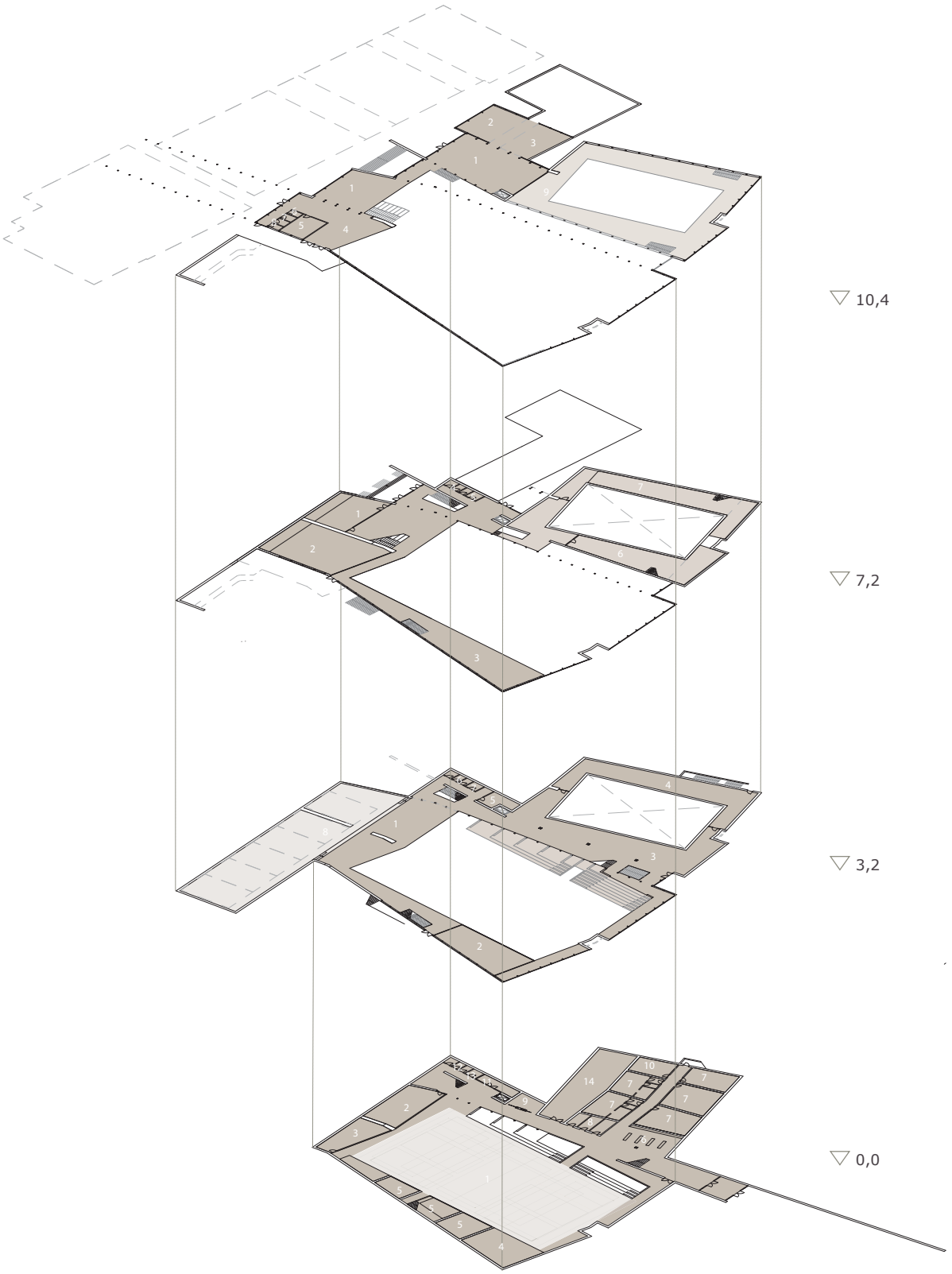
1. Workout 170 m2
2. Activity room 4 115m2
3. Entrance and spectator area 270 m2
4. Office 130 m2
5. Depot 33 m2
6. WC 3x3 m2
7. HC WC 4,8 m2

0,8 meter below:

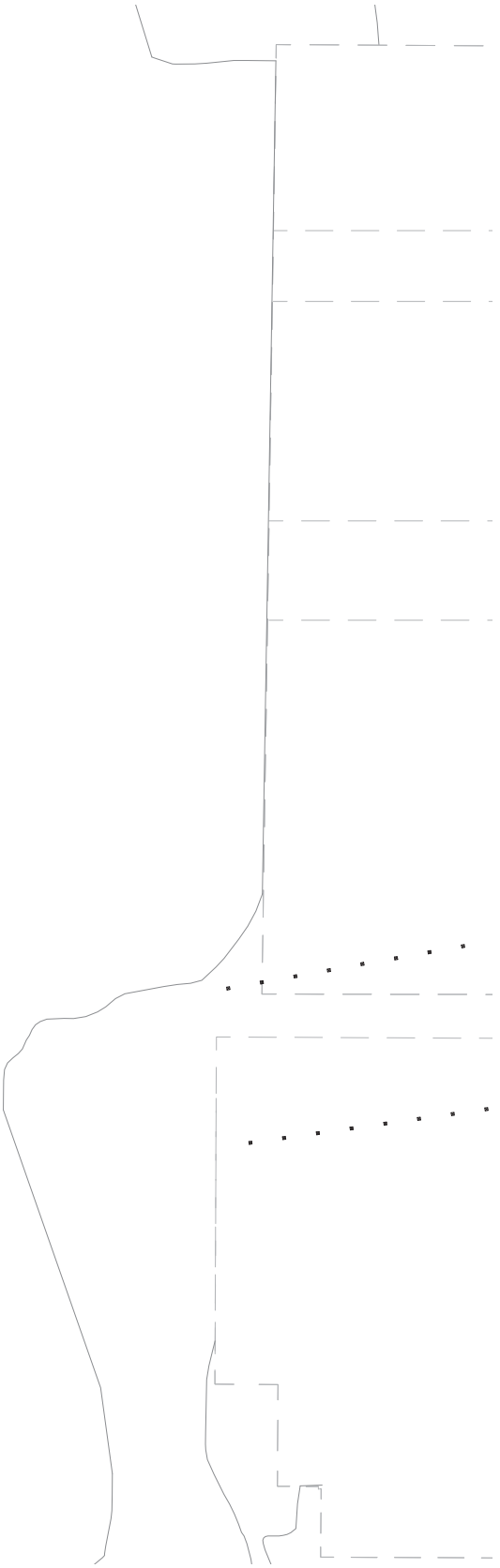
8. Squash 6 units total area 400m2

Level 1

1. Multipurpose hall 23x44 m
2. Activity room 1 100m2
3. Activity room 2 70 m2
4. Activity room 3 85 m2
5. Material room 2x25 m2 1x42 m2
6. Lockers area entrance East 60 m2
7. Wardrobe 5 units total area 280m2
8. Judges wardrobes 3x10 m2
9. First aid 20 m2
10. Depot/laundry 33m2
11. Depot 20 m2
12. WC 3x3 m2
13. HC WC 4, 8 m2
14. Technical room 155 m2


▽ 10,4
▽ 7,2
▽ 3,2
▽ 0,0

Presentation
Level 4



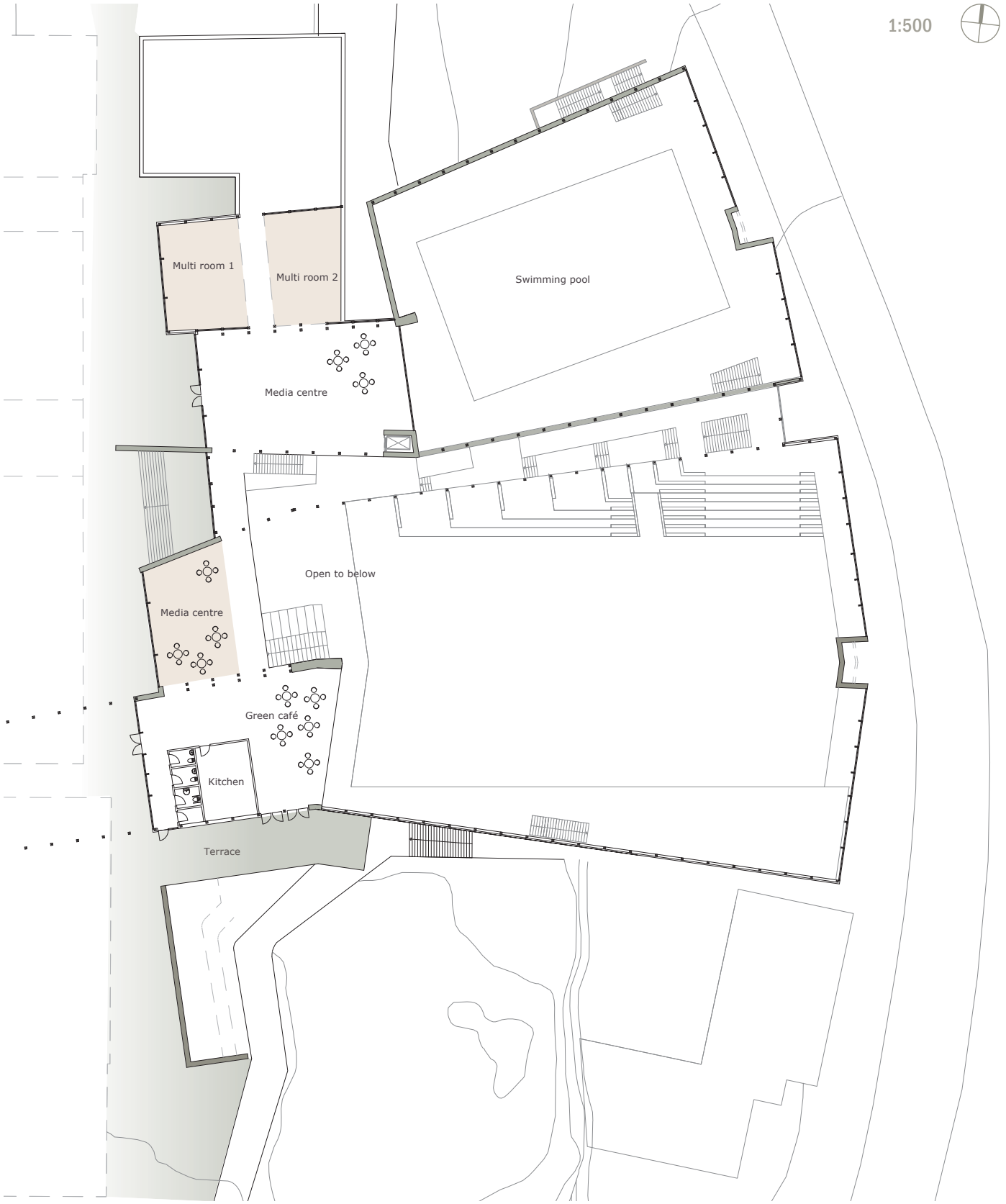
At level 4 the green café sets a focus on a healthy environment. It is a gathering point between the different sports facilities in the new and existing buildings. From the café there is access to a terrace and there are possibilities for serving food outdoors. From the balcony there is a great view through the building and it connects you to activities as well as the surrounding landscape.

The media center should bring a supplement to the sport facilities. It contains computers with internet access and can be used for booking activities in the building or for educational purposes. The media centre provides a good synergy between body and mind.

In connection to the media centre there are two multi rooms and a balcony with a view to the swimming pool. From the swimming pool large glass surfaces give a pronounced view to the sea and horizon.

The roof structure embraces all the activities in the building and from level 4 the roof shape leans out and floats over the multipurpose hall and swimming pool.

From level 4 the transition down to the harbor starts. As you move the ceiling height increases while a wide and open stair brings you down to level 3.

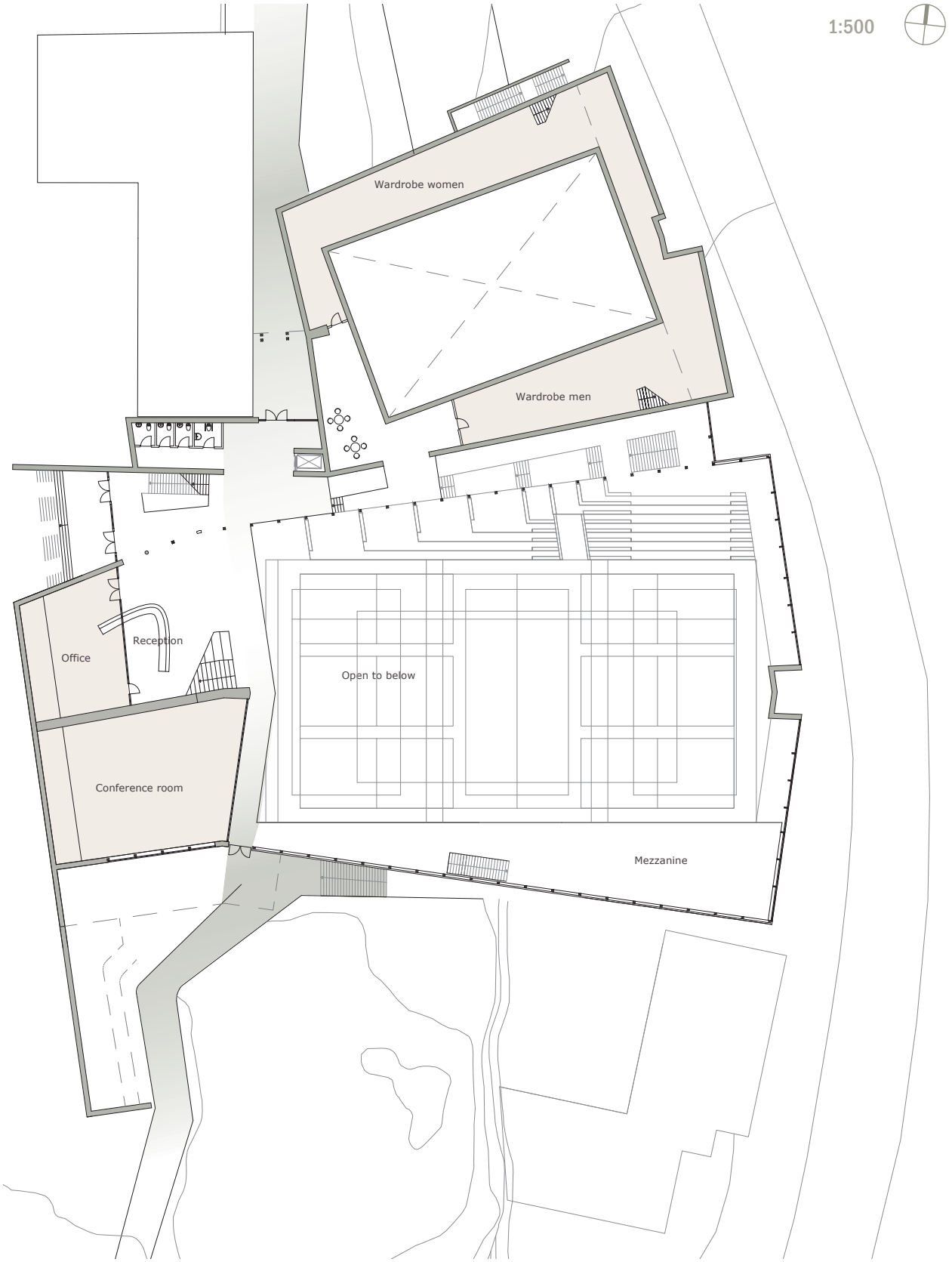

Multi room 1
Multi room 2
Swimming pool
Media centre
Open to below
Media centre
Green café
Kitchen
Terrace

1:500

Presentation
Level 3

The main transition level in the building is level 3. Along with the circulation spine this level also has a transition across from north to south. The reception is placed in the crossing between these two axes'. Behind the reception desk there is room for an office in a more quiet atmosphere. There is an open connection to level four with the wide stairs which also create a place for sitting. Furthermore the balcony is on this level on the entire south side of the building making room for spontaneous activities and social experience.

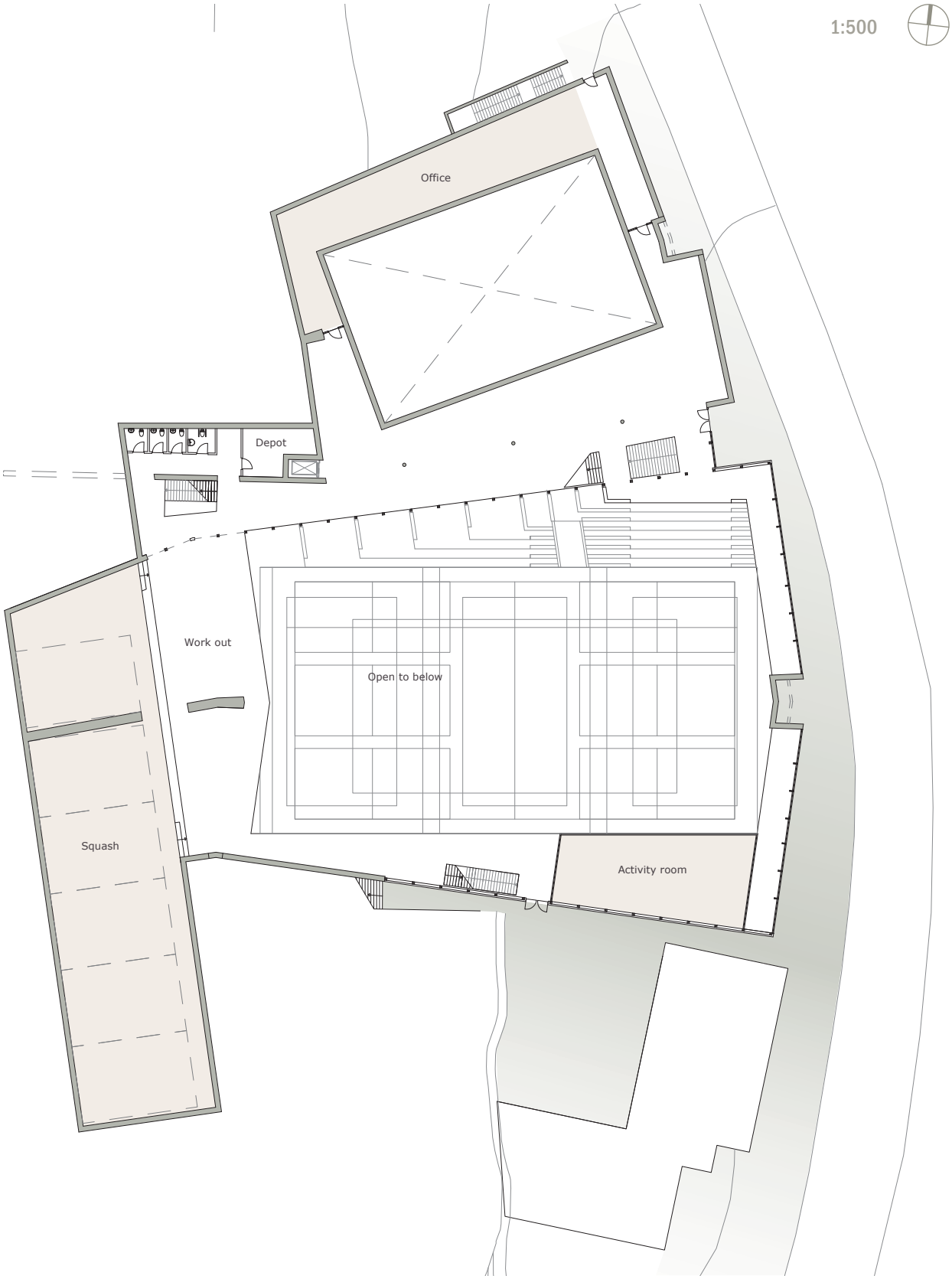
A conference room with connection to outside makes up a flexible space for educational and other events. With large glass walls it is still in visual connection to the hall environment
One meter below level 3 a mezzanine brings you to the wardrobes connected to the swimming pool. In the East end of each wardrobe there is potential for outdoor terraces in connection to the wardrobes.


1:500
Wardrobe women
Wardrobe men
Office
Reception
Open to below
Conference room
Mezzanine

Presentation
Level 2

Level 2 provides an entrance from street level and connects to the green promenade. The entrance area is lifted above the multipurpose hall and gives an overview to the hall environment. The massive concrete core creates a niche next to the circulation spine, a social meeting place in close connection to the tribune. At the north side this niche gives room for offices.
From the workout area there is a visual connection to the activities in the hall environment. The physical and visual connection between the workout area and the multipurpose hall underline the workout area as a supplement to the activities in the hall.
Behind the work out zone the squash areas are lowered to step down and create places to sit and view the activities in the squash area.
Activity room 3 is acoustically divided from the other activities at level 2. The room's location and connection to tribune and spectator area give an opportunity for a flexible use. With folding doors the room could open up and be a temporary stage.

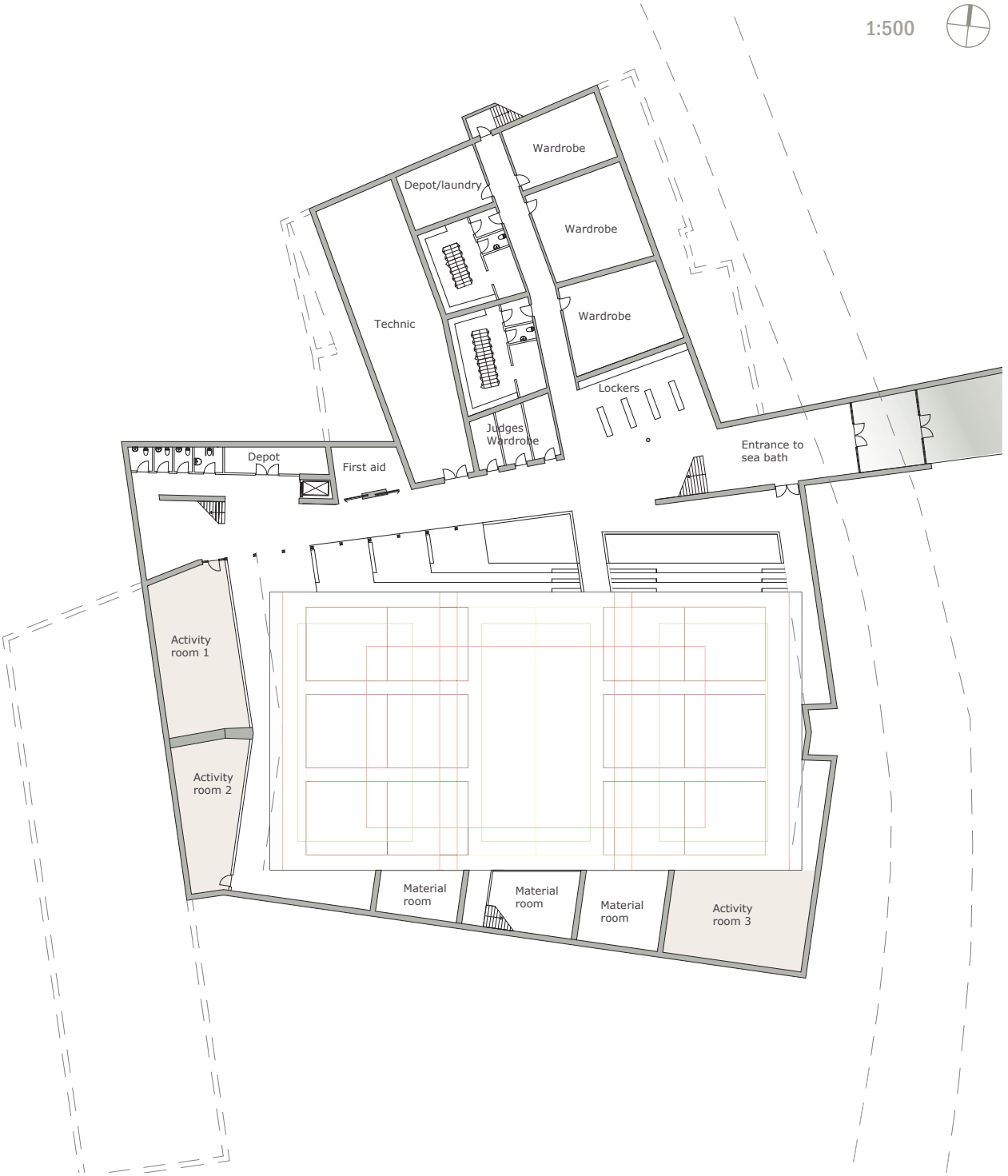
1:500



Presentation
Level 1

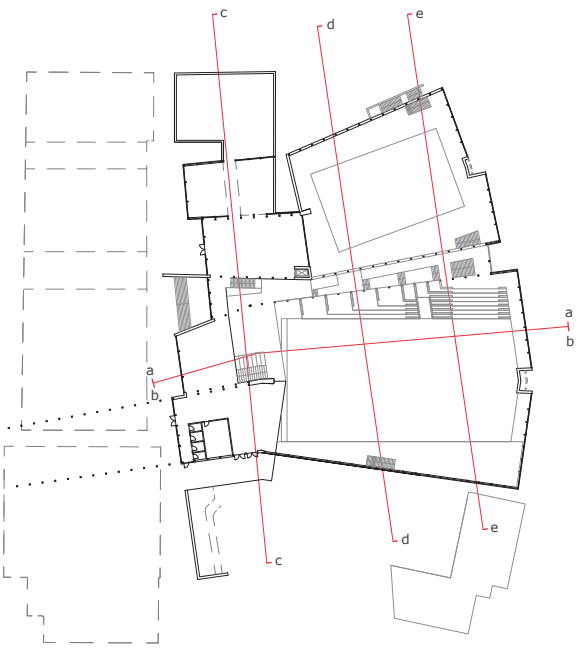
Level 1 is lowered down into the terrain and by a tunnel it connects to the park and harbor front, ending the circulation through the building into the sea bath. The tribune is a sculptural concrete element which not only is a place for the spectator but creates place for exercise and spontaneous activity in connection to the multipurpose hall.
The multipurpose hall can be divided into three zones. These zones are not acoustically separated and the users can therefore hear each other. Each zone has a material room connected to it.
In connection to the multipurpose hall there are three activity rooms, activity room 1 and 2 are behind a glass wall with wall bars. The wall bars create a transparency and visual connection to the activities in the multipurpose hall and the glass makes a zone in the hall environment which is acoustically divided. The rooms can be used for aerobic, gymnastic and dance as well as clubrooms where they can have their meetings before and after exercise. Activity room 3 is a niche in connection to the hall area, a more private place for individual activities before and after exercise.
The wardrobes are divided in five units. By furnishing the units with lockers, more people can have advantages of the wardrobes at the same time. The size of each unit also gives room for the football or handball teams when this is needed. In connection to the entrance from the sea bath an area with lockers and benches gives the possibility for a faster change before exercising. The main purpose is to have an alternative to the wardrobes if the needs are only to change shoes before the running trip, the activities in the multipurpose hall or the sea bath.

1:500

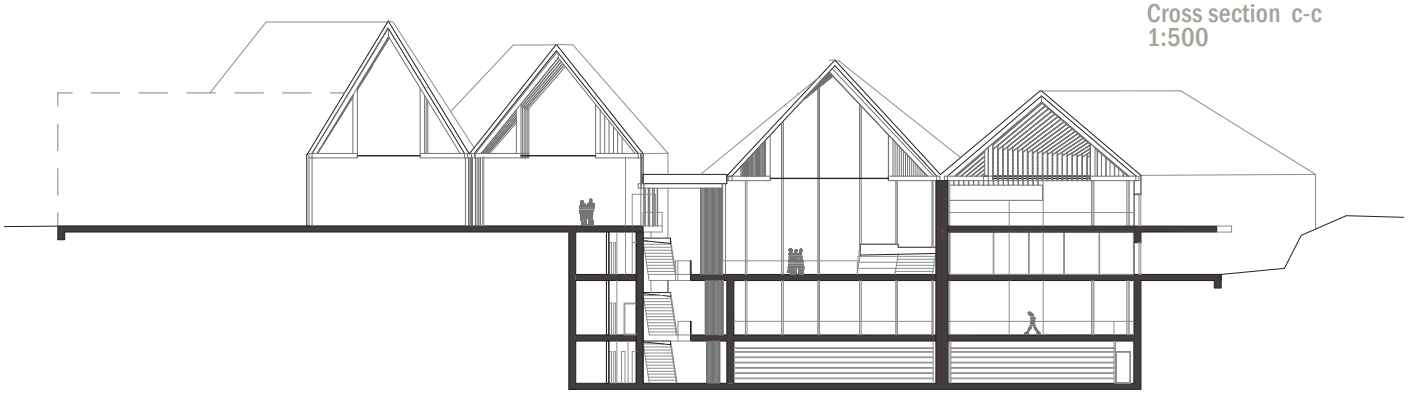

Wardrobe
Depot/laundry
Wardrobe
Technic
Wardrobe
Lockers
Judges
Wardrobe
Depot
First aid
Entrance to
sea bath
Activity
room 1
Activity
room 2
Material
room
Material
room
Material
room
Activity
room 3

Presentation
Sections

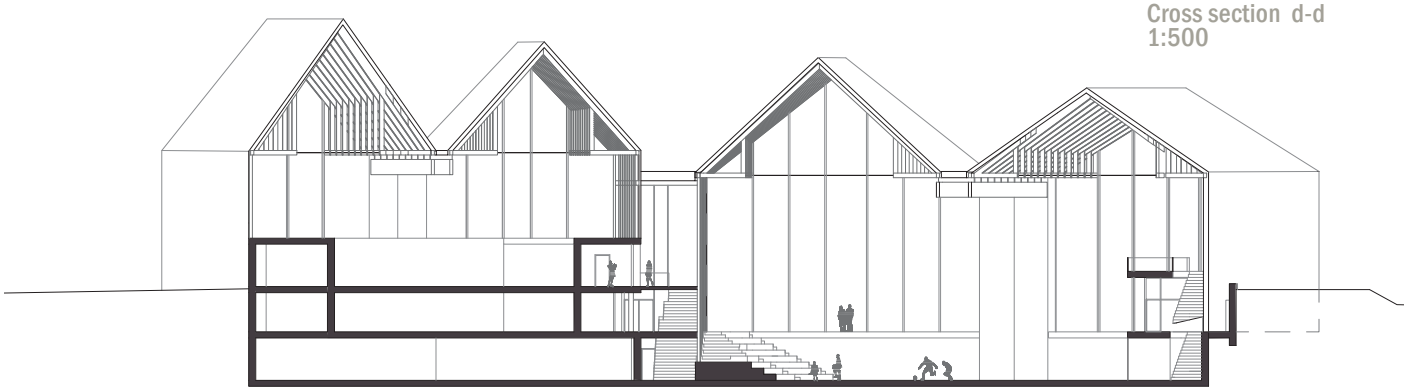
The construction creates the spatial experience in the building. Wooden columns are meeting the concrete foundation and floors in different heights. The structure defines spaces with transparent connections both to the surrounding as well as inside the building volume. The four different shapes in the structure create flow through the building and frame different views throughout the East facades large glass surfaces.
Moving down, the circulation spine separates you gradually from the structure; the space becomes larger above you and emphasizes the transition from inside to outside and the sloping terrain.
The roof structure and plan layout merge together and create one entity.



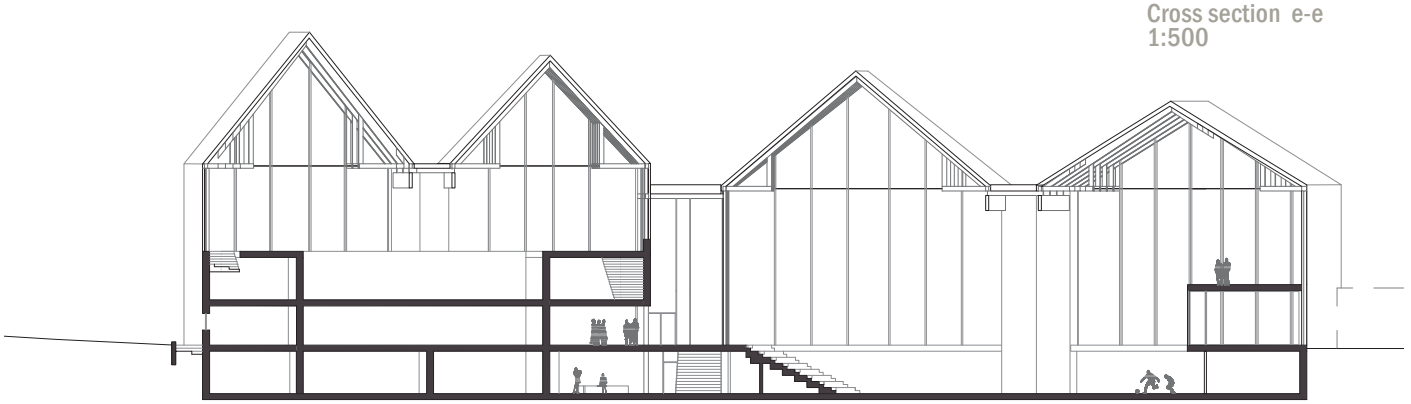
Cross section c-c
1:500

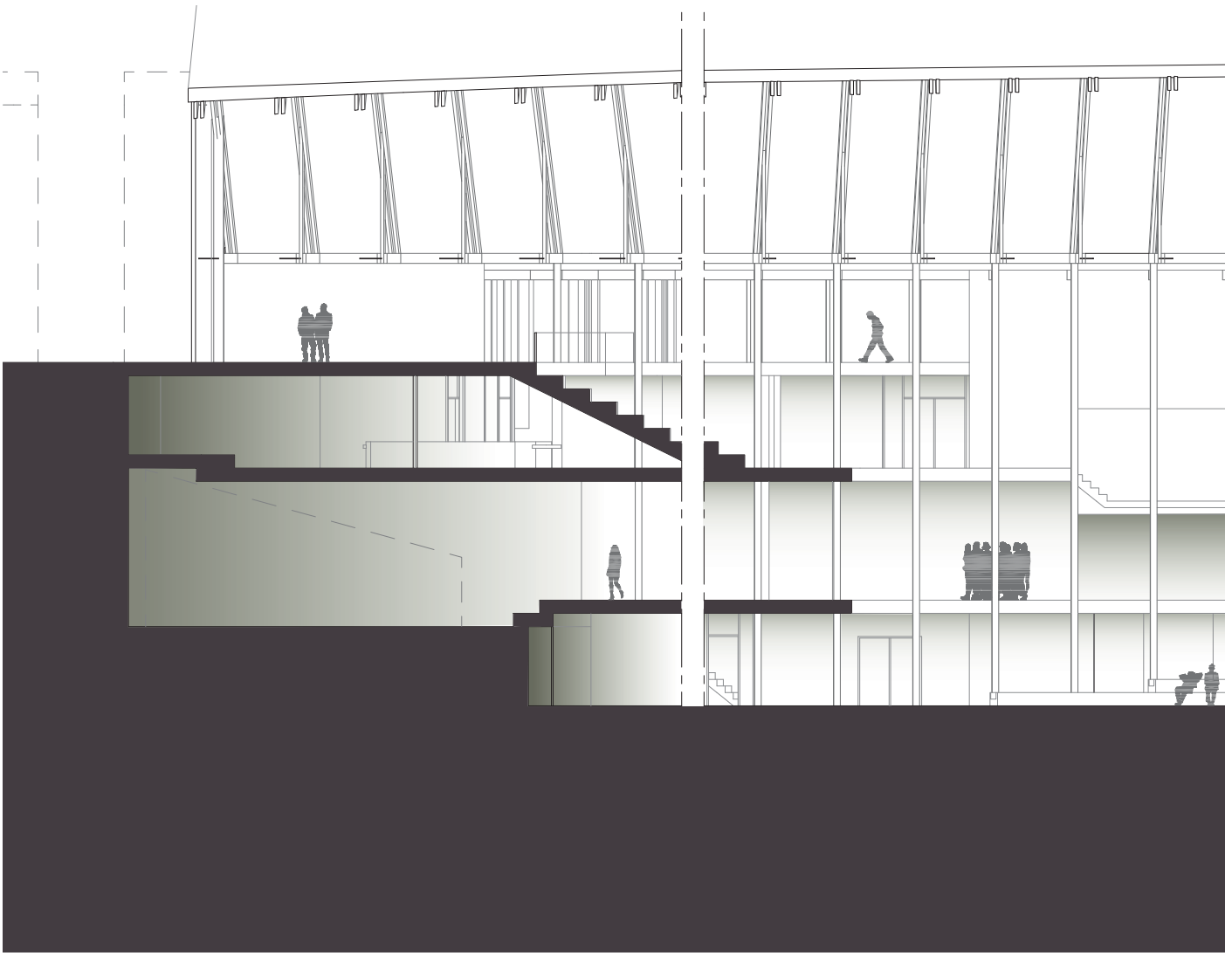


Cross section d-d
1:500

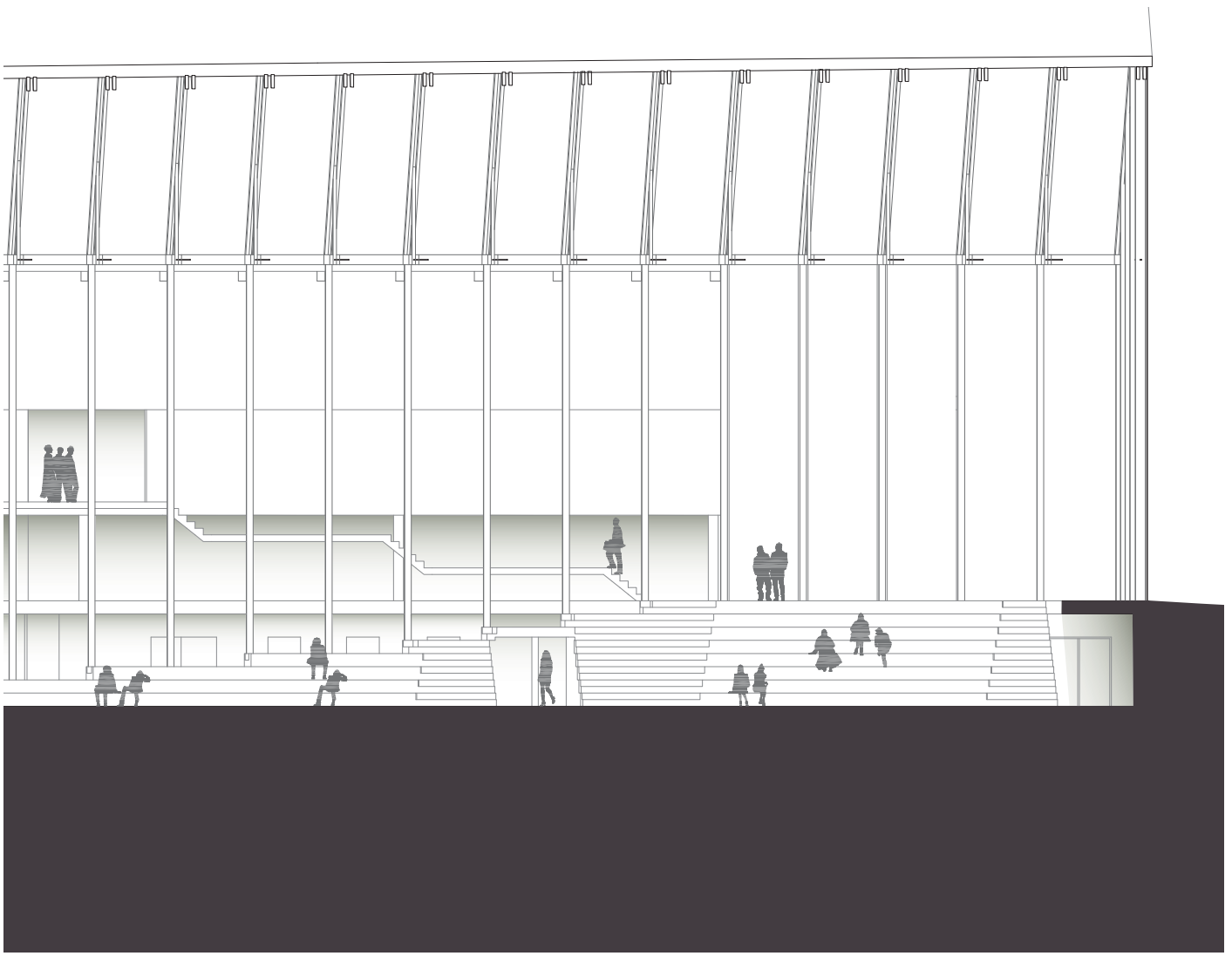


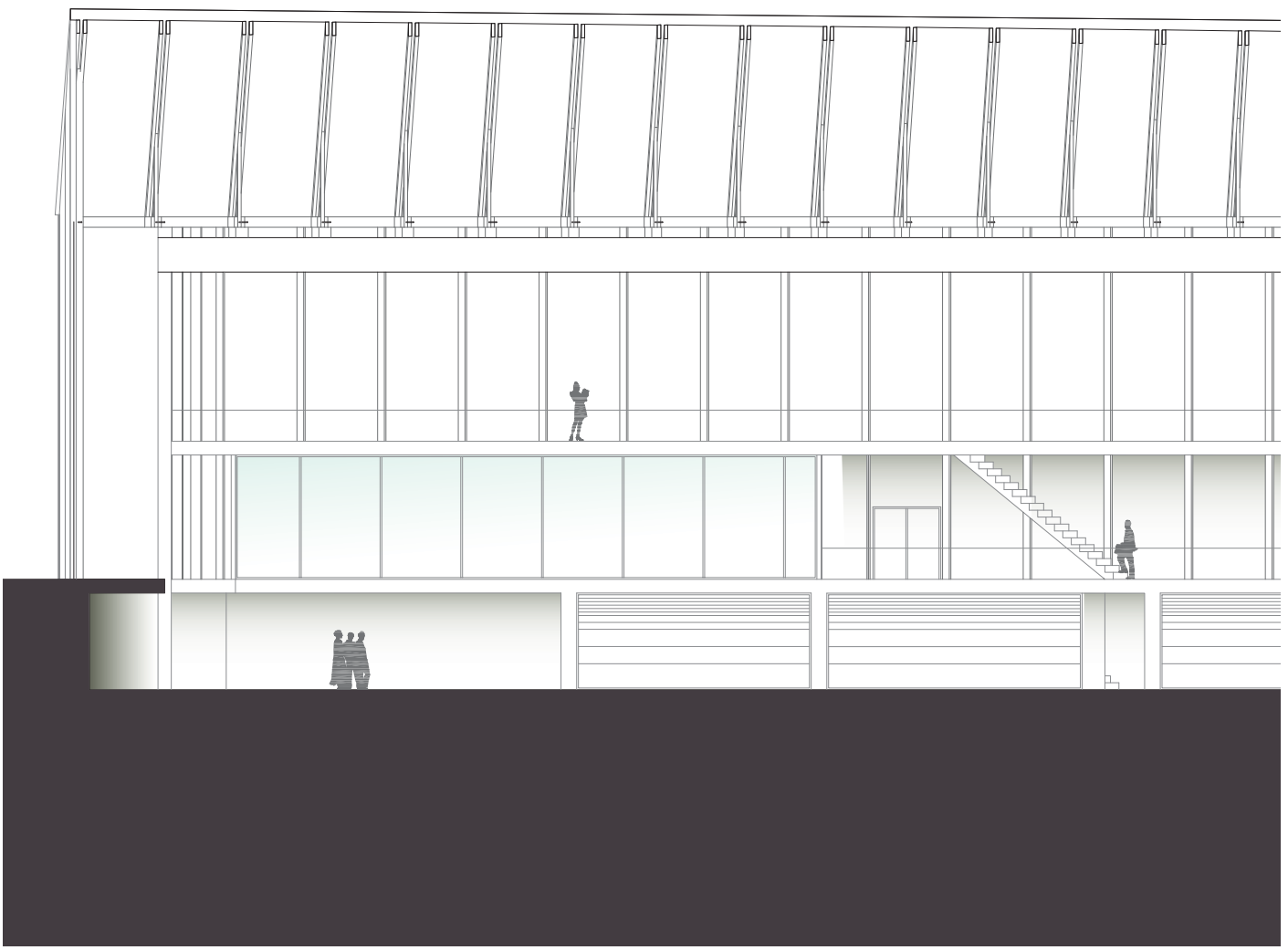
Cross section e-e
1:500



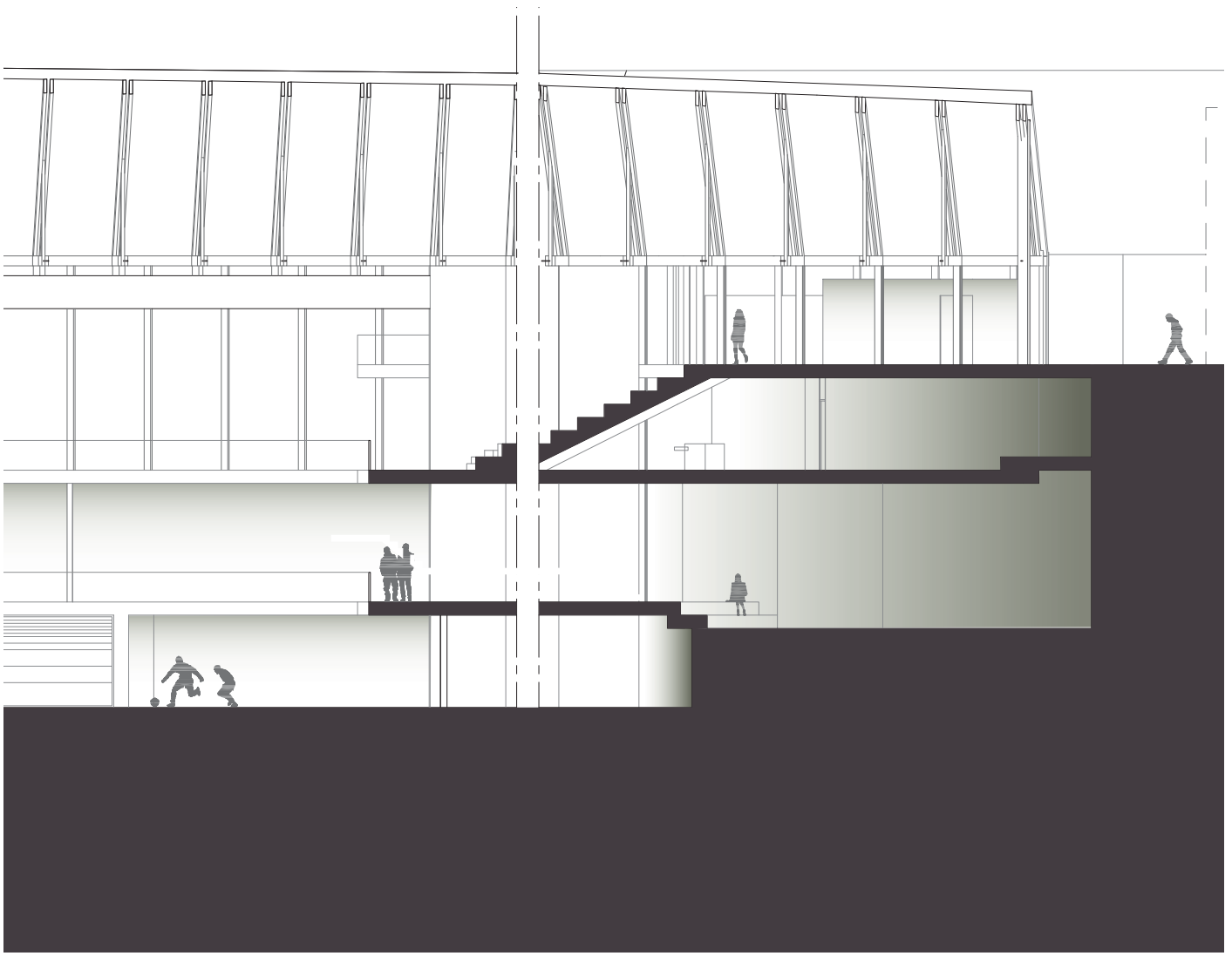


Longitudinal section a-a
1:200





Longitudinal section b-b
1:200



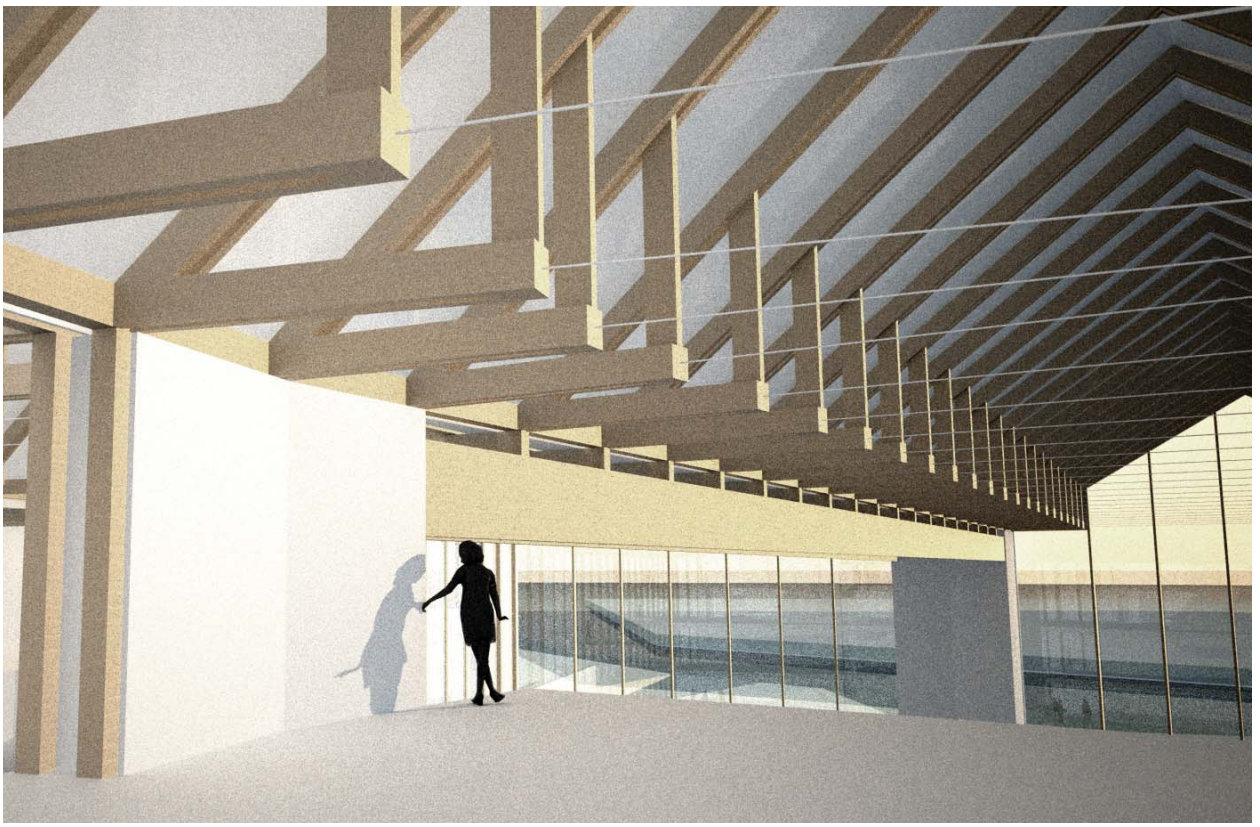
Presentation
Perspectives

View from mezzanine iin level 3

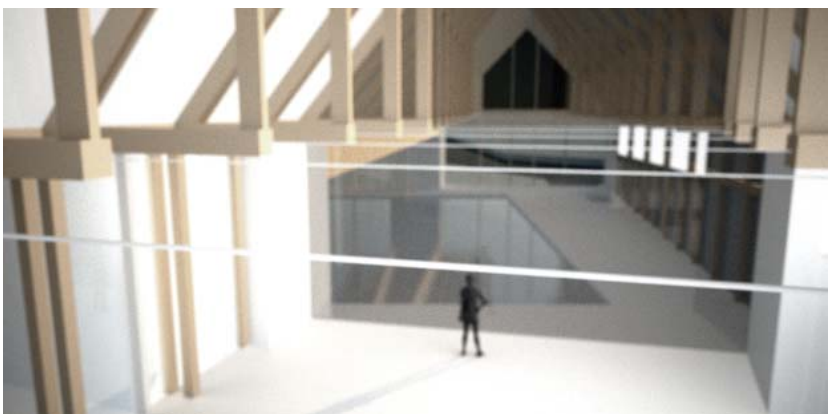
View from entrance East at level 2

The roof construction in the hall with view to Ryfylke in back.

View from circulation spine at level 3



View from cafe area at level 4



View to swimming pool from Media centre in level 4

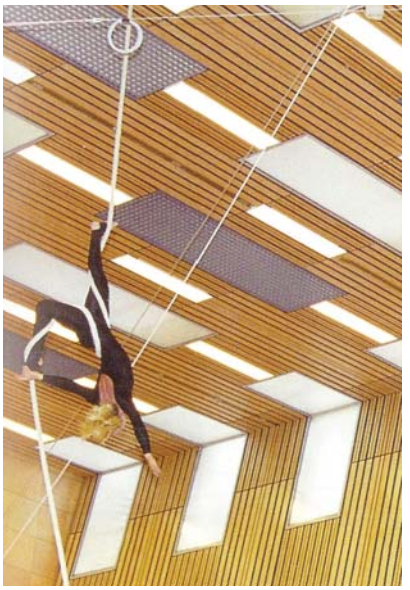
Presentation
Materials

Glass facade with transparent okalux insulation, with facade lighting

The interior cladding and finishes are kept to a minimum, leaving exposed much of the wood and concrete. Where there is cladding wooden surfaces with acoustic perforations is used and all technical installation should be integrated in the surfaces.
The construction material, Douglas Spruce, has a redish brown color.
This wood is used because of its god constructive quality with its large cross section dimensions and long length, which can be 10-15 meter.
The tribune and floors in concrete provide robust materials in the areas connected to the outdoor, and constitute the main floor finishes.
All floors in the activity rooms, multi rooms, offices and conference rooms are in light ash wood.
The main part of the facades will consist of transparent or translucent materials such as profile glass, polycarbonate, normal glass or glass fiber. The question of sustainability leads to a possible solution in a translucent bio composite material. There is currently a research project at the University of Michigan about transparent façade panel typologies based on recyclable polymer materials (Giles 2009). Having a facade like that could be interesting proposals for this project. The current area of investigation relates to typologies that use thermoplastic polymers (as skin material) and bio composites (as core material). Independent of which solution is the best, the idea with the translucent material is to bring daylight into the building and signalize openness to the surroundings. In the evening the building will glow and bring light and life to streets and urban area.

Polycarbonate

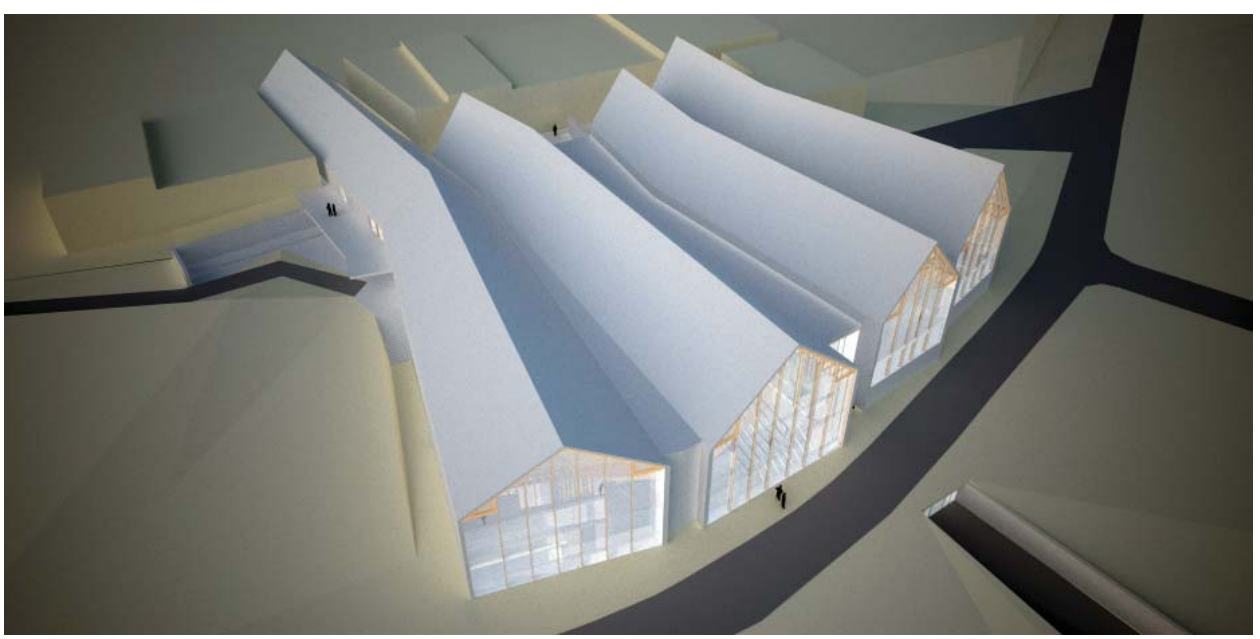
Glassprofile wall system filled with filled with thermal insulation



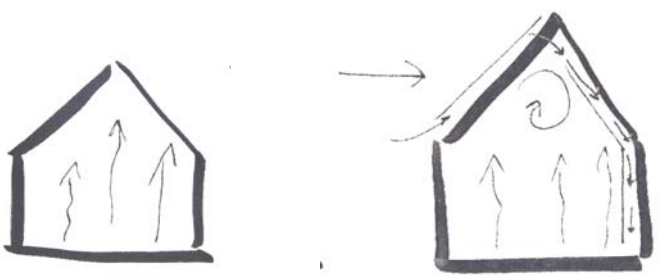
Structural panneling with birch wood

Presentation
Facades

Because of the large focus on the interior space and the structure, the facades are still on a conceptual level. The previous references should therefore be a supplement to the following illustration. The exterior of the building should emphasize the shape by the continuous skin on its long length, and the translucent material covering the structure will some places make the structure visible from the outside.
The large East facade is simply divided by six wooden columns, which is meeting the wooden frame in top. Connected to this the glass surface should have thin frames so that the prominent elements in the facade are the wooden structure.

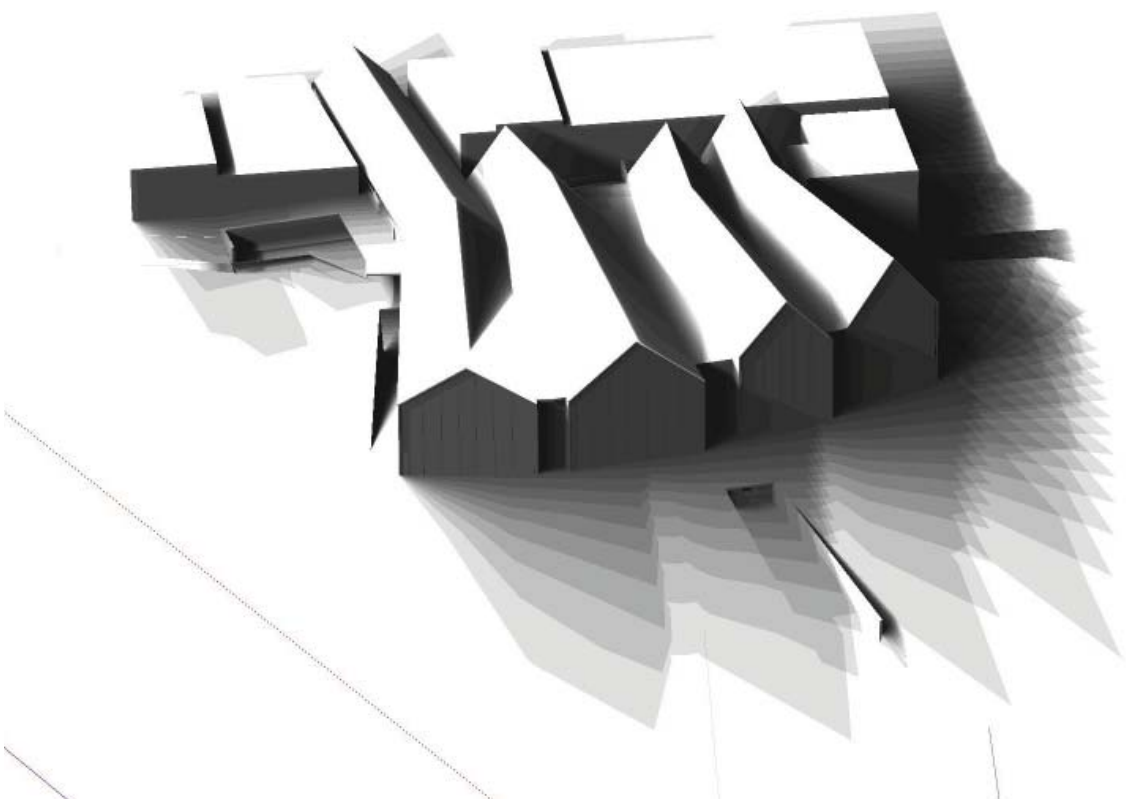


Presentation
Ventilation Strategy



The shape of the MSC shows potential in using the large roof surfaces to the south for solar warming.
Ventilation strategies have been considered in terms of the large volume and height to the ceiling. One way of saving energy for heating is to take advantage of the warm air that rises up and mix it with the fresh air from outside. Furthermore the roof can be used to preheat the air that enters the building, for this the surfaces can be made as solar panels, with air channels.

The strategy for the ventilation in MSC involves using the building surfaces and structure to create cavity channels and use a mixture of natural and repression ventilation. The air will be heated in the south facing roof surfaces, and transported through channels integrated in the building design. One example is to use the U—shaped concrete columns in the facade for air extraction.
It should be noted that this part has not been fully implemented in the design of the building at this stage.



Presentation
Summary

The multipurpose sport centre will become part of Stavanger's façade towards the sea. By the fan shaped plan and the large glass surfaces at the East façade the building volume opens up to the park and green promenade.
It sticks out from the falling terrain and by its clear and translucent facades invites people in. The plan layout is in clear connection to the shape of the volumes. From outside the building almost reveals its structure, but its first when you get inside you really experience the building.
The composition of spaces and niches as one whole, organized by the structure and roof creates unity in the new MSC. The buildings cold and simple appearance from the outside turns to a warm and lively environment once you come inside.

p.073-099
Own illustrations

p.100
Steven Holl, Kansas City, www.flick.com

p.101
Top left: Laban Dance institute, www.flickr.com

Bottom left and bottom right: Langhof, Sport complex, Berlin (Broto 2005:39)

Top and centre right: Fink-Jocher, Ballspielhalle Ingosltadt, (Broto 2005:215)

p.102-107
Own illustrations

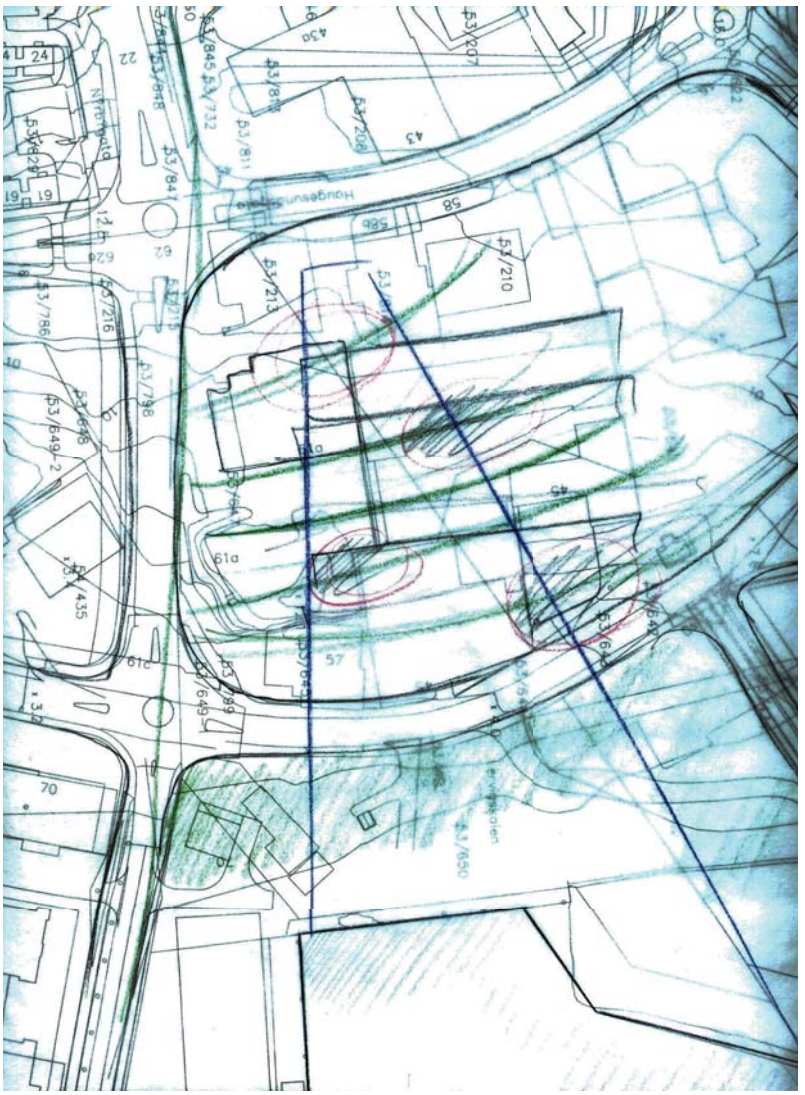
Process
Introduction

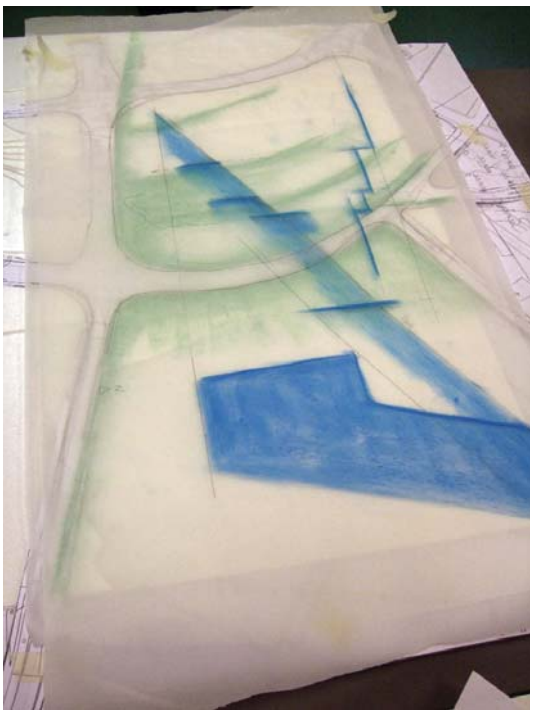
The design of the MSC has been through an elaborate creative process. Starting with the strategies for the overall site and building shape, moving into the distribution of functions and finishing up with the adjustment and merging of the plan layout and physical structure. The process gives a chronological presentation of the design development.

The following chapter provides an extract of some selected sketches and model pictures.

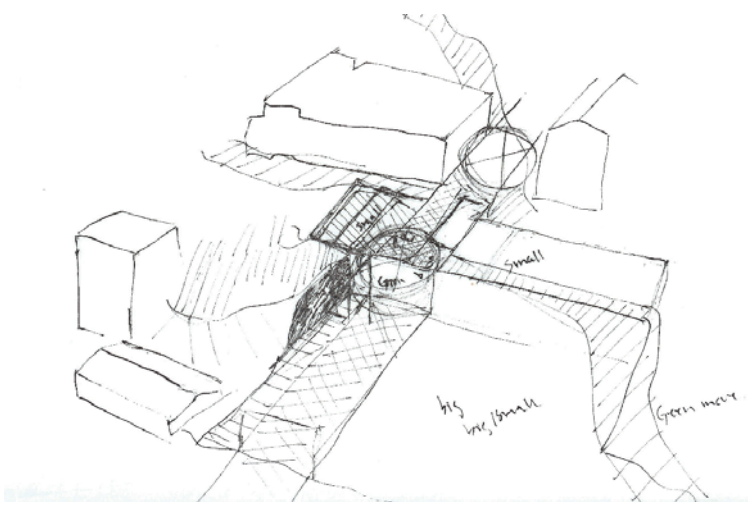
Process
Strategies for the overall area

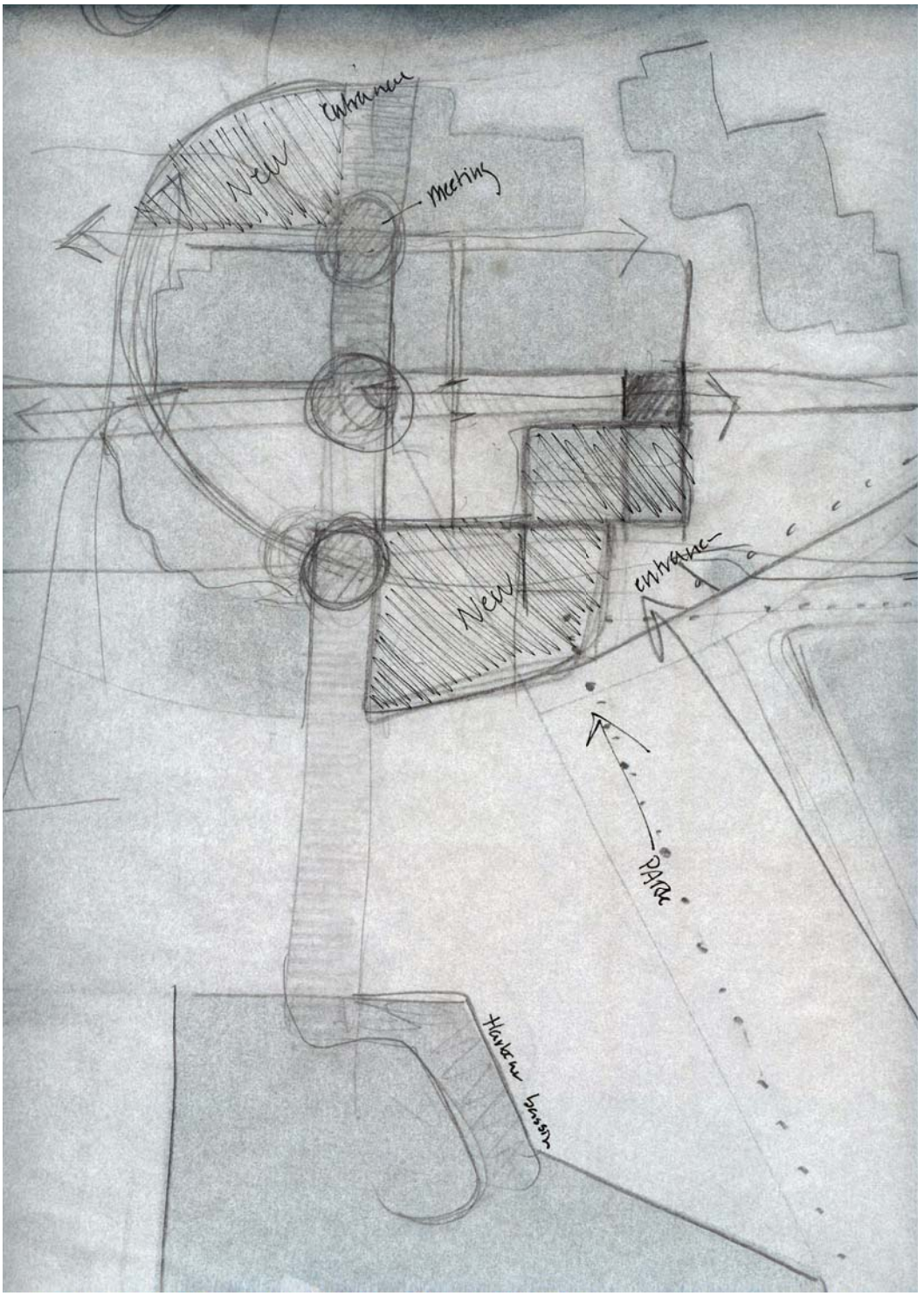
To create some overall guidelines for the design development, three different moves, a blue, a green and a red were the starting point for the strategy.
The red move was the activity functions.
The blue and green move was more about the connection to the surrounding, and therefore a natural starting point for this phase of the process.
The blue move should illustrate movement from Haugesundgata on the west side of the site down to the harbor front. Its keywords were the views, water and levels with horizon and the pronounced view to the Ryfylke Mountains as the driver.
The green move contains the green structure such as, paths and parks and terrain in motion. Its keywords are about accessibility, movement and active typography.



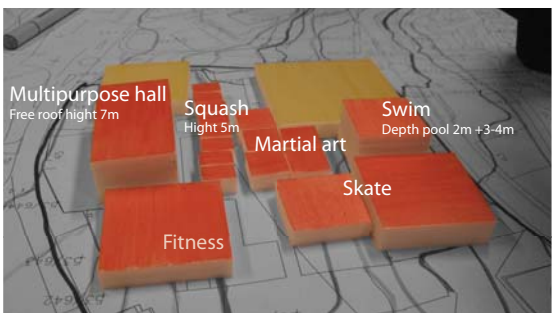


The summary of the previous sketches is that the green move should level up and follow the landscape curves, while the blue move should level down and merge with the horizon. The blue move should orientate itself in the direction were the bay meets the sea.
The strategies for the overall area became the idea of an axis going straight through the site from Haugesundsgata to the harbor front, ending in a sea bath with the park. Motions across this axis created nodes with meeting places and the sketch illustrates the idea that the new building volume should not be a barrier but filter people through.



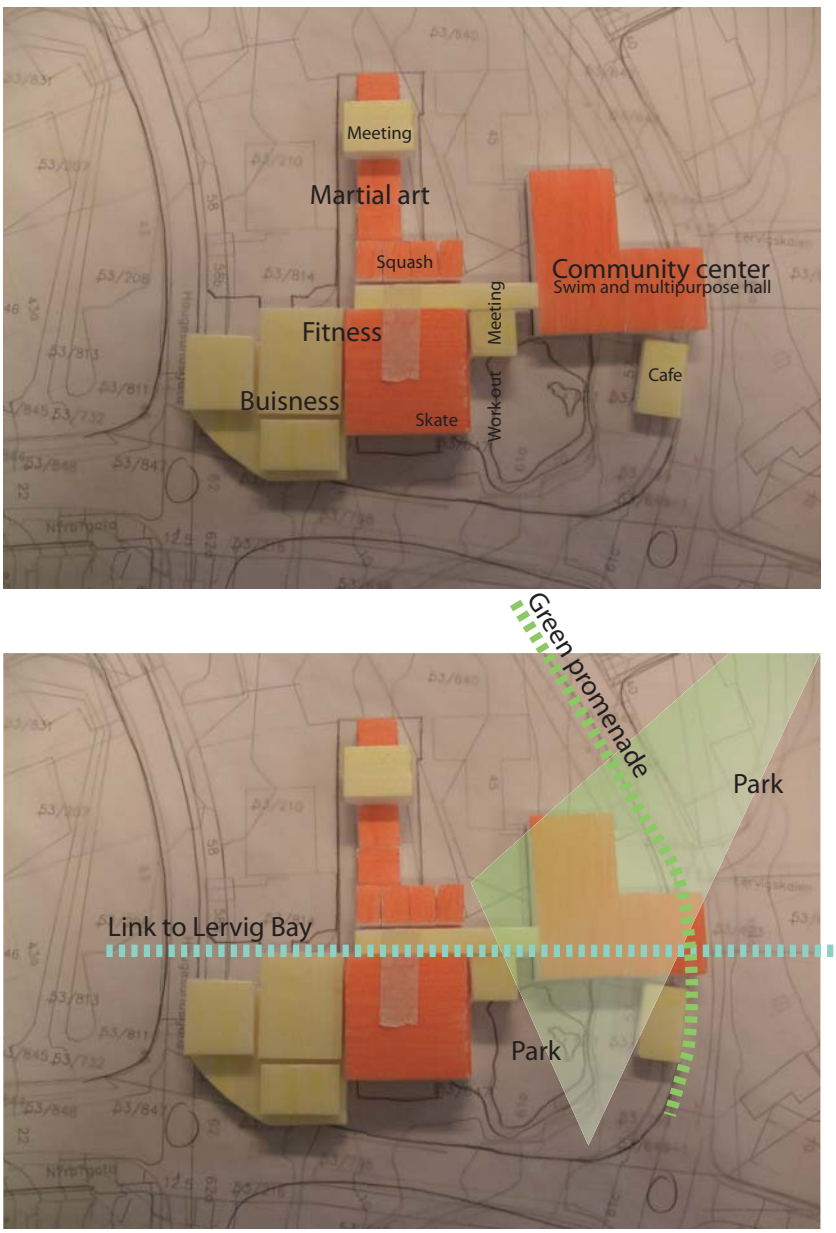

entrance
New
meeting
New
entrance
PARK
Harlem River

Process
Volume Studies



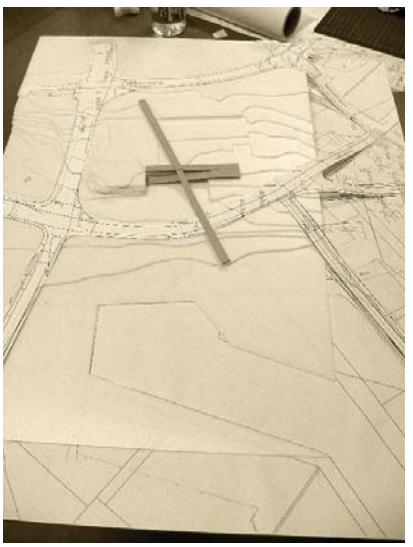
The program from the municipality of Stavanger was the background for the first actions; simple volume studies were done, trying to figure out if the registration from the site visit could fulfill the demands of the program.
The main thought has been to picture the MSC within different zones, taking sports functions as the offset, were the activities such as martial art, skate, squash, fitness, multipurpose hall and swimming pool were the main zones to distribute.

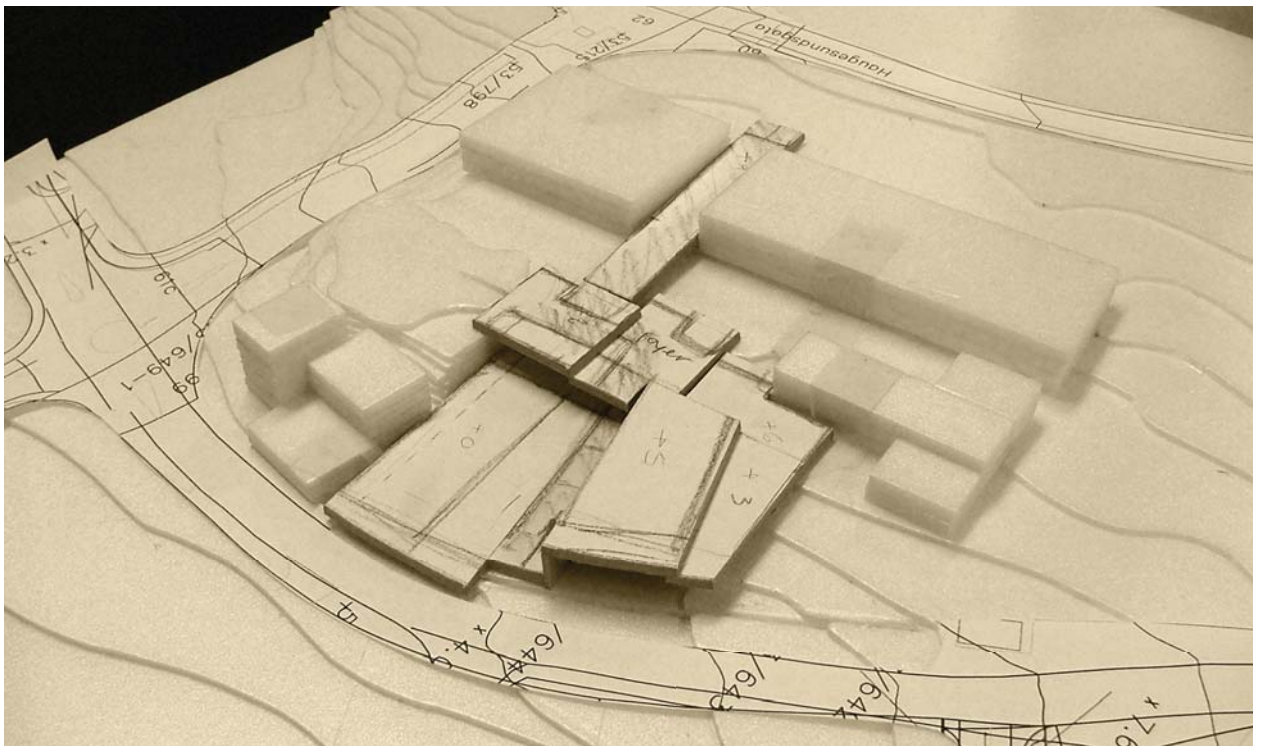
The multipurpose hall and the swimming pool are important offer to the district Storhaug and therefore these functions should create the frames for a form of community center, in closer connection to each other.
The size of these to functions also demands a new building volume. The skate hall which was newly established in the old margarine factory keeps its location and the old tin factory became at last the space for martial art.


Meeting
Martial art
Squash
Community center
Swim and multipurpose hall
Meeting
Fitness
Cafe
Buisness
Skate
Work out
Green promenade
Park
Link to Lervig Bay
Park

Process
First conceptual model

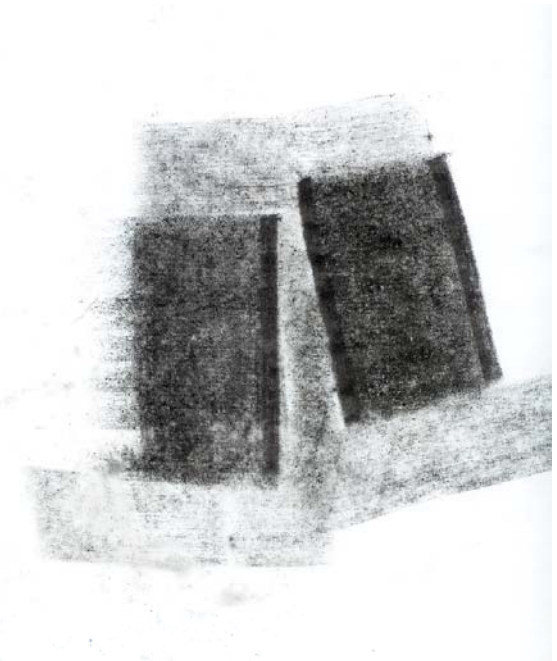
The idea of the transition through the building leveling down towards the harbor front has been the starting point for the development of the concept. Also to use the edges in the landscape and framing the view at the different levels became important.
The first conceptual model was inspired by the characteristic fan shape pattern of the boathouses. The two main volumes, the multipurpose hall and the swimming pool twisted in each direction along the curved road creating a void in between them. The swimming pool is lifted up to provide view and connection to the sea. On top of the merchant edge in the landscape the foyer was placed with views both to the activities and the surrounding landscape.

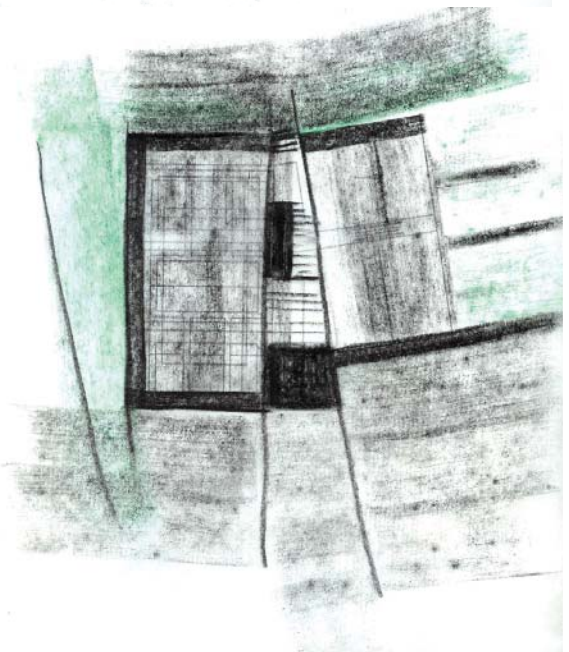




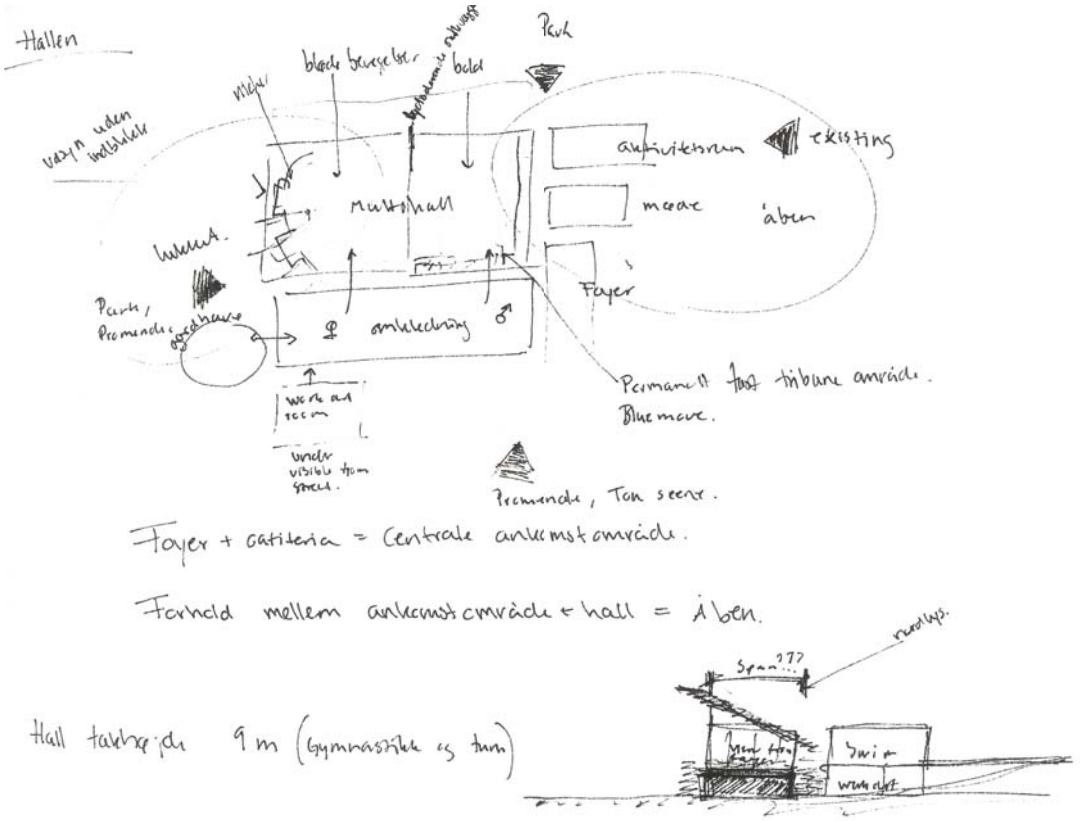
Process
Programming and plan layout

The idea of the fan shaped volume along with the transition from Haugesundgata to Lervig Bay, becomes the main focus. The work lies with how these two main volumes are connected and placed in the falling terrain. Also the void created in between the volumes becomes important.





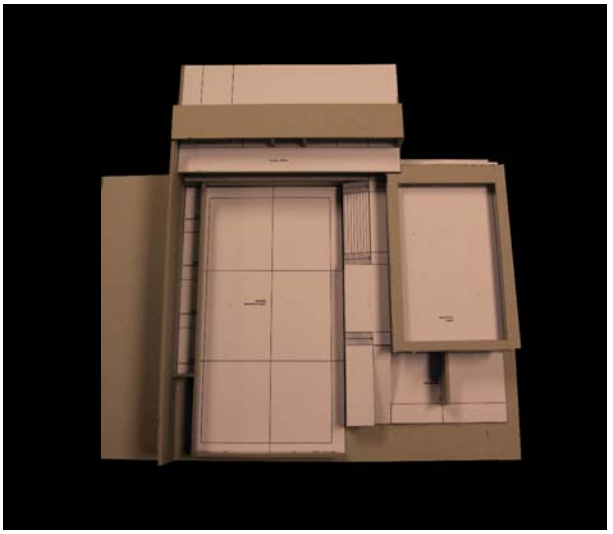
The process of distributing the functional diagram started with a simple model; placing the functions on the base of the first conceptual model.
The void between the two volumes became a transitional area and by lowering the multipurpose hall down there was made room for a tribune and access to wardrobes underneath.

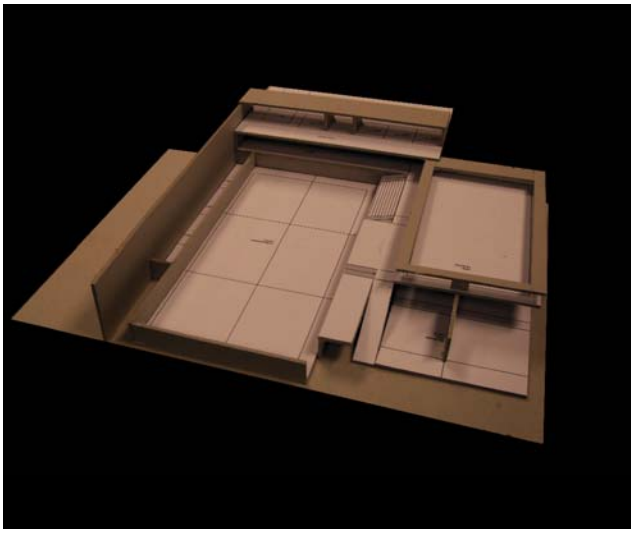


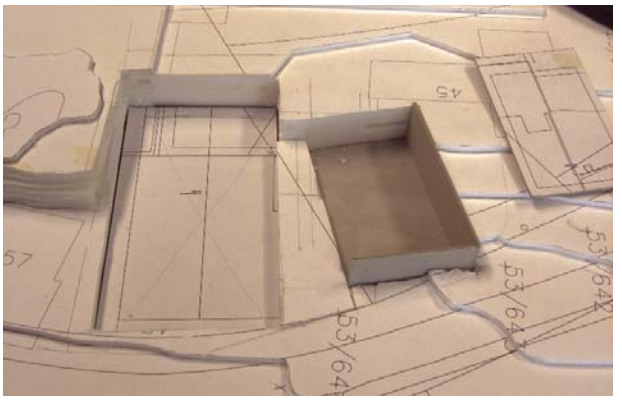
Foyer + cafeteria = Centrale ankomst område.

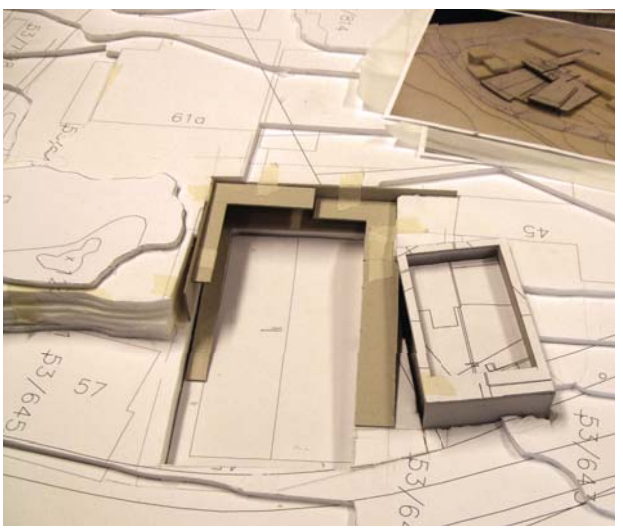
Forhold mellem ankomst område + hall = åben.

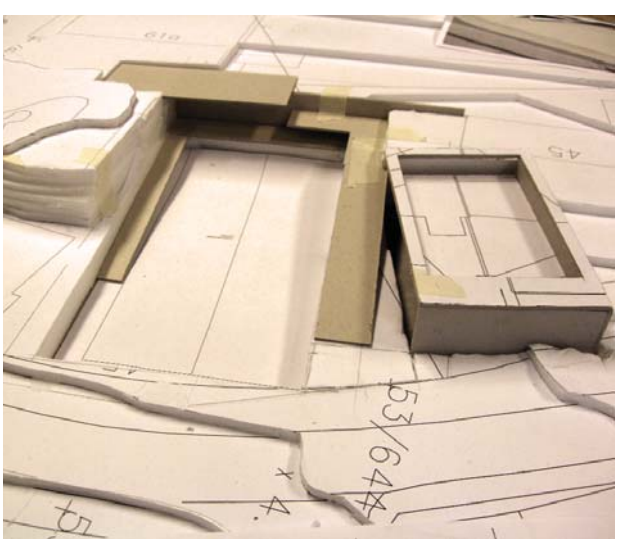
Hall takhøjde 9 m (Gymnastik og fun)



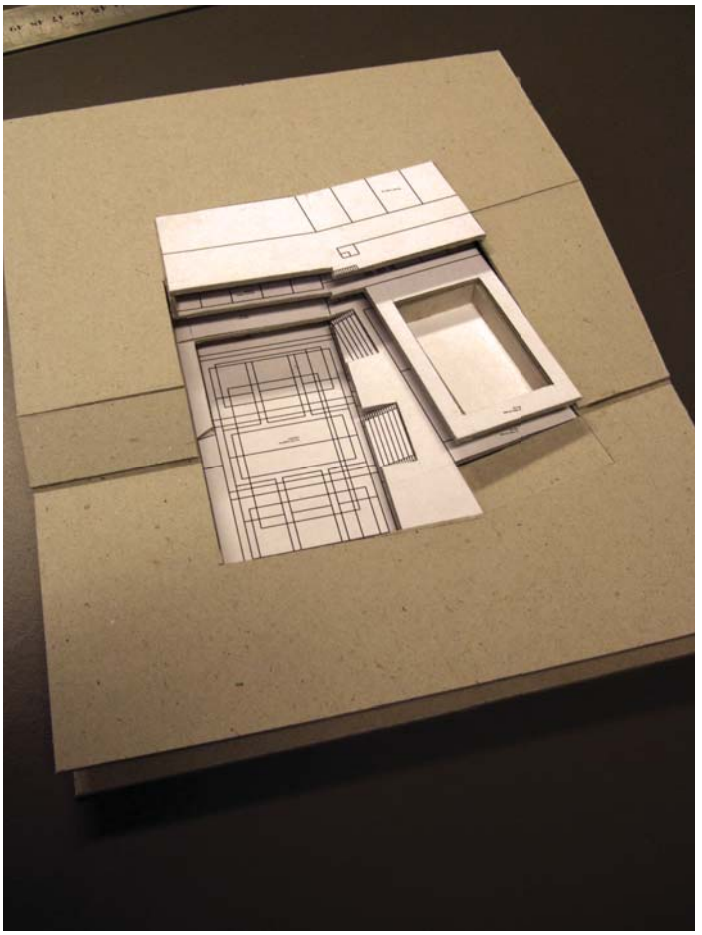


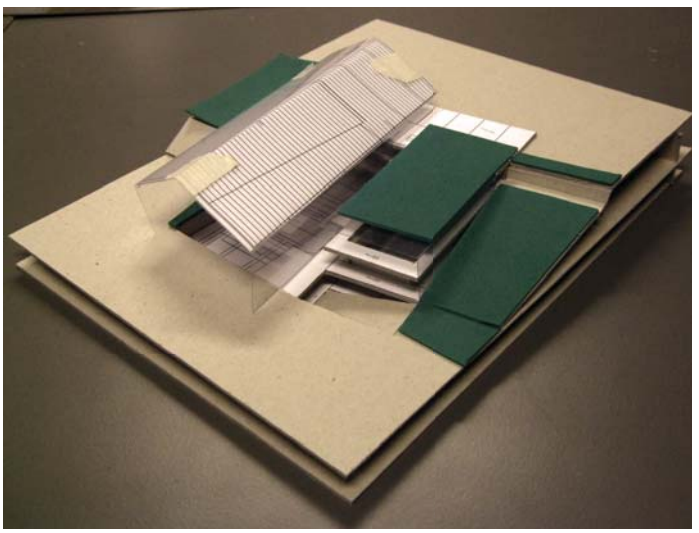




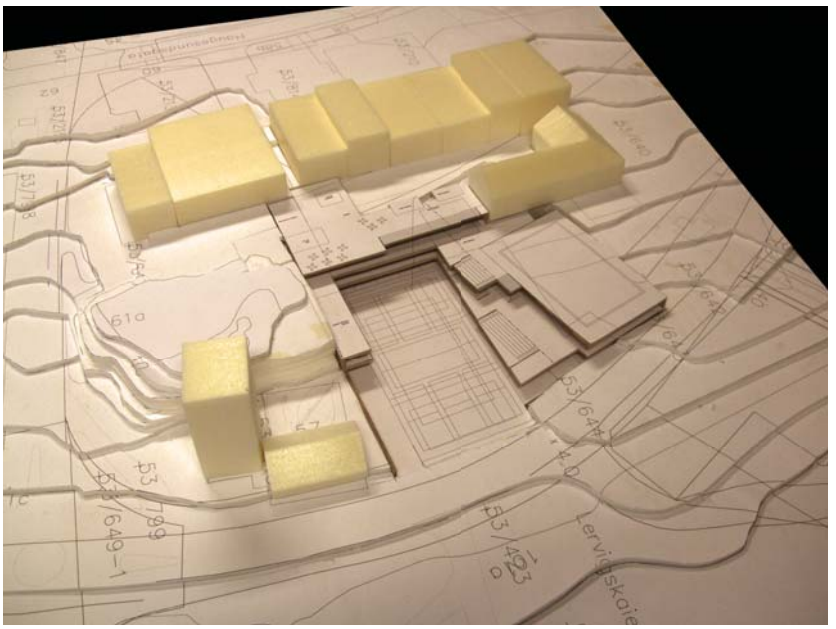


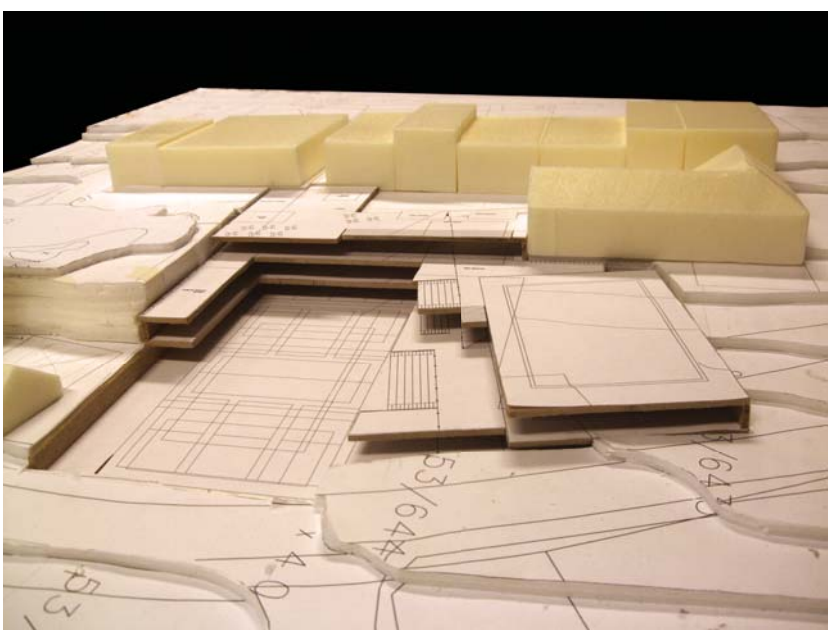
Following the process was about merging the building volume into the landscape. The main volume should follow the shape of the road. The hill side's edge creates a back with balconies that can provide places for spectators or other activities in connection to the hall environment.



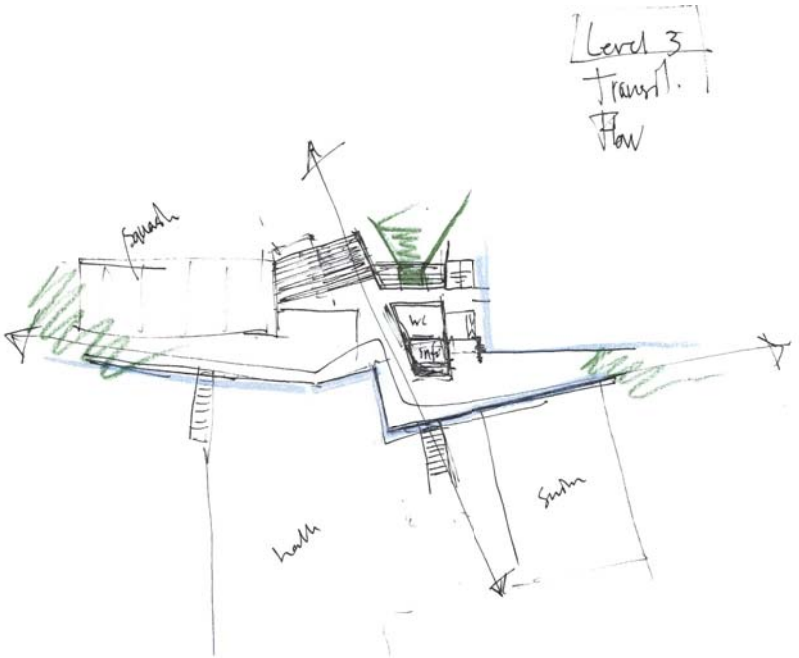


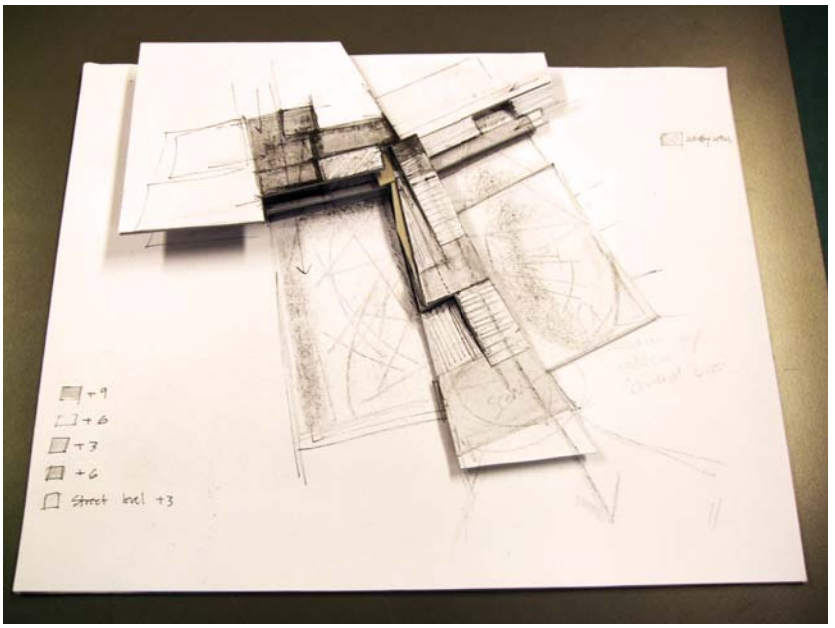
The multipurpose hall was sunken down into the terrain to provide enough space for the facilities. This introduces four levels in the plan layout. An advantage by lowering the building volume is that the tribune area gets access from street level and becomes a part of the entrance area. The connection between the three highest levels is too much separated in this proposal.





This model shows the first result from the first phase of the development of the plan layout. The tribune here is part of level 2 and level 3 and connects the levels in a more gradual flow than the previous model. This introduces the idea of a circulation spine that should connect all levels and be the main transition through the building complex.

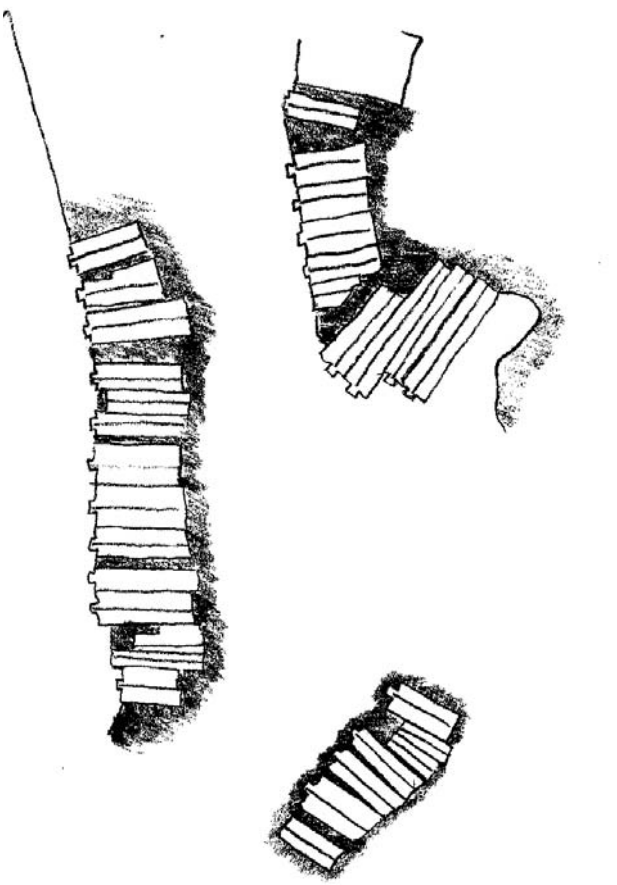


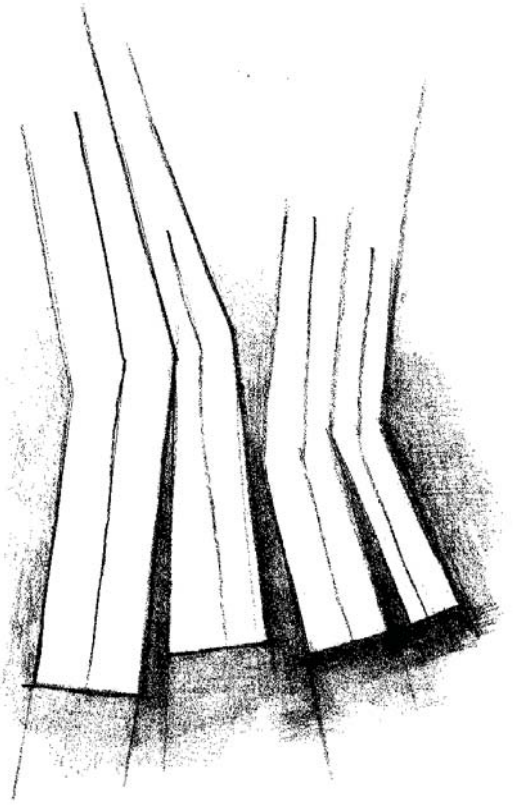


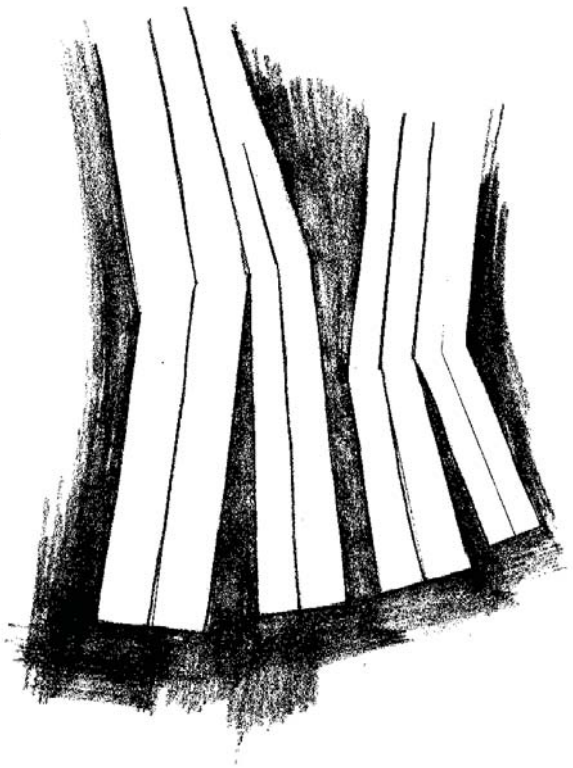
The circulation spine involves the tribune and spectator's area which connects the different levels and functions in continuous motion through the void between the two main volumes.

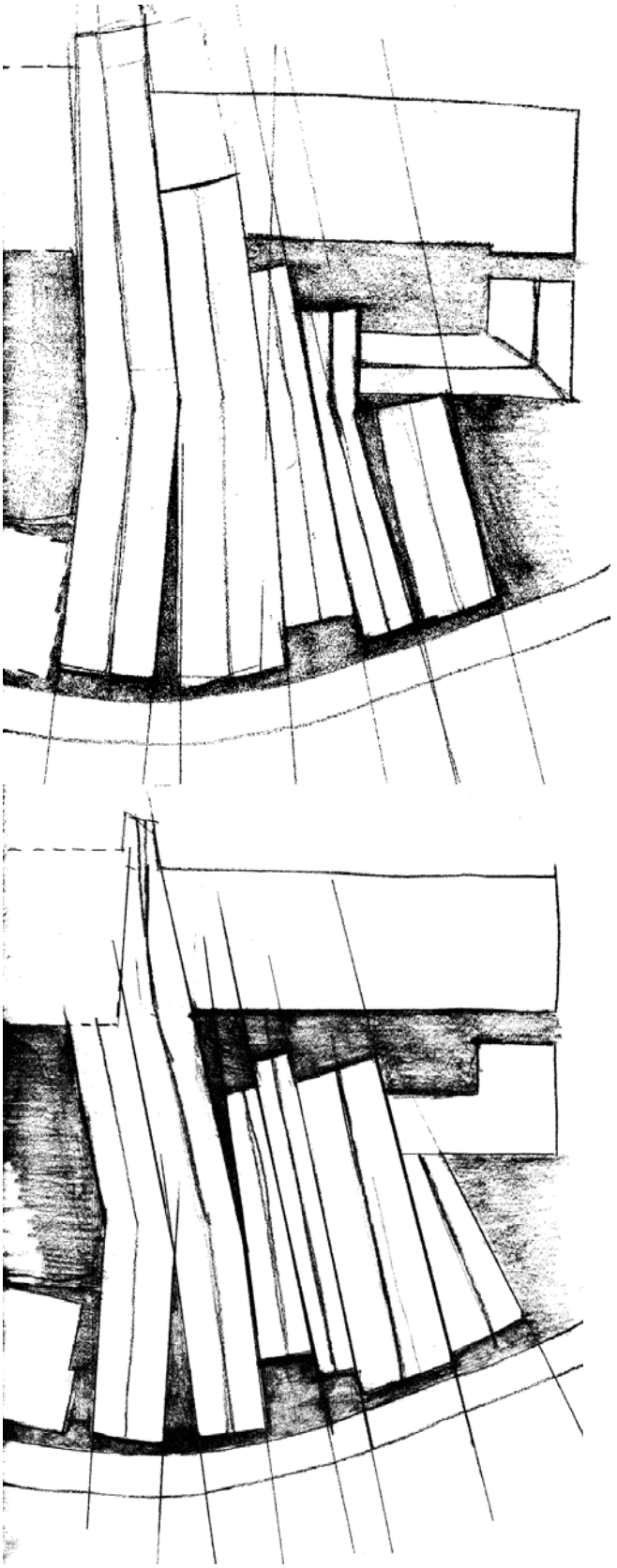
Process
Developing architectural concept

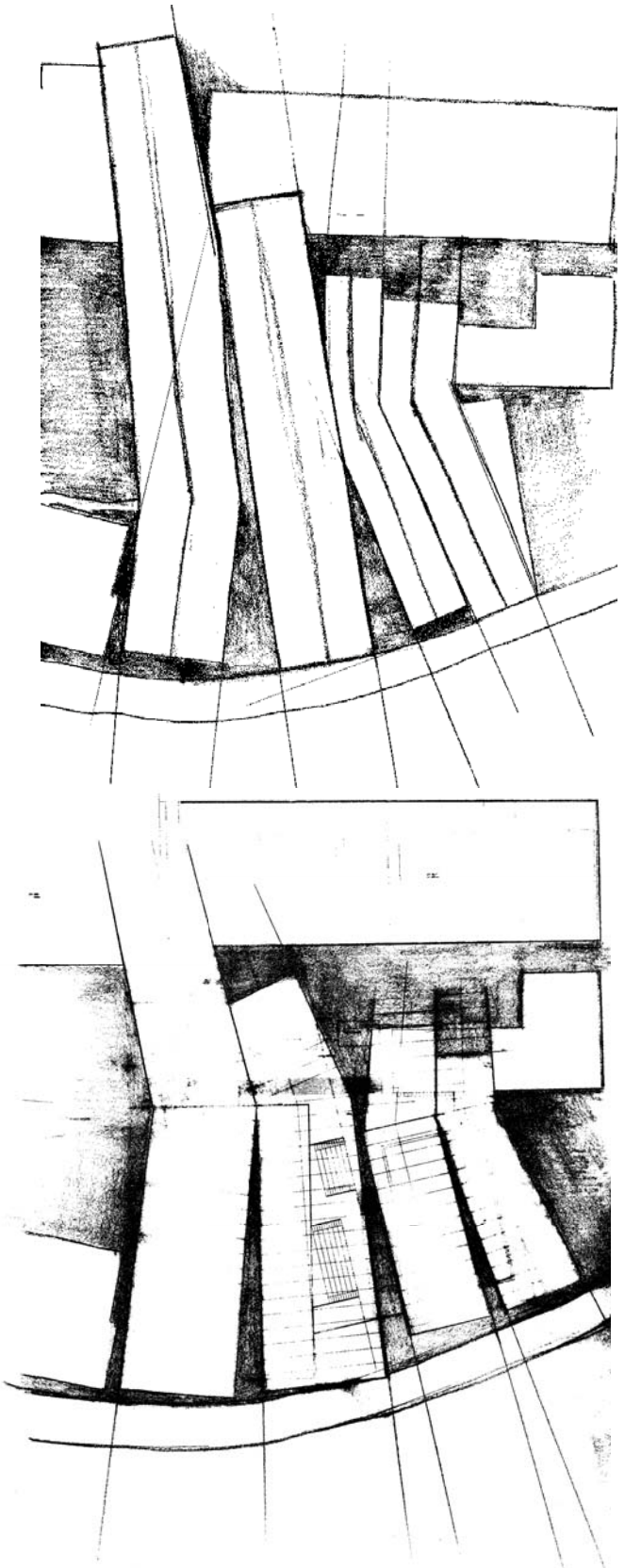
The main conceptual idea takes even more inspiration from the boathouses. Here observations of the shapes and spaces between the volumes gain the concept a stronger motif.
The important part in the conceptual idea became the roof and the process was about finding the right composition for the roof shape. Through sketching and model work, the main concept was developed into a motif and composition that became a driver for the plan layout. This process is presented in a chronological order by sketches and model work.

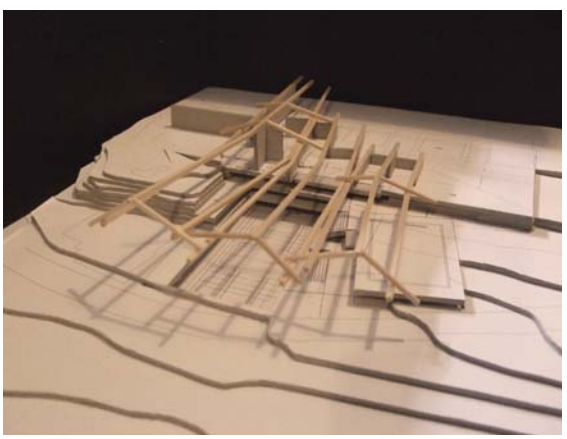


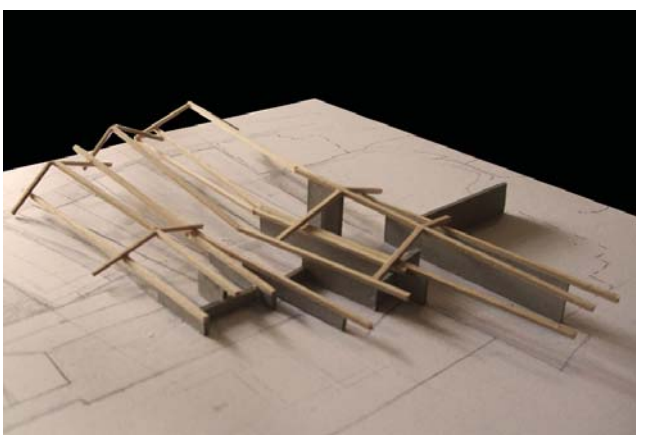


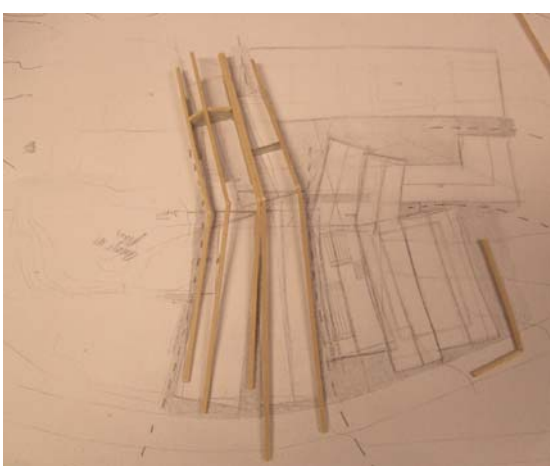


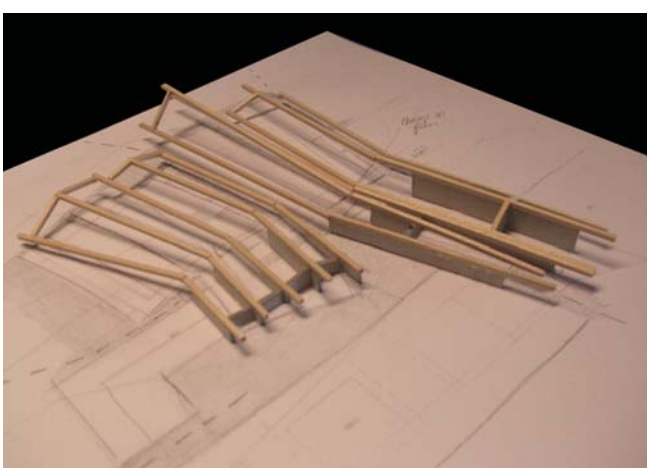


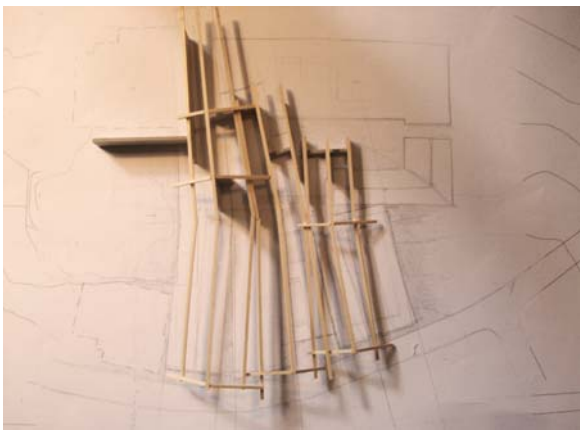


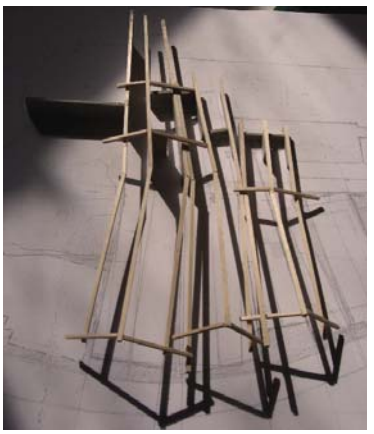


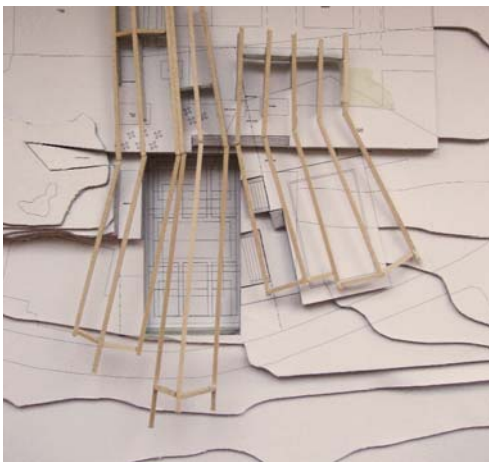


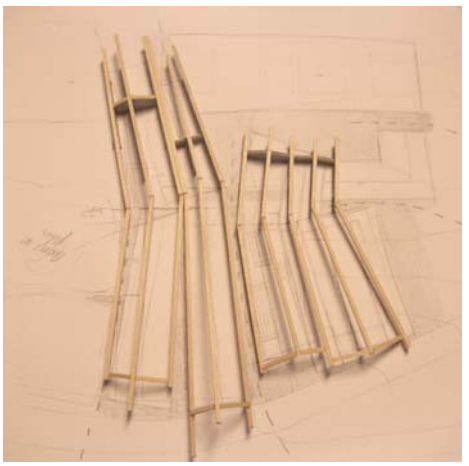


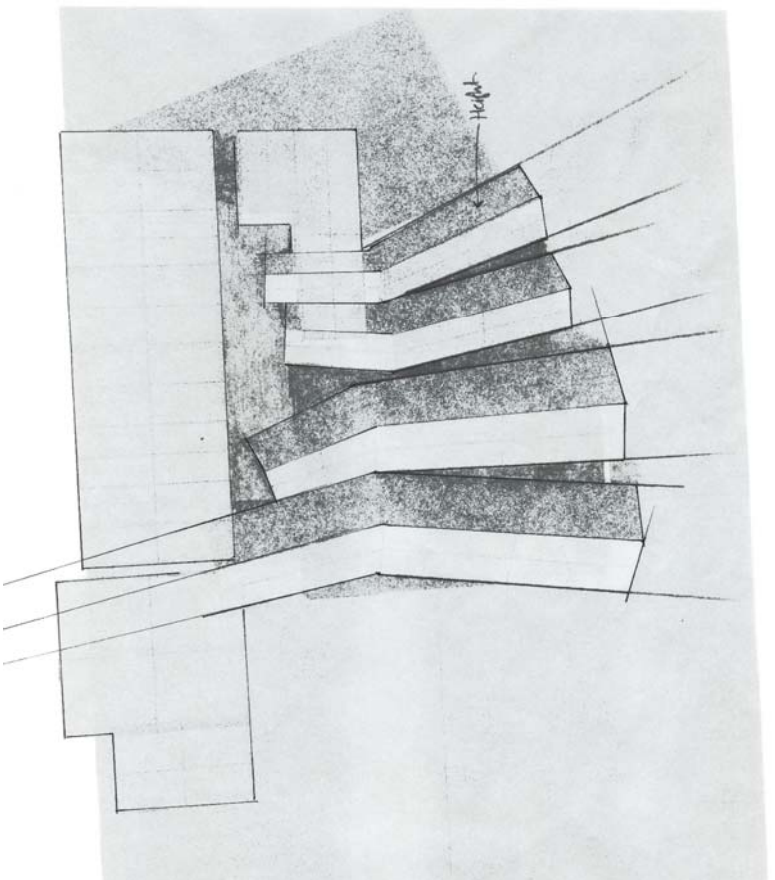




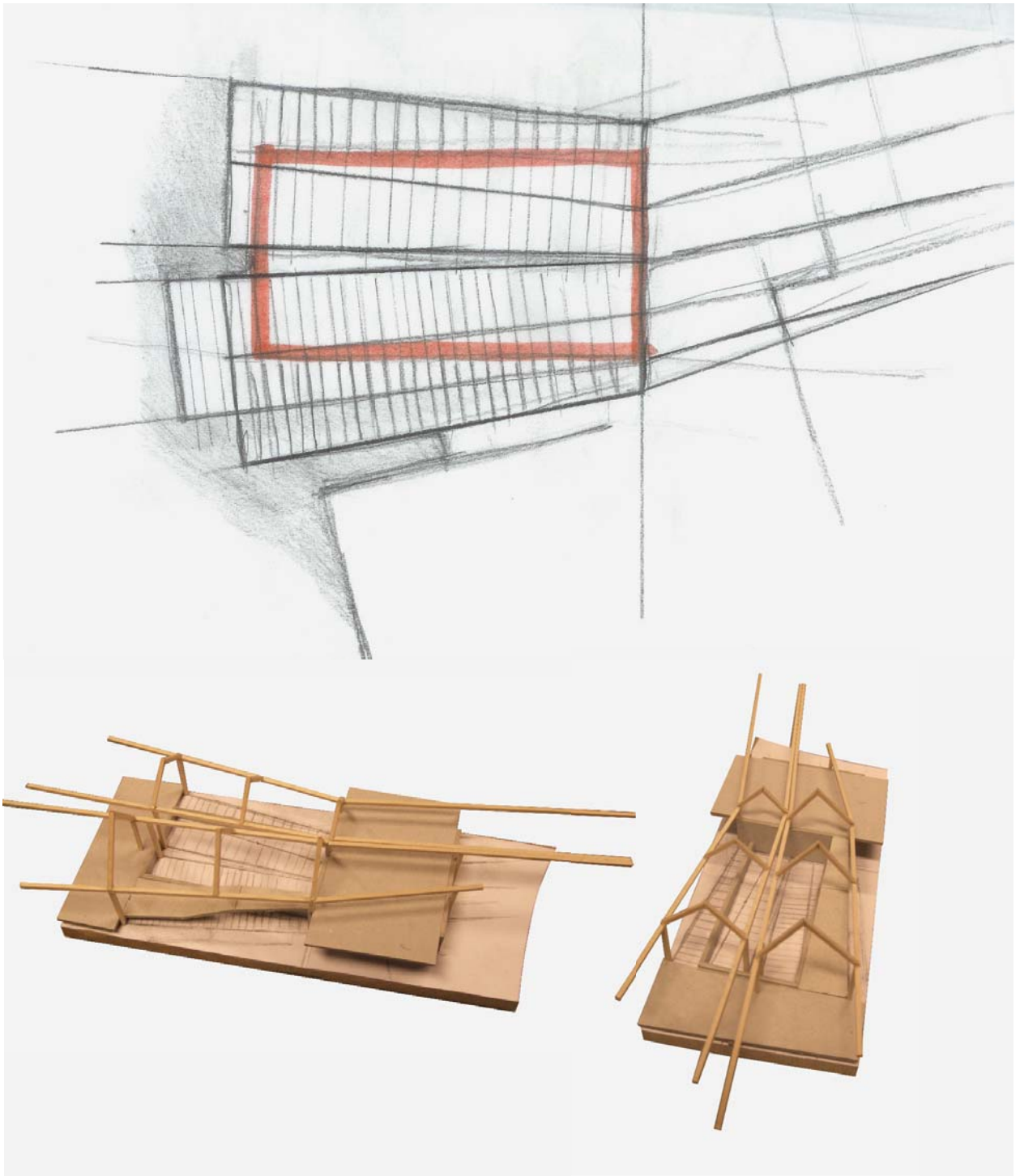








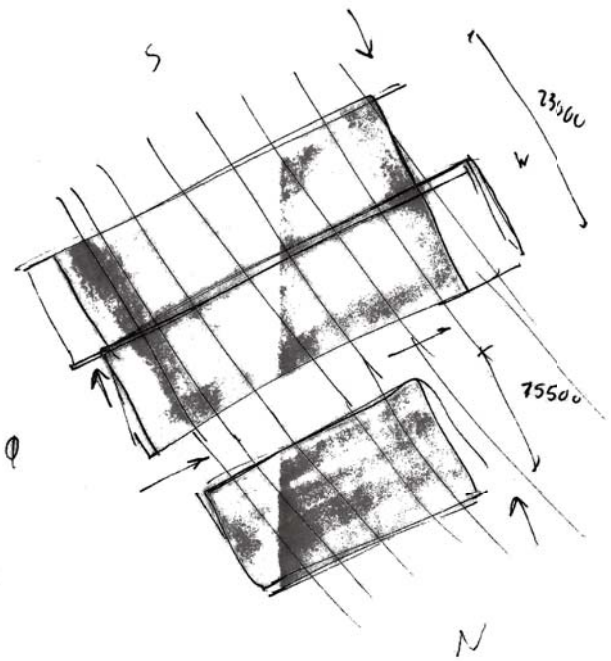
The roof structures composition consist of four shapes, two and two in pair and the process now was focused on the roof shapes over the multipurpose hall. How to combine the two roof shapes and the dialogue between the multipurpose hall and the roof structure was a starting point for the structural development.



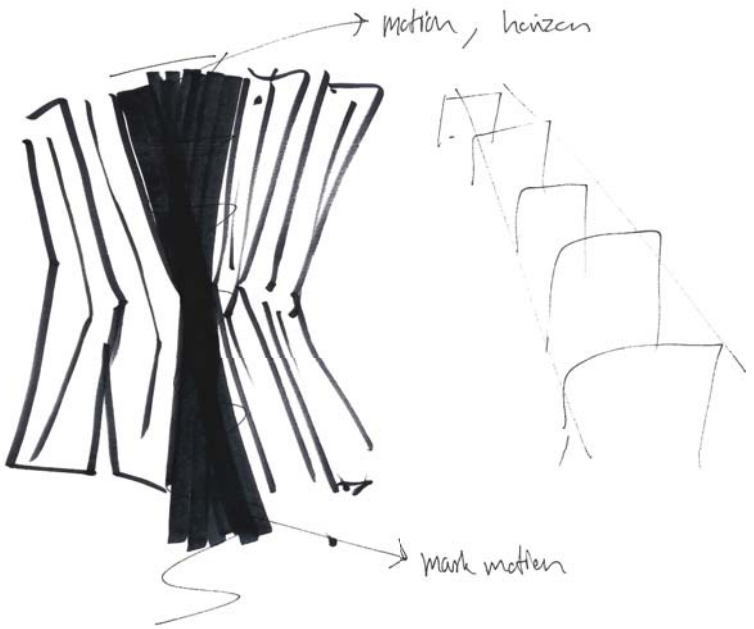
Process
Structural development

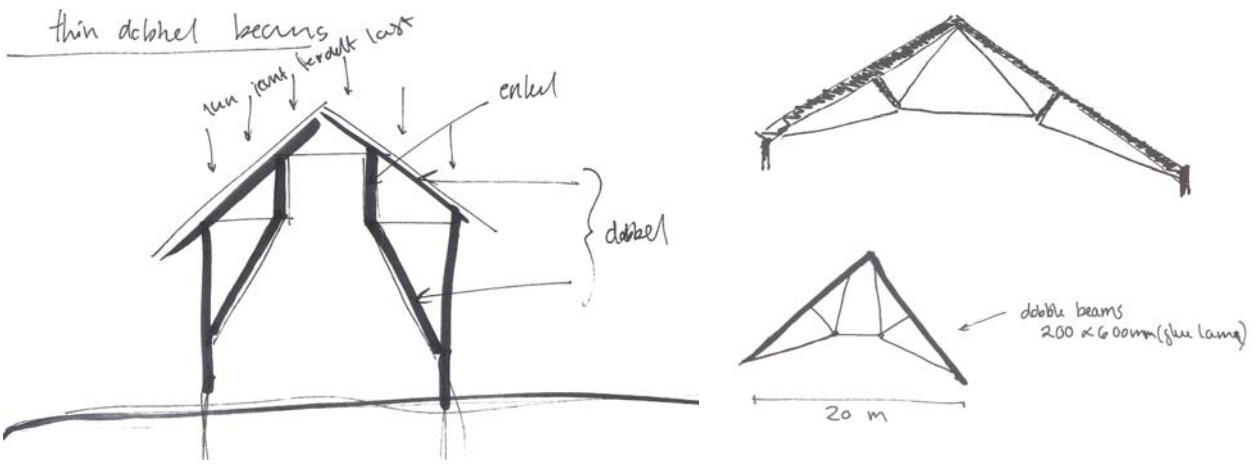
The motif of the structural form is connected to the tradition of the vernacular buildings in Stavanger and through structural analysis the shape of the construction has been developed: The primary structural systems, their spacing and the positions of the grid. The wish for a clear interior space that filters light from north and works both constructive and functional with experiences of clear views and transition through the building.

Footprint - boathouse

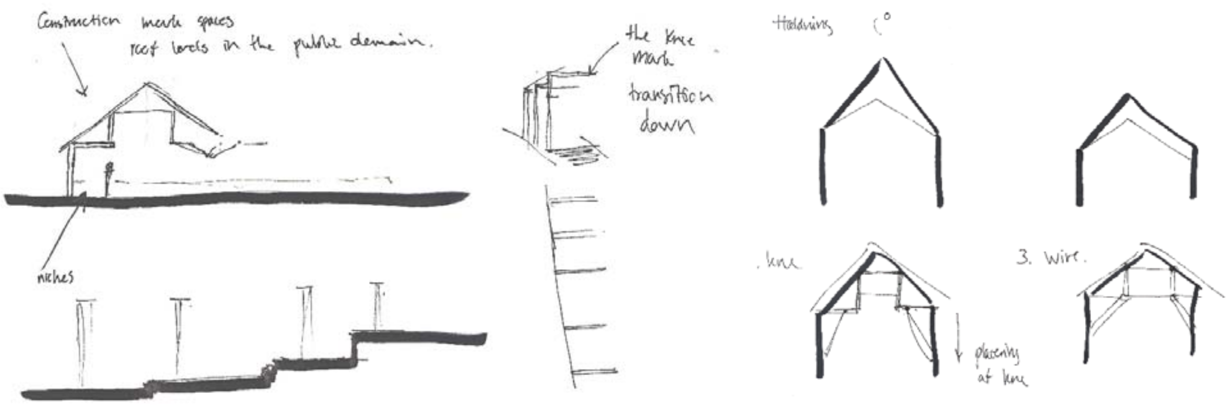


Construction:
- Filter light from north
- open clear view from west to south.
- largest span 23 m
- Rythm in roof archway.

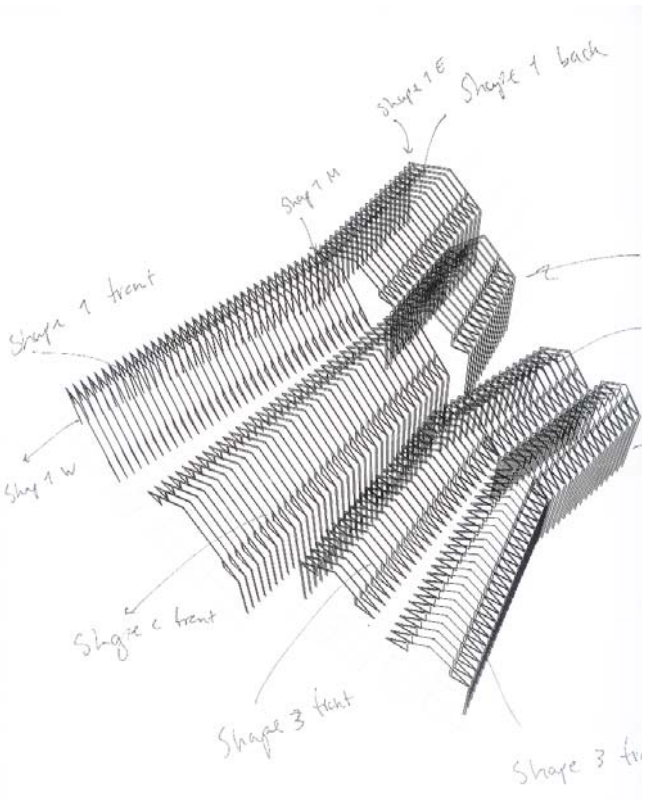




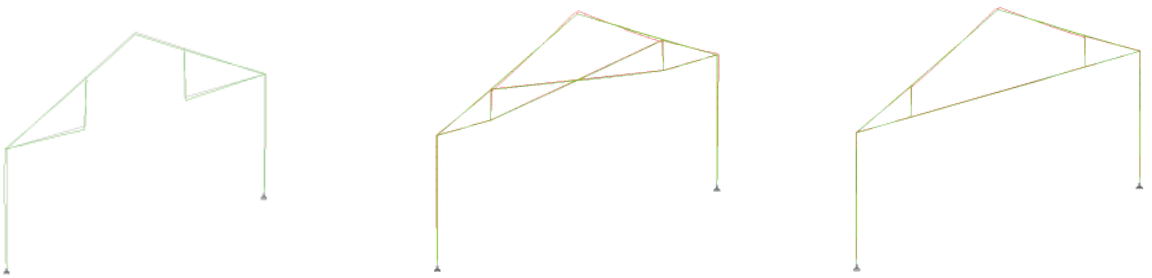
Leaving the elements of the structure exposed, making them attractive and comprehensive leads to the exercise in developing the old traditional "grindverksbygning" in the wide span structure.



Construction mark spaces
roof levels in the public domain.
niches
the knee mark
transition down
3. wire.

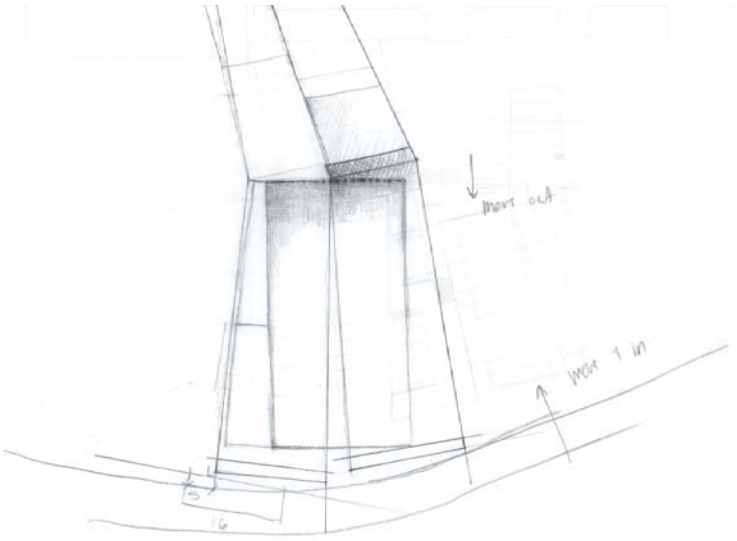


As the timber structures normally include the roof construction, the structural analysis begins with the roof covering. It is mainly the deflection case that governs the roof covering.
An alternative approach to understanding structures based on the stress pattern created in the field between a given load and particular set of supports can be formulated. Such a stress pattern can be investigated qualitatively by the use of three separate components; the structural task, the material stiffness and the shape of the body. These have been explored during the process of designing the structure through simple analysis of the structural form in the finite element program Staad Pro.
The result became a clear structural frame connected with a thin wire across, so that the clear interior space doesn't get disturbed by any other set of beams. The combination of the wire and the timber frame structure brings an exiting contrast and lightness to the three-dimensional shape of the roof.



Process
Merging plan layout and structural concept

Next step in the process was to merge the plan layout and structural concept. The roof shape became the driver for the plan layout and created more dynamic spaces. The levels and spaces inside should be in a constant dialogue with structures direction and spacing. Also the transition through the entire building shaped an entity with the structural concept. The plan layout and structural concept merged together as one whole creating the final design for the plan layout.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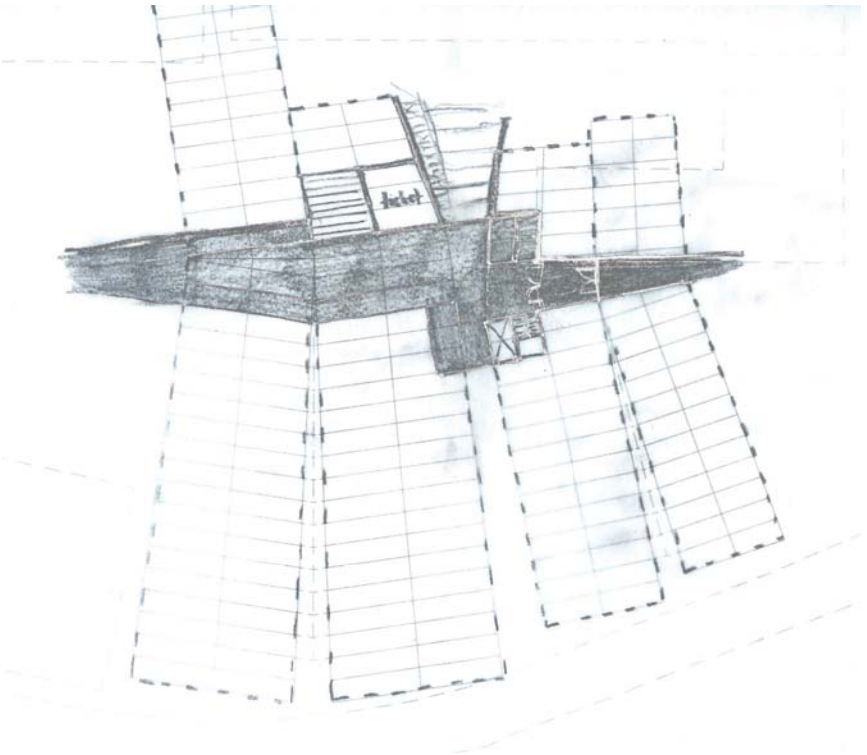
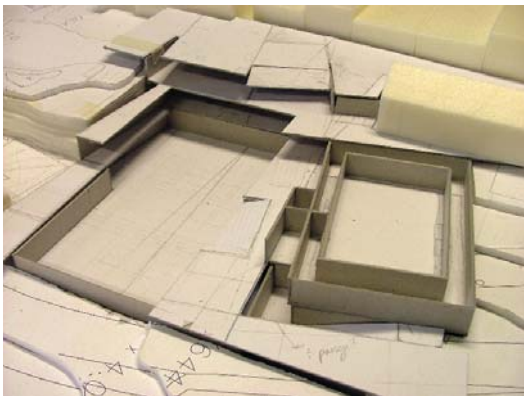
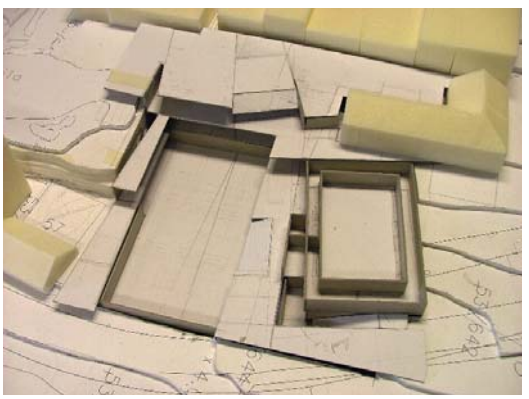
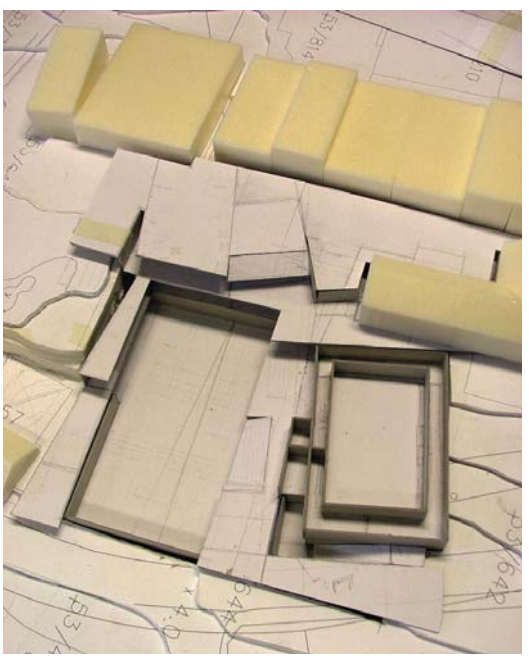
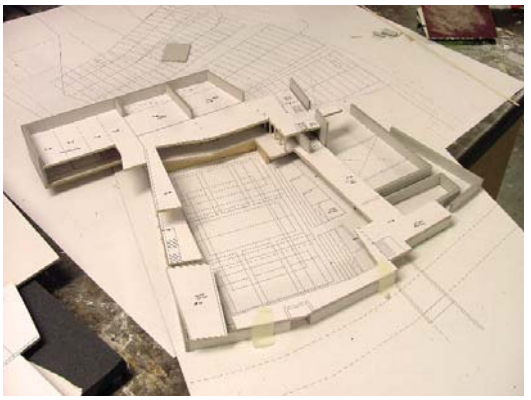
16

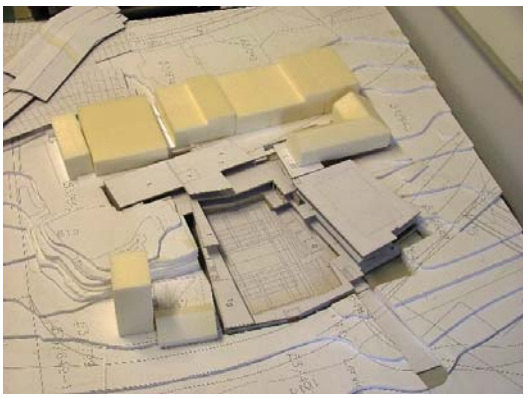

Jacket





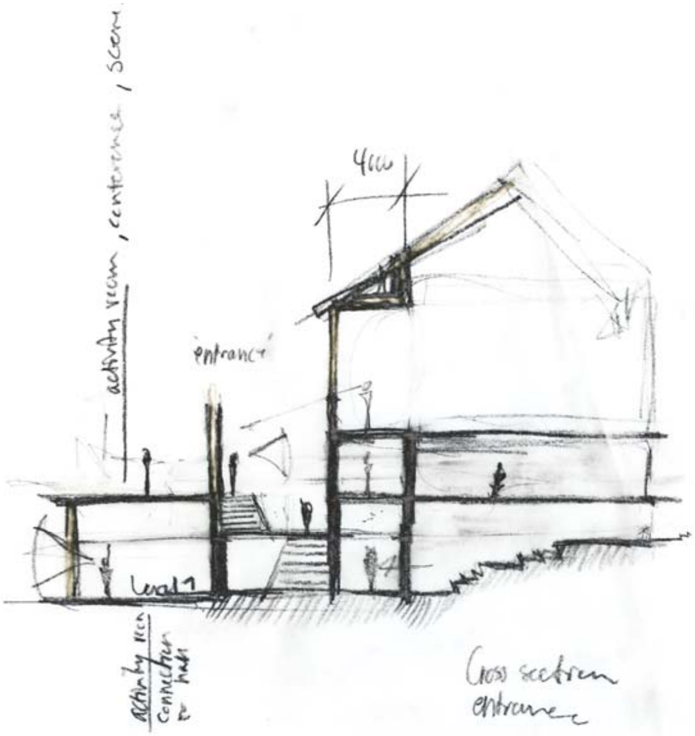


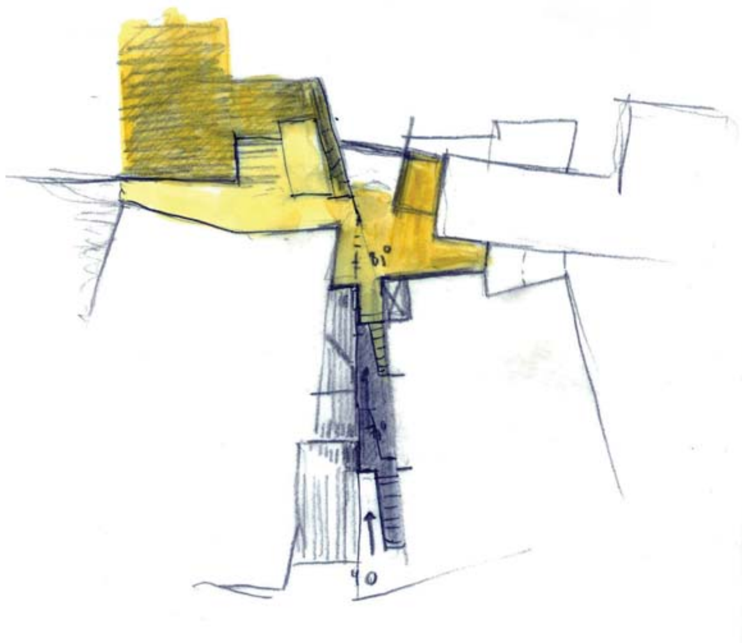


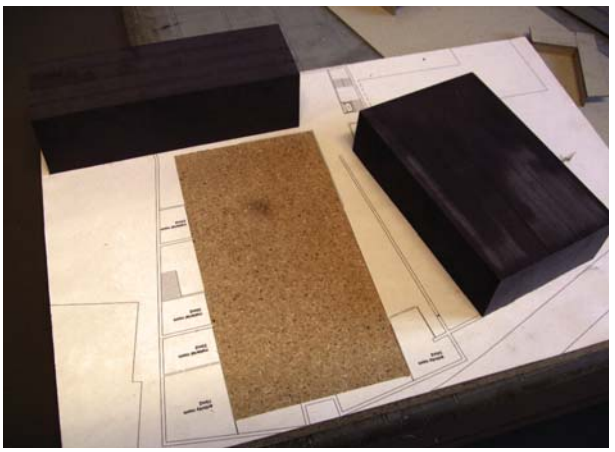


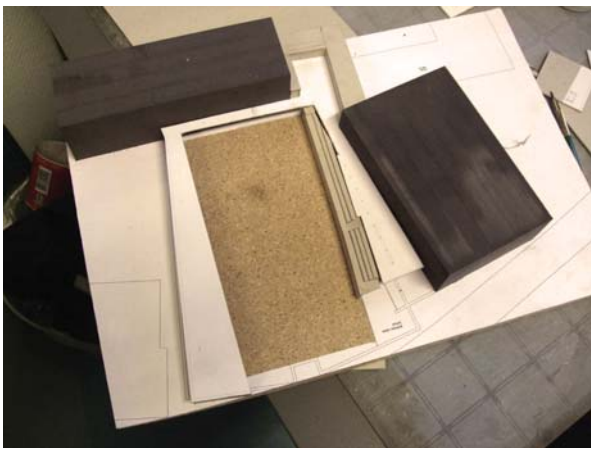
Process
Merging circulation spine and structural concept

One parallel process in the merging of the plan layout and structural concept was the development of the circulation spine. The circulation spine should be a place for movement and resting. From the street level it should connect to the higher level by a stair or ramp which follows the sloping terrain at site.

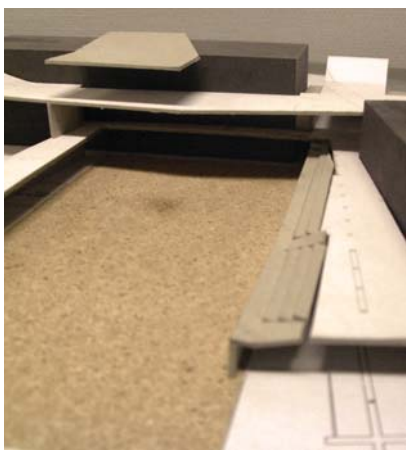
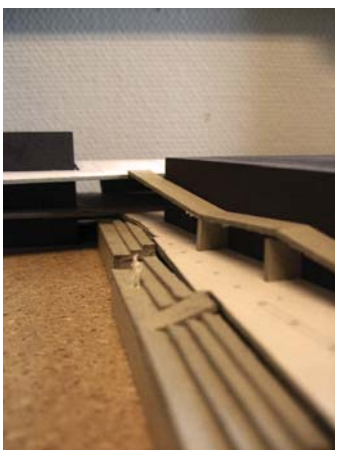
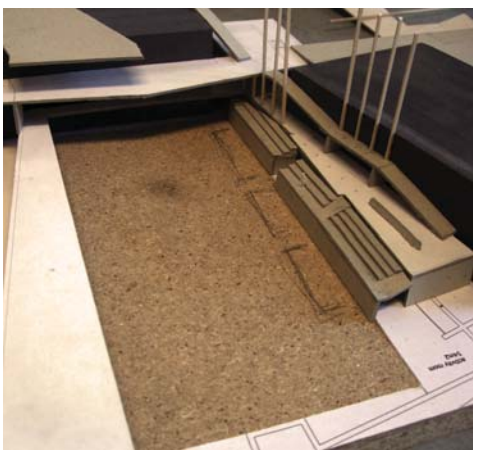

entrance
Level 1
Cross section
entrance



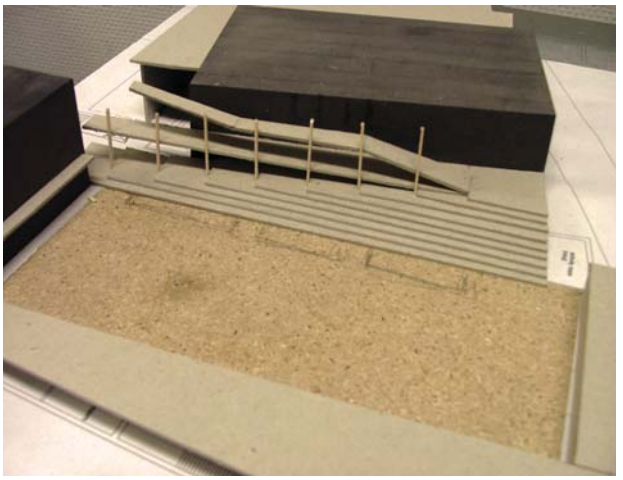


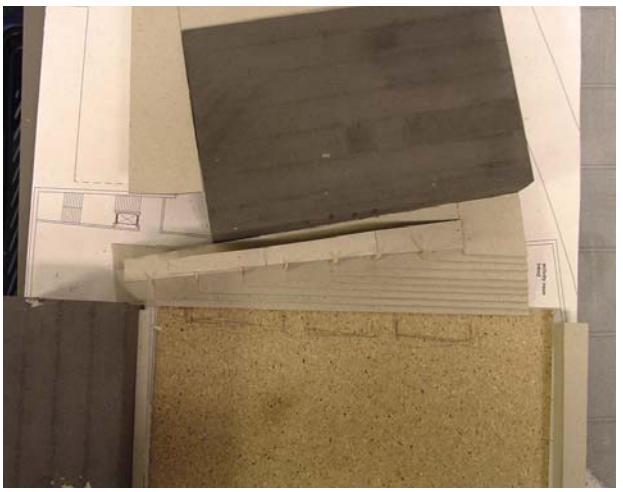


The model of the plan layout is simplified to involve volumes and the multipurpose hall it also frames the space for the circulation spine in between.
At first the tribune was separated from the hall area and could be extended by telescope tribunes. The structural concept and the tribune area did not have any influence on each other.

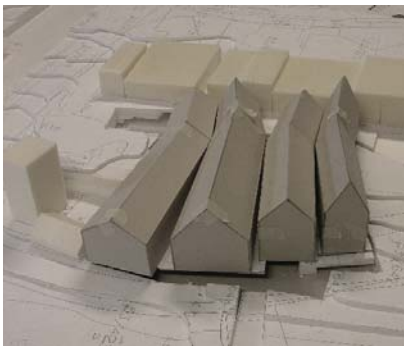




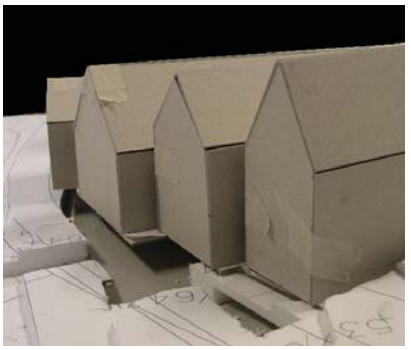
The process in finding a concept that could merge the circulation spine and structure resulted in a tribune area with a stronger architectural concept. From the entrance, the tribune slowly descends and connects to the hall environment. The structure follows the levels and emphasizes the connection between the structure and the ground.

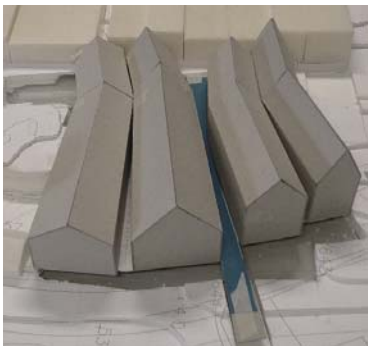




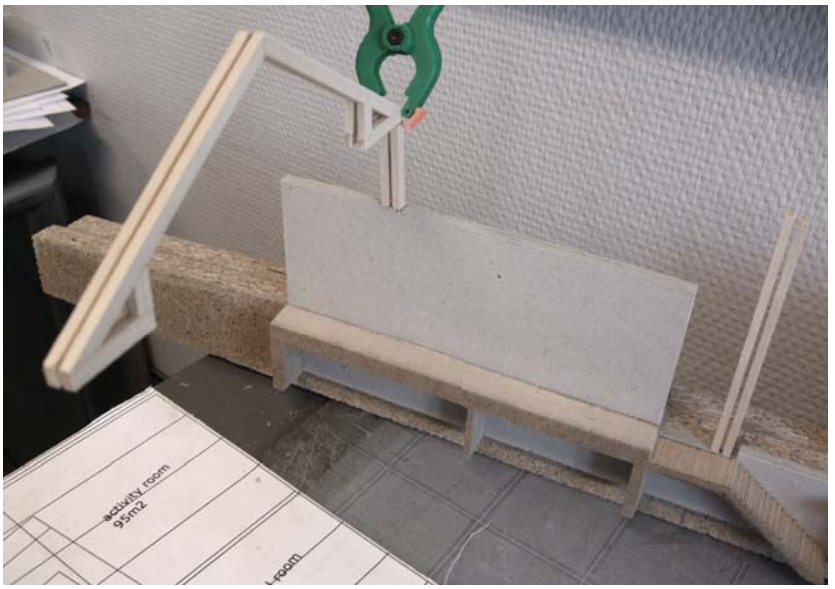
Process
Adjusting the shape and structure

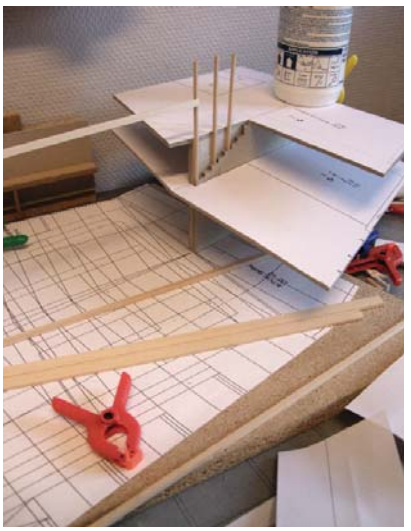


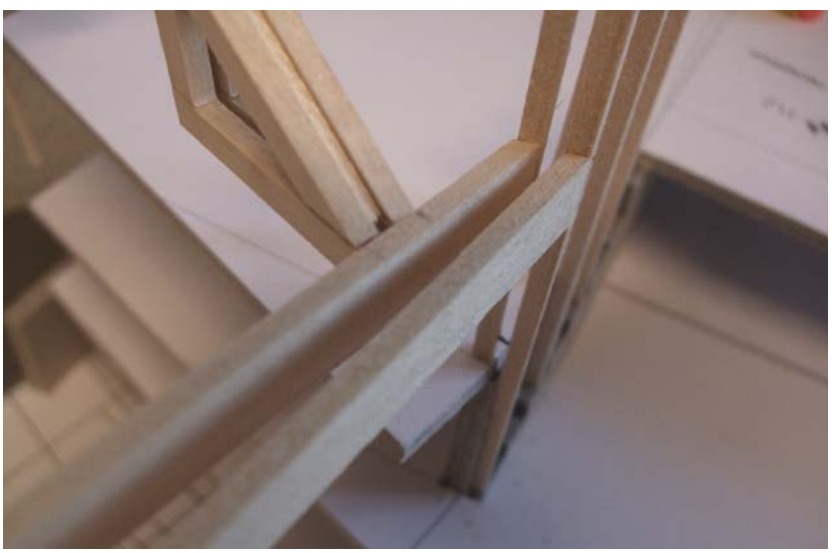


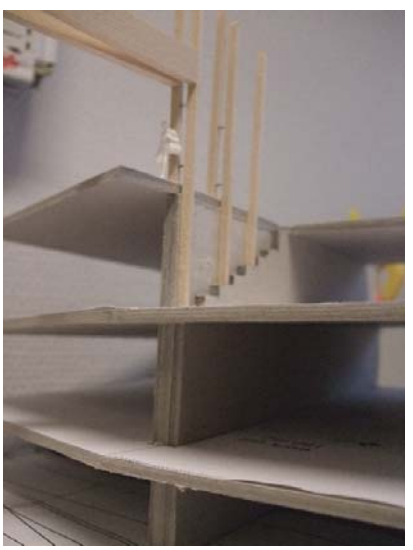


The overall concept for the structure and the shape of the volumes leaded to some more detailed work within the interior space.
The last model workshop was about solving details with structure and levels around the multipurpose hall. The important investigations with this model were the transitions in the middle of the roof shapes were the structure leaves the columns to span over the multipurpose hall.


activity room
95m2

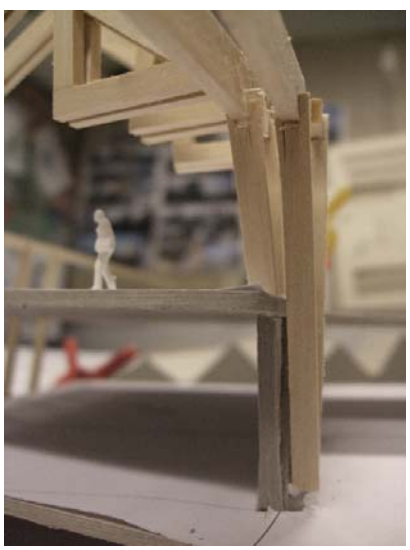


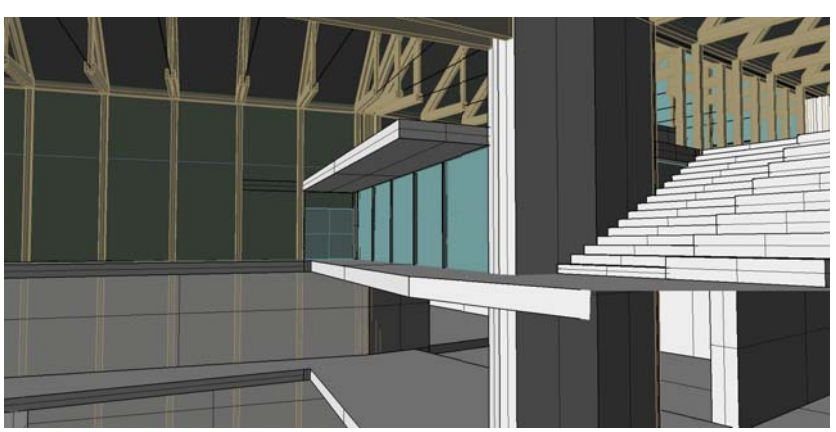




The concrete wall which supports the level steps back and lets the level edges cantilever. This emphasizes the function of the levels edges as transition areas. The connection between the structural elements in the roof surface ended with the solution of making this wall go all the way up to the roof structure. Instead of introducing a new strange typology for the timber columns, the concrete wall/ column-shape brings a clearer difference between the two structural systems and is in dialog with the concrete shape carrying the beam on the other side.

The model work have been of great importance when working with different problems and challenges in the design development. Along the whole process, model work has been the main media. As well as it's been an important part in solving the structural concept it has also played a major part in the development for the overall strategy and architectural concept.

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A presented are own illustrations

Reflection

In the compound urban area in Stavanger East the multipurpose sport centre gathers many activity spaces, each with their own identity and history. The multipurpose sport centre consists of old industrial buildings and a new building volumes which gently merge in-between the buildings and terrain. A void between the existing buildings connects to Haugesundsgata and ties it to the fjord.

The meeting between the new and the existing building volumes has not been a part of the design development for this project, but the new building layout has been developed with the idea of a void as a part of the transition through the area. Here there is potential for the structure to create an arcade or an outdoor covered area and lead to a parking lot in connection to the traffic in Haugsundsgata. Also there is a possibility that the relationship between the concrete in the existing and the wooden structure could have the same connection as in the new building volume. It's seen in many projects how old industrial building can create a special atmosphere for both sports and cultural activities.

Through the circulation spine, the journey through the building relates to the view of Ryfylke and the levels and roof structure connects to the horizon. The journey ends in a sea bath which physically connects the activities in the park to the building through the underground path. From here the motion of axis' spread out in the park and connects to the promenade along the water. This gives the people that prefer to exercise outdoors a nice option to use the center as a starting point and they could easily take use of the wardrobe facilities or lockers.

The constant rhythm of the timber frame structure creates a clear interior space inspired by the traditional and local style of building; it brings a special and unique character. By introducing wires the structure gets a twist of more modernity, it also provides a stirring contrast between the solid wood and the blur appearance of the repeating wires.

The building is in close connection to the infrastructure through the area and connects to the surrounding parks and urban environment with axis of motion spreading out in the city. The new MSC provides an overall strategy for the future sports life in Stavanger East. The building has a unique placement in the border between the city centre and nature areas. The overall strategy illustrates the potential in creating an active city image both locally and regionally.

A general move with large glass surfaces, gives the people passing by the east façades a view of the activities, this can inspire to do physical activity. The building gives the possibility to participate either as a part of the association, in teams or as an individual. This matches today's more flexible use of the facilities. Different multi rooms can also give the opportunity for the schools in the area to use the building for sport lectures.

The pattern of the traditional and typical sports hall does no longer match the adult's sports activities. Among other things there is need for more individual activities inside the hall environment. At the same time the sports halls often neglect the potential as attractive social places for teenagers. In the new MSC many places for meeting and spontaneous activities around the hall environment are developed. The physical and open connection between the spaces can bring some problems in terms of sound streaming out into the volume. Many rooms are already behind glass walls, but more physical divisions could be introduced. This could be folding doors making the division more flexible.

The MSC provides many places for meeting, interaction and synergies between different functions. It's a social place to be and it can be flexible when it comes to time and offer for the exerciser. It provides facilities for many user groups with establishment of an open, flexible and inviting scope. A deeper analysis and investigation among the future users for the center could bring positive input for adjustment of the design, and secure the functionality of the architectural space. What could be an interesting next step in the design is a workshop. Where both sports active and other interested could bring a final impact to the design. The structure would also gain another loop in the design development. Though the structural concept and expression are satisfying there could be some adjustments, both for the overall structure and for the details.

By its transparent appearance the multipurpose sport centre invites people in and in the evening the light from the building gives a secure streetscape to the urban area and streets. The multipurpose sport centre becomes a part of Stavanger's façade towards the sea and represents history, identity, tradition and innovation.

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