

# Skellefteå Cultural Centre

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## 1. Introduction

At White, we invest in research to keep pushing the boundaries of sustainable architecture. We mostly focus on practice based research that we conduct within our projects to generate new knowledge where we can use it. These last years we have had a special focus on wood.

Wood is of course a very interesting building material because of its environmental aspects but we're also intrigued by the new possibilities to use this traditionally small-scale material in large public buildings.

The open international competition for a new cultural centre and hotel in Skellefteå was launched in 2015 and our winning proposal comprising a 19 storey timber tower designed in collaboration with Dipl.Ing. Florian Kosche in Oslo is a good example of how we conduct practice based research.

Since winning the competition, site preparation has begun and construction is due to begin spring 2018 for an expected completion by 2020.



Figure 1: View from North (Image by White View)

## 2. Context

The city of Skellefteå lies on the boarder to Lappland in the northern part of Sweden, just below the Arctic Circle. Skellefteå is a city with very special climate and weather conditions with long dark winters with a lot of snow, summers with many hours of light.

The city has big mining and timber industry and is strategically situated by the Skellefteå river just before it reaches the Baltic sea. It is called the golden city, both because of the local gold mining industry and their hockey team that is very dear to many inhabitants.

As for many other smaller communities in Sweden, Skellefteå suffers from migration to bigger cities. The municipality set out to reverse this trend and launched a vision for Skellefteå to become a growing region with 80 000 inhabitants in 2030.



Figure 2: The city of Skellefteå in northern Sweden

One of the main strategies of the municipality to become a growing region is to densify and develop the city center, and thus make Skellefteå a more attractive place to live. A process including a series of public consultations with the inhabitants eventually led to an international architectural competition for a new Cultural center.

The public competition was announced in the end of 2015 and 55 entrees from 11 different countries were submitted. Our proposal called Side by Side was selected as the winner in June 2016.

The new hub for culture and events contains four existing cultural programs: Västerbotten Regional Theatre, Skellefteå City Library, Museum Anna Nordlander and Skellefteå Art Gallery and in addition a new theater stage hosting 1200 people and a new hotel with 150 rooms and conference centre. The total encompassing approximately 25.000sqm.

The site was selected through public consultation and is right at the heart of the city, between the main square and the future central station.

We started our work by travelling to Skellefteå to map the contextual conditions on site. We expanded the task of the competition and also proposed a design for the transformation of two main arteries in the city. A north-south axis for pedestrians to connect the river with the city and the central station, and a west-east axis transformed from a four lane -street for cars into a long stretched urban park.

From there we came up with three strategies for an environmentally, socially and economically sustainable culture centre.

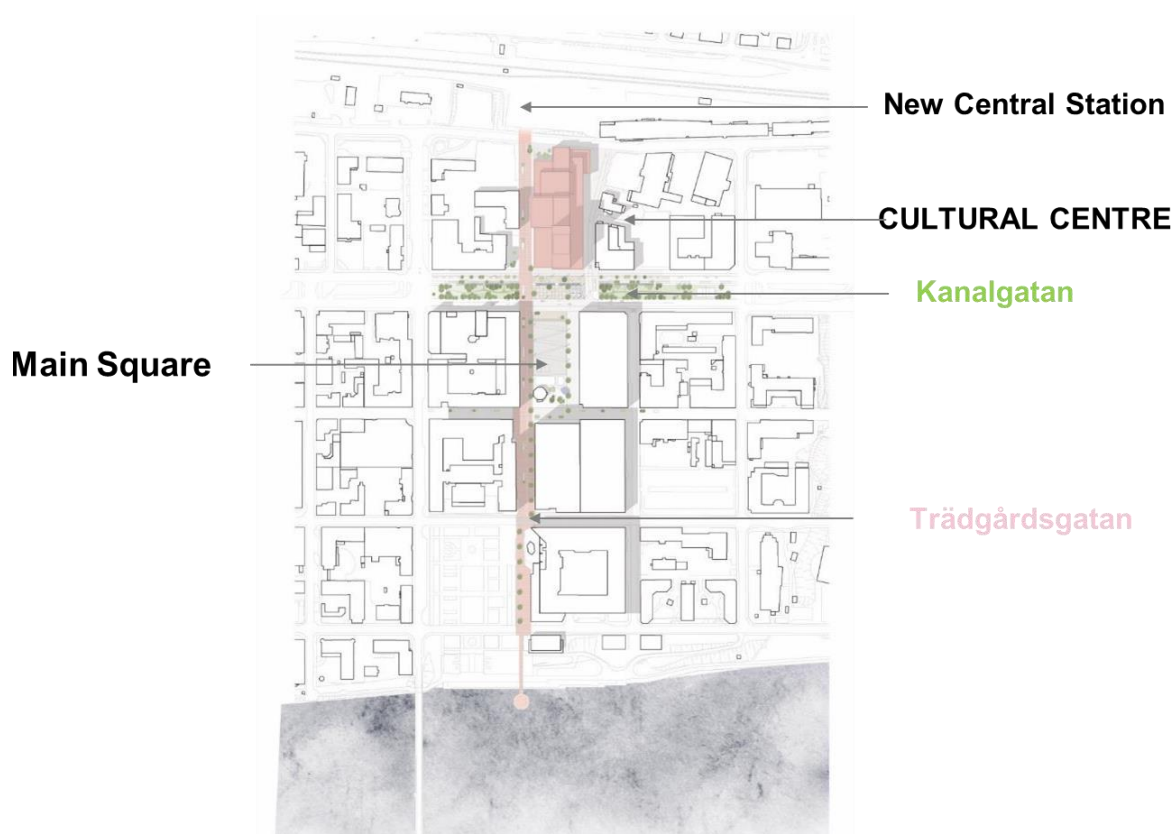


Figure 3: Site plan

### 3. Design Strategies

We designed the cultural center to push the boundaries for culture and vitalize the surrounding city. The transparent face invites and shows the events inside. This is a building created for new ideas and new ways of thinking, a cultural workshop that generates new and unexpected collaborations.

This is accomplished by placing the large and entirely dark stages in the middle of the site, surrounded by open functions facing the street. Adding a number of entrances around the block, the functions interact with the city and create a natural flow through the building. Small setbacks create a more intimate scale at street level around the quite large building.

The shape is an assembly of simple volumes adapted to their specific content. Lower volumes front the streets to maintain a human scale in harmony with the existing surroundings, and tower up towards the landmark of the hotel facing the big main square.

As we create this tall building, a landmark visible from across the city we have to give something back to the public, not only at street level. Therefore the building hosts new public spaces at different levels to make the cultural center an interesting destination, but also to give inhabitants and visitors new lookouts over their city.

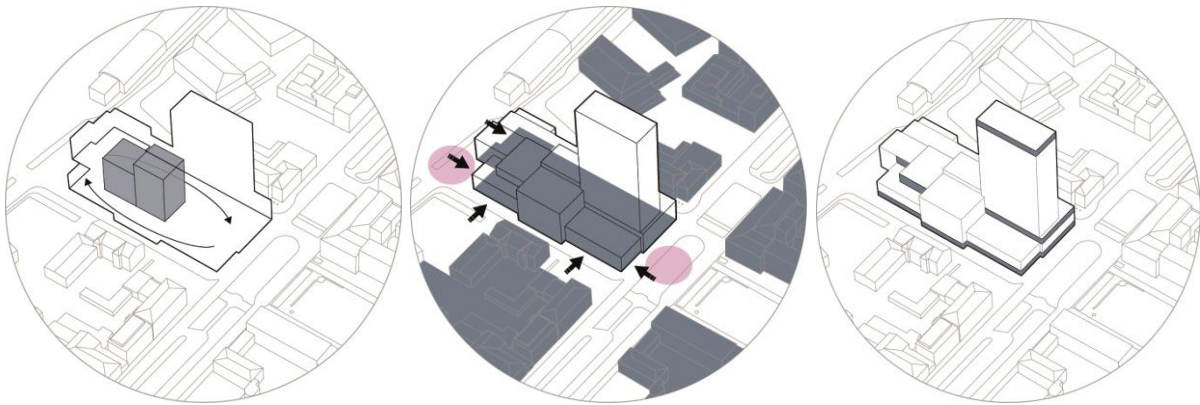


Figure 4: Diagrams showing respectively placement of theatres, entrances and public spaces.

By making the building accessible to everyone and maximizing the possibility for interaction between the different cultural functions, we are creating a democratic venue for meetings, dialogue and cultural events. A new indoor public space that can be used all year around.



Figure 5: View of the main entrance connecting all the functions of the building. (Image by White View)

The cultural centre is rhythmmed by wood lamellas covering a wood façade with large glazed areas. The hotel is features a double skin façade which allows to maintain a very clear glass veil to showcase the timber structure, day and night.



Figure 6: View from main square. (Image by White View)

## 4. A cultural centre made of wood

The Municipality of Skellefteå has a strategy to build in wood, but it was not a requirement for this specific project in the competition since complex multi-purpose buildings at this scale had never been done in wood.

We decided early on to design the cultural centre with a timber frame. But we clearly stated together with our structural engineer that the project should first and foremost be a cultural centre, not a wood building that could possibly house some culture. This means that wood is used as much as possible throughout the building, but other materials intervene where they are better suited so as not to limit the functionality or flexibility of the building.

Albeit the open approach to different building materials, the structure ended up consisting almost exclusively of wood. This allows for a good environmental record, but it also gives the building its character and shapes a new role model for sustainability. The exposed timber construction behind the transparent façade is also an architectural expression designed to boost the timber industry, by showcasing new ways of applying wood in large complex buildings.

Wood is the central strategy for sustainability obviously reducing the environmental impact in many ways: binding CO<sub>2</sub>, lightweight construction and the possibility of local sourcing to reduce emissions from transportation, reduction of thermal bridges which is crucial in the cold climate etc. It also confines a healthy indoor climate by absorbing and releasing humidity in a climate where the relative humidity ranges from 6 percent in winter to 100 percent in summer.



Figure 7: Aerial View. (Image by Luxigon)

## 5. Timber structure

The cultural centre features wood-concrete composite slabs to reduce thickness, to distribute lateral forces to the stabilizing elements of the building and ultimately to allow for the flexibility of the building. The public areas of the foyers, grand entrance and art galleries all require big freespans. This is accomplished with wood-steel hybrid trusses designed to optimise material use: by applying wood for parts in compression and steel for tension the amount of material is reduced to a minimum. These trusses are the interior signum of the building, guiding visitors through the public spaces of the centre.



Figure 8: Main foyer with wood-steel hybrid trusses. (Image by White View)

The hotel rooms are made as prefabricated 3D-modules in cross laminated timber that are simply stacked on site. This is allowing to reduce construction time and to maintain a very high finish within the rooms. Each floor is cast upon with concrete to form a wood concrete composite slab and distribute lateral forces to stabilizing staircase and elevator shafts. The stabilizing shafts are made solely of CLT and Glulam, and connected to the foundation by steel rods. This is possible thanks to their position at either end of the hotel slab, and to their shape spanning almost the entire width of the building.



Figure 9: Stabilizing timber shafts visible through the hotel double-skin façade. (Image by Luxigon)