# GNISTAN

- The spark -

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- A support center for people affected by cancer

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> Graduation and publication year 2021 Examiner: Johanna Eriksson Tutor: Elke Miedema

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A master thesis in Healthcare Architecture Chalmers School of Architecture Department of Architecture and Civil Engineering Architecture and Urban Design Graduation and publication year 2021

> Author: Agnes Ståhl Examinor: Johanna Eriksson Tutor: Elke Miedema

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# Abstract

# How can architecture support the mental and physical needs of people affected by cancer?

At some point in life most people will be affected by cancer, it is a widespread disease, affecting both the patient and everyone close to them. Getting diagnosed with cancer is tough, medical treatment is important but so is mental support. Today there seems to be a gap between the healthcare system and the mental support both during and after treatment.

About 60.000 persons in Sweden get a cancer diagnose each year. A support center aims to create a place where people affected by cancer can relax, recharge and become stronger. It is also about finding a way to remove the stigma and create a safe zone where it is okay to feel weak and to cry. A cancer support center is not a new concept, but it is non-existent in Gothenburg and would function as a complement to today's healthcare.

Research shows that architecture affects people's well-being, and that nature has a healing effect. Both architecture and nature can thus help the healing process and work as positive distraction. Biophilic design is focused on our basic need to connect with nature, using it as a tool and as inspiration it helps nature being a big part of the architecture of cancer care.

This thesis has been investigating how architecture and nature in a support center affects cancer patients and their loved ones. Hopefully this will contribute to the discussion about cancer treatment in Sweden and make rehabilitation and mental support a natural part of the care.

By combining existing knowledge in the healthcare field with experiences told from people affected by cancer and case studies of similar places the design proposal resulted in a center close to Sahlgrenska. This new support center provides both small intimate rooms for discussion and reflection, as well as larger rooms for rehabilitation and learning. The center has a close connection with nature, from the garden on the outside to the materials on the inside.

This is a place to process the cancer, learn how to live with it, how to move on from it, or how to move on without someone. The architecture in the center support these different needs that comes along over time and takes place at the same time for different people.

"As a cancer patient you lose your control, identity and integrity. You get dehumanized and need others in the same situation to be able to survive"

> Personal communication Translated by author

- Louise Lindquist Sassene, 2021

# Authors background

# Education

Bachelor Chalmers University of Technology (2015-2019)

#### Master

Tongji University, Shanghai, China - Exchange semester (2019)

Studio Reconstruction of Qingsha historical village in Dongguan

Chalmers University of Technology Architecture and Urban Design (2020-2021)

#### Studios

- Future vision for healthcare housing and work 2: Housing inventions

- Future vision for healthcare housing and work 1: Residential housing for seniors



# My relation to the subject

I think it is important to keep developing todays healthcare and have in mind that there is need for more than just medical treatment for a person to be and feel healthy. When talking to people that live, or has lived, with a cancer diagnosis there seems to be a gap between todays healthcare and the life after treatment.

I do think that we need to find a way for people with cancer that make them feel stronger so that they can fight the cancer the best way possible. Cancer is a disease that is becoming more common, but more people are surviving it and the need to take care of those fighting the aftermaths grows bigger too.

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# **Research Question**

How can architecture support the mental and physical needs of people affected by cancer?

### Aim

The aim of this thesis is to find a design that can support people affected by cancer, both mentally and physically. To investigate what role architecture and nature has in cancer care and incorporating biophilic design to deepen the knowledge of how these go together.

# Purpose

The purpose of this theses is to find a design that can help people affected by cancer when it comes to mental support and rehabilitation. This will raise and awareness about the psycho-social health and healing when it comes to cancer and fill the gap that seems to exist in today's healthcare.

# Delimitations

This thesis is partly based on Kraftens hus's expansion plans. This plan of a new Kraftens hus is in the start-up phase and has no assigned site. I will therefore make my own program that is inspired by the existing operation in Borås.

In this thesis I will focus on the mental health and rehabilitation needs and will not go into facilities needed for the cancer treatment itself, that part will remain at the hospital.

# 1 Introduction

In this chapter the aim of this thesis is explained. The chapter contains the research question, the purpose of this thesis as well as my delimitations and methodology.

# Reading instructions

In the first chapter, *introduction*, the aim of this thesis is explained. The chapter contains the thesis question, aim and purpose, as well as my delimitations and method.

Following chapter is the *background*, this part is divided into four categories, *About cancer, A healing approach, The already built* and *Site and context*. These provides the theoretical framework that has created the foundation of the design in the project.

In the chapter called *program* the design strategies based on the theoretical framework is presented as well as the functions and organization of the center.

The fourth chapter, *design proposal*, presents the final design proposal in the master thesis. It is a result of the findings made based on previous chapters.

The fifth chapter, *summary*, will conclude the master thesis with a discussion and conclusion.

The booklet is finished with *references* used in the project.

# Method

The method used in this thesis is mainly *research for design*. The research is done through literature studies, semi-structured interviews, surveys and case studies on already built examples. To support the design and material choices *biophilic design* has been used, as it is proven that nature has a positive effect on health.

The literature I have read is both on cancer and its effects as well as about healing architecture and biophilic design.

The interviews have been made with people affected by cancer, former patients and relatives, and professionals both in the field of healthcare and architecture. The interviews have been about an hour long and the questions were related to cancer care or life with cancer.

Two different surveys have been sent out. One to people visiting an existing support center, to see what they appreciate as well as wish for. The other one has been sent to people affected by cancer to research their wishes for a center. Three case studies have been made, two cancer centers in the UK as well as a visit to Kraftens hus in Borås.

Interviews, surveys, case studies and some other background information has been made in collaboration with Agnes Engström, who is doing a master thesis within the same subject.

The final proposal is based on the findings during research combined with sketching alongside, leading to a result with a holistic view of cancer care with nature as a health benefit.



### Project proposal

Designing

Summarizing

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### 2 Background

This chapter contains the theoretical framework that the design proposal is based upon.

The background chapter is divided into four different parts each deepening the knowledge needed to design for those affected by cancer. The final proposal is based on existing knowledge in the cancer care field combined with my findings from interviews, surveys and case studies, and some of these findings are presented in the following chapter.

# 2.1 About cancer 2.2 A healing approach

2.3 The already built

2.4 Site and context

# 2.1 About cancer

This part of the background contains information about life with cancer and its side effects.

# Living with cancer

In Sweden, one in three gets a cancer diagnosis (Cancerfonden, n.d), but the effects are not only physical, their whole life turns upside down and the same can be said for their loved ones.

Cancer is a large economic and social cost for Sweden, the quality of cancer care is high and the survival rates for many types of cancers are above European average (All. Can). Cancer treatment is different for everyone, but most people spends a lot of time at the hospital. It could be every weekday for a few weeks or less often but for a longer period of time, some patients do both. The side effects after are different for each person, but for most people it gets worse over time. (J. Nyman, personal communication, January 28, 2021) Unfortunately, the care seems to end with the treatment and many patients feel alone,

vulnerable and abandoned when the

treatment is completed.

# Stress and cancer

When stressed, the body sends out a boost of energy to help you through a though time, this is something that is happening to everyone, cancer diagnosis or not. This boost is helpful in the short term and in small doses but in long term with larger doses it causes more harm than it helps (Maggie's, n.d).

According to Van der Linden et al. (2016), Sternberg (2009) implies that the environment has an impact on people's well-being through the immune system. Identifying stress as a negative influence then implies relaxing environments as something positive.

Studies show that psychological stress can affect a tumors ability to grow and spread, but there is no strong evidence that stress can cause cancer directly (National Cancer Institute, 2012). Therefore, creating safe spaces for relaxation could help prevent stress, and maybe even the spread of cancerous tumors.





# Cancer and exercise

The body's strength and physique get affected by cancer and its treatment. Exercise has earlier been recommended to be avoided when undergoing treatment but today the recommendations are different, if the energy exists it is good to exercise.

Cancerfonden (2019) writes about a research on how exercise affects the results and side effects of cancer treatment. A combination of cardio and strength was most effective when it came to prevent fatigue, but only doing cardio was giving result too. Both forms of exercises helped the participants to a better life quality, less symptoms, maintain their weight and they got stronger than the control group. This is not only a way to get physically stronger but also a way to take control over your own body and life. People that are physically active also has a reduced risk of relapsing as well as an improved chance of survival.

### Cancer after treatment

The cancer care at the hospitals in Sweden works well, they have clear system to follow. It is not until after the treatment is done that you have time to think about what actually has happened and it is then the rehabilitation is supposed to start.

"The rehabilitation is something the care professionals talked a lot about during treatment, but when it was time there was nothing to offer"

> - Emelie Ogenhag, 2021 Personal communication Translated by author

J. Nyman (personal communication, January 28, 2021) agrees that it is probably after the treatment that the need of psychological support is greatest, but as staff at Sahlgrenska his perception is a bit different when it comes to what they offer. These different perspectives, about what support is offered after completed treatment, between patient and professional, is something you can hear about in En podd om cancer (Blomqvist, 2017) as well.

# Cancer hangover

Cancer hangover is an expression that you meet a lot when reading about cancer. It is about the life after cancer, a life that might not be as planned with physical and/ or psychological scars. Anxiety, infertility and a changed body is just some of the consequences someone who survived cancer might experience. More and more people do survive a cancer diagnosis and it is therefore of uttermost importance that knowledge about this is spread, in healthcare as well as in society (Ung cancer, n.d).

"The healthcare system is top notch when it comes to cancer and treatment. But when this is done it is goodbye immediately. What happens now?"

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# "During cancer treatment you are under the hospitals umbrella. But after treatment you are expected to go back to normal, that is called cancer hangover"

- Louise Lindquist Sassene, 2021 Personal communication Translated by author



These three are factors in people's well-being and all are affected when diagnosed with cancer. There needs to be a support system that can provide help and strengthen peoples mental, physical and social well-being.

# 2.2 A healing approach

This part of the background presents the architectural foundation and framework that has led to the design of the project.

# "Salutogenic design is all about encouraging active health rather than merely treating illness."

- Mazuch, 2017

# What is health?

According to WHO (2001) health is a state of complete physical, mental and social well-being and not merely the absence of disease and infirmity. This condition is something to strive towards although the disease when visiting a cancer support center might not be absent.

*Physical well-being* is related to a healthy body. Physical activities and rehabilitation are important to build up strength and to gain energy.

*Mental well-being* refers to the psychological state of an individual. How a person handles different situations and their feelings.

Social well-being is often related to social support. Having the ability and opportunity to share experiences and concerns with loved ones, professionals and/or people in the same situation.

These three combined creates the core of what this thesis strives towards.

# Salutogenic approach

Salutogenic design originates from Aaron Antonovskys theory of salutogenesis. It is about promoting an active and healthy life instead of the pathogenic approach that focuses on treating the disease or injury. The salutogenic approach is about preventing the disease instead of treating it (Mazuch, 2017).



# Positive distraction

One way to help reduce perceived pain is by positive distraction. Studies show that positive distraction leads to better emotional well-being, less stress, kept attention and pain releasing. These distractions work well when being natural elements found in our history, like trees, flowers and water. Unthreatening animals, kind faces and music could also work as positive distraction (Ulrich, 2012). When focusing on nature, or something else that works as positive distraction, less conscious attention is paid to pain and the perceived pain is therefore lower (Kellert, 2011).



# Connection with nature

Peter (2017) mentiones in her article that urban environments, that more than half of the world's population now live in, can have a negative impact on mental health. Incorporating natural elements such as trees and water in the cities to stay connected to nature is henceforth something to priorities to make people feel better (Peters, 2017).

Ulich (2012) show in his research that architecture affects people's well-being and can help promote the healing process. Design aspects such as daylight, greenery, space, colors and privateness can affect both physical and mental health (Ulrich, 2012). It is shown that even small doses of greenery have been proven to have lasting physical and mental health benefits (Peters, 2017).

# **Biophilic design**

Biophilic design is a tool for us to reconnect with nature and what was natural in humankind's beginning. We have an inherent need to connect with nature in the modern built environment, since nature is where it all started. Biophilic design is something we today see as innovative, but it really is a part of our history. It is not about making buildings greener but about humanity's place in nature, and how the built environment will affect the natural environment (Kellert, 2011).

Biophilic design is designing for people as a biological organism and using the mind and body as indicators of health and wellbeing (Browning et al., 2014). Connection with nature leads to relaxation of muscles, as well as lowering of diastolic blood pressure and stress hormone levels (i.e., cortisol) in the bloodstream. Making biophilic design a tool reaching towards health and wellbeing (Browning et al., 2014).

To easier incorporate, detect and understand biophilic design Browning et al. (2014) has given us 14 tools that encapsulates this method. These are presented and visualized on the next spread.

Apart from the illness itself, cancer is turning life upside down, often leading to stress, depression and feeling lonely. Biophilic design could help counter these side effects.

# Inclusive design

Heylighen et al. (2017) explains inclusive design as a design approach that aims to include all, and to help everyone to have the same opportunities in every aspect of society. It is hard to see to everyone's need and it is therefore important as a designer to be able to empathize with the people we design for. It is still easy to miss something, we all see things from different perspectives and the experience may differ from person to person (Heylighen et al., 2017). Cancer affects everyone differently, by using inclusive design, hopefully an environment where everyone feels welcome is designed.

"Biophilic design can clearly improve wellbeing and wellness and can expedite healing within a world of increasing populations and urbanization and increasingly hermetically sealed living spaces"

- Mazuch, 2017

# Stimulating atmosphere

According to Boscherini (2017) it is important to create a restorative environment that is well balanced, beautiful and reflective. It creates a sense of coherence when the design is based on an understanding of the persons emotional and physical needs. At the same time as the spaces should be familiar, they should ideally offer a variety, in size and character (Boscherini, 2017).

U. Ahlqvist (personal communication, January 28, 2021), talks about the importance of an enriched environment. An environment full of impressions, color, forms and stimulus, gives the brain something to work with and this increases the synapses and connections in the brain. Creating new connections is what develops the brain, this also creates a chemistry in the brain that increases well-being. Both the new connection and the chemistry of well-being secures a greater future but is also good for well-being in the present (U. Ahlqvist, personal communication, January 28, 2021).

By programming the environment, clarity is given for the activities taken place. This will invite visitors to use their surroundings while being reassured they are doing it right. Familiarity can in this way be created without repeating the same room over and over.

# 14 Patterns of Biophilic Design



Visual Connection with Nature A view to elements of nature, living systems and natural processes.



Non-Rhythmic Sensory Stimuli Feels as if one is momentarily experiencing something special, fresh, interesting, stimulating and energizing.



Non-Visual Connection with Nature Sounds, aromas and textures giving a positive reference to nature, living systems or natural processes.



#### Mystery

The promise of more information achieved through partially obscured that entice the individual to travel deeper into the environment.



Thermal & Airflow Variability Subtle changes in air temperature, relative humidity, airflow across the skin.



Complexity & Order Rich sensory information that adheres to a spatial hierarchy similar to those encountered in nature.



Presence of Water Experience of a place through seeing, hearing or touching water.



Dynamic & Diffuse Light Varying intensities of light and shadow that change over time.



Connection with Natural Systems Awareness of natural processes, seasonal

and temporal changes characteristic of a healthy ecosystem.



Refuge A place for withdrawal from environmental conditions in which the individual is protected from behind and overhead.



#### Biomorphic Forms & Patterns

References to contoured, patterned, textured or numerical arrangements that persist in nature.



#### Material Connection with Nature

Materials and elements from nature that reflect the local ecology or geology and create a distinct sense of place.



#### Prospect

An unimpeded view over a distance, for surveillance and planning.



#### Risk/Peril

An identifiable threat coupled with a reliable safeguard.

# 2.3 The already built

f people feel less alone after visiting

feel more confident talking to their medical team

# Maggie's

Maggie's center was founded by Maggie Keswick Jencks alongside with her husband Charles Jencks, after Maggie got diagnosed with cancer. Maggie felt that it was not just her the cancer affected, but her whole family. She wanted to create a place where people where brought together and could share experiences and comfort. Unfortunately, Maggie did not survive to see her vision come true, but Charles kept pushing and today 30 Maggie centers exists, mainly in the UK but the concept has spread world wide. When getting a cancer diagnosis, you need more than just medical treatment and that support is given at Maggie's (Maggie's, n.d).

All of the centers are located in close connection to a hospital, they are not a part of the it but works as a compliment to the healthcare. Known architects, Zaha Hadid,

> "For some, getting into the center is a difficult decision because they have to face their illness. Therefore it is important that the house receives people in the right way"

Information from https://www.maggies.org

#### Snøhetta and Frank Gehry to mention some, are responsible for the design, with one requirement, they have to follow the Architectural brief (Van der Linden et al., 2016).

The heart of the building is the kitchen with its large kitchen table. Spreading out from this the building contains a library, consultation rooms, different sized rooms to host yoga, workshops and lectures (Maggie's, n.d). All the main entrances have glass doors, so that you can see the entrance and what is going on from outside (Van der Linden et al., 2016).

- M. Rask Gregsen (Center for kræft & sundhed, n.d).

### Lanarkshire

Location: Lanarkshire in Scotland Architects: Reiach and Hall architects Year: 2014 Size: 300 m<sup>2</sup>

#### The building

Maggie's Lanarkshire is located in close connection to the Monklands General hospital. It is a tale of enclosure surrounded by a brick wall. The wall is designed to offer a degree of separation from the hospital, gives privacy and a human scale (Reiach and Hall Architects, 2015).

The entrance is through a calm courtyard with two lime trees and a spring of running water. On the other side of the building is another closed yard, framed by the brick wall. The building is closed towards the street and completely open towards the two yards. The surrounding wall gives privacy to the building and creates a mystery to what lies ahead of you when crossing the threshold.

The building plan consists of four small sheltered courts. The two central courts have a highly polished gold perforated metal light catcher in each, reflecting sunlight onto the floor of the courts (Reiach and Hall Architects, 2015). The two other courts are faced towards the façade and creates a connection between the building and the outside. They are more nature themed and brings in the presence of water.



Image 1 - View on the building Photo by: Reich and Hall architechts



Image 2 - Main entrance Photo by: Reich and Hall architechts



Image 3 - Kitchen table and courtyard Photo by: Reich and Hall architechts



Image 4 - Courtyard facade Photo by: Reich and Hall architechts

The floor plan is open in the middle, where the courts work as dividers between the entrance, the kitchen and the library. Each room is facing one of the courtyards, internal or external, many rooms are facing both. This gives a light atmosphere which thanks to the surrounding brick wall feels private even when glazed.

#### Materials and structure

The building has a simple steel frame structure that is defining and creating intimate spaces. There is a lot of wood showing, the timber partitions allow more private spaces and rooms to open up or create safety.

The material palette is muted and soft with blond Finnish birch walls, limed oak floors and white stained pine ceilings (Reiach and Hall Architects, 2015).



Image 8 - Section through building Section by : Reich and Hall architechts



Image 5 - Sightlines Plan by : Reich and Hall architechts Lines added by Author



Image 6 - Movement Plan by : Reich and Hall architechts Lines added by Author



Image 7 - Public - private Plan by : Reich and Hall architechts Lines added by Author

### Leeds

Location: Leeds in England Architects: Heatherwick Studio Year: 2020 Size: 462 m<sup>2</sup>

#### The building

The building is located within the campus of St. James's University Hospital in Leeds. The plot is small and surrounded by large hospital buildings and a multistory car park. The main entrance is located in the north, reached by a walking path surrounded by vegetation. The garden is mostly covered in plants, with the exception of a small outdoor seating space, located by the garden entrance. Incorporating greenery is a large part of the concept, where it helps both providing privacy, a healthy environment and a healing, biophilic environment.

From the entrance you reach the central space. There are three structural cores, that enclose the more private counselling rooms, these are placed around the central space. This central space ties together the entire building and is also where the stairs are located. The other spaces in-between the cores are placed on different levels and are reached from the central space. The glazed rooms between the cores house social activities, with a kitchen, an exercise room, a library and some more private nooks. The central circulation along the different levels allows for a good overview throughout the building. There is also an accessible rooftop



Image 9 - View on the building Photo by: ©Hufton+Crow



Image 10 - View on social space and structure Photo by: ©Hufton+Crow



Image 11 - View on the kitchen table Photo by: ©Hufton+Crow

garden, where the visitors are encouraged to help take care of the plants.

The extensive use of vegetation on the plot helps increasing the privacy within the building, even though there are large glazed facades. The more private cores have less windows to ensure privacy within. The building is situated to the northeast of a large multi-story car park, which is partly shading the site. However, daylight is ensured through the large glazed surfaces, which are oriented in several directions.

#### Materials and structure

The aim was to use healthy materials throughout, with a structure consisting of prefabricated spruce elements. The structure resembles large trees and is visible throughout the building. Porous lime plaster has also been used to support good indoor humidity levels (Heatherwick Studio, 2020). The roofs are covered with a large amount of native plants of different kinds, adapted to the local climate (Maggie's, n.d).



Image 15 - Section through buildin Section by : Heatherwick Studio



Image 12 - Sightlines Plan by : Heatherwick Studio Lines added by: Agnes Engström



Image 13 - Movement Plan by : Heatherwick Studio Lines added by: Agnes Engström



Image 14 - Public - private Plan by : Heatherwick Studio

# Kraftens hus

Kraftens hus is a cancer center in Borås that opened 2018. The organization started since both patients and personnel experienced gaps in today's healthcare. It is a patient driven innovation that offers both physical and creative activities, lectures and support for both the patient and other affected. The activities should have a purpose, and many times the deep conversations take place around the kitchen table during fika.

The place has an open floorplan with the possibility to enter through different doors. Like in Maggie's the kitchen table is the heart of the organization, in the big kitchen cookies are baked and there is always a fresh pot of coffee C. Mannefred tells us when we visit (personal communication, January 26, 2021). Kraftens hus is located in an existing building and earlier was an office, some adjustments have been made to fit the new organization.

The area right after the entrance, with some magazines and a place to sit



The open floorplan allows connection between different spaces and activities



The large kitchen table is i the middle of the place and used the most





One of the counselling/group rooms

# A gap to fill

After interviewing both people who lived with a diagnosis and staff at Sahlgrenska I can see that the experience of the existing support for cancer patients looks different. While undergoing a cancer treatment you have a safety net, but after that many patients feels left alone. Professionals seems to think that there is both rehabilitation and mental support after treatment, information I gathered from interviews and listening to the podcast *En pod om cancer*. The support after treatment which might exists seems to not be enough or sufficiently available when listening to the patients and their voices are the most important here.

There is also a stigma when it comes to cancer, many prefer not to tell people outside of their closest circle or avoid telling even them. People are being ashamed of their diagnosis, as if they did not go through enough already.

"In 2030, half of the population will get cancer at some point in their life, so we have to break the stigma around cancer. It is not you today, but it might be tomorrow"

> - Louise Lindquist Sassene, 2021 Personal communication Translated by author

# "No one should have to be alone with their cancer".

- Kraftens hus slogan Translated by author

# "During treatment you are focused on following the treating steps. And there is often a shock afterwards. The healthcare talks a lot about rehabilitation in each step but after the treatment was done and I asked about it no one knew anything"

- Emelie Ogenhag, 2021 Personal communication Translated by author

In the survey people express how fond they are of Kraftens hus and how much it has helped them. Wishes for a center in Gothenburg shows up and the future for a cancer support center in Gothenburg seems bright.

The experienced gap, from the patients' point of view, in today's cancer care seems to lie in the mental and physical support. This support should be offered and a support center for people affected by cancer could help to contribute with that and revile the cancer care from that responsibility.

# 2.4 Site and context

In this chapter the location of the project is presented. An analysis of the site and its surroundings are made.





# Criterias for site

When looking for a site I created some criteria for it.

It should not be located in the hospital but preferably close. To get away from the hospital building was something many expressed that they wanted in the survey.

**Central location.** It should be easy to access the center, both by car and public transportation, this was also wished for in the survey. It also felt important to not try to hide the center but instead place it relatively central and, in this way, lower the threshold and stigma around the subject in society.

Close to nature. This is not always easy when also trying to find a central location, but nature is a great influence in our wellbeing and therefore seems important to incorporate in the criteria's when looking for a site.

A site that is likely to be built on in the future. There does not have to exist a detail plan, but I want the project to compatible with reality.

 $\langle | \rangle$ 



Image showing sightlines towards south



Image showing sightlines towards west



Image showing sightlines towards north



Image showing sightlines towards east





Lanscape section Scale 1:4000

# Location and character

The chosen location for the cancer center is currently a parking lot, owned by Akademiska hus. As with the rest of Norra Medicinareberget, the process is underway to obtain an approved detailed plan.

The site is located in a valley between two mountain edges, on the west side Norra Medicinareberget hosting Sahlgrenska and Gothenburg's university premises and on the east side is residential area. South and north of the site are two allotment gardens located.

In each of the south- and northeast corners mountain rooms are located, one hosting district heating and cooling and the second one belonging to Göteborg Vatten. These doors have to be accessible when built in the area.

Since the location currently is a parking lot, the area is relatively flat. In the summers the site is surrounded by a green wall of trees, something that loses its effect in the colder months. Apart from the high residential buildings in the east and some residential area in the horizon in the south the sightlines are mainly green.

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Image showing bigger part of the site, taken in north direction.



Image showing bigger part of the site, taken in south direction.



Images showing how the site looks when approaching it



Image showing one of the two mountain rooms on the site

### Functions in the area



# Approaching the site

The site is located close to Sahlgrenska hospital which has good transportation options. The public transport opportunities are a short walk away, at the stop Medicinaregatan five trams and two busses stops. A bit further away the stop Sahlgrenska huvudentré is located, here three additional busses stops.

The most common way to arrive to the site is from the south, by public transport a seven-minute walk awaits, the same way is used by bicyclists and drivers as well as the pedestrians. Walking from the oncology clinic at Sahlgrenska to the center would take approximately 9 minutes, taking the bike or car would only take 5 minutes.

There are several small paths leading to the site from the residential area north and east of the location, mainly used by pedestrians.

#### Car and public transport





The walk from the tram stop towards the site is mainly next to the allotments



The walk is almost flat with only a small angle making it easy to approach.



#### Pedestrians and cyclists

Pedestrians Cyclists

# Species and greenery

In the nearby area there is a lot of different recreational areas. Two parks, Slottskogen in northwest, and Botaniska trädgården in the south. Also located in the south is the nature reserve Änggårdsbergen. The allotment gardens contribute with greenery as well.

Lesser spotted woodpecker is today a threatened bird that exists in the area. In the nature inventory made by Norconsult (2013), this bird is in focus, and it is important to not disturb or take away the birds' habitats and other needs for its survival. By using an existing parking lot, the existing spices and their habitats will remain and the flora and fauna in the area can continue to flourish.



# Site strategies

To approach the site in a good way, some site strategies has been developed. This has helped me develop the project in coherence with its surroundings.



Take advantage of the already hard surface and build on them and let the green areas stay green.

Common trees in the area





Bird cherry



#### Green structure



Other local nature value Other nature areas







Create a green connection between the two allotment gardens in the south and north of the site. In this way the project will contribute to the area and not only to the cause of the center.



# **3** Program

This chapter presents the architectural and organization program, mainly based on answers in the survey made. Users of the center are presented as well as design strategies.

# Organization and activities

The center is for those affected by cancer, both people with the diagnosis as well as their loved ones. The intention with the center is to strengthen these people, both physically and mentally. Physically by offering for example rehabilitation, meditation and yoga. Mentally by providing social support, knowledge and the feeling of not being alone.

The centers primary users will be individuals but there is possibility for different cancer organizations to host events. At the center you can just drop-in, attend a certain activity, book a private meeting or stay as a guest at the patient hotel.

This center will mainly be driven by volunteers, somehow affected by cancer, and paid staff. Lecturers with expertise in for example cancer, exercise or nutrition will be hired to come and hold lectures.

The nearby location to Sahlgrenska will hopefully open up for collaboration between the center and the hospital. This will help people affected by cancer to get knowledge about the center and possibly support in the first visit.



### Users

There are three types of users of the center, cancer patients, family and friends and staff. Each person will use the center differently and having different needs and expectations when entering the building.

#### Cancer patients

The primary users of the support center are those diagnosed with cancer. This includes those with ongoing treatment, chronic cancer and those in remission. They can come to visit the center or stay as a guest at the patient hotel while undergoing treatment.

There is no age limit, but since the existing support for children with cancer i located at the childrens hospital, the centers activities are mainly focused on adults. This includes the teenager just finishing high school, the young adult about to start life, the dad with three young children, the single mom, the man in the middle of his carrier, the lovely grandmother with 10 grandkids and the newly retired wondering what to do now.

The spectrum is broad, and a variety of activities is offered to meet all the needs there might be. The center offers rehabilitation, yoga, tactile massage, counselling, lectures, everything from the more active and planned activities to the more calm and unplanned conversations and everything in-between.



#### Family and friends

Partners, kids, parents, friends and coworkers, they can all get affected when someone gets diagnosed with cancer. Life changes for those living with someone diagnosed with cancer alongside with the patient. The daily life can probably not go on as before and a lot of worrying and stress is usual. At the center loved ones can for example come and meet people in the same situation, get someone to talk to about their worries, get help with how to explain cancer to small children and attend lectures. It might not always be easy to talk about cancer between loved ones and with this the center can offer support.



#### Staff

As mentioned, the center will be driven by volunteers and paid staff. Many of the people in the personnel, both paid and volunteers, have some connection to cancer. This will ease the visitors knowing that the people they meet have an understanding that cannot exist if not experienced firsthand.

The staff affected by cancer will benefit from the activates and spatiality in the same way as many of the visitors will. They might have come further in processing their cancer but that is not the same as not needing support and coherence.

It is important to have an office close to the entrance, so staff can withdraw and do paperwork but still have an overview of who is coming and going. A staff room is also useful even if the staff is encouraged to mainly use the public areas of the building.



# Functions

Function	Amount	$M^2$	M <sup>2</sup> (total)
Entrance/lobby	1	30	30
Kitchen	1	40	40
Lecture hall	1	54	54
Exercise room	1	34	34
Group rooms	2	8-12	20
Creative room	1	22	22
Pocket spaces	4	7-15	42
Locker room	2	17	34
Treatment room	1	9	9
Office	1	15	15
Staff area	1	20	20
Toilets	4	2,5-5	17
Hotelrooms	10	25	250
Storage	3	8-31	58
Technical space	6	11-62	132
Waste	1	6	2
Cleaning	1	12	12
Laundry room	1	13	13

41

Total (Including circulation and additional spaces)

Room flows

1300

Visiting a support center is something very personal, and it is therefore important that the architecture supports the feeling of safety. The more public functions are therefore located towards the street in the west. The more private rooms are located towards the garden where the insight is not to fear as much.

The hotel rooms are located on the first and second floor to give them more privacy by not having to face someone immediately outside of the window.





# Patterns in focus



Visual Connection with Nature A view to elements of nature, living systems and natural processes.



Material Connection with Nature

Materials and elements from nature that reflect the local ecology or geology and create a distinct sense of place.

# **Design strategies**

Four design strategies have been developed to keep focus throughout the project. These goals are mainly based on wishes from the surveys in combination with biophilic design, in hope to create an environment that support the activities and needs taking place in the center.



Connection with Natural Systems

Awareness of natural processes, seasonal and temporal changes characteristic of a healthy ecosystem.



Use local materials for sustainability reasons and coherence with the area.



Presence of Water Experience of a place through seeing, hearing or touching water.



Prospect An unimpeded view over a distance, for surveillance and planning.



Refuge

A place for withdrawal from environmental conditions in which the individual is protected from behind and overhead.





Create safe а environment where you can feel protected and pick the degree of social interaction that suits you.



Make nature a part of the building and make sure it is accessible for everyone.



Create a human scaled building in contrast to the large hospital.

# Shape process

Different shapes have been tried and evaluated throughout the project. The focus on the volumes below has been varying, searching for the one suited best for the site.

On some I tried to keep the building to only two floors, to keep it small scaled but it ended up in a massive volume.

Instead, I started elaborating with three floors giving each floor some outdoor space thanks to the growing building. This gives an affinity between the shape of the mountain behind and the volume.

> On these the building is shaped in a solid volume creating a very heavy impression.

MAR PARA



North Base

A more solid hotel part created a more uneven building.



**医**教育教育

Ending up with a long rectangular piece. V Two atriums were added to the building square. V A second floor was added, placed with the mountain as a spine and with the attempt to block the atriums as little as possible.

Since the site is narrow, I

started out with looking

at how much space I

had to work with.



floating down to the ground.

# **4** Design Proposal

This chapter contains the master thesis final design proposal, it is the result of the findings made during the semester. A support center for people affected by cancer that can help them through a though time. The design proposal is explained through diagrams, drawings, illustrations and text.



When approaching the site, the building floating down from the mountain greets you. The glazed entrance gives a glimpse of what is going on inside of the building and the threshold is lowered by being able to prepare for what is to come.



Site plan Scale 1:1000

# Site approach

Entrance towards south or west, visible when you enter the site

Scaling down from the high buildings and mountain in east to the smaller allotment gardens nearby

Creating a green connection between the two existing allotment gardens. With a garden as well as green elements in and on the building.

Keep a distance between the cars and the building with a green area.



Lanscape section Scale 1:1000



The image gives a perception of the volume in relation to its surrounding. The loading is located south of the building to minimize the traffic that needs to pass it. The parking for the center is located to the west. Both the loading and the parking is in reinforced grass, this breaks up the hardened area and helps take care of rainwater.

# Ground floor

1. Lobby

2. Kitchen

- 3. Creative room
- 4. Office
- 5. Lecture hall
- 6. Exercise room
- 7. Lockerroom
- 8. Atrium
- 9. WC
- 10. Staff room
- 11.Treatment room
- 12. Group room
- 13. Garden storage
- 14. Waste
- 15. Social spaces

3





When entering the building the lobby gives a good overview of what is happening in the more public parts of the building. This gives the visitor a degree of choice of social interactions. There is a small library with a chair and a bookshelf for those not wanting to enter the building further. To lower the threshold of the first visit the entrance is a safe zone not overwatched by a reception but in close connection to the kitchen, the stairs as well as the office and someone will always come and greet the visitor.

 $\left( \right)$ 

Ground floor

Scale 1:200

Continuing into the building the public and semi-private rooms are facing the street whilst the ones in need of more privacy lies on the other side, facing the small green path and the mountain. The corridor gives a good overview and divides the different zones in a natural way, to ease wayfinding for the visitor.

The lecture hall and exercise room could be merged into one larger room for hosting bigger events. The closeness between the lecture hall and the kitchen ease the possibility to serve coffee and such during breaks. The small pocket spaces placed in the corridor offer a place to sit down and rest if out of breath. They also give great refuge for those wanting to draw back but still want to have a clue on what is going on in the rest of the center.

The closed group rooms offer more privacy for the most intimate conversations taking place. The variety of rooms and privacy is large to satisfy all the visitor's needs.

A second entrance is placed on the northern part of the west façade, close to the locker rooms and exercise room. This gives frequent visitors another possibility to enter or leave if not feeling comfortable using the big entrance.

There are several other doors leading outside to reach the garden, these are not used when entering the center but more as a way to easy get out on the center's premises.





The kitchen is one of the most important rooms in the building, it is an open room inviting all to join in. Fika is a Swedish tradition that allows us to meet over a cup of coffee. Having something in your hand, allows you to focus on this if the deep conversation taking place makes it uncomfortable to keep eye contact.

Here fika is served at least once a day and there is always a fresh pot of coffee. This is also where the hotel guests' meals are served. The kitchen is a lively place and function as the heart of the building.

Section A-A Scale 1:300

# First floor

1. Hotel room 2. Terrace





The first floor is a hotel floor and is mainly for hotel guests. When entering the floor, by elevator or stairs, the view towards the large terrace is what greets you. The large terrace can be used by the hotel guests as well the visitors of the center. It gives more outdoor space to the narrow site. Many different places to sit is offered, you can be almost enclosed by the large flower boxes surrounding the terrace or chose to sit in one of the sofas watching over them instead.









Personell

On this floor six rooms are located, all of them have a view outside when entering them and most when exiting them as well. To easily locate nature is something that has had an impact on this projects design.

# Second floor

1. Hotel room 2. Terrace 3. Laundry room



# Program



Private Public

Visitors

On the second floor four hotel rooms are located and as on the floor below, when entering and exiting a room there is a view directed towards nature.

On this floor the laundry room is located, it is mainly used by employees but can be booked by guests. When having a longer stay the everyday life should be possible.





On this floor a smaller terrace is provided to give all floors the possibility to reach the outdoors without having to go downstairs. The terraces on both floors are on the west side of the building and it is only in the east that the building blocks the sun.

# Basement

1. Storage

- 2. Cleaning
- 3. Heating
- 4. Cooling
- 5. Tele
- 6. Sprinkler
- 7. Electric
- 8. Ventilation



The basement contains the buildings technical spaces. Rainwater collected from the building is saved in the basement and used by the sprinkler system.

There are two separate storages, one for the center and one for the hotel. Here extra beds, chairs and equipment is stored.

The basement is accessible from inside of the building, entering close to the storage and cleaning, as well as a stair going immediately to the outdoors, with the technical spaces easily accessible.



Section B-B Scale 1:300

### Interior concept



When entering the building a grand but homey feeling is greeting you. From here all the rooms and activities taking place in the building are easily reached but there is a choice to just stay in the entrance, if the threshold feels too large.

On the inside of the building the focus on nature and local materials is as precent as on the outside. The stone pavement on the outside floats into the building and merges the outdoors, the entrance and the atrium together. In the rest of the building there is mainly wood flooring, this gives a homey feeling, something that has been wished for in the surveys.

The wooden structure is showing on some places and smaller wooden beams are placed as room dividers but do also give a hint about the structure even if not load bearing. These wooden beams are placed



The main corridor is framed with wooden beams, between some of the beam's lights are placed to create a diversity.



The atriums in the building are not only for letting light in from different directions but work as room dividers.

in different places throughout the building, as dividers to give privacy but still keep a connection between rooms. This creates an open atmosphere in the center, to welcome anyone interested in taking part of the ongoing activities.

Most of the walls are in a light color but in some places a different color or wallpaper are added to give contrast. This together with a lot of exposed wood gives a light and warm feeling to the interior.

# Private areas

The two group rooms are intended for smaller groups to sit down and talk, therapy sessions and a sanctuary to sit relax and reflect in. There are many more spaces where this can be done but these are the ones always dedicated to this specifically. To create a cozier feeling in the group rooms, the floors are covered in carpet.

The group rooms, pocket spaces in the corridor, as well as the hotel rooms have different themes connected to nature. For example, the forest and jungle themes give a darker and more calm feeling whilst the meadow and beach themes give a more uplifting and bright feeling. This stimulates the mind and works as positive distraction when having different things to look at and take in.



This jungle themed pocket space in the corridor feels like its own room thanks to the height difference in the floor.



With happy, but still calm, colors the group room is furnished with views towards nature and details that gives a feeling of being home.



The creativity room is mainly a place where art classes takes place, it is a space where everything else is let go and focus is on creativity. The room can also be used for group therapy sessions when there is a need for a bigger room than the group rooms.





Hotel room



Hotel room section Scale 1:50

The patient hotel consists of ten rooms. They are all designed to host at least two adults, if a family of three wants to come all together the small sofa can be unfolded into a bed. The rooms can be furnished with two separate beds if the visitor brings a helper or a friend and does not want to share bed. When going through treatment most people have a need for support and to bring a loved one is something that should be easy.

The rooms are 25 m<sup>2</sup>, they all have high accessibility to allow anyone to stay at the hotel. When entering the room, a view towards nature greets you, the bed is not visible from the entrance to create privacy when lying in it. The rooms are furnished with the intention that daily life can be ongoing while visiting, equipped with a desk, a small fridge and a sofa. The windows are deep enough for someone to sit in, this creates a hang out area between the sofa and the window.



Hotel room with single beds Scale 1:100



The calm and darker color gives a sense of safety and helps with relaxing when in the hotel room.



The bright corridor on the second floor brings nature inside with help of the large windows and gives an uplifting feeling when exiting the hotel room.

# Exterior concept



North facade Scale 1:300

For the façade thermo pine is chosen. It has a low moisture absorption which makes it optimal for outdoor use. The thermo wood process is chemical free and the modifications made is making the whole wood stronger not just the surface.





building, the ground floor's wooden panel are placed horizontal while the upper floors panel are placed vertical, by keeping them in the same material the connection that exists between the floors are kept. In the details, windows and benches, oak is used as a contrast material. Both materials are local timber, something that has been important when it comes to choosing them, it is environmentally friendly and will help the building with blending in with its surroundings.

To enhance the two different uses in the

West facade Scale 1:300

East facade Scale 1:300



South facade Scale 1:300



Facade detail Scale 1:50







The building is highest in the east to keep the relation between the building and the mountain. The building then gradually contains more space with the ground floor as the safe base. The pitched roofs keep the building to a human scale as if there is small rowhouses placed above the center.

# Outdoor environment





The outdoor areas used by the center is surrounding the whole building and exists on all floors. The upper terraces offer hang out and relax places surrounded by flowers and greenery, with a view out on the allotment gardens and the surrounding greenery.

Surrounding the building is a walk path with different things to look at along the way. In the south of the building cultivation boxes are placed, here the visitors can learn about gardening and in an easy way connect with nature. In the north a small playground is placed for the center's youngest visitors.



The path leading around the building splits in various places giving the pedestrians a choice of direction.



The terrace is enclosed by greenery, to support the biodiversity in the area and give a calm and nourishing atmosphere to those stepping out.

Three fountains are placed to bring in the presence of water into the center, one in the atrium, one in the garden and one on the first-floor terrace. The last one helps collecting rainwater and can be used to water the plants on the terrace.

Flowerbeds are placed on each level hosting local plants that gives awareness of the seasonal changes. These are also a part of the gardening activities arranged by the center.

# 5 Summary

This chapter contains the discussion and conclusions made in the process of this thesis. Hopefully this can contribute to the discussion and development of cancer care in Sweden.

# Discussion

This thesis aimed to investigate how architecture can support people affected by cancer. It started with the existing plans of an extension of Kraftens hus as a center in Gothenburg and the experienced gap in today's healthcare that lies in the mental and physical support. The design proposal resulted in a center close to Sahlgrenska that would fulfill this experienced gap.

The type of organization that are aimed toward do exist in Sweden, but not in Gothenburg and none of them have buildings tailor made for their activities. Having architecture that supports these activities will help the purpose and help the people visiting feel safe, thought of and give them a sense of belonging.

By incorporating nature with the help of biophilic design the center will be associated with what is natural for us as humans. Nature is good when it comes to health and wellbeing and will help lower stress hormones for those visiting the center. Nature creates stimulating atmospheres and positive distraction, something that develops the brain and keeps focus on other things than pain. Using biophilic design as a strategy is one of the things that has been most challenging during this thesis. Having nature surrounding a building is easy but how to incorporate it in the building design in a good way was not as easy. This is knowledge that I now have started to investigate and will be able to bring into my future projects.

The user focus has been of uttermost importance in this project, to create a safe environment where those affected by cancer can feel like they are the ones in charge, the interviews and surveys made have played a big role in this. Since I have no experience with cancer, and everyone's experience is different, the information gathered have helped me develop a building that can answer their wishes with support from existing research.

# References

# Conclusion

In conclusion this project focuses on how architecture can support a cancer support center in Gothenburg. It resulted in a combination of a support center and a patient hotel for cancer patients coming from afar, with biophilic design as a tool to implement nature.

The biophilic patterns that has been in focus is about making nature a part of the building. It is not just about seeing nature but hearing, touching and smelling it as well. To perceive natural cycles, patterns and movements, sometimes just subconsciously as a complement to the more obvious tree outside of the window.

Future research in this field could be focusing on continuing the development of biophilic design in this type of building. The time has been limited and digging deeper into different activities and how they can be supported by architecture and biophilic design would take this a step further.

Another step could also be to ask if this design is only needed for people affected by cancer, or is there an existing need for similar centers when living with other chronic illnesses as well?

This project contributes to the more human and planetary centered design and care that is evolving in Sweden. This project also opens up for the discussion about the stigma that many people affected by cancer experiences, something that is necessary when looking at the prognosis that half of the population will be diagnosed with cancer at some point in their life by 2030.

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# GNISTAN

- The spark

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