On Ice:
Large span structures and public interior

Pia Kristine Tveit

Introduction
At Økern in Oslo, the sports club Hasle / Løren IL have their facilities. One of their main branches is ice hockey. In the future the club has confirmed that they will build a new arena for ice hockey.

A sports club can have the power to form a community. Sports can create relationships that extend beyond their club on to their neighborhood. Across of all ages, gender and culture, sports can be a place of common ground. But in order for social life to emerge in the best possible way, it is necessary to arrange for a place where people can meet in shared space. They can gain ownership over their community and the socio-economic benefits can be much in place.

There is a large-scale development in this part of the city. The population is and will grow rapidly in the years to come. I will look at the possibilities of a new ice arena in my diploma. Where I will look at the future plans in the area, the current situation and the social value of the sport and club.

Why:
The sports club is going to get a new ice hockey hall. The entire sports park will be rezoned. The plans have been temporarily stopped and fortunately Lørenhallen has not been demolished yet.

There is a shortage of ice surfaces in Oslo. And it's hard to make time for every team to be on the ice. It takes a lot of logistics to handle this. When the new plans were put on the table, no good solution was presented as to where the Hasle/Løren ice hockey teams would train during the demolition of the current hall and until the completion of a new one.

Buses are suggested for all players. Then they will be driven to other halls that have free time on the ice. As a hockey mom and with some insight into how this sport is organized, this solution is bad.The players come from all over the city to play in Lørenhallen. There are trainings 2-4 times a week, there is a lot of equipment and there are no scheduled workouts on the ice. It might as well be a workout at 8 a.m. on a Sunday morning as it could be 8 a.m. on a Thursday night. And other days the week after.

Spatial Program
The new Ice Hockey facility should be able to offer an architecture adapted to the specific needs of the sport, the public and logistics.

Programmatically, one can roughly divide the functions into 3 main categories:

- **Ice Surface**
- **Public Interior**
- **Logistics**

Research Themes:

Spanning Structures
Public Interior
Sustainability
Sport

How:
1. Give the club two ice surfaces, so the lack and availability of ice surfaces does not weigh down as much as today.

2. Build in stages. Build a new ice arena before the old one is demolished. So that players always have an ice surface available. Then build the other.

3. Create a good relationship between the local area and the game with a focus on public interiors

On Ice:
Large span structures and public interior

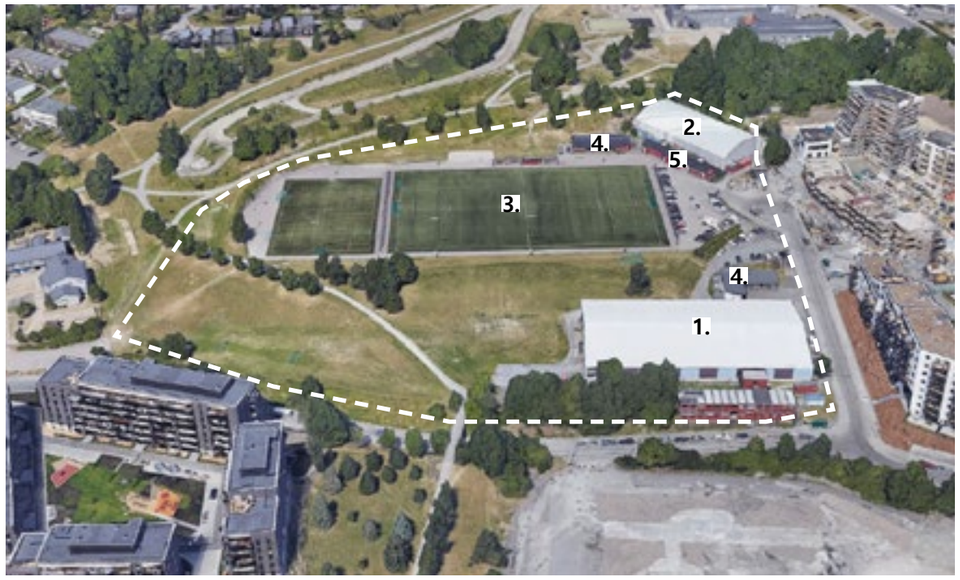


Fig. 1.
Overview photo, structure presentation

Site description.
The sports park consist today of 5 structures and fields. One plastic hall, football fields; an 11'er field, a 7'er field and an ice hall. There are also changing rooms and a clubhouse. It is Hasle-Løren IL that uses these facilities.

– – Area, sport park
1. Ice hall
2. Hanball hall
3. Football field
4. Warderobes
5. Clubhouse

Topography and landscape
Løren Idrettspark is located in an area with terrain variations, trees and shrubs. A green park section extends from the southwest upwards to the north. This area has inviting paths and trail surrounded with grass and trees. An important hiking route, D2 is within this part of the park. This is important to maintain as it is well used for pedestrians, cyclists and for training. D2 will be a continuation of the Green Ring planned in Hovinbyen. The park is used as a recreation area for residents in the surrounding area. But also used for fun and games all year round.

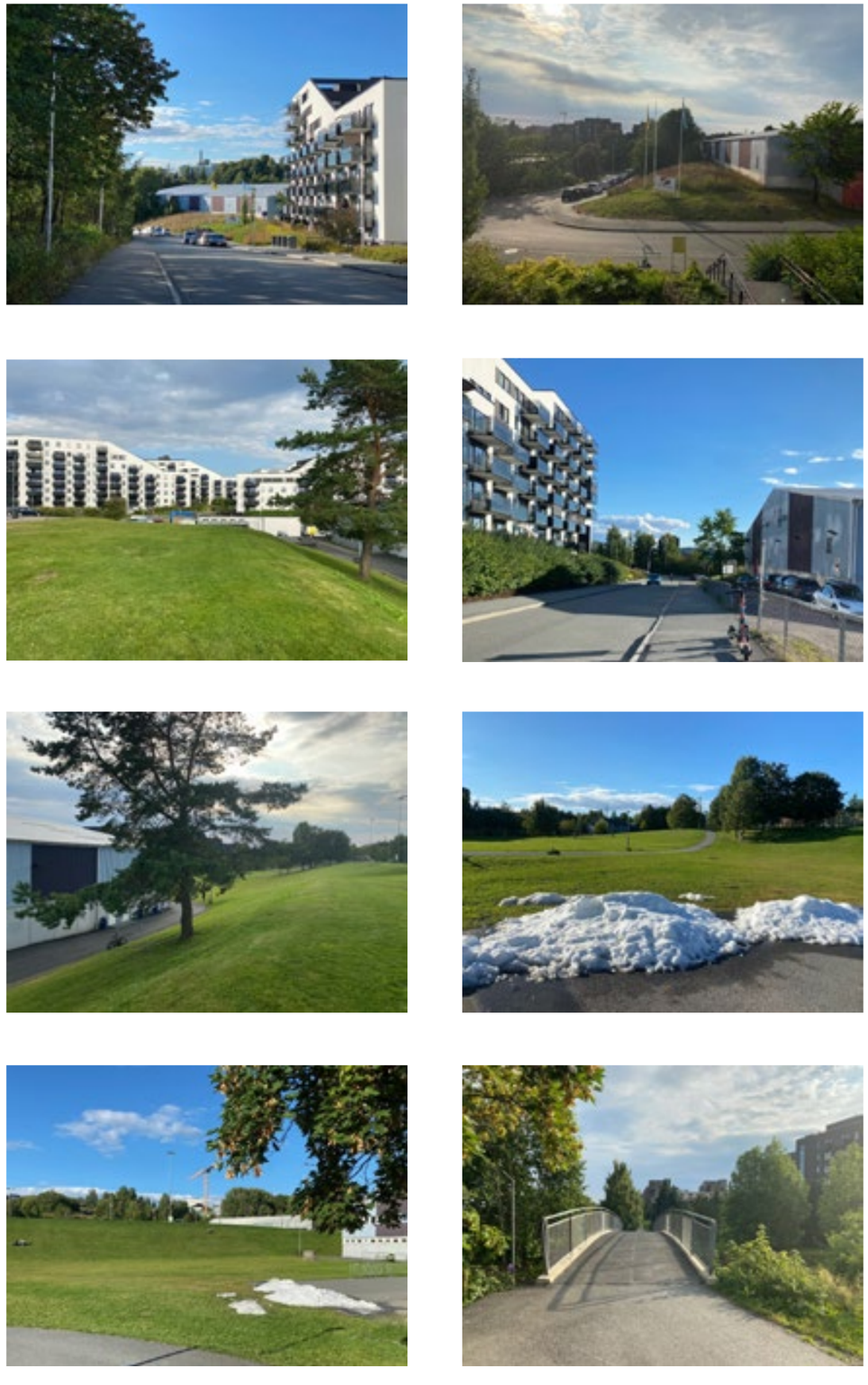


Fig. 2.
Site Photos, 2022.

Existing ice hall

0m. 40m. 80m

Fig. 3.
Situation drawing of ice hall. Drawing from 1985.

Legend:

1	main entrance
2	players' entrance
3	driving gate
4	ice surface (60m. x 26m.)
5	secretariat
6	player bench
7	changing room
8	toilet
9	grinding room
10	technical area
11	gym
12	office
13	grandstand
14	training area
15	mechanical room
16	ice machine room
17	storage
18	café
19	vip room
20	kitchen

Program

Løren Ice Hall is located in Lørens Idrettspark.The ice hall is located in the south - east of the park. The hockey part of the entire sports complex consists of two structures, the hall itself and a smaller single-standing building. The smaller building consists of changing rooms, offices and is in conjunction with the cooling system for the hall. Between these volumes, space is set aside for parking. On the west side of the hall is snow/ice depot. This is where the ice maker drives out excess ice.

Facts: Existing hall
Built: 1986
Main structure: Steel
Sqm. : 2900sqm.
Span: 40m.
Audience capacity : 1500

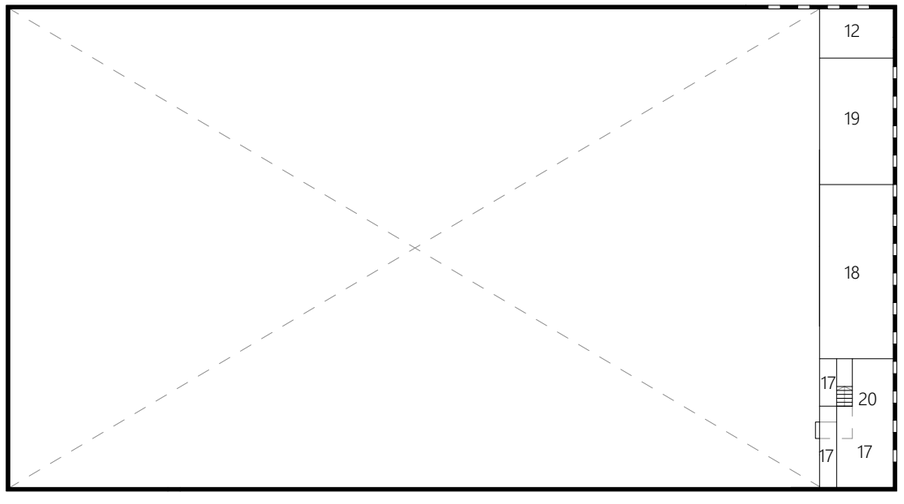


Fig. 4.
Program, 2 floor.

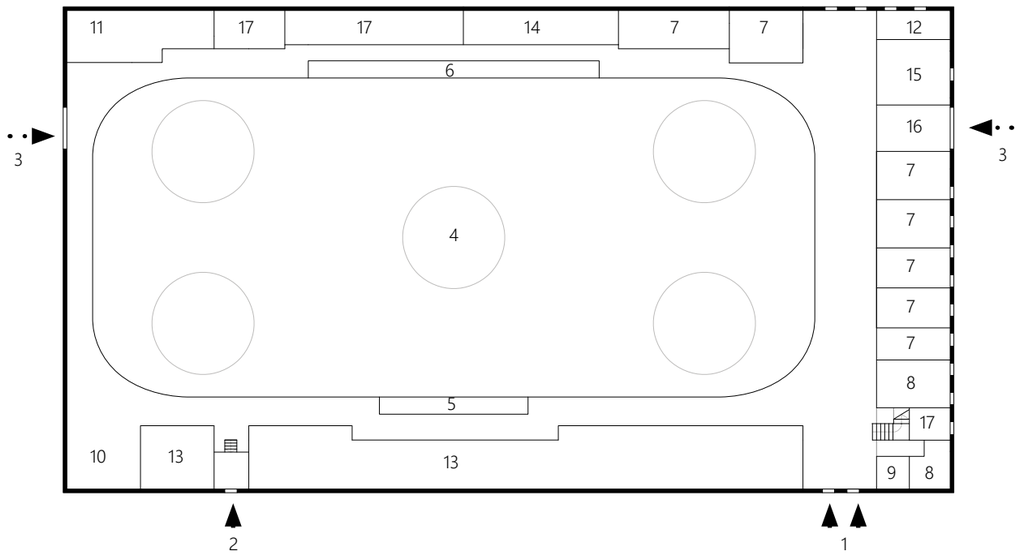


Fig. 5.
Program, 1 floor.

0m. 20m. 40m.

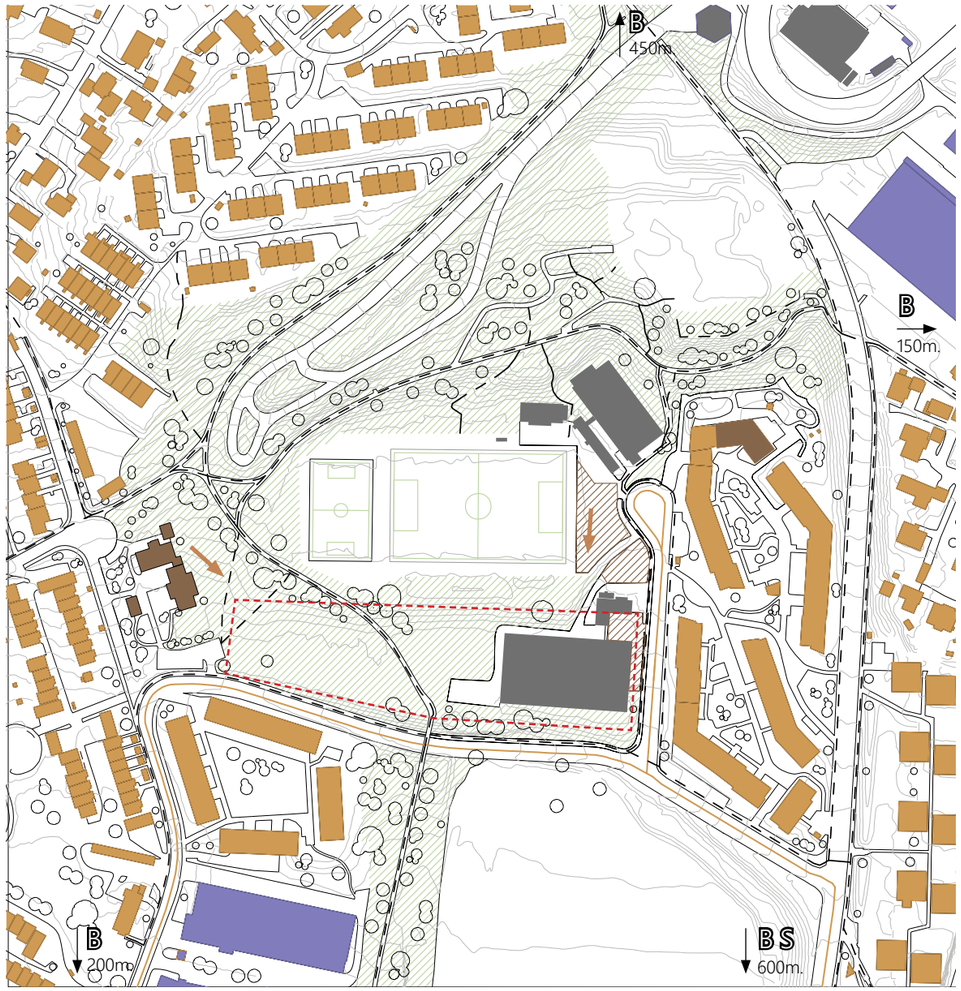
Fig. 6.
Photo: Facade, west and north.

Fig. 7.
Photo: Interior, ice rink and grandstands.

Fig. 8.
Photo: Facade, East and north.

Fig. 9.
Photo: Interior, ice rink and ice maker.

Current situation



Terrain
Dwelling
Kindergarten
Commercial
Sports facilities
Bus
Subway
Hiking and bike
Carparking
Car
Trees
Green area
Terrain fall towards site
Project site
100m.
200m.

Fig. 10.
Use

Re-regulation of Løren Idrettspark

Undervisningsbygg (UBF) has been commissioned by Utdanningsetaten (UDE) to build Refstad Multipurpose Hall. The proposal has been prepared by: Futhark Arkitekter AS.

Undervisningsbygg Oslo KF proposes to re-regulate Løren Idrettspark from a traffic artery and technical infrastructure – sidewalks/ hiking trail / ski trail to sports facilities, meeting places and recreational areas.

The purpose of the proposal is to facilitate a new multipurpose hall and ice hall, more outdoor courts and that Refstad creek can be opened through the area. Proposer proposes two alternatives where the difference between the options is the placement of a new multipurpose hall. The proposed plan is shown with two options for the placement of the multipurpose hall. Option 2 - west is located 42 m further to the west than option 1 - east. I n option 2, the multipurpose hall is virtually in the middle of the largest of the football fields. In this option there will be room for a sand handball court east for the multipurpose hall.

Fig. 11.
Program 1.

Fig. 12.
Alternative 1.

Refstad school

Løren Idrettspark: Multipurpose hall, football fields, ice hall, outdoor ice surface.

Økern Torg: School, multipurpose hall, housing, parks

300m.

Fig. 13.
Development

As part of the development in the area, I will take a closer look at how an ice hall can be part of the sequence of sports, school and park that is formed from the up-coming projects in the area. From Refstad school and down to Løren school. It will be part of a rhythm with different functions and types of space that together form an elongated public urban space. The new ice rink will be centered in this sequence.

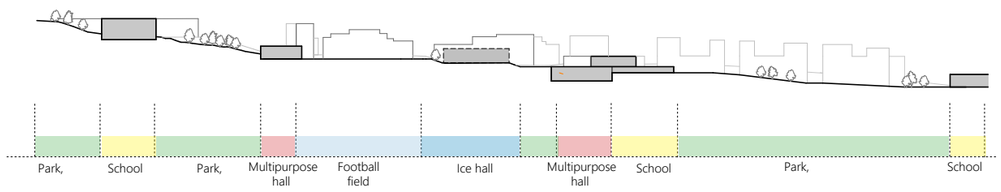
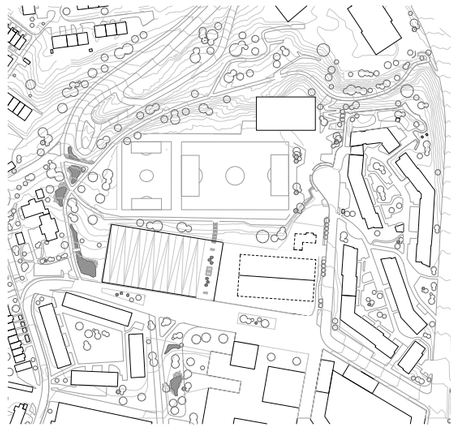
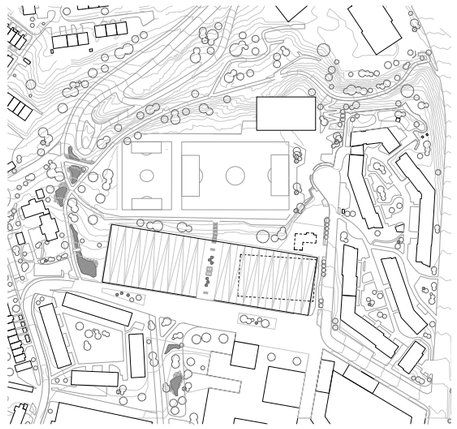
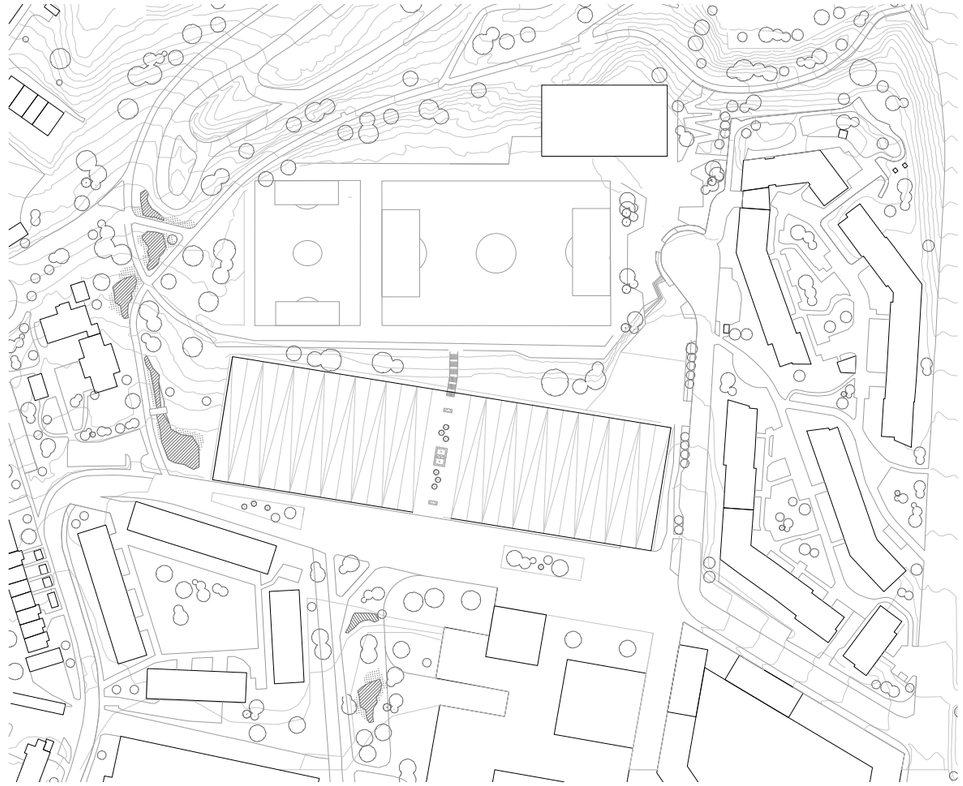


Fig.
Area program section

Construction steps.
Step 1: Build the arena located in the west of the sports park.
Step 2: demolish the existing ice rink.
Step 3. building the opposite arena

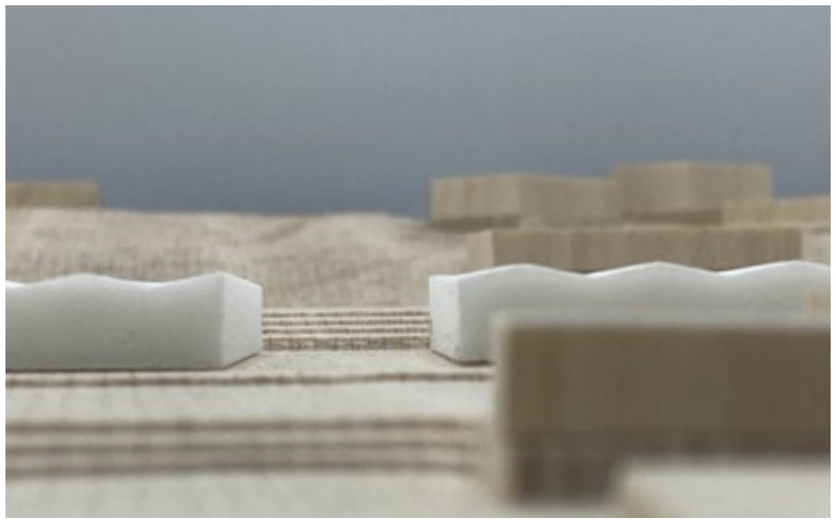


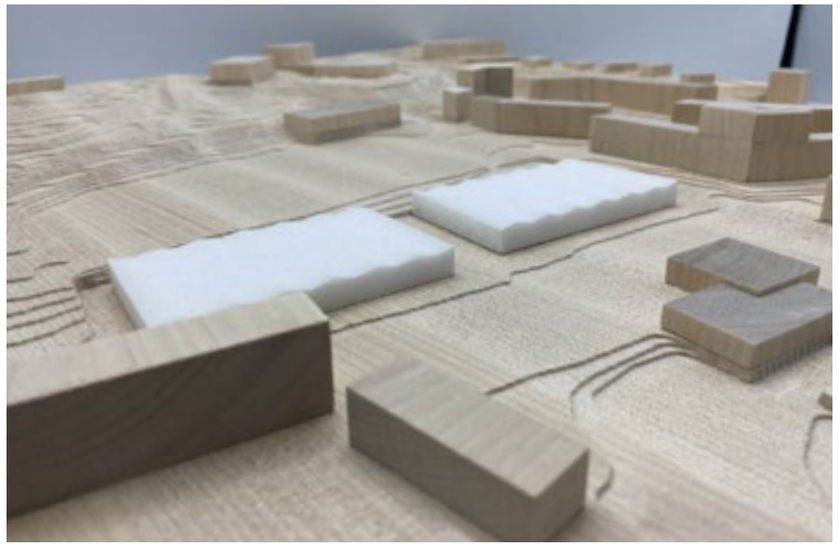




Siteplan

Model Photos





The proposal consists of two nearly identical ice hockey arenas. And the building has a footprint of about 11000 square meters. The building is lowered down two floors. It is only one floor above ground level. The main entrance to the facilities is located between the arenas. Here a gathering place is formed for players, spectators or hikers. This public outdoor space forms a passageway up to the football field or surrounding hiking trails.

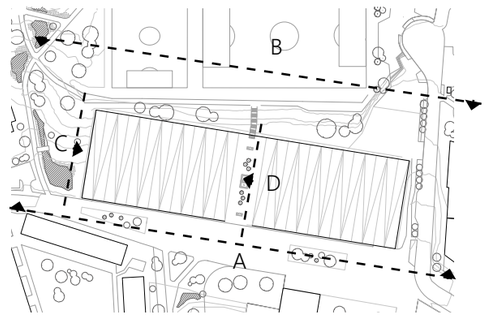
Elevation A

Elevation B

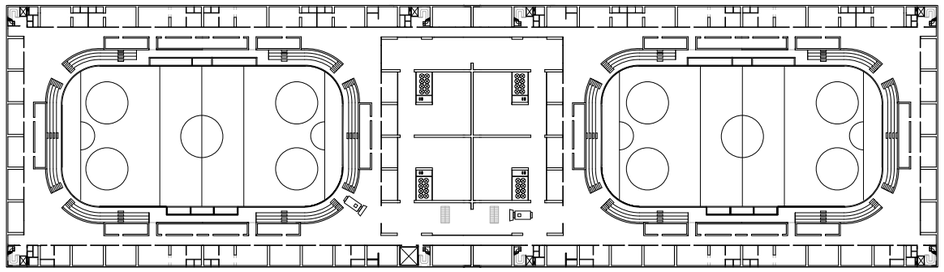
Elevation C

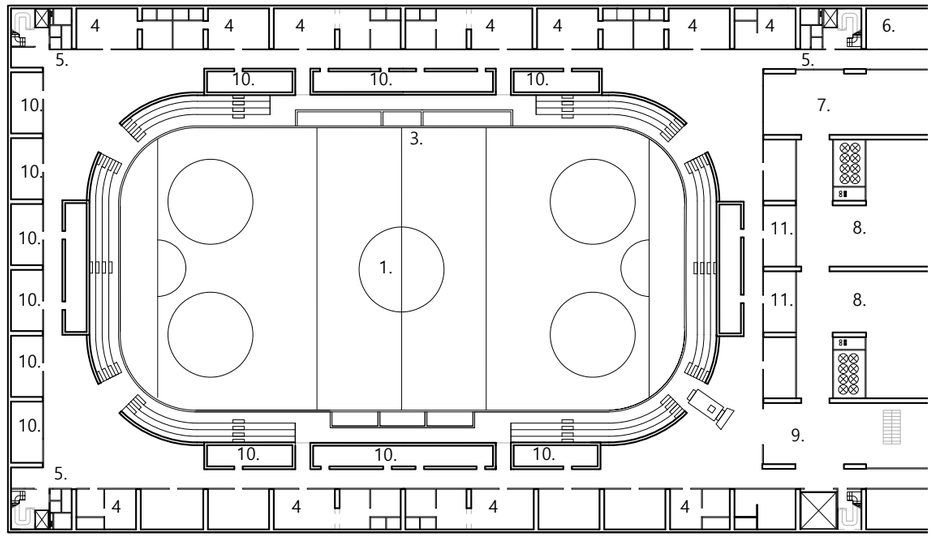
Elevation D

The building has a metal façade. It is of aluminum plates that have a layout corresponding to the movement of the ceiling. These have a reflective effect that reflects the surroundings in a diffuse way. With this, the idea is that the building will merge into the park and “dissolve itself”.



Exterior illustration, seen from south





Legend:

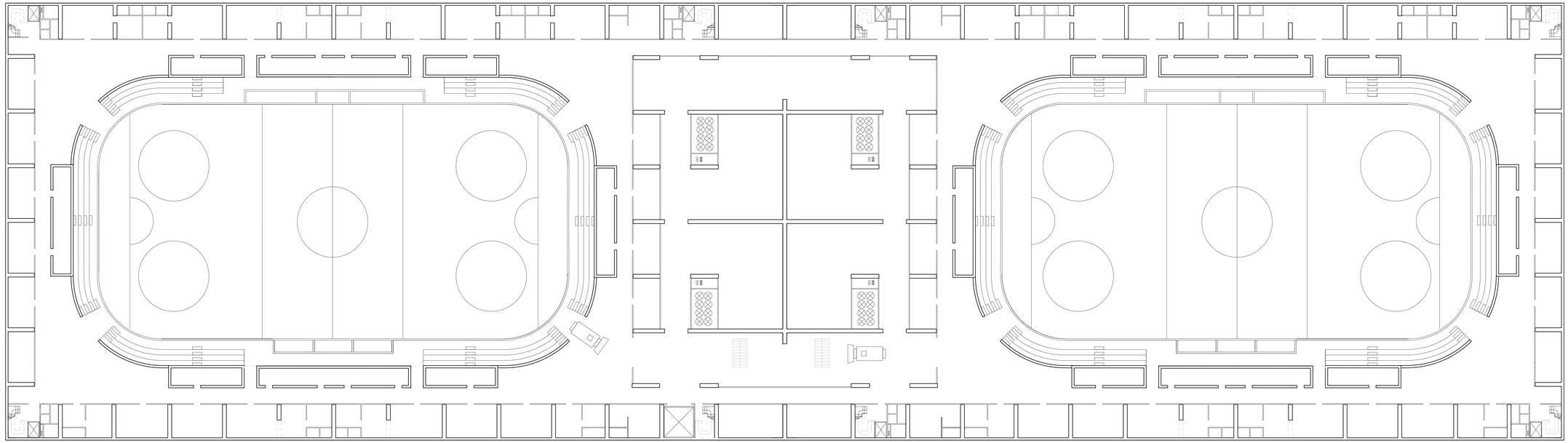
1	ice surface (60m. x 30m.)
2	secretariat
3	player bench
4	changing room
5	toilet
6	grinding room
7	gym
8	mechanical room
9	ice machine room
10	storage
11	washing room

50m. 100m.

Floor plan - 2

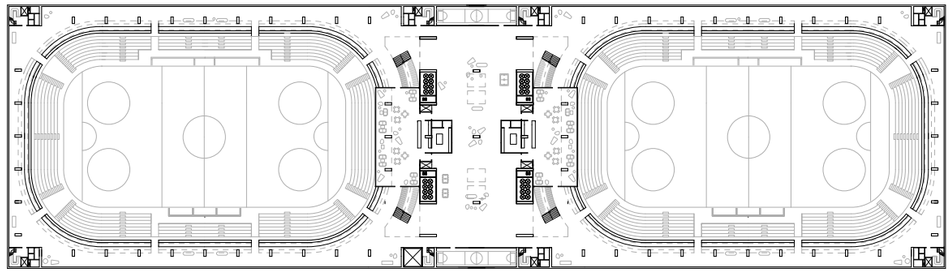
50m.

Part of floor plan - 2



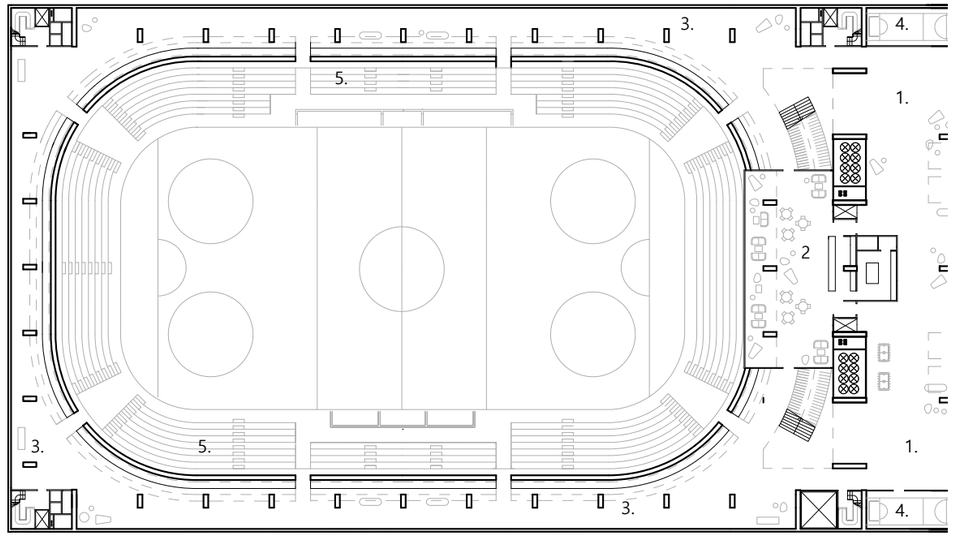
50m.

Floor plan - 2



50m. 100m.

Floor plan - 1

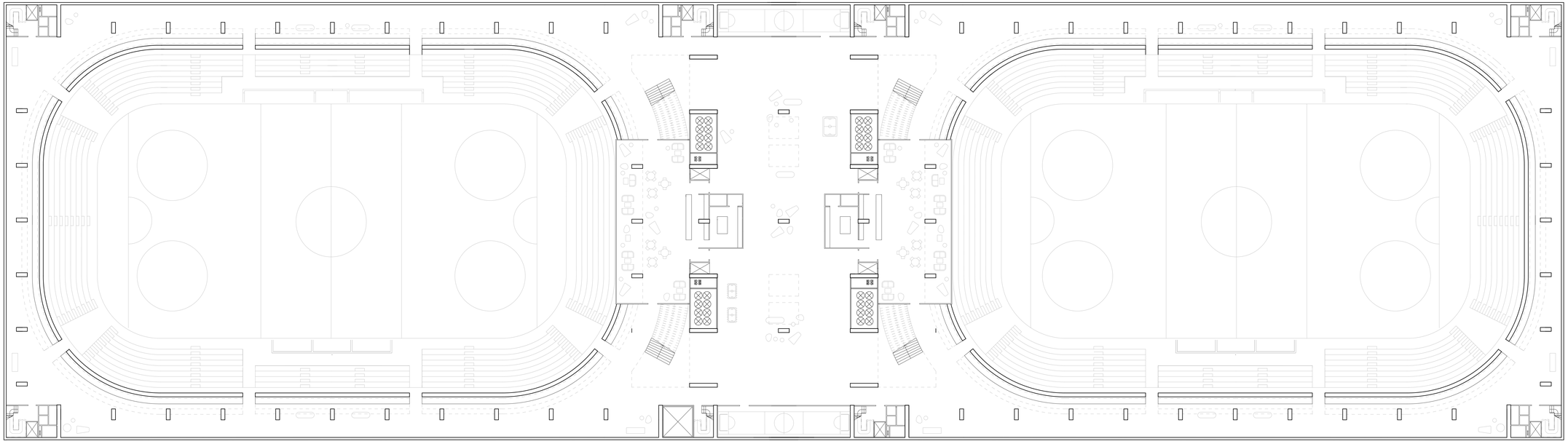


50m.

Part of floor plan - 1

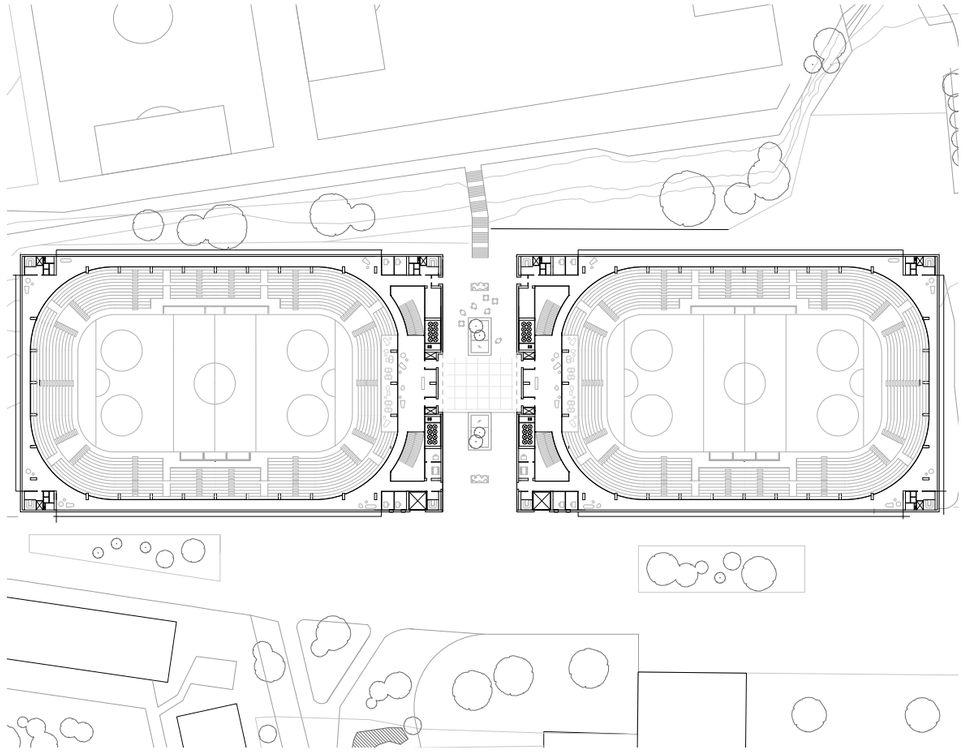
Legend:

1	lounge area
2	resturant
3	pathway to tribune
4	practice area
5	grandstands



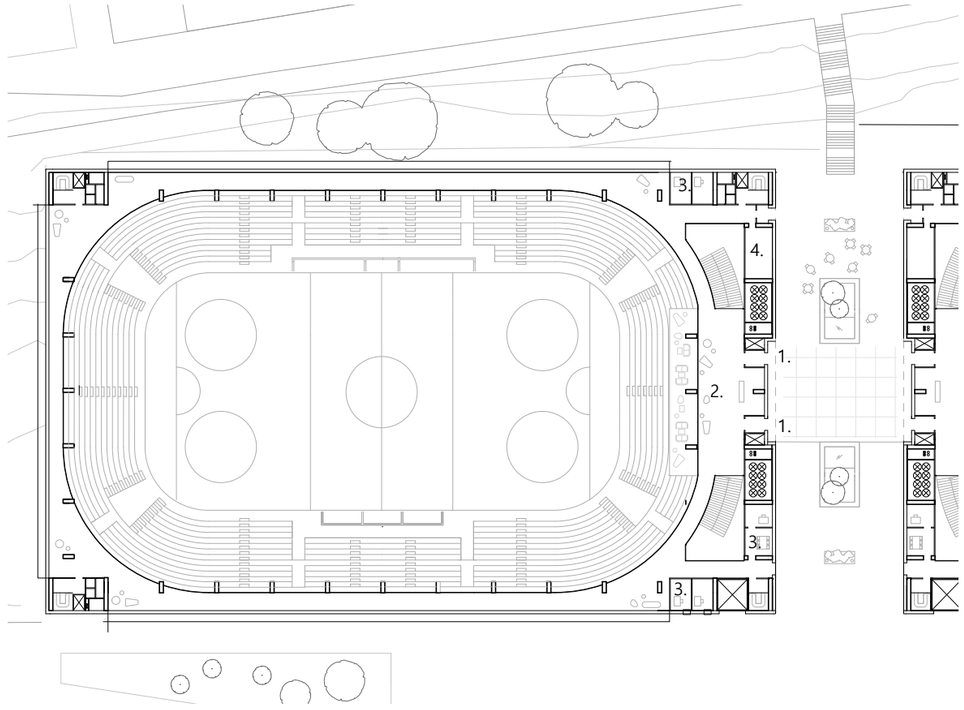
50m.

Floor plan - 1



50m. 100m.

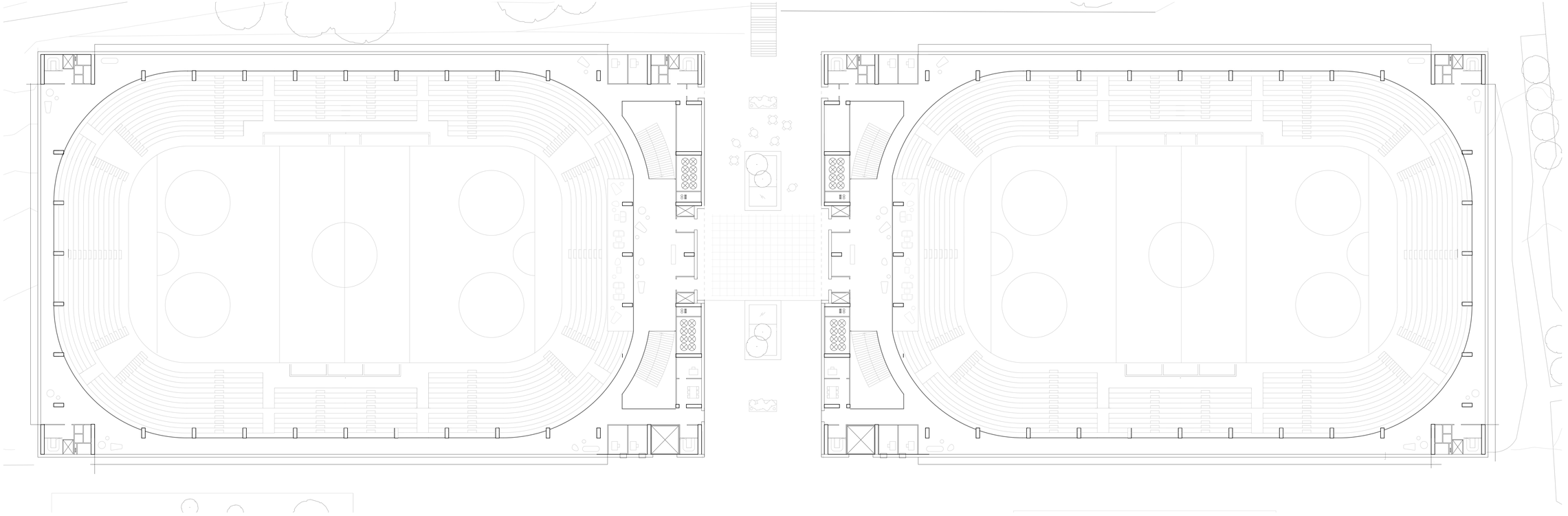
Ground floor plan



50m.

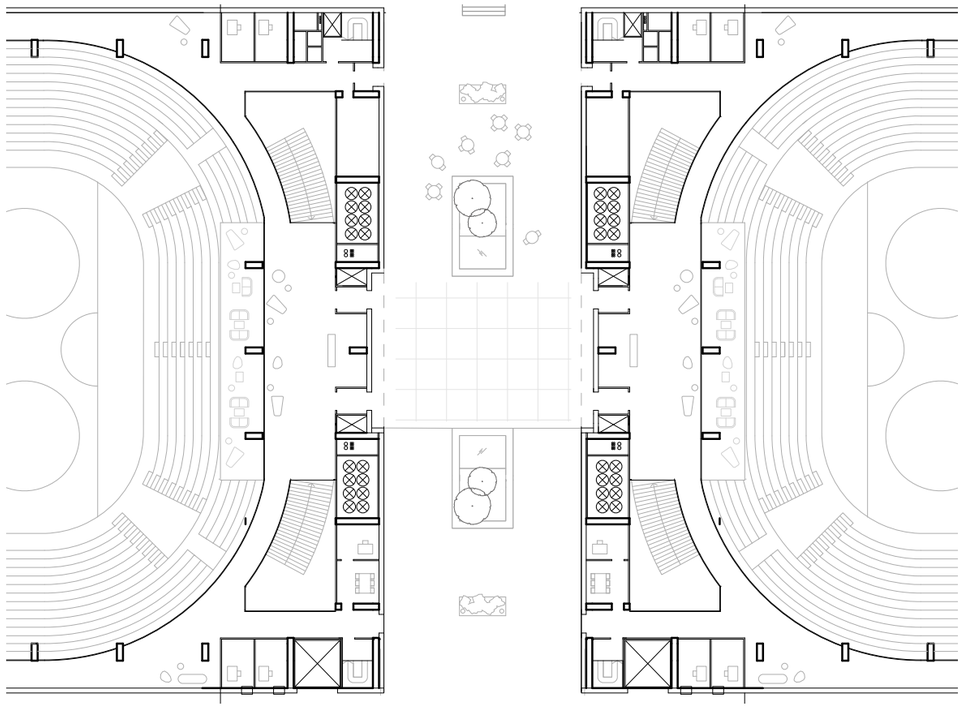
Part of ground floor plan

Legend:
1 main entrance
2 lobby
3 office
4 kiosk



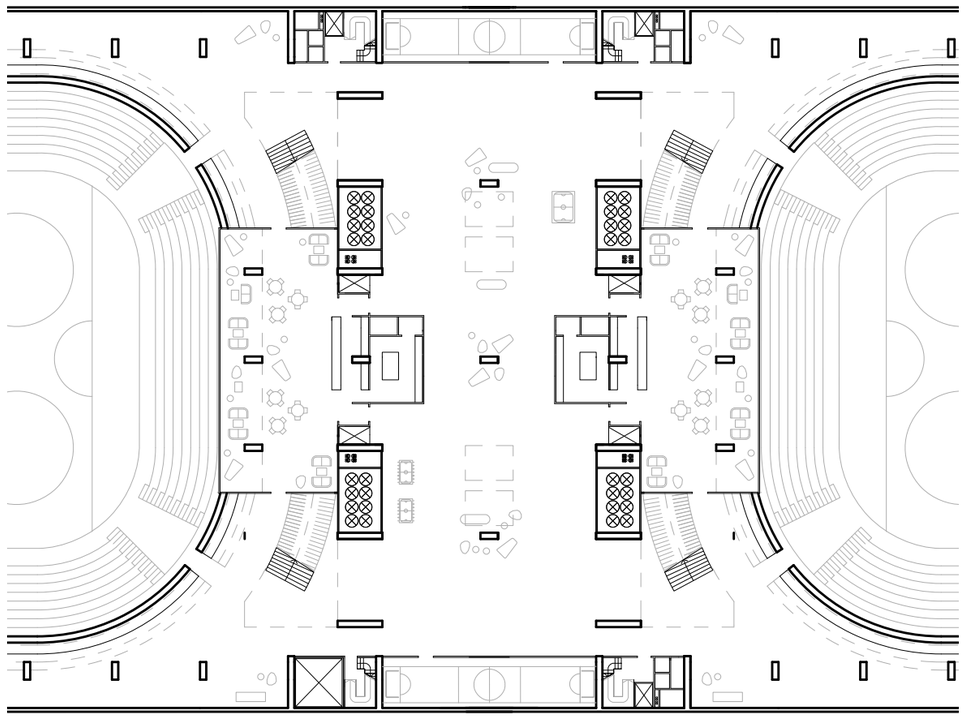
50m.

Ground floor plan



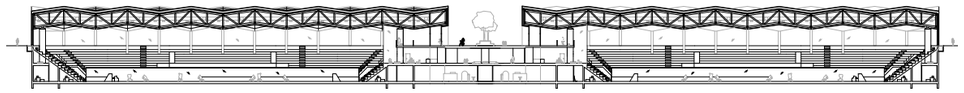
50m.

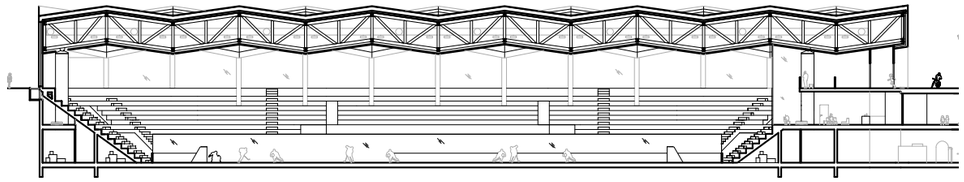
Ground floor plan, entrance situation

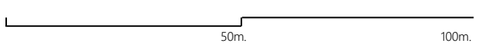


50m.

Floor plan - 1, Public space, lounge area







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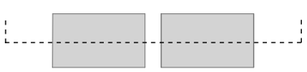
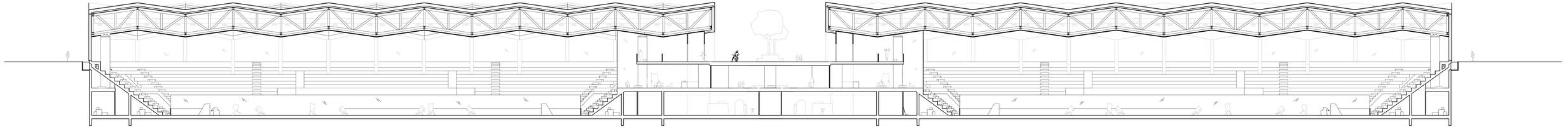


Zoom into section



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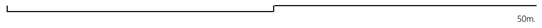

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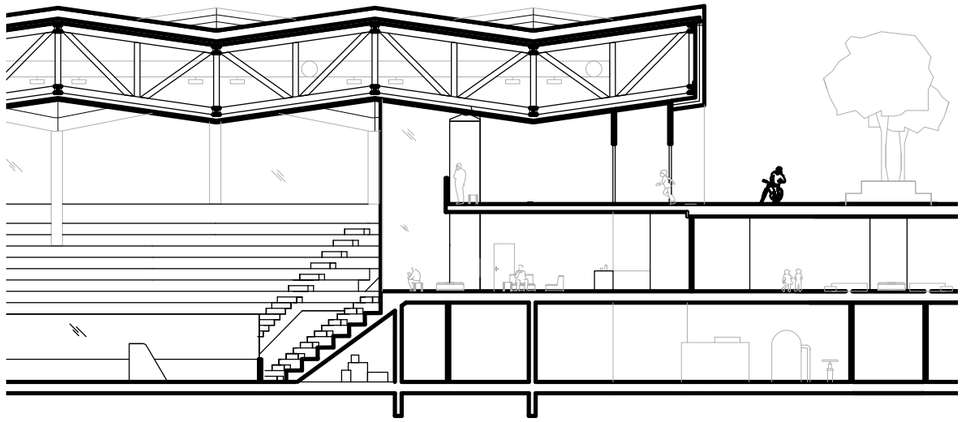
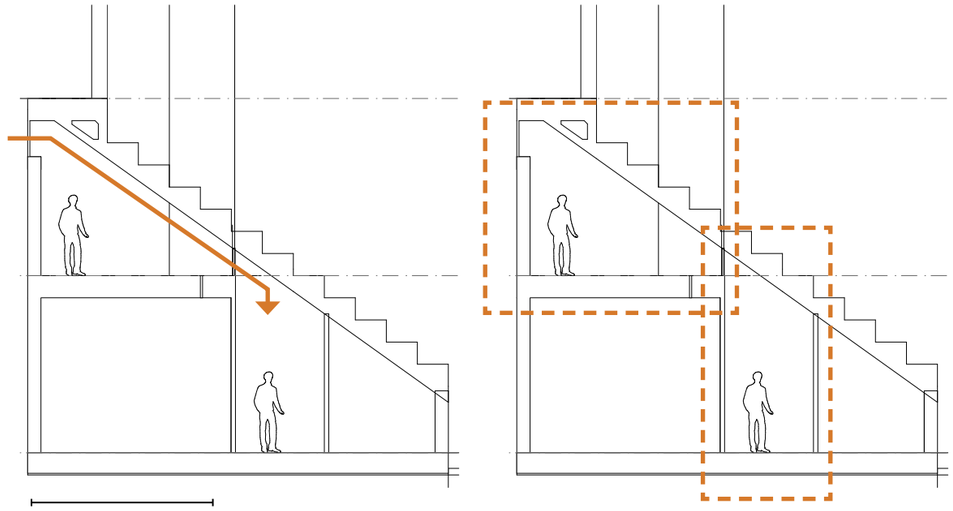
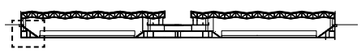
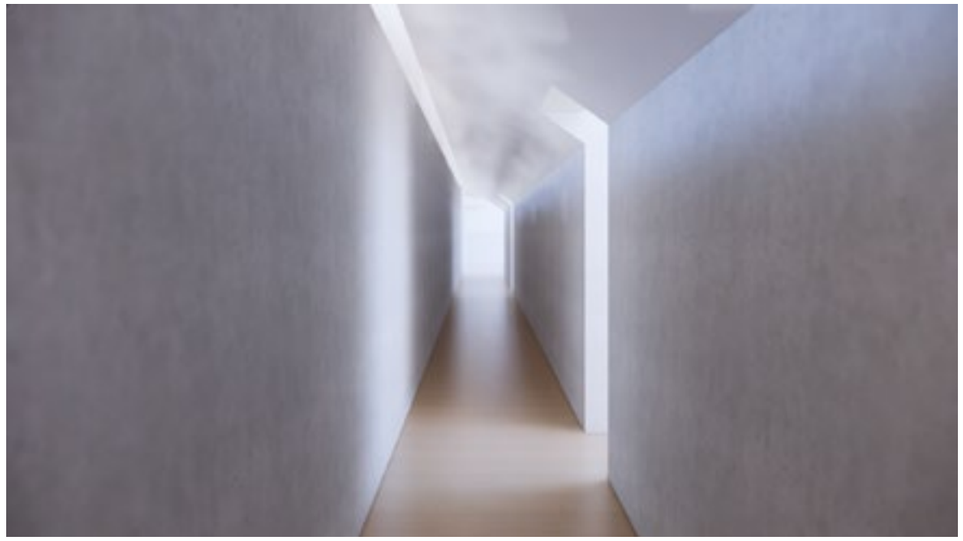




In this section, light is used to connect the various functions and rooms together. To strengthen the interaction between the players and the audience.

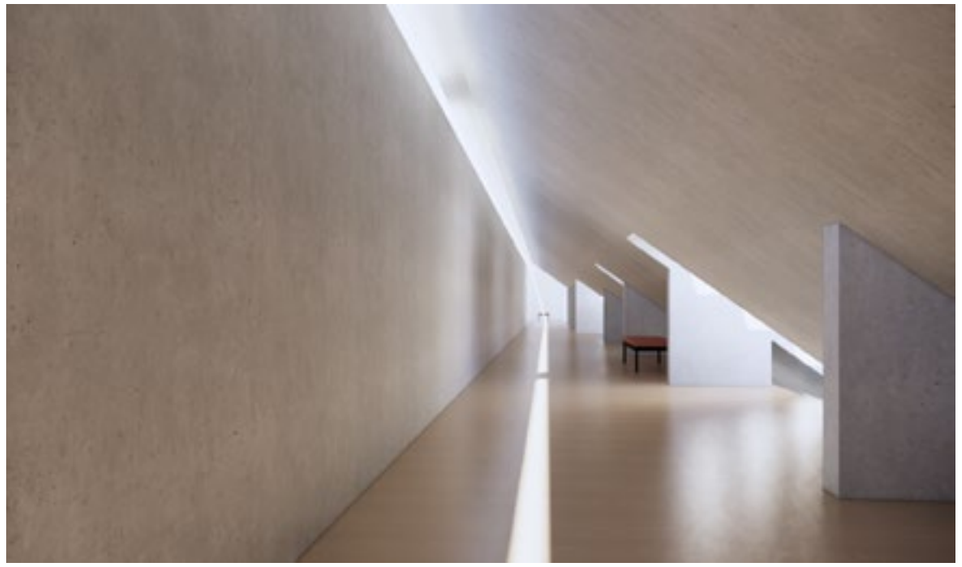
Zoom into section



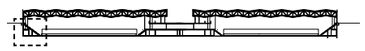


Interior Illustration. Pathway for the players. Floor - 2.

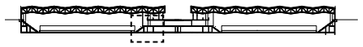
Interior Illustration. Pathway for the players. Floor - 2.



Interior illustration. Public space. Pathway for spectators. Floor - 1.

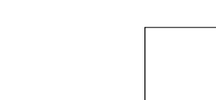


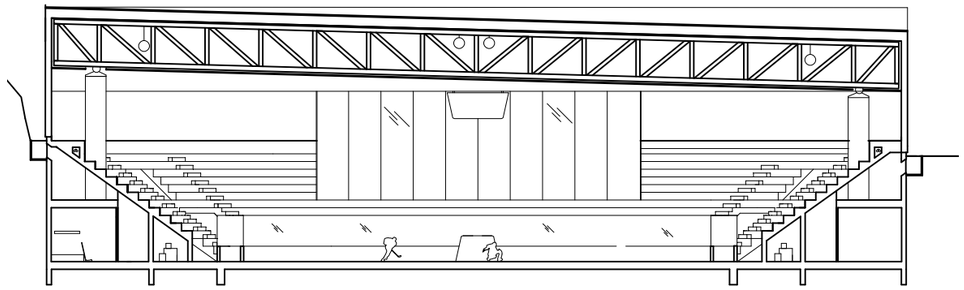
Interior illustration. Public space. Lounge area. Floor - 1.



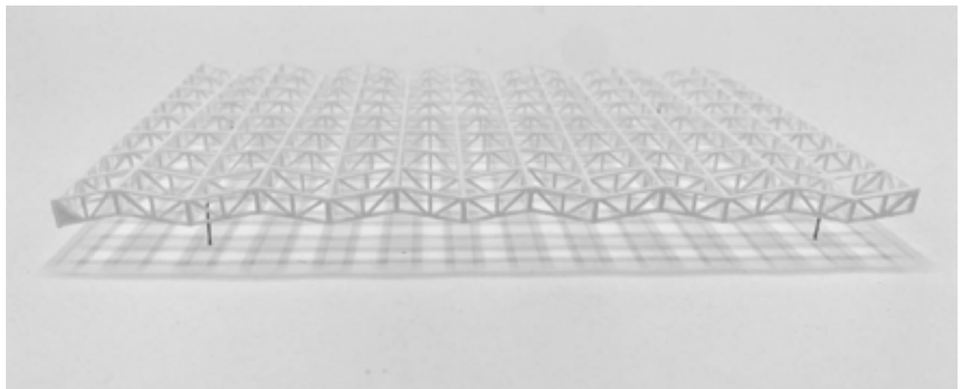
50m.

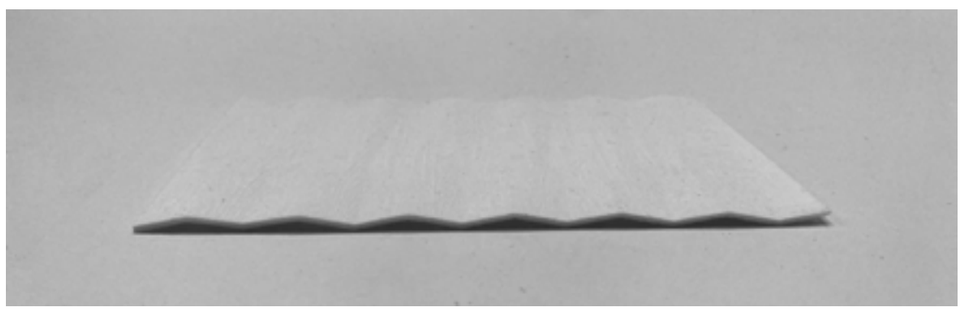
Section



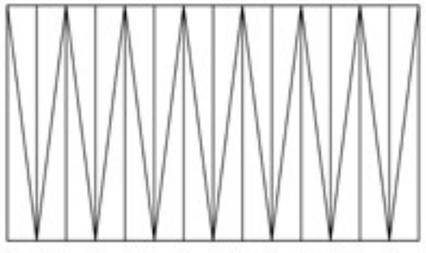


Zoom into section

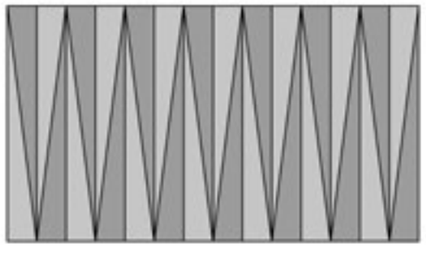


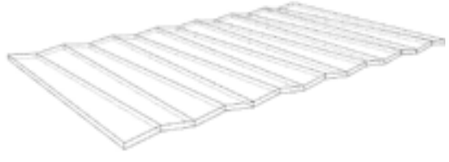


Model photos

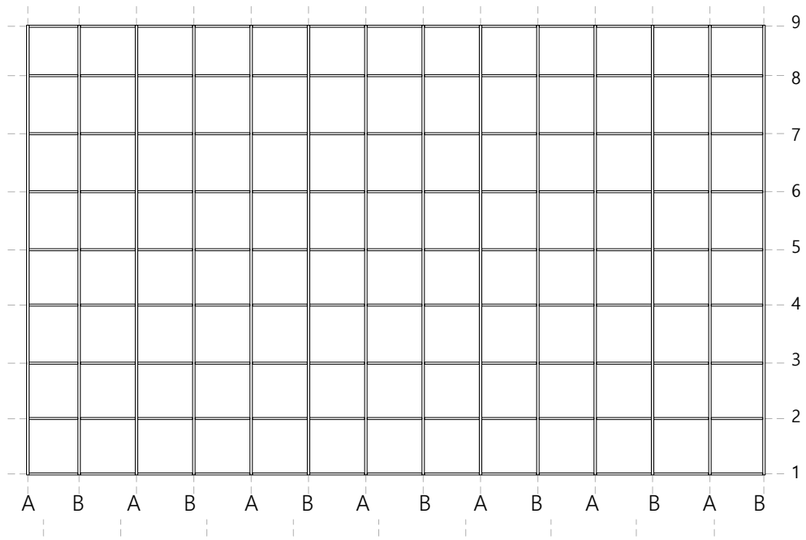


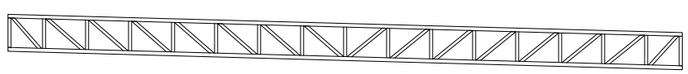
The roof construction is a steel structure. It has beams in the direction with the shortest span, which is 50 m. The second direction there are modules that are welded on the beams. The construction has a height of 3m. And consists of H beams and 25cm square steel tube. The entire construction rests on concrete beams with a cross section of 50cm.



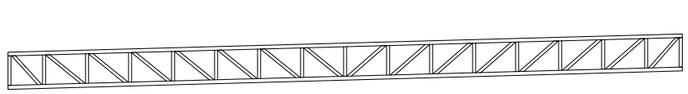


Roof grid.

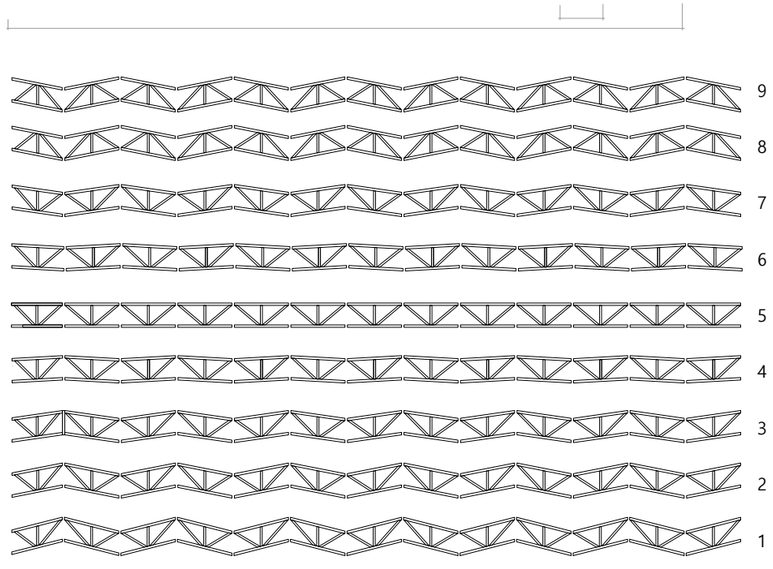




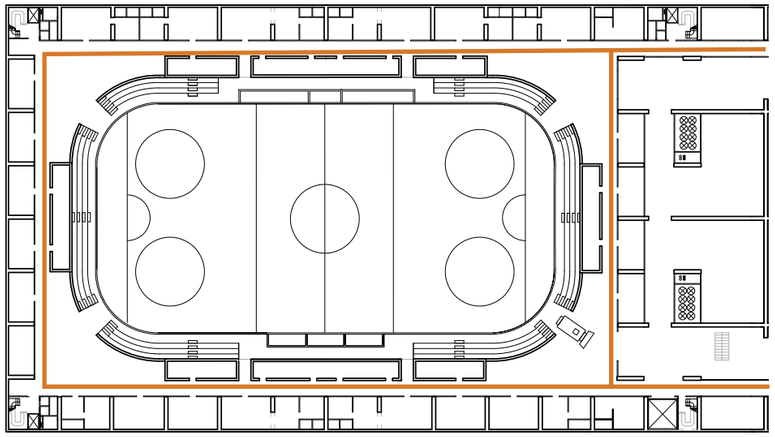
Beam A



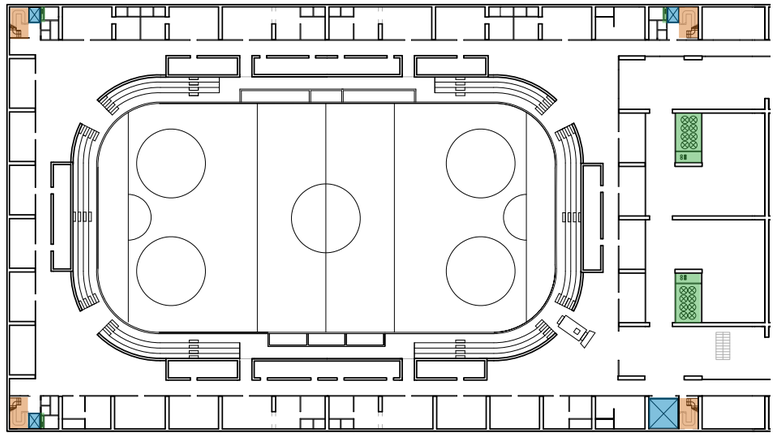
Beam B



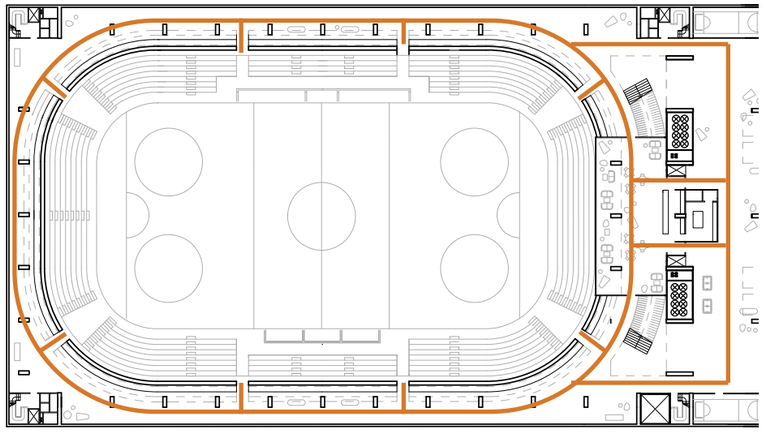
Module formation



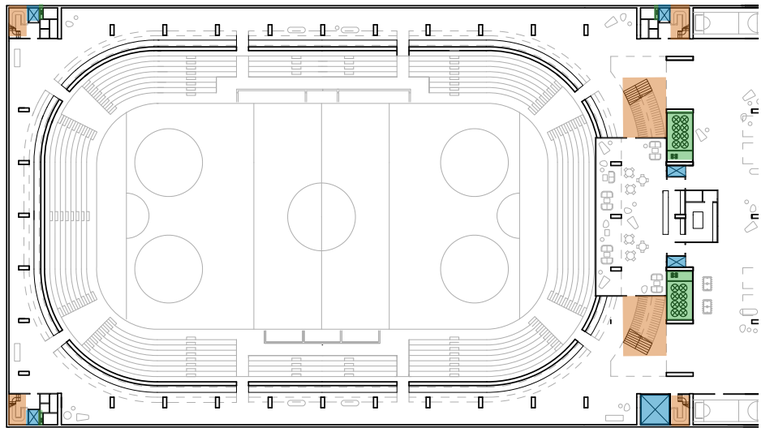
Floor -2, Circulation



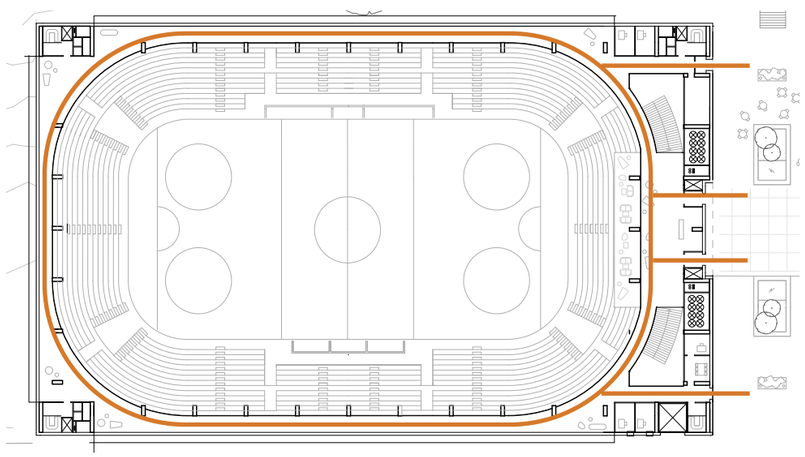
Floor -2



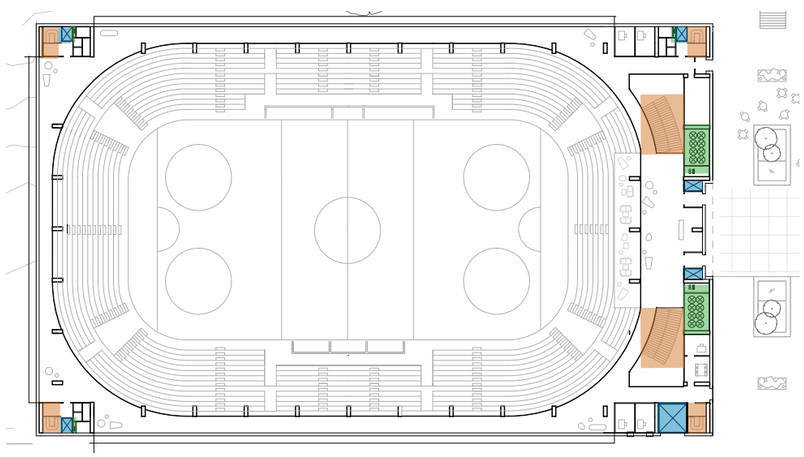
Floor -1, Circulation



Floor -1



Ground floor , Circulation



Ground floor

Stairs

Elevator

Shaft (technical, water and ventilation)

Figurelist:

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