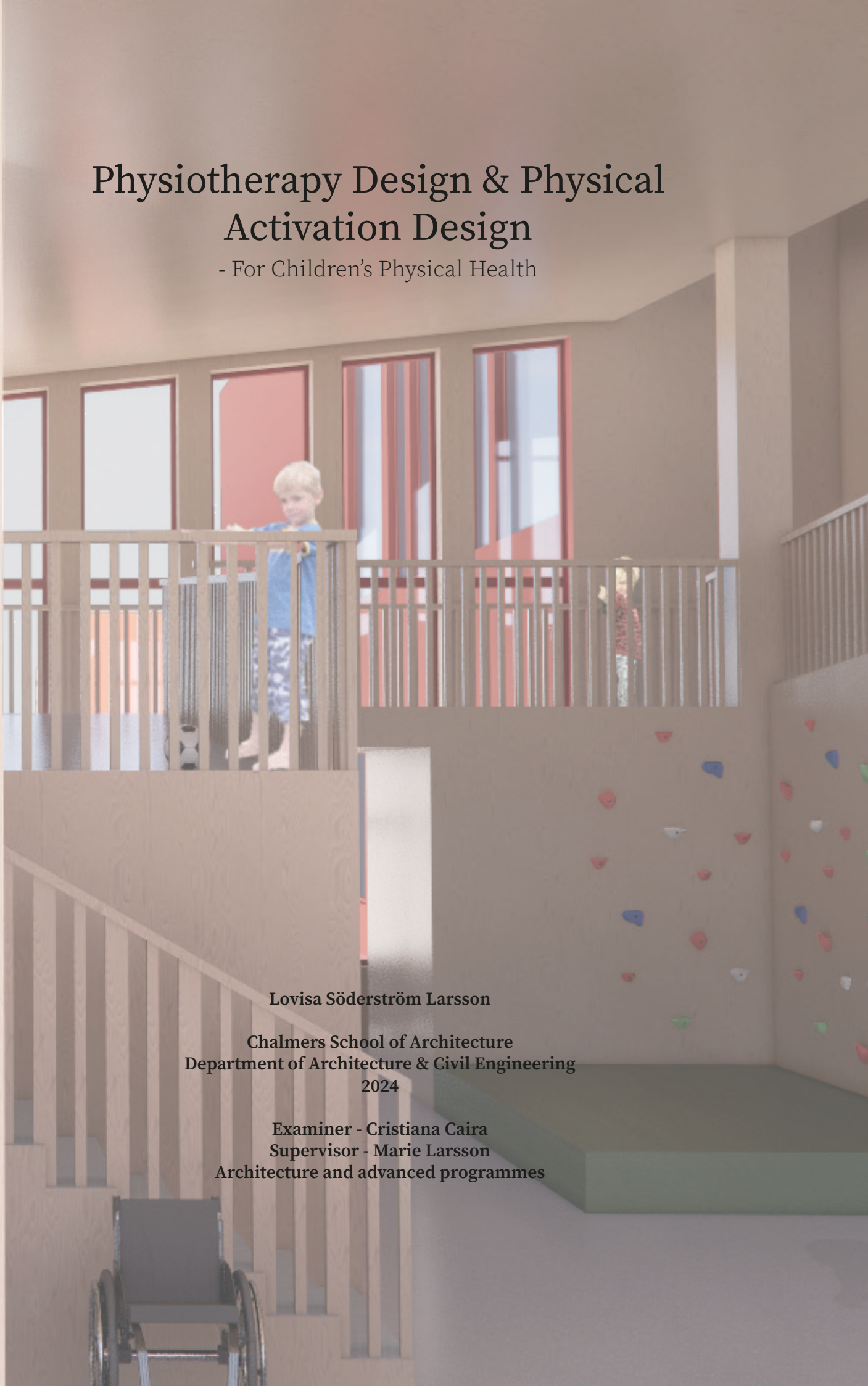
Physiotherapy Design & Physical Activation Design

- For Children's Physical Health



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Chalmers School of Architecture
Department of Architecture & Civil Engineering
2024

Examiner - Cristiana Caira
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Architecture and advanced programmes

Honerable mentions

Mum & Dad

Grandpa Henrik Söderström for always supporting me

AND

As a thank you for participation, sharing of knowledge, engagement & your time

Carolina Klüft & Sara Westberg - Generation Pep

Linus Bernhardsson - Unit manager & Physiotherapist at Capio Ortho Center Rehab Göteborg

Anders Näs - IFK Kliniken Rehab/GLTK

Elke Schubert Hjalmarsson - Unit manager & Specialist physiotherapist at Drottning Silvias Barnsjukhus, Occupational therapy and physiotherapy children

Fredrika Mattsson - Assistant principal F-5 at Noblaskolan, Nya Hovås

Hjalmar Oskarsson - Plan Architect at Trollhättans stad Stadsbyggnadsförvaltningen

Rebecca Norberg Johansson - Guardian to child in habilitation

Eva-Johanna Isestig -Designer

Viktor Weiselius & Micaela Lööf - Sylteskolan

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Master thesis
Spring 2024

Abstract

Children's health related to physical activation is not something new and we all know the positive outcomes. Today it is to little of the activation which concern us about the children's health status.

I saw how it was important to do something for the physical health, because it is a big part of the whole health perspective and related to the health status, and how that could be done by combining functions as physiotherapy and physical activation in one building, to improve children's physical health through rehabilitation and habilitation and with activation, and exercise. The solution was to find possible strategies to realise it in the building design, where these functions were combined.
It was a strive for the inclusion of groups and accessibility, to make it possible for people with different needs and wishes to use the space.

In the process an inventory of physical therapeutic activities have been compiled into functions and turned into a room program and brief. What to include in program and design also came from three physiotherapy clinics and projects related to physical activation. Relevant interviews discussed physiotherapy, physical activation, children's needs in care, staff flows, facilities, and context of project, together with specialist literature for physiotherapy students. Other reading about activity in design and other contexts, gave input to the program and later the design as well.

The finished building shows how the two functions uses each other (Schultz, 2023) and how the room designs becomes a useful space for physiotherapy, but also for physical activation. The building design offers playfulness, healing spaces, challenges, exploration, variation in intensity (Movahed et al., 2023; Närhälsan Västra Götalandsregionen, 2019) group activities, space for the physiotherapist resulting in inclusion for all children (Movahed et al., 2023) and improvement of the physical health. The building also results in complex structures and flows, since the sharing of rooms between the two parts of the program creates a symbiosis and invitation to other occupancies (Schultz, 2023).

Finishing discussions describes the project as a contribution to a visualisation of the concept.

Keywords: Physiotherapy; Physical Activation; Building Design

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Introduction

Major subject /Problem description of study

The thesis focuses on the functions and programs of physiotherapy and physical activation. It is directed to improve children's physical health through rehabilitation, and habilitation, since the physiotherapist have an education in both (Fysioterapeuterna Sektionen för habilitering och pediatrik, 2016), and with activation, and exercise. These functions will be dedicated to the children both in the way of healthcare through the physiotherapy, and for play and movement in the active environment. From research within the topics, an idea over a building that support the programs will be presented. One major part of the focus will be the symbiosis of physiotherapy and physical activation and how these functions can take advantage of each other. The goal of improving the physical health makes physiotherapy and physical activation a tool in the work with that (Shannon et al., 2021).

Generation Pep Sweden (n.d.a.) and Boverket (2021) describe the health issues that can occur in our daily life when we don't have enough of movement. This is supported by Shannon et al. (2021) who is presenting the possible heart problems, and tack on the bad status about obesity. Generation Pep Sweden (n.d.a.) bring forward diabetes and mental health effect despite the heart problems, as something children could end up in. Boverket (2021) agrees with the mental health and add even more aspects. The diet has the same level of importance as the movement and the key in the work of shaping durable routines is to have a big focus in the younger children (Generation Pep Sweden, n.d.a.; Shannon et al, 2021).

The chances of suffering from the mentioned physical and mental issues could be reduced if we become more active (Generation Pep Sweden, n.d.a.).

The point of physical activation through physiotherapy is to receive health benefits to improve the capability of the body (Beckung et al., 2013a; Fysioterapeuterna Sektionen för habilitering och pediatrik, 2016; Shannon et al., 2021; Roşca et al., 2022). This type of physical activation could be unique for the improvement of one ability, and it can also simplify the daily-life and tasks (Beckung et al., 2013a; Roşca et al., 2022).

Exercise releases endorphins positive for the mental health, to give another good example.
It is not only the health benefits that shows the significance of the topic. Beckung et al. (2013a) is describing the relevancy to the Children's Convention and the obligations and requirements we have for the children. As well does Movahed et al. (2023) and Närhälsan Västra Götalandsregionen (2019) and they describe the importance of the appearance of equality and inclusion of all children to be presented in it. They are highlighting there is a responsibility for the no neglecting of groups and that the care and inclusion of these are of a great meaning (Beckung et al., 2013a), something also Shannon et al. (2021) mediates through stories from physiotherapist that are focusing on that. The context is not only brought up by Beckung et al. (2013a). It is one of the compasses for Generation Pep (Generation Pep Sweden, n.d.a.), where their idea of physical activation is aiming for that. It is of importance for Generation Pep to understand what children perceive as well as reaching out to bigger groups.

Children within rehabilitation could have other prerequisite than other children depending on if there is a function variation or condition (Beckung et al., 2013a; Fysioterapeuterna Sektionen för habilitering och pediatrik, 2016 ; Shannon et al., 2021; Roşca et al., 2022). Balance rehabilitation is something that could be necessary if you have autism for example (Roşca et al., 2022). Depending on situation it is possible a bigger team work with the patient, but also making the parents included (Beckung et al., 2013a; Fysioterapeuterna Sektionen för habilitering och pediatrik, 2016 ; Shannon et al., 2021). Beckung et al. (2013a) continuing by describing the physiotherapist must work to find solutions to children within habilitation to make an improvement possible (Fysioterapeuterna Sektionen för habilitering och pediatrik, 2016), but it should not be time consuming (Beckung et al., 2013a). This improvement is also something Shannon et al. (2021) describes when presenting similar situation of work tasks for the physiotherapists. These solutions could be examples of physical activity (Beckung et al., 2013; Fysioterapeuterna Sektionen för habilitering och pediatrik, 2016; Shannon et al., 2021). Something that interplay with Shannon et al. (2021) describing the health risk in vulnerable groups and possible solutions for it.

These issues and benefits constitute an important reason for the need of a project like this. The project would support the work with the health problems and act as a tool for the whole movement of change.

The main user group would be children in general. In the expansion of the program and within the symbiosis will the user group become wider when bringing families together (Beckung et al., 2013a; Generation Pep Sweden, n.d.a.; Movahed et al., 2023; Roşca et al., 2022; Shannon et al., 2021), but still with the starting point in the children. The building has potential to expand and combine more functions for parallel use, which would make it possible to expand the size on the building. That shows the possibilities for a complex and logistic program, which the building must answer.

The references above show how health is a primer issue when we have these potential health problems (Beckung et al., 2013a; Boverket, 2021; Generation Pep Sweden, n.d.a.; Shannon et al., 2021; Roşca et al., 2022). But if there are not enough of developed methods to handle it (Shannon et al., 2021), an extra dimension is added.

For example, Shannon et al. (2021) strengthens the reasons for combining physiotherapy and physical activation by explaining how there are no great examples, but how that is something that can support disabled children and children in general and making the access to activation easier. They also explain by referring to previous studies of how the topic of combination within the occupancy organization already is discussed. They describe it as important to have buildings that can handle people with variate capacities and it is presented not to be so common, but it would be good if it was (Shannon et al., 2021). Support varying capacities is mentioned by Movahed et al. (2023) as well. A building having these functions is described to be good for promoting activation (Shannon et al., 2021). Both physiotherapy and physical activation are included in the physiotherapist's profession which shows the importance from a staff perspective (Beckung et al., 2013a; Fysioterapeuterna Sektionen för habilitering och pediatrik, 2016; Shannon et al., 2021) and the relevancy for the collaboration of functions (Shannon et al., 2021). This can be placed in situation to Beckung et al. (2013a) and Generation Pep Sweden (n.d.a.) description of the Children's convention, where this is an example of an inclusion (Shannon et al., 2021).

It will mainly be a work against the health problems, the support of it, and make space for change. But this project would also be an answer to the problematic or add qualities that can improve those weak parts described by Shannon et al. (2021).
In conclusion it is to work with the physical health issues by attempting Generation Peps focus of physical activity (Generation Pep Sweden, n.d.a.).

Research question

How could the building design include and integrate physical activation and physiotherapy to improve physical health of children?

How can the integration between physical therapy and physical activation take place and how can possible strategies combine them?

What should a children physiotherapy department consist of and what design do kids with special needs, need for the habilitation?

What is needed in inclusive design for children to be active with parents and other children no matter of disabilities, in consideration of participation, will and promoting being active?

Definitions

Inclusive design

Variation of spaces to meet the needs, attractive elements for the whole family, and offering space for several capacities (Movahed et al., 2023).

Physiotherapy

In this report are functions as rehabilitation, habilitation, physiotherapy, and occupancy therapy included under the same category, since Fysioterapeuterna Sektionen för habilitering och pediatrik (2016) describes the possibilities to employment in different occupations.

Symbiosis

Physical activation and physiotherapy hand in hand, presented as the professions starting point (Fysioterapeuterna Sektionen för habilitering och pediatrik, 2016). How physiotherapy can take place during regular exercises (Roşca et al., 2022) and how they are related (Shannon et al., 2021).

Rehabilitation

Rehabilitation is when you had full function from start and need to rehabilitate to get back your function after an operation, for example (E. Schubert Hjalmarsson, personal communication, December 29, 2023).

Habilitation

Habilitation is for the children who won't gather full function and for example are born with the preconditions of not full function. These children need the habilitation to function as good as possible (E. Schubert Hjalmarsson, personal communication, December 29, 2023).

Background

Personal starting point in topic

Physical activation has always been a personal interest. I have enjoyed participating in sport during my youth both in football and team gymnastics. The last one is still one of the exercises I prefer, when it is both fun, physical, and social. But my interest in sports don't stop there.

Gymnastics was fun, but sometimes, also attached to injuries. I have been lucky it hasn't ended up in something too serious. But the ones that comes and goes, irritates and hurts is still tough. This has resulted in several visits to different physiotherapist. I saw that profession and work field as interesting at the same time as I was interested in the medical. When applying for university I was choosing between physiotherapist or architect. Eventually it ended up with architecture, but it wasn't obvious.

For the thesis I saw a possibility to make the two interests meet and close the circle before I enter the next stage as an Architect.

These experiences give a personal background and an overall understanding for the physiotherapist profession, even though it is on a basic level. Personal experiences over examinations and the situation in the exam room has given examples over the layout of the room and its elements, what and how you feel as a patient, and how the appointment together with the therapist can take place. For example, going through different exercises or treatments depending on situation and disease.

Topic inspiration and context in topic

The topic of physical activation is presented in several contexts. One of them who see the problematic and aiming for a change is Generation Pep Sweden (n.d.a.). With active methods for activity improve unhealthy signs (Generation Pep Sweden, n.d.a.; Boverket, 2021).

I see their vision, aim and knowledge as something inspiring, interesting, and important to connect to and keep build upon (Generation Pep Sweden, n.d.a).

There was a wish of taking part of even more reflections and insights from Generation Pep, to create a stable foundation for the work and to hear what they believe are important to reflect over. An interview was therefore held during the pre-studies in the autumn together with Generation Pep through Sara Westberg and Carolina Klüft. General discussion about the organisation were brought up together with different conversations they have with actors, special collaborations, research, different perspectives of physical activation for example in relation to user group, how you can explore the program and specific opinions about needs and functions.

C. Klüft (personal communication, October 25, 2023) explains the physiotherapy or rehabilitation they are facing is not about sport injuries but rather being a supportive function in the promotion of treatments and preventive health work, as a reflection over this thesis topic.

The organisational work is everything from influencing programs, concept making, collaborations, physical projects performed through physical gatherings or as real built projects in varying scale (C. Klüft, personal communication, October 25, 2023; S. Westberg, personal communication, October 25, 2023; Generation Pep Sweden, n.d.a.).

Relevant discussions in field

One relevant discussion is about how much connection it is between physiotherapy and physical activation. What literature says is that physical activation and physiotherapy are linked together by the physiotherapist to some extent (Fysioterapeuterna Sektionen för habilitering och pediatrik, 2016; Shannon et al., 2021). Beckung et al., (2013a) present a Swedish perspective over this. See problem description of study p.2.

Physiotherapy together with physical activation is something Generation Pep has discussed with Barncancerfonden, tells C. Klüft (personal communication, October 25, 2023) during the interview. The discussions have touched upon how cancer treatments and the period of illness can cause a loss of intercourse and preconditions for physical activity that could have been an advantage after treatment since it can lead to the physical condition becoming reduced. As a result of that they have in the discussions brought up how the therapists can get the opportunity to contribute during the treatment or before the treatment and how that becomes a reason for wanting facilities supporting that. If these facilities existed, it would be possible for the therapist to contribute, and the child would be able to reduce the complications. In addition to this Klüft also brought up the aspect of how it would be a way for siblings and the rest of the family to the cancer ill child to be active during the child's rehabilitation or treatment when it is difficult to leave the hospital, since you want to be close to the ill child. The sibling child relation is something Movahed et al. (2023) advocates in other situations. The sibling's physical health will not be forgotten, and the sick child gets rehabilitation or preventive treatment (C. Klüft, personal communication, October 25, 2023). "Möjligheternas hus" is a children cancer centrum and they have specifically lifted how an environment that encourage that would have been of interest (C. Klüft, personal communication, October 25, 2023). The discussions of childhood cancer and physical activation as a preventive method is brought up in more contexts, which Klüft refers to studies done by Karolinska Institutet, but the field of combination is also a topic in American studies.

Discussion in field in combination with inspiration and references

Stickers for interaction created by Mural Arkitektur is an already tried out promotion strategy (Generation Pep Sweden, n.d.b.). The idea will be brought into the design. C. Klüft (personal communication, October 25, 2023) described during the interview how it is a method for increasing awareness about the health.

Another project and the first inspiration source for this project, working with different health actors, comes from Generation Pep and Capio. Generation Pep Sweden (n.d.c.) gives another example of how physical activation becomes part of the primary care, which can be compared to Shannon et al. (2021) earlier presented view of physical activation and rehabilitation. I see a potential of evolving Capios and Generation Peps perspective into design instead of their way of working with it digitally (Generation Pep Sweden, n.d.c.).

S. Westberg (personal communication, October 25, 2023) develops how the collaboration with Capio was performed and their role in it during the interview. She explains how Generation Pep became a collaboration partner and could contribute by pairing the researcher Marie Löf and Karolinska Institutet, behind the digital project, with the care occupation Capio. What's now is a finished research study (Henriksson et al., 2020) showing how the digital project that were supposed to spread knowledge

Background

Discussion in field in combination with inspiration and references

and help the parents to encourage the children's health habits, in the app format "Ministop" succeeded concerning activity and diet (Henriksson et al., 2020; S. Westberg, personal communication, October 25, 2023).
I see a potential of evolving Capios and Generation Peps perspective into design instead of their way of working with it digitally (Generation Pep Sweden, n.d.c.; S. Westberg, personal communication, October 25, 2023).

Other types of projects beyond the Capio collaboration are for example how they work with centres with collected functions for children (S. Westberg, personal communication, October 25, 2023). Sara explains how the goal is to spread knowledge about the health and good habits to avoid an unhealthy lifestyle further on.

To spread the active lifestyle is also something Generation Pep tries to do through the Pep Parks, and these have certain criterion for instance how to reach out to more user groups (S. Westberg, personal communication, October 25, 2023; Generation Pep Sweden, n.d.e.). C. Klüft (personal communication, October 25, 2023) still points out how the parks have a big freedom. She describes them as an inspiration and an encouragement to see how an unused space could be used in an active way even if it is considered unusable for physical activation.

The work with increasing physical activation is done in other contexts as well. For example, in schools and preschools. Boverket (2021) gives examples of strategies in classroom and corridors (Zwenger & Tidningen LÄRA, n.d.), which can be found in other projects (Unisport, n.d.a.; Unisport, nd.b.), as well being proposed by Brittin et al. (2015), Movahed et al. (2023), Gymnastikförbundet et al. (2020) and Närhälsan Västra Götalandsregionen (2019). In this thesis would the physical activation be attached to the physiotherapy and won't be a secondary function. They have the same importance, when the physical health and physical activation is the main purpose and activity in the building. In schools, the teaching and learning is the primary function (Boverket, 2021). The movement is not something added to the project. It is the project.

Inspiration from other works

Carlén (2021) brought up the topic about physical activation in her thesis. The focus was on a different user group and on another site. But her work can be used as an inspiration.
She explored the topic and design both in her master thesis and in one of her previous courses. The master thesis is an development from that. What can be seen as an inspiration from these works are described further in the theory and programme when it comes to different elements in the activation. In her work she present different movements and activation (2020) that this thesis will make use of together with the input from other sources to understand what functions the building would need, to be able to support the activities the children does.

Like other references brought up in theory does Carlén describe in her work (2020; 2021) the spread of free activity or the ones being more controlled. This reflections will be brought up in theory and gives interesting input and shows how this building project could provide those things as well.

Despite the theory she is doing an interesting analysis for the selection of site and surrounding schools (Carlén, 2021), which is something I bring with me when I reflect over suitable place in relation to schools and other collaborative functions.

"Framtidens idrottshall" by Gymnastikförbundet et al. (2020) has done a thorough investigation about the gymnastic halls and their opportunities and compiled it under different categories concerning inclusion, current health situations and explorations of design by looking at the different rooms. The report has mainly been used as an inspiration to get in contact with the pictures of different reference projects to find inspiration to the design. The project references from the report are mentioned further on in the report under Case studies.

The work by Schultz (2023) have been an inspiration in working with one building that could be used by more than one occupancy and how they adapt depending on time.

Knowledge gaps

How can we work with this in another environment that becomes more general and public? Does it need to be an exercise area or a specific activation spot to make it happen?

It is needed to see relevant examples of how these functions can be visible together in design. For my personal knowledge gap, I need to see if I can find any similar projects to understand what I as the designer should think of. I don't know if there are any concrete advice or strategies for combining them. I need to find that out, and if I can't find any, it would be necessary to figure out by research. From Shannon et al. (2021) it is described that in Canada, they don't have any good examples of these functions combined. But do we have that in Sweden? Which ones could that be?

Contribution

The project will unite functions and strengthen the physiotherapy and physical activations relation (Fysioterapeuterna Sektionen för habilitering och pediatrik, 2016; Shannon et al., 2021), increase the social sustainability and reduce health problems (Shannon et al., 2021). Functional variations will be included.

The project will give another view of how the design of these facilities could be. Give extra perspectives to the architecture profession and collect ideas of the combination of functions and compile information from the different fields and actors. It will also be an inspiration for future master thesis projects in the field of physical activation or physiotherapy and hopefully an inspiration for real concepts and projects in the future.

General aim and specific purpose of the project

Combining functions as physiotherapy and physical activation in one building, aims to improve children's physical health through rehabilitation and habilitation since the physiotherapist have an education in both (Fysioterapeuterna Sektionen för habilitering och pediatrik, 2016), and with activation and exercise. Therefore, the goal is to find possible design strategies to realise in the building design.
In this way could the children in physiotherapy easily continue their rehabilitation process outside their appointments, in the attached physical activation sections of the building.

Within the thesis, aim for the inclusion of groups and accessibility, to make it possible for people with different needs and wishes to use the space together. This not only includes children from physiotherapy with different functional variations, but welcoming children and parents from surrounding neighbourhoods.

It will be two ways of working with the physical health, where the aim is to find solutions through design that is both healthcare and health promotion. Therefore, create a program that looks at the needs for physiotherapy, physical activation, the symbiosis and its supporting functions. The probability of a physical health improvement would increase if that were done.

Delimitations

- It is likely the building could be connected or in close relation to an already built primary care or other health facility. The design of the new facility won't focus on the primary care.
- Depending on the size of the building some functions or rooms will not be showed in detail. Some functions will be delimited or briefly designed to put the focus on the most important parts. Those specific points will eventually be described through text to state the relevancy.
- Economy won't be in focus.
- The delimitation or the freedom to the site is stated in the context chapter.
- There is no client asking for this building, but the starting point would be that it is one, and I would design for this interest. It will be a combination of the needs I consider are existing, and how this would be an answer for that.
- A simplification in descriptions of medical diseases and medical terminology.
- The design will be directed to the physical benefits of physical activation. The mental benefits is not in focus in the design.
- Safety - chemical safety
  Chemical safety will not be considered. The physical safety will be kept in mind and rationally reflected by personal risk analysis. The project won't follow any specific restrictions and regulations.

Reading instructions

- The research part of the booklet ends with the output from relevancy for sustainability, theory, context, and program. It summarises the most important parts and what till be brought into the design work.
- The output and the steps to reach the output can be found in the end of the chapters or topics.
- Method and process describes the steps and which projects and interviews that will contribute to the theory.
- The theory is divided in one part about physiotherapy, one about the symbiosis and one about physical therapy.
- The physiotherapy starts with research from literature and interviews and ends with case studies from study visits.
- The physical activation starts with research from literature and interviews, and ends with case studies from study visits and internet searches.
- The output from theory is summarised in the end of the chapter
- Context zooms in on site in steps together with different analysis.
- Understanding the activities and functions the buildings needs to find the rooms and room connections.
- Concept
- Building design and result.

Relevance for sustainable development

The combination between the functions of physical activation and physiotherapy and the user groups is shaping the idea of inclusion and accessibility. The project will work against inequalities, by building for people with different needs. The physiotherapy is a context where the people's capacities and needs depends (Fysioterapeuterna Sektionen för habilitering och pediatrik, 2016). One may need help to walk, while another needs to strengthen a knee. The physical health that is reached through physiotherapy will be reached from the physical activation as well, which makes the whole building as a node for health promotion and a step on the way for social sustainability.

Even if the focus will be on the project's social values, decisions on the way may have an impact on the ecological and economical perspective. It can be in the structure of the building, material choices or arguments of rationality. The project is working towards a topic that is mentioned in a sustainable context, specifically the Sustainable Development Goals (Salvo et al., 2021).
There is room to go deeper into Salvo et al., (2021) documentation to explore the SDG´s even more.

Sustainability OUTPUT

Social sustainability
1. Health promotion by offer an environment where you get invited to be physical active.
2. Rehabilitating by offer physiotherapy or habilitation in the sense of improving physical health.
3. Inclusion - Everyone are welcome and the building is aiming to support the individuals no matter of disability.
4. Adaptation for different physical levels. Let the building offer activities or elements where intensity level and difficulty level goes from low to higher in different fields (Movahed et al., 2023).
5. Accessible spaces & accessible options - giving the building a general accessibility but also different options that are available and still letting you be included in the play.

Ecological sustainability
1. A bearing construction in wood.
2. Options for extension.

Economic sustainability
1. Flexible rooms in the way of general usage when it comes to treatment rooms and how some rooms can serve different things depending on the current needs. Sharing room but controlling the access by several doors depending on time.
2. Co-exploitation -> making it useful for more than one occupancy, is inspired by Schultz (2023) way of combining occupancies, both applied when it comes to combining physiotherapy and physical activation in this context, but also when inviting more type of functions. It will be an addition to the special school that can lend space during specific times. To contribute to patient flow the physiotherapy could collaborate with Trollhättans primary care facilities.

Methods and tools

Research & Design (approach)

Research for design and research by design in a combination. The research for design will be more dominant in the early steps. In that way building up a foundation for what the design will need. A transition into research by design will come. In the combination I have the possibility to go back to the research for design. Existing research will guide me together with possibility for me to investigate how my design will work (Verbeke, 2013). An evaluation may say it needs to be changed (Verbeke, 2013). Research for design will be something I can fall back on.

Needed materials

To answer the research questions, it is necessary to talk to physiotherapists, people that are informed about physical health promotion, and physical activation. It is also relevant to talk with someone that is working with children or someone that can give information about different physiotherapy or activation facilities. Actors that have a possibility to answer questions related to Trollhättan would contribute to arguments for the decision of site.

With these actors in mind would the project gather qualitative research. The actors will be a tool to build up the theory about physiotherapy and physical activation for how the design could be in these facilities or what type of treatments that should get space. The needed material will also be related to what functions the activation part could have and arguments for the perspectives meeting in the design. It is important to have an understanding for the children's needs. For the physical activation it would be valuable to understand what type of activation that works for different physical capacities (Movahed et al., 2023) and what could promote movement. All this for connecting the physical space design to theory.

To find answers for this, the contact with people will bring information together with literature and reference projects covering both physiotherapy and physical activation design.

Actors related to fields and topics is mapped in table 1. Study visits projects related to field is mapped in table 2. The table 1 and 2 shows all interviews and study visits.

Methods / tools

The methods cover phases that could be divided in research, transition zone and design. For the researching parts interviews will give specific answers to selected questions, scientific papers and other relevant literature and study visits will expand the theory together with result from case studies. Collecting information will also help choosing the site. I want to document relevant facilities to add the physiotherapy and physical activation to. Carlén (2021) does a similar compilation while she creates a view over the physical activation situation on her site. The way she documents her sites qualities is an inspiration for me while writing about Trollhättan in the following context description, as well as the steps of context investigation by Schultz (2023).

Different analysis and mappings from inventory of site will contribute with understanding for the context. What the site will need and the possible affects it will have on the design. Compiling the inventory will be a way of explaining the context for the future presentation material and to describe why some decision may be taken.

Taking research and inventory as help in program creation.

Working with the program and translating it into scale and room areas in floor plan and continuing developing it into sketches. Volume studies will be a part of understanding the building and possible shape and diagramming to describe the uses of the building.

Developing drawings to later turn it into finished drawings showing all major parts of the building, together with physical and a digital 3D model for perspectives, to present the design idea as an answer to the research question and problem description. The design phase will partly visualise the result.

This would be the optimal sequence of tools, describing the project and idea.

Table 1

Interview and Topic

Interview person	Description	Field	Description of field / Deepened topic	Combined with study visits
Generation Pep	Organization	Physical activity	About the organization Promotion input Role of Architecture? Problem / situation /effect	
Elke Schubert Hjalmarsson (Västra Götalandsregionen Sahlgrenska Universitetssjukhus, 2023)	Unit Manager Sahlgrenska (Västra Götalandsregionen Sahlgrenska Universitetssjukhus, 2023). Physiotherapist	Physiotherapy and occupational therapy environment (Västra Götalandsregionen Sahlgrenska Universitetssjukhus, 2023). Physiotherapy Profession Environment	Understand the specific occupancy How you work with children. What do the children need? (Fysioterapeuterna Sektionen för habilitering och pediatrik, 2016).	X
Linus Bernhardsson	Physiotherapist	Physiotherapy Profession Environment	Their work Type of treatment The facilities	X
Anders Näs	Unit manager physiotherapy clinic	Physiotherapy Profession Environment	Their work Type of treatment The facilities	X
Eva-Johanna Isestig	Architect	Environment and childcare	Healthcare related rooms	
Hjalmar Oskarsson	Trollhättan Municipality	Program, functions, city planning	Options on sites	
Fredrika Mattsson	Assistant Principal	School yard	Activation	X
Rebecca Norberg Johansson	Guardian to child in habilitation	Habilitation	Experiences of the habilitation	

Note. Interview person, description, their field and deepened field BASED ON *Arbetsterapi och fysioterapi barn,* by Västra Götalandsregionen Sahlgrenska Universitetssjukhus, 2023, November 20, Retrieved January 19, 2024, from (https://www.sahlgrenska.se/omraden/omrade-1/verksamhet-neurologi-och-psykiatri-barn/enheter/arbetsterapi-och-fysioterapi-barn/) & *Vad gör en barnfysioterapeut?* [Information brochure], by Fysioterapeuterna Sektionen för habilitering och pediatrik, 2016, (https://www.fysioterapeuterna.se/globalassets/_sektioner/habilitering-och-pediatrik/aktuellt/infobroschyr-2016.pdf).

Table 2

Study visit or case studies and topic field

Study visits or case studies	Field	Type	Ownership
Drottning Silvias Barnsjukhus	Physiotherapy, rehabilitation (Västra Götalandsregionen Sahlgrenska Universitetssjukhus, 2023)	Hospital environment	Region
Ortho Center Rehab Göteborg	Physiotherapy	Sport environment	Private
IFK kliniken	Physiotherapy	Sport environment	Private
Generation Pep park	Physical activation	Playground	Public
Noblaskolan F-5	Physical activation in school yard	School yard interesting in an physical activation perspective	Municipality / private
Aarhus Gymnastic and Motor Skills Hall	Physical activation	Free play	
Spiralen - Denmark (Gymnastikförbundet et al., 2020; LOA Fonden & Johansen, n.d.).	Sport hall	Physical activation in an indoor context	

Note. Study visit, field and ownership BASED ON *Arbetsterapi och fysioterapi barn* by Västra Götalandsregionen Sahlgrenska Universitetssjukhus, 2023, November 20, Retrieved January 19, 2024, from (https://www.sahlgrenska.se/omraden/omrade-1/verksamhet-neurologi-och-psykiatri-barn/enheter/arbetsterapi-och-fysioterapi-barn/), *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall* by Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB, 2020, (https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf) & *Spiralen, Kalundborg, Danmark* [Photography], by LOA Fonden & R. Johansen, n.d, Framtidens Idrottshall. In Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB, *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall*. (https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf).

Figure 1

Study visit form

Study visit form

For each project - or study visit, the form will be a tool for documentation and simplification for a future analysis or comparison between projects, to get equivalent information. The form is open for extra documentation and addition of questions if the project needs it. Depending on project some questions will be more relevant than others. That would be taken in consideration for the compilation. A future compilation may focus on specific parts of the form.

- Project - *Name, context, situation*
- Type of project - *Which field?*
- Location - *Where?, Context, What is around? Inside or outside?*
- How do you get here? - *Is it easy to reach? What transportation options is available? Ways of entering the area? Parking space?*
- People - *Which individuals are here? What are they doing? How many? Age? How long are they staying?*
- What does the space look like? - *Which elements can I define? How are they connected?*
- Building design & Program and functions - *Which rooms is being used and included? How are they connected? What type of design is it? What functions are needed, which are most important?*
- Possible flows - *How is the place being used? Peoples flows? Flows in the activity? Is things done in a specific order? Does the room create flows?*
- Is something distinctive? - *Is something more used than something else? What is eye catching?*
- Furniture and equipment - *Sitting area, workout tools?*
- Materials - *Ground texture, walls, any patterns? Tactile*
- What do I notice with my senses? *Sounds, smells, views, taste, touch*
- Sketches & drawings
- In what way is it relevant for physical activation?
- In what way is it relevant for physiotherapy?

Note. Form with question for future study visits.

Process and structure of the thesis

Methodology

Stage 1- Concept phase

Searching for inspiration, title, research questions and aim.

Stage 2 - Research

All methods for information

Stage 3 - Compilation

Compiling all research material and visualize it

Stage 4 - Inventory phase

Inventory of both buildings and site, where note taking, photographing, measuring, documenting in a variation of ways helps out with the work of a site analysis or context analysis, to eventually formulate all the programs.

Stage 5 - Sketch phase

Continuation of formulating programs with a experimental approach and curiousness for ideas. Early sketches and process models (sketch models) / concept models together with diagramming leads to developed sketches and volume studies. Both in design and text.

Stage 6 - Development phase

Development of sketches turns into drawings and further volume studies and 3D-modelling. Writing text for booklet and reflection before the last stage.

Stage 7 - Presentation

In the presentation stage do the renderings and possible presentation model, presentation drawings and posters. The final text for booklet and preparation for seminar and exhibition.

Process

Some stages are parallel, the transition zone will be entwined between stages, possible that part of one stage is entwined in one stage temporarily. For example, I believe research and inventory would be parallel. Compilation would be connected and entwined with the research. The sketch phase is entwined in the research- and inventory phase but will become more in straight line in the end of that stage. The sketching will have signs of iterative process and the research and compilation may entwine some more. First part of the development phase could be iterative in the interlacement with sketch phase before it becomes more linear and ending in the linear stage of presentation.

Time plan - ACE370 & ACE425

Preparation course - ACE370 & ACE425

In the preparation was the path for the master thesis found and the understand of what fields needed to be explored, by visualising it in a table, diagram, and text. A study visit form, see figure 3, was prepared in an early stage for reflecting over what information that would have a value.

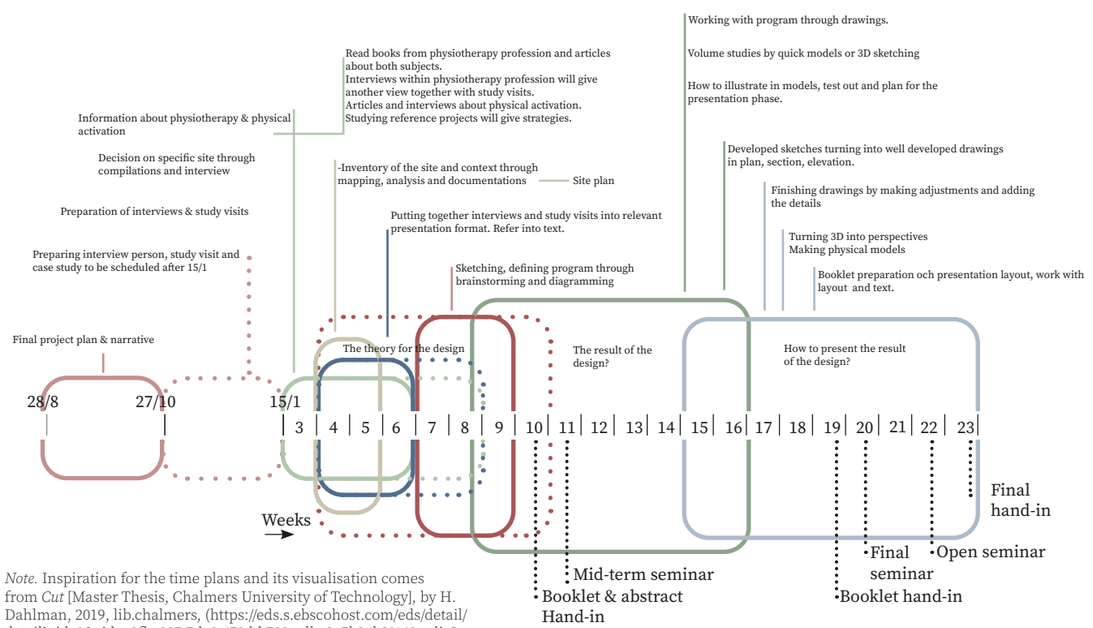
Most of the theory was done in the master thesis course, but some initial, the design narrative of “Symbiosis - physiotherapy and physical activation” was done in ACE425. This is as a way of showing how the two functions would work together in design. The narrative and theory from ACE425 is included in the thesis.

At the end of the course period of the preparation courses an interview with Generation Pep was held. This interview brought up the organizations work, aim, vision, ideas, and general reflections and questions for the following research and design work. Question about the Capio collaboration (Generation Pep Sweden, n.d.c.) was also in focus.

Process and stages overview

Figure 2

The original time plan diagram



Note. Inspiration for the time plans and its visualisation comes from *Cut* [Master Thesis, Chalmers University of Technology], by H. Dahlman, 2019, lib.chalmers, (https://eds.s.ebscohost.com/eds/detail/detail?vid=1&sid=c0fbe997-7de0-470d-b799-cdbe9a7b94b9%40redis&bdata=JnNpdGU9ZWRzLWxpdmUmc2NvcGU9c2l0ZQ%3d%3d#db=cat09075a&AN=clpc.oai.edge.chalmers.folio.ebsco.com.fs00001000.b98fdd2f.7393.4f34.82e6.a9135f62e840), & *Unlocking Tibro – Rethinking Collaboration and Value Making in Rurban Areas* [Master Thesis, Chalmers University of Technology], by L. Gabrielsson, & S. Peterson, 2023, Master’s Thesis 2023 Archives, (https://projects.arch.chalmers.se/wp-content/uploads/2023/06/petersonsofia_27742_2791670_Gabrielsson-Peterson_Linnea-Sofia_Rurban-Transformation_MT-2023-Booklet.pdf).

About theory references

The theory is divided in different chapters.

First part is looking into the theory of physiotherapy and goes deeper into the children's perspective, staff perspective and the facilities. Combination of reliable literature and interviews.

As an continuation of the first part are different study visits from physiotherapy facilities presented according to the study visit form. The documented projects are Capio Ortho Center Rehab Göteborg, IFK Kliniken Rehab/GLTK and Drottning Silvias barnsjukhus.

The second part is based on academic papers discussing the symbiosis of physiotherapy and physical activation resulting in some personal reflection. (Shannon et al., 2021; Roşca et al., 2022)

The third part introduces theory about physical activation in the perspectives of health, perspectives, accessibility, other contexts, the facility and its program. Combination of reliable literature and interviews.

As an continuation of the third part are a case study of Noblaskolan presented as well as some project references and inspiration.

As a final part of the theory is a compilation from the literature and interview concerning physiotherapy and physical activation, as well as an compilation from the important aspects from study visits and case studies. This is resulting in OUTPUT data within the categories of Function & brief and Architecture and design / heath promotion. The two categories of OUTPUT data are together with previous output data concerning sustainability and the following OUTPUT data concerning the site, based on the next chapter about context, are compiled together on a finalizing OUTPUT data page, ending the theoretical part of the booklet. It shows what is brought into the following Main Material consisting the design proposal.

Theories for Physiotherapy

Children rehabilitation and habilitation

It is important to understand what is included in the field.

Fysioterapeuterna Sektionen för habilitering och pediatrik (2016) describes several relevant topics.(Fysioterapeuterna Sektionen för habilitering och pediatrik, 2016).

Fysioterapeuterna Sektionen för habilitering och pediatrik (2016) together with Beckung et al. (2013b) are bringing up the profession and the work in the context of an educational book for physiotherapy students and goes deeper in to different treatment areas.

The treatment can be disease specific, which Roşca et al. (2022) gives example of when describing rehabilitation whiting autism. Their study is presented more deeply in the chapter "Symbiosis - Physiotherapy & Physical activation, p.22".

Elke Schubert Hjalmarsson, unit manager and physiotherapist at the department of "occupancy therapy and physiotherapy children" at the hospital "Östra Sjukhuset", describes how they work with patients in the physiotherapy from almost all department of the hospital. The physiotherapy is a bit different depending on the age on the children. The physiotherapy for the younger children requires more playfulness in the exercises and rehabilitation (E. Schubert Hjalmarsson, personal communication, December 29, 2023).
Since they offer physiotherapy in so many fields it is very different from patient to patient how much care and contact with the physiotherapist the children need and where the meetings are taking place (E. Schubert Hjalmarsson, personal communication, December 29, 2023).That is in line with Fysioterapeuterna Sektionen för habilitering och pediatrik (2016) description about the work field profession. Elke explain that if the patient is still in hospital, it is either in the rehabilitation department or in the patient's room (E. Schubert Hjalmarsson, personal communication, December 29, 2023), which is natural within the field (Fysioterapeuterna Sektionen för habilitering och pediatrik, 2016). Type of illness or susceptibility to infection decides the location since it can be patients from orthopaedic to cardiology departments (E. Schubert Hjalmarsson, personal communication, December 29, 2023; Fysioterapeuterna Sektionen för habilitering och pediatrik, 2016).
Some patients need continuous meetings and others only need two and when asking what you should think of when working with children Elke says that you always have the parents to think of as well, but the most important thing is the child contact (E. Schubert Hjalmarsson, personal communication, December 29, 2023).

Elke explains how their focus in the department is on the rehabilitation. The habilitation is in another department and the two functions are separated at the hospital. She explains the difference is that rehabilitation is when you had full function from start and need to rehabilitate to get back your function after an operation, for example. When it comes to the habilitation, she describes it is for the children who won't gather full function and for example are born with the preconditions of not full function. These children need the habilitation to function as good as possible (E. Schubert Hjalmarsson, personal communication, December 29, 2023). Similar understanding for the inclusion can be read in Fysioterapeuterna Sektionen för habilitering och pediatrik (2016)

Rebecca Norberg Johansson (personal communication, February 7, 2024) present her experiences of the habilitation, from a relative perspective to a child within the habilitation. She describes her good experiences and tells how the team around her child consist of a speech therapist, special education teacher and physiotherapist. It corresponds to Fysioterapeuterna Sektionen för habilitering och pediatrik (2016) description of the therapist wide work field.
R. N. Johansson tells the physical difficulties they are getting support in are hyper-mobility, hips, and feet by working with different support and mobilisation tools. The therapy is taking place in gymnastic hall.

Physiotherapist

The previous perspectives of the children's treatment will become deeper with the professionals and staff perspectives. In this way understand the profession in several ways.

Beckung et al. (2013b) and Fysioterapeuterna Sektionen för habilitering och pediatrik (2016) present a Swedish professional descriptions.
Fysioterapeuterna Sektionen för habilitering och pediatrik (2016) describes the staff perspective and how to work with children.

Shannon et al. (2021), brings in an international perspective showing their discussions. The results and discussions are presented in the thesis's following parts.

How the therapists are working are quite similar, but it is a bit different if it is a private or regional facility as well who the patients are and scale of the facility.

Anders Näs, Unit manager at IFK Kliniken Rehab/GLTK, which is a private owned facility, described parts of the physiotherapist workdays in their facility and their focus areas. Orthopaedic related physiotherapy visits are in majority with treatments covering the bigger body parts from shoulder to feet with no age focus. He says the staff circulates between the kitchen that is a multifunctional area covering breaks and possible meeting area, gym, and treatment rooms. They have no offices and therefore uses the treatment rooms for journal taking afterwards (A. När, personal communication, January 25, 2024).

Linus Bernhardsson, unit manager and physiotherapist at Capio Ortho Center Rehab Göteborg, shares about their physiotherapy occupancy. Their facility is private owned as well. Many of their patients are reaching out to them for help within the sports medicine field and they cover all ages. How they work with the patients could vary as well how much of continuous contact you have with the patient. That results in either more individual work for the patient following the therapist program at home, or more of the training at the clinic. In all the cases will the therapist evaluate the program and the progress. All work including journal taking for the therapist are taking place in the gym or in the treatment room. When it comes to the spread of specialisation within the occupancy or not, he says that is something that should be related to the number of staff. In the case of Capio Rehab centre the size of treatment rooms is smaller because of the way they want to manage the therapy. It leaves space for a bigger gym that can host a bigger variation of exercises (L. Bernhardsson, personal communication, January 23, 2024)

Occupancy therapy and physiotherapy children at Östra Sjukhuset is a bit different since it is in the regional hospital. Elke Schubert Hjalmarsson explain how they need to use offices for journal taking because they can't occupy a treatment room for journaling because there are more staff than rooms. When they are planning the program for the children, they want to include exercises working with own weight. If the therapist can't provide the children and their parents with exercises possible to do at home, it won't be to any help. By using door frames to do push-ups or using the nature, the same exercises that are done in the department would be available in their own home (E. Schubert Hjalmarsson, personal communication, December 29, 2023).

Physio facility

Another part of the theory is to understand how it is designed today.

• Which spatial features does the facilities usually have?
• Which are the general spatial qualities need?
• Should you have special spatial features for different treatments or situations?

Three project have been part of the understanding of the physio facility. These cases are listed in table 2 and under the rubric study visits further down. The aim for the practice-based references is to get an idea of how different physiotherapy environments can be shaped and designed. The projects should together give different perspectives from different environments. Both the hospital like and the private owned where sport health is more central. The study visit projects were chosen with the criteria of relevancy for physiotherapy to get an understanding for the need of rooms. *The study visit form* was used during the visits and its documentation.

During the interview with Anders Näs, he gave his reflection about the IFK Kliniken facility. A lot of his reflections about the facility is about the flows and relations between the functions, which they partly do by zoning. He says he prefers facilities with as short distance as possible between the gym area and the treatment rooms (3x4m). The facility Näs describes is on floor 2 which does it necessary with elevator and it becomes a barrier for people and an obstacle when it comes to the equipment. He describes the importance of designing the area for both patient and staff. When it comes to the staff, he says it is an active choice to make a difference in the colours and light in staff area compared to the gym, and how the lightning can create different effects and conditions. They don't want it to feel like a clinic (A. Näs, personal communication, January 25, 2024).

Linus Bernhardsson talks about different aspect that would be beneficial for a physiotherapy facility. He experiences the ceiling hight in their building is a bit too low and to have varying heights or generally a higher celling would offer exercises using the whole room volume. If the rooms were organized around the open gym area, they would all have the same access. The flow would be easier if it was only one floor. Thinking of the order and placement of the functions would avoid going back and forth. Offering exercise spaces that are open supports the possibility to adapt the therapy, similarly to the exercises you do at home or the spaces you have access to.

He describes how the facilities controls what types of exercises that are possible to perform and how the sizes of the rooms and space also limits the exercises (L. Bernhardsson, personal communication, January 23, 2024).

Elke Schubert Hjalmarsson (personal communication, December 29, 2023) says all rooms can be used by all patients since it has a general appearance, but some have some special functions making it more suitable for specific patient groups that requires special equipment and environments. The rooms are also depending on the age. Elke describes the problematic situation of an open office landscape with too few smaller private working spaces. When everyone needs to dictate the journals, you can't do it in a way without disturbing anyone else. They need more space for dictation. Another thing Hjalmarsson is talking about is the effect from colours. She believes the colours makes the environment more pleasant, but they need to be balanced. The staff is spending more time in the facility than the individual child and too extreme colours becomes annoying in the long period for the staff. But the colour also helps creating a more playful environment for the child and the design is a way of removing the possible nervousness among the children during visits. The hospital feeling should be removed but keeping parts of the serious feeling. Working with nature inspired colours is an option and she says colour coordination can be an option in bigger scale buildings and more of the colours on dedicated spots. The furniture in the rooms or the equipment are simple with rubber band, ball, mattress, wall bar, benches, bed, balance board. Installing a lift in the ceiling is important. A final reflection of the facility is the consideration of door opening size and avoidance of sight lines through the dressing rooms (E. Schubert Hjalmarsson, personal communication, December 29, 2023). When it comes to the colours are nature inspiration described by Närhälsan Västra Götalandsregionen to be good as well and she gives several options of real objects or motives (2019). R. N. Johansson (personal communication, February 7, 2024) agrees with the significance of the colours.

Eva-Johanna Isestig has written a book about waiting areas for children in care environments (Närhälsan Västra Götalandsregionen, 2019). During the interview are parts from the book brought up together with other reflections about the activation environment. Like Elke's previous discussion about the feeling of safety (E. Schubert Hjalmarsson, personal communication, December 29, 2023), Eva-Johanna Isestig mention how play can be used to relax the children in environments like hospital that's tends to cause anxiety or nervousness (E-J. Isestig, personal communication, February 13, 2024). In the Book Isestig also writes about the active waiting areas and how it through different element works as relaxation for the children (Närhälsan Västra Götalandsregionen, 2019).

When the topic of waiting areas is discussed Isestig agrees with how all knowledge about it doesn't limits it to only the waiting area but can be used in all surrounding spaces to the direct care (E-J. Isestig, personal communication, February 13, 2024).

I see the opportunity to develop the idea of the activity in the waiting area to make it connected to the activation in the building and placing it on the boarders between the physiotherapy and physical activation. Something Isestig sees as good because it imitates the children's natural perceptions of starts and endings on areas and activities (E-J. Isestig, personal communication, February 13, 2024)

As some finalizing words for the physio facility Isestig explain how specific equipment could be easier to use when you evaluate the children's actions and movements, but you can get the same activation for the children in environments without typical tools, but where the design supports it (E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019). She mentions the inclusion of fine motor skills in physiotherapy and that is something that can be integrated in several spaces (Närhälsan Västra Götalandsregionen, 2019), which also R. N. Johansson (personal communication, February 7, 2024) sees as beneficial. But you shouldn't be limited to only placing ordered equipment in the room, since the room could provide it depending on the design (Närhälsan Västra Götalandsregionen, 2019), only making the measuring more difficult (E-J. Isestig, personal communication, February 13, 2024). But Boon et al. (2020) explain how you with the tools that you easily could measure with, possible digital, are common within the care and can guide and make the physiotherapist work more precise. They see the active gaming as one example of that but requires more understanding from the children.

One useful tool for the physiotherapy and physical activation is trampoline with grip (R. N. Johansson, personal communication, February 7, 2024)

Study Visits Physiotherapy facility

Capio Ortho Center Rehab Göteborg

Study visit in combination with interview of Linus Bernhardsson, Unit manager and physiotherapist at Capio Ortho Center Rehab Göteborg (L. Bernhardsson, personal communication, January 23, 2024).

Project type
Private physiotherapy occupancy in the Capio concern.

Context, Situation & Location
L. Bernhardsson (personal communication, January 23, 2024) present how they chose a building in Gårda in Gothenburg. It is next to the newly built Kineum and Jacy'z Hotel & Resorts (Google, n.d.a.). Ullevi is directly on the other side of the river, which leaves a combination of multi residential housing, student apartments, different companies with offices and some restaurant or food related business in between (Google, n.d.a.).

How do you get here?
The closest bus stations are Gårdatorget, Vagnhallen Gårda, Ullevi Norra and Ullevi Södra and both stations at Ullevi have good connections to Korsvägen, which is suitable for changing trams (Västtrafik, n.d.a). Walking from Ullevi is a bit farer away than the other, but it is good communication for walking and biking. It is in a central context (L. Bernhardsson, personal communication, January 23, 2024) with good access for cars as well. Two possible entrances from two directions (Capio Ortho Center Göteborg, n.d.a.), but only one accessible. The accessible one has a bit of unclear orientability finding the right way after entering. The reception is visually clear when you eventually reached the internal entrance. There are no parking possibilities on the street, but it is an available accessible parking spot close to the accessible entrance (Google, n.d.a.; (Capio Ortho Center Göteborg, n.d.a.).

The users
During the visit it was people in all ages passing through reception and the gym. From middle school children, teenagers, to adults and seniors. L. Bernhardsson (personal communication, January 23, 2024) says they don't have any specific age focus. They work a lot with sport injuries, youngsters, and adults. For example, operational rehabilitation (Capio Ortho Center Göteborg, n.d.b.). If someone need rehabilitation after a neurological injury, they can be helped as well (L. Bernhardsson, personal communication, January 23, 2024). It was a continuously flow in the reception area but despite that calm in the gym area since the patients are spread out in treatment room and gym.

Building design & Program and Functions
The facility is in two floors. The first floor contains reception with waiting room. From those two rooms it is an access to the dressing room and staff room deepest into the building. On the upper floor, accessed from the stair directly inside the entrance, are several treatment rooms placed in line with connection to the free gym area in façade. The gym follows the façade on the other side of the stare as well with gym machines, barbells and some more treatment rooms in the end of the gym area.

Flows
Self-checking or reception -> Dressing room -> Waiting room-> Treatment room-> Gym ->Dressing room. The stair between the floors is directly after the entrance and before the reception and the dressing rooms, which means it is a lot of traffic between staff, patients that coming from the outside to the receptions and patients moving between the treatment room and gym on the upper floor and the entrance floor. L. Bernhardsson (personal communication, January 23, 2024) says the staff is going between their dressing rooms, treatment rooms and gym on upper floor, and the staff rooms on entrance floor.

Distinctive elements
The free gym area and elite athlete competitions suits hanging on the wall in the stair

Furniture & Equipment
The reception makes room for some seating area. Mainly through simple soft benches, but also with a few upholstered chairs. L. Bernhardsson (personal communication, January 23, 2024) explains that the loss of back support on the benches is an active choice because you shouldn't spend more time in the reception than absolutely needed. But you should keep in mind what difficulties the patients have and use furniture's that are simple to get up from.
The equipment in the free gym area is easy to move. Weights, different elastic bands, balls, TRX, bike, mirrors, blocks, benches, balance board etc. In the other section is bigger machines, cross trainer, spinning bike, tread mile, different barbells and machines.

Materials
The colour theme has a white base with light and soft earthy accent colours. A dove blue colour is used as a contrasting to the white walls and the light grey-blue floor with darker marks. The upper floor adds a blue noise cancelling matt (L. Bernhardsson, personal communication, January 23, 2024) to the colour palette together with the dark gym equipment. Most of the colour is used in the reception area, with seating in different green colours, beige curtains, and a warm wooden raster on the reception desk.

Senses related perceptions
Talking from the reception and people in the waiting room. Local sounds in the gym area where the physiotherapist instruct the patient and from the use of equipment, machines and working out. All gym area has views towards the outside.

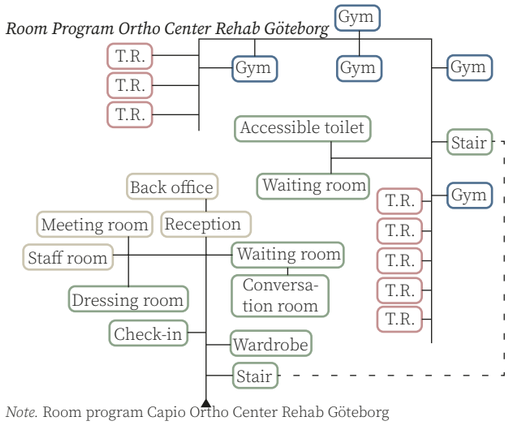
Figure 3

Pictures of Capio

Note. Pictures of Capio Ortho Center Rehab Göteborg

Figure 4

Room Program Ortho Center Rehab Göteborg



Note. Room program Capio Ortho Center Rehab Göteborg

Study Visits Physiotherapy facility

IFK Kliniken Rehab/GLTK

Study visit in combination with interview of Anders Näs, Unit manager IFK Kliniken Rehab/GLTK (A. Näs, personal communication, January 25, 2024).

Project type
Private physiotherapy facility. IFK Kliniken has three Facilities spread out in Gothenburg (IFK Kliniken rehab, n.d.).

Context, Situation & Location
The clinic is situated towards Delsjön in Gothenburg. It is a lot of multi residential buildings around and has access to nature and both indoor and outdoor physical activation in the outdoor area (Google, n.d.b.). This specific clinic shares a building together with tennis and padel, Nordic Wellness gym, a sport shop, and a restaurant.

How do you get here?
If you are coming from the central parts of the city without car you could go by bike. The easiest is to take the tram (Västtrafik, n.d.b.) and walk the last 100 meters. The building and its main entrance are easy to find on the way of walking. A lot of parking spaces outside the building is shared with the other functions in the building. While entering the main entrance the physio facility is directed up the stairs with its own entrance next to the gym Nordic Wellness.

The users
While waiting in the waiting room it was a flow of about 5 patients. During the visit it was about 4-6 patients in the gym at the same time, from adults to seniors, together with a physiotherapist or on their own. A. Näs (personal communication, January 25, 2024) describes how they help young children to elderly with the orthopaedic problems in focus, which could have occurred while being active in one way or another.

Building design & Program and Functions
The immediate feeling while entering the clinic was the perception of a regular and cool gym. The dark colours and the overview of the gym area, hides the fact that it is also a place for medical treatment and treatment rooms. The little space for waiting is in relation to the reception, which has its own back office. Toilets and hanger for jackets is next to waiting area. From the waiting area you walk directly into the gym area. The treatment rooms are facing the gym and are placed deepest into and along the room. The staff has its own room which also is in connection to the gym. The gym is in two steps and connected with a short stair. The first one is an open room with different sections. Equipment is close to the bearing construction leaving space for access and free movement in the middle. Barbells and other machines along the windows transitioning into a calmer part with flexible equipment and mirrors. The other part is a running track and machines along the wall.

Flows
A. Näs (personal communication, January 25, 2024) explains the different flows and zones have been in focus to create an easy use. They have sectioned it to one calmer zone in the corner for treatments and lower intensity together with a mirror wall for different calmer exercises, and then collect the bigger machines in one zone. They have made room for working with weights. Furthest away from the entrance is the warm-up space, which leaves the rest of the space for more flexible use.

Distinctive elements
The running track becomes an eye-catching element in colour and in function.
A canvas with elite athlete signatures.

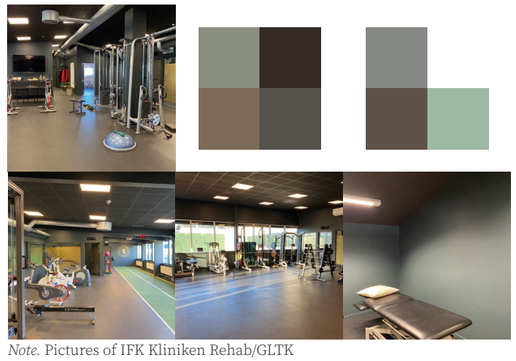
Furniture & Equipment
Sparingly furnished besides the gym equipment. The waiting area has two simple chairs and a smaller side table. The ruff feeling is increased with a wooden block as a bench with some seating on. On the other side of the wall of the waiting area you could use the spinning bikes in front of the TV or watch a game on the ping pong table. Some orthopaedic anatomy models on a shelf remembers you of how it is a physiotherapy clinic. The free equipment is collected at 2-3 places by hangers and shelves.

Materials
The plastic floor in the gym got a matte finish in solid dark grey. The colour on the floor in the treatment room got a pattern with white and light grey sprinkles. In contrast to the dark grey paint in the gym the treatment room seems to be a bit darker green blue in colour. Like the rest of the room, the roof is in a dark grey colour. The work with the light has come to be important and is explored, but A. Näs (personal communication, January 25, 2024) sees the possibilities to develop that even more to better meet the dark surfaces. Despite the dark surfaces it still becomes a contrast to the gym equipment and ventilation pipes in shiny steel. The green ground texture at the running track got more of a texture.

Senses related perceptions
Calm gym with talking between patient and physiotherapist from casually talking or from giving instructions.

Figure 5

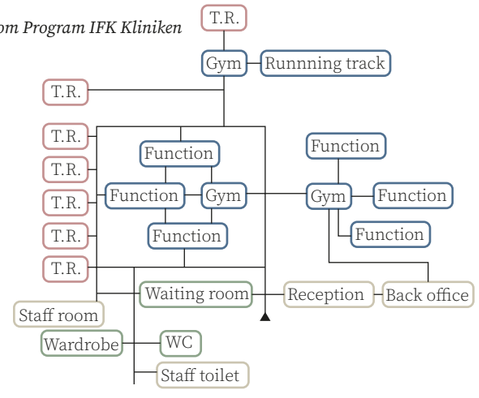
Pictures of IFK



Note. Pictures of IFK Kliniken Rehab/GLTK

Figure 6

Room Program IFK Kliniken



Note. Room program IFK Kliniken Rehab/GLTK

Study Visits Physiotherapy facility

Study visit in combination with interview of Elke Schubert Hjalmarsson, Unit manager and specialised physiotherapist at Occupational therapy and physiotherapy children at Drottning Silvisas barnsjukhus (E. Schubert Hjalmarsson, personal communication, December 29, 2023).

Drottning Silvias barnsjukhus - Occupational therapy and physiotherapy children

Project type
Department of Occupational therapy and physiotherapy children at Drottning Silvias barnsjukhus on the hospital area of Östra Sjukhuset (Västra Götalandsregionen Sahlgrenska Universitetssjukhus, 2023).

Context, Situation & Location
Drottning Silvias barnsjukhus is located on the hospital area in eastern Gothenburg where it is next to "Östra Sjukhuset – Sahlgrenska Universitetsjukhuset", "The delivery at Östra Sjukhuset", "Children emergency". It has its own building and entrance. It is on the border between Sävenäs and Vidkärr with a lot of residential apartment buildings and Ugglum with a lot of singe household villas (Google, n.d.c.). Next to the hospital is an allotment garden (Google, n.d.c.), which I believe could become a recreational space for family members and staff.

How do you get here?
One of the easiest accesses is by the tram, but since it is on a hospital area it is good car communication and parking spaces. Going from the tram station "Östra Sjukhuset" (Västtrafik, n.d.c.) requires a walk over the area and orientation to find the way to the right entrance. When you reach the entrance a map over the hospital guides you directly to the right by signs and a leading corridor. A bigger common space or waiting area welcomes you before the entrance to the physiotherapy department, hospital library for children, hospital school and a glassed atrium working as a square and "indoor garden" while it also serves the communication.

The users
The patients are in the age between 0-18 years and are accepted by remiss from the hospital (Västra Götalandsregionen Sahlgrenska Universitetssjukhus, 2023).

Building design & Program and Functions
The rooms are organised along two parallel double-sided corridors creating rooms with parallel use (E. Schubert Hjalmarsson, personal communication, December 29, 2023). The two corridors are being crossed by an open corridor. While entering the department this corridor integrates the reception and a defined waiting area with seating and entertainment for the children.
The treatment rooms have different focus because of the needs for treatment, disease state and age (E. Schubert Hjalmarsson, personal communication, December 29, 2023) varies. E. Schubert Hjalmarsson (personal communication, December 29, 2023) shows how they are similar in appearance and design, but differs in the need of storage, colour and equipment depending on if the room is for younger children or teenagers, the tools for physiotherapy and level of sensitivity for infections. She also presents they still are similar and could be used a bit flexible as well, while she guides me through the following rooms (E. Schubert Hjalmarsson, personal communication, December 29, 2023).

Breathing room has its own exterior entrance if the children are extra sensitive for infections and must be careful in the exposure of others. This room is also regulated with pressure (E. Schubert Hjalmarsson, personal communication, December 29, 2023). It is equipped with a spinning bike, bed, wall bar and a desk.

Teenager room (Picture 2) has a bed and some hidden storage in the corner. The floor is marked with lines for exams, pilates ball, wall bar, different seating, and a fold-able matt. Traverse in the roof (E. Schubert Hjalmarsson, personal communication, December 29, 2023).

Treatment room - burns (Picture 1), has like the other treatment rooms a bed. Because the burn victims need extra care for their wounds it is necessary with storage in this room (E. Schubert Hjalmarsson, personal communication, December 29, 2023).

Treatment room younger children has equipment and furniture in smaller size. The bed is like a table able to rise up or lower down. Same amount of storage like the standard room but more toys and sensory stimulations on the wall.

Training apartment (Picture 11) looks like a regular apartment. It is equipped with all furniture's you have in your home from bedroom to kitchen to bathroom. E. Schubert Hjalmarsson (personal communication, December 29, 2023) explain that this room is not a room you stay overnight in, and it is only for practice. She continues by explaining that since normal homes don't have an accessible toilet on higher level, this one is aimed to mirror that. In this way the patient could learn how to get up from the bed, move around on the toilet and use the kitchen in a way adjusted for their injury or healing process (E. Schubert Hjalmarsson, personal communication, December 29, 2023).

Hand room focusing on the motor skills in the hand (E. Schubert Hjalmarsson, personal communication, December 29, 2023). It is equipped with tables and chairs for examinations, exercises, and observations. Several play tools where you must use your hand is placed in the room. E. Schubert Hjalmarsson (personal communication, December 29, 2023) shows how the storage and products are placed along one of the walls, to be able to adjust supports and cast etc.

The test room (Picture 9) is a bit deeper with a traverse. Despite the bed, storage and a table are a wall bar, and some simple equipment. Some exercises need to be done between a specific distance and to not have to remeasure every time some measurements and distances are marked on the floor (E. Schubert Hjalmarsson, personal communication, December 29, 2023)).

Movement room (Picture 6 & 7), is showed and demonstrated by E. Schubert Hjalmarsson (personal communication, December 29, 2023) of how it is designed in a way that makes it possible for rearrangements and how they use the floor, walls, and celling to affect several senses. She says the hanging elements glides in one direction and turning, twisting and moves which makes it into a balance element and something that will make you aware of your own body. The stuffing in the mattress's changes in texture and size (E. Schubert Hjalmarsson, personal communication, December 29, 2023). The floor is covered with mattresses and soft blocks. Towards the wall and on the wall is different climbing equipment with soft landings.

Training hall with gym (Picture 8 & 12) looks like a smaller gymnastic hall. It is accessible by a lift. Thicker mattresses, basketball, rings in the roof and wall bars. The training hall is higher in roof since it is some steps down. The gym is available in the other direction with spinning bikes, tread mile, cross trainer, and some sitting machines. A traverse is installed in the celling.

Pool (Picture 5) with a lowered level for the physiotherapist to stand on and to see into the pool through a glassed wall (E. Schubert Hjalmarsson, personal communication, December 29, 2023).

Bathtub room/water therapy room is a smaller room with a special bathtub for water rehabilitation.
Despite the rooms for treatments and movement E. Schubert Hjalmarsson (personal communication, December 29, 2023) notes the importance of having a lot of storage. All equipment takes a lot of space. She says one effective way of integrating the storage has been to let the storage becomes a neutral and shared space.
The dressing rooms has access to the pool and corridor. The same goes for the bathtub room. Mainly all rooms are entered from the corridor, but at least on entrance to the personal office is through the mail and copy room.

The personal office is an open landscape with fewer smaller and closed offices. The open landscape has become a problem when dictating journals (E. Schubert Hjalmarsson, personal communication, December 29, 2023). Lunch room for the staff is shared and located directly outside the department on the way passing by the laundry etc. (Picture 4) (E. Schubert Hjalmarsson, personal communication, December 29, 2023).

Flows
Patients would come to the reception and wait in the waiting area and then go to the treatment room or activity rooms. In some cases, does the physiotherapist visit the patients in their hospital room, if the child shouldn't move between departments (E. Schubert Hjalmarsson, personal communication, December 29, 2023).

Distinctive elements
When children use the movement room the child and the physiotherapist can enter together through a miniature door (Picture 10) (E. Schubert Hjalmarsson, personal communication, December 29, 2023).

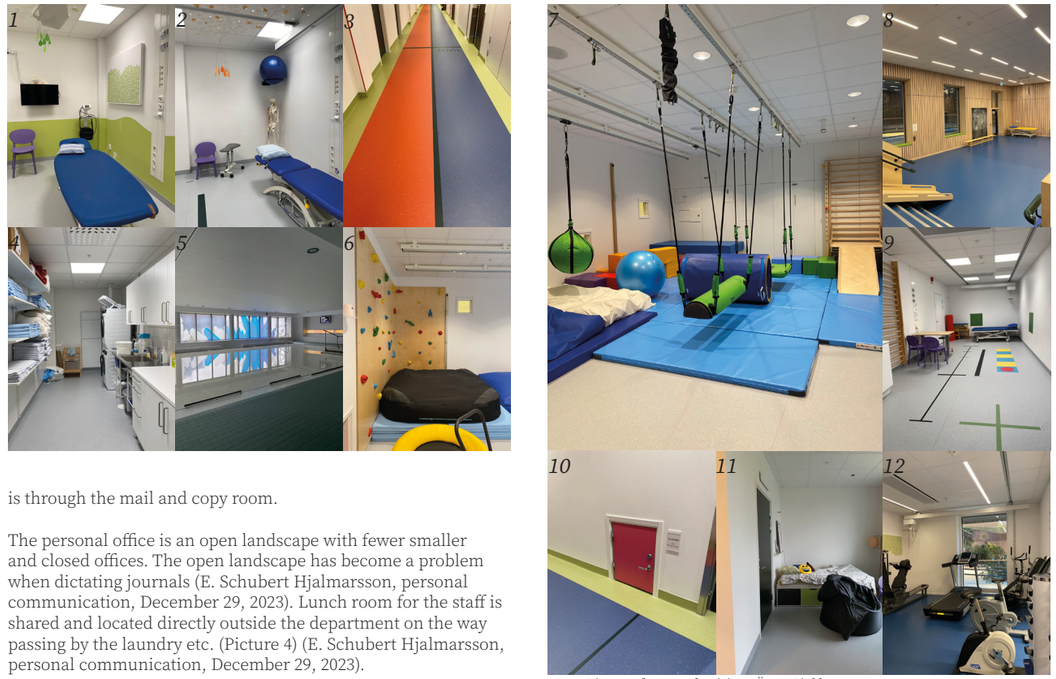
Furniture & Equipment
The equipment is quite similar between the treatment rooms, but the tools and design are changing a bit depending on the rooms main purpose (E. Schubert Hjalmarsson, personal communication, December 29, 2023). It is the movement room that got the unique equipment, with several interesting solutions.

Materials
The department has a white base through the corridors and the treatment rooms but also works with an additional colour palette and patterns. The colours in the treatment rooms are varying from warm yellow with light orange leaf patterns on wall sections and celling to blue and purple details with the orange leaves in the celling. The yellow and orange is in another room changed to a warm light green. Stickers in the shape of animals in the same colour palette are put to the walls. The colours in the movement room are much brighter in comparison with the others. The training hall appears a bit different. Wooden panels on the walls and a softer flooring in darker blue makes the character to something different and removes the clinical feeling in the treatment rooms.
The floor in linoleum has a light grey colour with bigger sprinkles and seems a bit blue or yellow depending on the lightning. In the corridor it is a lighter green linoleum combined with a red blue running track in the same material (Picture 3).

Senses related perceptions
The characteristic hospital smell is not present here.

Figure 7

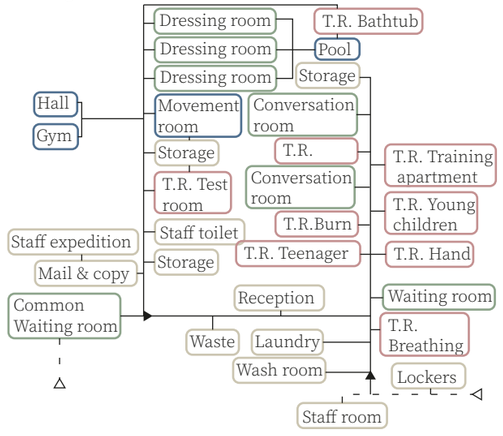
Pictures of Östra sjukhuset



Note. Pictures from study visit at Östra Sjukhuset

Figure 8

Room Program Östra



Note. Room program occupational therapy and physiotherapy.

Symbiosis - Physiotherapy & Physical activation

The symbiosis is how the physiotherapy and physical activation can work together as a building. What functions and qualities can strengthen the relation and what should be included to support it, or where should the relation be stronger? Shannon et al. (2021) and Roşca et al. (2022) present two different perspectives of the two functions. Shannon et al. (2021) is focusing on the physiotherapist and Roşca et al. (2022) on the children in physiotherapy that has autism. What can be found in both is physical activity (Shannon et al., 2021; Roşca et al., 2022). Buy studying these two articles it is possible to get some first ideas over what could be implemented in design for support the collaboration and collect their reflections, ideas, and potential strategies to bring together in the design. But also understand what is more of physiotherapy or physical activation. At the same time the physiotherapy and physical activation meets, it will help the patients and the staff (Roşca et al., 2022; Shannon et al., 2021).

These articles have in common that both work with the transition between the functions and that physical activity is a strong tool for physiotherapy (Shannon et al., 2021; Roşca et al., 2022; Fysioterapeuterna Sektionen för habilitering och pediatrik, 2016)). Shannon et al. (2021) partially collects reflections about that, when specifically letting physiotherapists discuss how the relation should be. Those two aspect are something the professionals already see as linked to each other in the Swedish context (Fysioterapeuterna Sektionen för habilitering och pediatrik, 2016). In the Case of Roşca et al. (2022) it is mentioned what the patients, in this case the children, can get use of outside the physiotherapy and still do something that improves their health, even though the main content in their study and article is about what can be done in physiotherapy. Which it turns doesn't need to be limited only to that situation.

The rehabilitation is discussed in the relevancy of autism and for physical improvement where the predominant factor is the children's postural control (Roşca et al., 2022) Their study is to present how the physiotherapy can work with that. They present how one study already was performed showing how materials to stand on, affect the children's balance and how doing it in alternative approaches showed a variation in outcomes.

The presented program by Roşca et al. (2022) gives instructions of exercises and how they should be performed, how many repetitions and time span. They are performed with the own body or with balance board or bench. When doing these exercises, they are aiming for activations in different body parts, which contributes to the physical health improvement. The balance is still included. The exercises where you only use your own body shows different positions where you need to keep balance on the spot, or between spots, same is for the balance board and for the bench it is balance during movement (Roşca et al., 2022).

What Roşca et al. (2022) present is both physiotherapy but also what exercises are good for the disease in general. Both works as rehabilitating, and not only on the balance aspect. The program is promoting it, while the general exercise creates it naturally. Some examples of general physical activity are presented to be regular sports. Body control is something that is relevant in gymnastic, dancing and skateboarding.

The balance became better with the program.

Text for design narrative in the course 425 by author

Reflection:
A conclusion could thereby be that physiotherapy doesn't need to be limited only to the physiotherapy department (Roşca et al., 2022) and show the importance of making room for rehabilitating activities in the physical activation part in the proposal. The suggested balance program consists of flexible elements (Roşca et al., 2022), which doesn't force it to be performed in a specific environment or in the physiotherapy department. Which open for a further collaboration with the physical activation part. Though, it is presented in the article as physiotherapy (Roşca et al., 2022) it can contribute to both parts.

The free types of exercises explained by Roşca et al. (2022) could be implemented in the physical activation part of the building for example several rooms that could offer different activities or one that can support several (Gymnastikförbundet et al., 2020).

To bring into the design: Rooms in the design or design elements that can promote the balancing part, by having the equipment as in the proposed training program (Roşca et al., 2022), but also new ones developed from that. It could be design that reminds you over the standing balance exercises (Roşca et al., 2022) or in a fun way makes you do them voluntarily. Motives on wall you can copy with your body, similar to Mural Arkitektur and Generation Pep Sweden (n.d.b) health promoting stickers, , which also C. Klüft (personal communication, October 25, 2023) describes as useful for spreading knowledge. Also adding surface materials that you can walk on that isn't smooth can be a way of building a design on the previous study Roşca et al. (2022) promoted. Could it be a way of keeping balance while walking between elements? The functions the benches have in the training program (Roşca et al., 2022), what possibilities do they have in the architecture?

In the case of Shannon et al. (2021) is the study built upon what the physiotherapist thinks about the relation. It is from a Canadian perspective (Shannon et al. 2021), but the ideas will be reflected over in a swedish context.

Why the report strengthens the project is already brought up in the introduction, as well how the project supports the article (Shannon et al., 2021). The theory will give a deeper understanding for the strengthening, but also present their reflections and discussions that affect the collaboration of functions (Shannon et al., 2021), to further on be translated and interpreted into design.

Shannon et al. (2021) compiles the physiotherapist answers over the responsibility and their reflections. It shows how it is very individual how much physical activation promotion you do and even if you don't do it actively several still believe it would be good. The promotion is in this case described to recommend further activation for a patient outside physiotherapy, that the therapist sees as good health benefit. The reflections and answers show in this case that it is a difficulty (Shannon et al., 2021).

Several therapists want to recommend specific activities and does it, but another problem is that others find it hard even if they want to (Shannon et al., 2021).

Shannon et al. (2021) says the information knowledge wants to be stronger for the therapists. They keep mention it is hard to know what to recommend when you don't know what activities you can offer. They say that you also want to be able to give examples that is suited for the patient's capability. Even if they don't manage to do the promotion on their own, it is important information can be spread in other ways (Shannon et al., 2021).

Symbiosis - Physiotherapy & Physical activation

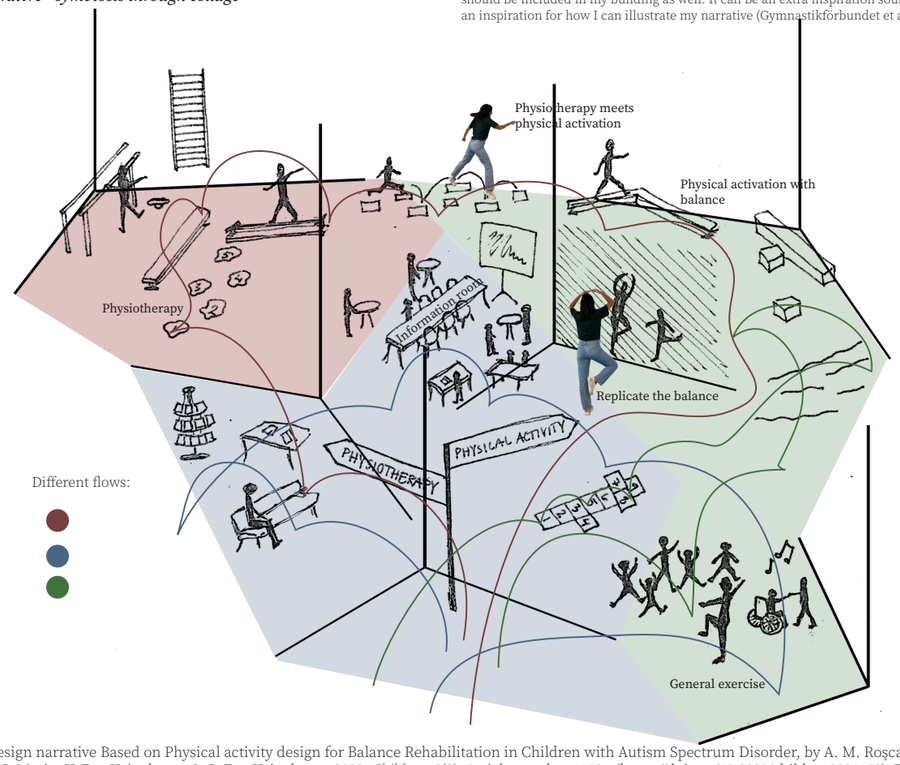
How that information can be spread is discussed and the presented reflections are if it should be taken care of by a specific actor and one of the actors presented to be a community program (Shannon et al., 2021). Shannon et al. (2021) continues with referring to an interview answer, as they would collect and give the information in an organized form. The best would be if the physiotherapy department could give space for that (Shannon et al., 2021).

Test out the activities is something Shannon et al. (2021) describes as a given idea over inspiration gathering, but in this case for the physiotherapist during a specific event.

Reflection:
The symbiosis could theoretically strengthen the physiotherapist own views, that today is presented to be varying (Shannon et al., 2021), when the physical activation and physiotherapy will be put together. The physiotherapist would see the functions easier. It would be put in a contrast for what the architect can do and what is up to the physiotherapy profession (Shannon et al., 2021). Could the architect steer the physiotherapist into the believe the functions should be connected, and that I, with the design and placement of functions, do that.

Figure 9

Design narrative - symbiosis through collage



Note. The design narrative Based on Physical activity design for Balance Rehabilitation in Children with Autism Spectrum Disorder, by A. M. Roşca, L. Rusu, M. I. Marin, V. Ene Voiculescu, & C. Ene Voiculescu, 2022, *Children*, *9*(8), Article number 1152., (https://doi.org/10.3390/children9081152), Do paediatric physiotherapists promote community-based physical activity for children and youth with disabilities? A mixed-methods study, by J. Shannon, D. Legg, & L. Pritchard-Wiart, 2021, *Physiotherapy Canada*, *73*(1), 66-75, (https://doi.org/10.3138%2Fptc-2019-0043), *Mural Arkitektur Rörelsebana*, by Generation Pep Sweden, n.d.b, Generation Pep, Retrieved September 15, 2023, from (https://generationpep.se/sv/hur-vi-arbetar/samarbetsinitiativ/mural-arkitektur-rorelsebana/), & *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall*, by Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB, 2020, (https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf).

Text for design narrative in the course 425 by author

If the building has the functions the physiotherapist would recommend and they are aware of that, the problem with having information difficulties would become better (Shannon et al., 2021). It will be easier for them to direct the patients into the physical activation space and the specific part of that. The article gives inspiration for improvement of the organizational structures and working methods they describe as problematic in the organization (Shannon et al., 2021), which the building with its function can give opportunities for. What types of room they could refer to can for example be connected to the exemplified general exercises forms that Roşca et al. (2022) presented for autism.

A possible idea from this is to create spaces for information when Shannon et al. (2021) points out how important it is and how valuable it can be. They way the physiotherapist could test out the activities (Shannon et al., 2021) could instead be for the children. This could be solved by making room for an information section in the building for both theory and physical participation (Shannon et al., 2021).

The layout of the sketch over the design narrative "Symbiosis – Physiotherapy & Physical activation" is inspired by Whites illustration "Schema över hallens innehåll" in the report Framtidens Idrottshall. I show the program/ room functions based on the theory by Shannon et al. (2021) and Roşca et al. (2022), but from Framtidens idrottshall being an environment for physical activation gives it examples over functions that should be included in my building as well. It can be an extra inspiration source as it is an inspiration for how I can illustrate my narrative (Gymnastikförbundet et al., 2020).

Theories for Physical activation

Physical health

During the interview with Generation Pep, C. Klüft (personal communication, October 25, 2023) shares what she knows from some studies concerning how activation can have a preventive effect on cancer or an effect before cancer treatments. She says more detailed information is explained in the studies at University of Gothenburg and in the results documented in American studies. The recovery phase could be facilitated by building up a strength before and she talks about strategies where you design specific training programs to do before operation in the same way you also do it after, to give the patient as good outcome as possible. But only having a basic physic and being active could make the recovery phase shorter no matter of, when it comes to some other diseases, which shows the activation meaning on a general level (C. Klüft, personal communication, October 25, 2023).

Based on C. Klüfts (personal communication, October 25, 2023) reasoning you could see how the building becomes useful for patients in the after-care and before a treatment or procedure, which is something they have understood the physiotherapist wished for their own. Maybe it is possible the needs are different then and that the training before treatment is not about the actual exercises but rather creating as good precondition as possible just being active. Based on the output from the interview you could understand how having the physiotherapy connected to a part with physical activation gives the children an access to a more playful and freer environment for physical activation and physical build up in consultation with a physiotherapist, something that is also being promoted by Shannon et al. (2021), and will get more variation and avoid the controlled and strict healthcare environment the child will experience enough of in the after-care. It is a possibility for the physiotherapist to adjust its program or create a program to the child where the strength can be developed in the active part of the building and not limited to the facilities of the physiotherapy. That position, the physiotherapist can get by the symbiosis of the function, is something Shannon et al. (2021) brings up in their research. They are reflecting over the professionals possibilities and see how they would get opportunities to affect the treatment or activation. Having the activation part of the building would also make their work simpler and creating an easier and shorter contact to the activation for staff an patients where the activities are possible to show (Shannon et al., 2021). That could also be evaluated in the recovery process. In addition, the access to those facilities could maybe give the children an interest to continuing the physical activation after finished treatment and create good conditions for good health.

In the article by Wang et al. (2023) they are presenting the effect on the health. They describe the relation activation has but are mainly talking about its relation to the bigger urban scale, but still highlights how the design can become a tool in the promotion together with social aspects. In turn resulting lowered risk of several illnesses (Wang et al., 2023; Shannon et al., 2021).

Shannon et al. (2021) describes how group workouts is a good way of creating interest. All children would take advantage of activation, but disabled children are in the biggest need of it.

Activation perspectives

By understanding different strategies, the building would have the possibility to choose to include the ones that seems relevant for each other or where some strategies can complement the others.

Perspectives concerning the staff as well as proposals on physical activation for the users are all brought up during the interview with Generation Pep. C. Klüft (personal communication, October 25, 2023) tells that when it comes to the staff perspective, they have heard from Barncancerfonden how they see the physical activation the physiotherapists can provide the children, as important from a preventive perspective and how the knowledge should be used to reduce injury from the treatments.

When it comes to the view on physical activation among the users C. Klüft (personal communication, October 25, 2023) presents activities including children that stays away from the physical activation. For example, by combining physical activation with other technical interests, which these children may prefer. It is something “Fuzed” (https://www.fuzed.com/) have built a concept on in an occupancy, for instance in Uddevalla, where you could use VR and be part of physical activity while you are gaming (C. Klüft & S. Westberg, personal communication, October 25, 2023).

During the interview Eva-Johanna Isestig says it can’t be a continuity in the activation which makes changes in intensity to something required (Närhälsan Västra Götalandsregionen, 2019). The contrast in design where you become more active or not can also be compared to changes in layout and structure that divides a space and changes its character (E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019).

When she designs for the children, she sees the benefit of combining functions. She looks at the possible ways of movement and how that can be combined with other things in the product (Närhälsan Västra Götalandsregionen, 2019). One example is a modular furniture creating an interest for the child to climb and investigate (Närhälsan Västra Götalandsregionen, 2019), which let the doctor see the child’s movement in an environment the child doesn’t realise it can be analysed in. Another example when she combines function is when designing wallpaper with a meaning (E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019).

Another view of the physical activation is presented by Chen (2013). In a compilation of research question the researcher aims to compile material about increasing motivation. The environment and its furnishing should be adapted to the children and if children and grown ups are using it together there shouldn’t be a conflict between the types of activation and possibilities for miss use. Like previous mentioned reflections about VR, does Chen see its possibilities in motivation and how active gaming is interesting from the children’s perspective. The report doesn’t give any specific strategies but an inspiration for different fields to work with (Chen, 2013).

One study is about activation play tool design in a hospital environment and the relevancy of this study is not the resulting play tools but their reflections, knowledge, and theories behind with starting point in aspects of free, dispersed, and bodily play (Boon et al., 2020). These aspects remind about the aspects Carlén (2020; 2021) is bringing up in her master thesis and studio project about physical activation. Carlén (2020; 2021) describes her categories as different level of structured activity from the free one to organized trainings, where the free stretches from undefined exercises to using equipment by your own exploration or using the equipment in a specific way on your own. Their categories are mainly connected on the description of free, but the categories of activations in the different situations and categories overlaps (Carlén, 2020; Carlén, 2021; Boon et al. 2020). What is described as free play by Boon et al. (2020) is like the activities you could do in Carlen’s (2021) examples. It is the avoidance of rules and letting the fantasy control (Carlén, 2020; Carlén 2021; Boon et al., 2020). When designing Boon et al. (2020) explain how undefined design or design open for investigation or free in its way of use, are aspects to think of when designing for free play, which theoretically can be interpreted in Närhälsan Västra Götalandsregionen (2019) as well. When Boon et al. (2020) describes bodily play, they mention the inclusion of movement categories. Boon et al. refers the movement categories to a previous study by Maude (2010). Maude (2010)(refereed in Boon et al., 2020) present how these are about what types of movement you do in the activity, like the verb balance. Maude (2010) (refereed in Boon et al., 2020) explains how this play is when the body movement frames the activity. These types of activity movements are something Carlén (2020) documents when she visualizes different sorts of activities, for example climbing and throwing. The presentation of the movement categories and its translation into functions is presented on page 44-45. When Boon et al. describes the last category, it is mainly about movement and to reach a specific position within the play. The designs presented by Boon et al. further on in the study shows the connection to the different play categories.

Accessible activation:

We all can not do the same things, which is something Shannon et al. (2021) and Movahed et al. (2023) brings up. We need to find activities for everyone.

In a study concerning playground are several results and outcomes from interviews and investigations presented by Movahed et al. (2023). The discussions are about the problematic situation of non-accessible environments and presented design strategies against it. Decisions in the design when it comes to levels, surfaces material choices and furniture or equipment should be reflected over, since they are elements that for example effect wheelchairs users. Their reach is limited and the hight on things should be uplifted. The preconditions for possible participating are very different. The study is not only relevant for its topic of accessibility and physical activation, but it also partly refers to the age group in this thesis project, connecting it on several levels (Movahed et al., 2023).

A big part of Movahed et al. (2023) study focuses on the physical environment. Movahed et al. (2023) describes how diversity is one solution. By explaining, Movahed et al. gives an answer to the last sub question of the thesis showing how the following design should find a way of working with the variation in the buildings to create an inclusive design among all users and age groups and their capacities. The variation concerns activities in different field, big and small body parts, the design of the physical space and difficulty level. An example of the smaller body parts is the fine motor skills or sensory stimulation affecting the whole body, which Rebecca (personal communication, February 7, 2024) suggest as elements to incorporate as well.

Movahed et al., (2023) suggestions for the physical design concerns the equal importance of having activity as having resting spaces. The resting spaces relevancy is brought up in Närhälsan Västra Götalandsregionen (2019), as well.

The area should be easy to overlook and navigate which create better opportunities for the children’s play and the parents’ control (Movahed et al., 2023), which also Rebecca (personal communication, February 7, 2024) agrees to. Movahed et al. (2023) present how working with ramps is a way of making the paths useful for every child and the flow could be simplified by adding parallel communication. An inspiring way to use the ramps are presented by LOA Fonden & Johansen (n.d.). Movahed presents how the natural environments have a higher value and is more preferred than artificial constructions and brings the nature closer in outdoor environments. Another wish is to have accessible swings and adding grips to facilitate the balance (Movahed et al., 2023). Their explanations of the social values being created when these strategies are being applied speaks for the social values the thesis generates when it comes to inclusive design (Movahed et al., 2023). Movahed et al. explain how the playgrounds can be used for physiotherapy, which shows how the elements from the playgrounds could help with the symbiosis between physiotherapy and physical activation.

S. Westberg (personal communication, October 25, 2023) see the benefit of a project that reaches out to a bigger group of users and where you could find strategies to meet the different mental and bodily preconditions the children could have, even if it is hard to find a balance in between. She explains that is what the guides on the web page could help with (Generation Pep Sweden, n.d.e.; Generation Pep Sweden, n.d.f.; Generation Pep Sweden, n.d.g.). Generation Pep have met the differences for instance through visual communication, talking to experts in neuropsychology and letting the activities difficulty level start on a low bar (C. Klüft, personal communication, October 25, 2023).

Physical activation in another context

The belief of other situations could be studied and bring theories or tested out strategies.

S. Westberg (personal communication, October 25, 2023) brings up Lundens preschool where the physical activation has been combined with the occupancy. As a red thread are the strategies visible through the whole project with the goal to perceive physical activity outside as inside to put the movement in the first room (S. Westberg, personal communication, October 25, 2023)

Another example explained by C. Klüft (personal communication, October 25, 2023) is how they in Växjö put a big focus on the active school yard in a new project planning, but which later got aborted. Since the design will be for the children it is in Klüft's opinion valuable to understand their situation. She describes how "Children consequence analysis" was a tool used in the process and integrating these reflections contribute to sustainable decisions and involving the user group. It could strengthen this thesis if also those aspects are valued (C. Klüft, personal communication, October 25, 2023). That type of analysis is something Isestig advocates in her book (Närhälsan Västra Götalandsregionen, 2019).

The physical activation is put forward in other context than the schools. It could also affect playgrounds or parks (Generation Pep Sweden, n.d.d.; Generation Pep Sweden, n.d.e.) which also C. Klüft (personal communication, October 25, 2023) develops. Klüft explains that the Pep Park's could be seen as tools to use unused spaces more efficient and create values. If the space is empty, is it better than nothing to make room for any activity (C. Klüft, personal communication. October 25, 2023). For example, Klüft explains that if it is delayed before an area are being built it could be used during the time. That would be suited for the empty plot today and a way of hinting of what will come and offer activity before the building can do it. The activation on playground is described by Movahed et al. (2023) and shows its relevancy for the physical activation since they describe how the play at the playground support it.

Physical activation in schools is both described by Brittin et al. (2015) and Boverket (2021). Brittin et al. (2015) present an American report with a compilation of guidelines, which shows how the importance of activation has started to become more integrated in other contexts. There are parts of the guidelines relevant for this thesis topic as well. As mentioned by other references in this report, Brittin has documented guidelines from resources about active transportation, architectural qualities like sight lines towards the places where the activation is taking place and equipment variation inside as well working with the exterior environment. Other guidelines are general activity space and working with variation, for similar reasons like Movahed et al. (2023) present, but also how activation can be encouraged with painted patterns and activation elements in corridors (Movahed et al., 2023; Gymnastikförbundet et al., 2020), remembering of Röresebanan (Generation Pep Sweden, n.d.b.) or examples from other design projects (Gymnastikförbundet et al., 2020; Unisport, n.d.a.; Unisport, n.d.b.; Zwenger & Tidningen LÄRA, n.d.; Boverket, 2021).

In addition to the physical strategies Boverket (2021) also explain how the school operation may need to bring the activity into the school work beyond the added functions in the physical environment. But this also shows how the new ideas of movement put higher demands on the facilities and the space it needs. Corridor activity is an option (Gymnastikförbundet et al., 2020; Unisport, n.d.a.; Unisport, n.d.b.; Zwenger & Tidningen LÄRA, n.d.; Boverket, 2021; Brittin et al., 2015).

When visiting the school yard belonging to Noblaskolan F-5 in Hovås, the assistant principal Fredrika Mattsson talked about her experiences about the school yard and the physical activation, since a school yard on the roof is quite unique. Aside from the interesting environment she has experienced a lot of injuries there. Several of the injuries depends on material choices. An irregular wooden island for climbing and play is very popular, but its wooden surfaces get slippery. Another thing that is slippery is the surface material on the roof. What should be considered is to have climbing for people with different heights. When discussing the opportunities for activations for children with disabilities, she says there is not so many fun things for students in wheelchair. She gives an example of maybe creating fun wheelchairs paths as a further development (F. Mattsson, personal communication, February 1, 2024). The material choices is in line with the conflict concerning materials mentioned by Movahed et al. (2023).

Physical activation facility and its program

C. Klüft (personal communication. October 25, 2023) pushes on the new information from University of Gothenburg that Generation Pep have taking part of, which shows the good effects of natural outdoor environments. Klüft claims these are so important they should be included when you design buildings and how it therefore could be good to look at the environment around the building. She explains how the natural environments favour the activation and the different types of body movement that could be used, like swinging and climbing (C. Klüft, personal communication. October 25, 2023). Natural environments and their relevancy for encouragement is something Boon et al. (2020) refers to several sources about, as well strengthen how the movements described by Klüft can occur. Movahed et al. (2023) gives the perspective how that type of environment is desirable as well as it touches upon Isestigs documentation about nature inspiration (Närhälsan Västra Götalandsregionen, 2019)

When asking Klüft (C. Klüft, personal communication. October 25, 2023) if she sees if the wishes for the outside could be applied on the inside, she brings up intensity and safety as factors you could work with no matter of environment. To have the opportunity to watch and rest from activity is important according to her, since all children can take it in their time (C. Klüft, personal communication, October 25, 2023).It is something C. Klüft (personal communication, October 25, 2023) says the Pep Parks classification need (Generation Pep Sweden, n.d.e). The importance of resting space is something requested in the context of playground as well (Movahed et al. 2023). C. Klüft also says it can't be a too controlling environments because there should be possibilities to challenge the capacity resulting in a need of considering the safety level (C. Klüft, personal communication, October 25, 2023; Generation Pep Sweden, n.d.e). It is in line with reflections presented by Movahed et al. (2023) in their report.

When working with the facilities Eva-Johanna Isestig explain aspects to think of when it comes to the safety. She describes how she in the book talks about the physical and chemical safety (E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019). She recommends looking at them both but also sees it as an opportunity to create a limitation within the thesis and only put more focus on one of them. The physical is more related to the rooms and the other one to the materials (Närhälsan Västra Götalandsregionen, 2019). It could be by creating barriers to control the user groups, by planning floor plans that offers an overview for adults and follow the drop hight guidelines of 50 cm and having mattresses is one way of handling falls from higher heights (E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019).

Isestig mention "room in room" (E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019), which also R. N. Johansson (personal communication, February 7, 2024) does during the interview when she describes the benefit of different zones or rooms but still with overview, since her children prefer different activities. Further recommendations from Isestig are the chapters about communication and embodiment (E-J. Isestig, personal communication, February 13, 2024) in the book (Närhälsan Västra Götalandsregionen, 2019).

An active way of reaching the children is to gather different units, which S. Westberg (personal communication. October 25, 2023) describes Generation Pep has experience of. It is mainly through family centres. What is seen as a benefit, is if the functions compile different fields and cover different needs. It could be primary care or kindergarten inside one family centre. She explains the benefit of creating an environment for a healthier life and to make it easier for children that are healthy to stay healthy.

When Klüft and Westberg gets the question of what the program could be if they could be totally free, C. Klüft (personal communication. October 25, 2023) proposes silent disco, but also VR solutions. The outdoor environment should be included in some way. Even if the building will be for children, she also says space should be provided for the parents since they have a huge impact on the children's habits. She does a parable to the diet and how parents decide what the children should eat. They have the same opportunity for movement. She says you could look at how the support can be provided for the parents, something Klüft propose could be meeting spaces and space for inspiration. The parents impact on the child is brought up by several resources. Wang et al. (2023) describes about how parents actions are an inspiration for the children and how actions in early years has an impact on routines further on (Shannon et al., 2021), based on their scooping review, but also how making them be active together are a strong way of creating that. Wang described how making space for the whole family is a way of spreading inspiration from adult to child when it comes to the future routines, As well are Chen (2013) describing their impact on motivation.

Even if silent disco is a very specific proposal, it shows how the building can contain all types of activities or events.

Practice based & Case studies

The aim for the practice-based references is to get an idea of how different physical activation environments can be shaped and designed. The projects should together give different perspectives from different environments.

For the study visits was t*he study visit form* a way to collect, document and analyse and turning the visits into theory to base the design on.

When choosing the projects they were evaluated on
- Relevancy for physical activation.
- Projects with interesting solutions or installations.
- Projects where physical activation creates an extra dimension for the occupancy.
- An international perspective.

The case study or reference projects were found through literature and internet.

To mention some of them: Boverket (2021) present interesting examples in their article. Other interesting project to look at are presented in the Framtidens idrottshall by Gymnastikförbundet et al. (2020).

Study Visits Physical activation

Noblaskolan F-5

Study visit in combination with interview of Fredrika Mattsson, assistant principal F-5 at Noblaskolan Nya Hovås (F. Mattsson, personal communication, February 1, 2024).

Project type
School F-5 with school yard on the roof.

Context, Situation & Location
A building for the older children is facing Hovås allé (Noblaskolan, n.d.) and frames a parking lot together with ICA kvantum Hovås (Google, n.d.d.). But the building in focus is Noblaskolan F-5 (Noblaskolan, n.d.), two blocks away with residential buildings with public entrance floors. It shares building with Sats gym but works with entrances from different directions and from different heights. The physical activation takes place on the outside school yard on the ground and on the roof. The school yard for the school and the interconnected kindergarten is quite steep with a lot of stone. This hight difference is something the slides takes advantage of.

How do you get here?
Going from the central parts of Gothenburg to the project is an easy journey. By changing from tram to bus at Marklandsgatan takes you to a bus stop between the two schools (Västtrafik, n.d.d.). The entrance with a big sign of the school's name makes you believe it is the right door, but instead you are directed to the backside. The other entrances are hidden by the building and not visually marked. The hight differences hides the school yard and entrances from the backstreet.

The users
F. Mattsson (personal communication, February 12, 2024) explains the school yard is only available when the teachers open the locked doors to the stairs leading up to the roof. In this way non authorised can't visit the roof when the school is closed or when there are no adults in the nearby. It is children from the age of 6-12 that uses the school yard at the same time during breaks (F. Mattsson, personal communication, February 12, 2024).

Building design & Program and Functions
The school yard is in two floors. One is on the ground, and one is on the roof with access by two external stairs and one interior accessible. The yard on the ground is divided in two on each side of the entering path. One is enhancing a long slide and cliff-like ground. That is being shared with the kindergarten (F. Mattsson, personal communication, February 12, 2024). The other part of the yard is an open but intimate area in front of the doors into the corridors. It is shaped by the buildings angels and the entrance balcony connecting to the stairs. The open area has two geometrical irregular islands, creating an element to play with. The yard on the roof follows the shape of the building. The program is in different zones. It melts together but still has neutral passages. Multi-field, free area, hills and jumping going into climbing, balancing, and climbing and body control.

Flows
The roof yard is open for undetermined flow, but it could also become a circular flow between the entrance balcony and the ground yard if the doors are open. The children can move freely between different activities and elements by going directly to it or use another element on their way.

Distinctive elements
The concept of having the school yard on the roof is special. Some parts of the roof are covered with net to catch flying objects. It is only over the multi field and part of the free area.

Furniture & Equipment
Benches and ping pong table on ground level together with a slide in addition to the activities on the roof. F. Mattsson (personal communication, February 12, 2024) point out the problem of the high-speed slide and no protection towards the hard surfaces in the end, which have led to injuries.

Materials
Asphalt on the ground level and soft asphalt on the roof. F. Mattsson (personal communication, February 12, 2024) says the materials are something to consider, since the roof material gets very slippery as well as the wooden island and have caused several injuries. The soft asphalt got different colourful marks on the roof, as well as letters and numbers.

Senses related perceptions
The higher railings on the roof have windows to look out over the buildings around.

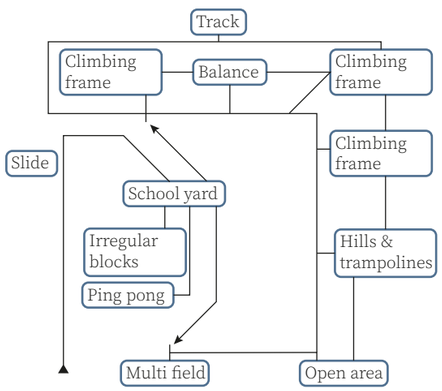
Figure 10

Pictures of Noblaskolan school yard

Note. Picture of Noblaskolan

Figure 11

Room Program Noblaskolan school yard



Note. Function program

Case study Physical activation - Inspiration and reference projects

Aarhus Gymnastics and Motor Skills Hall

Location: Denmark
Architects: C.F. Møller Architects

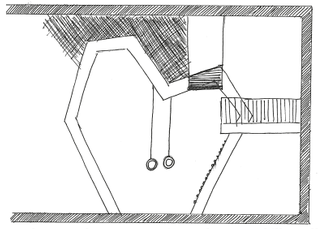
The encouragement of activation is the underlying reason for this project (C.F. Møller Architects, n.d.; *Aarhus Gymnastics and Motor Skills Hall / C.F. Møller,* 2010; erika kim, 2010; Mains, 2020). The parts of the room are named after its similarities to the animal world, like swinging monkeys or jumping kangaroos.
Ropes, trampolines and climbing opportunities are all part of the room (C.F. Møller Architects, n.d.; *Aarhus Gymnastics and Motor Skills Hall / C.F. Møller,* 2010; Mains, 2020).

The inspiration:

The interesting part of this project is the height, all climbing options and the exploratory design.

Figure 12

Sketch of Aarhus project



Note. Sketch based on *Aarhus Gymnastics and Motor Skills Hall* [Photography/Drawings], by C.F. MØller Architects, n.d., cfmoller, (https://www.cfmoller.com/p/Aarhus-Gymnastics-and-Motor-Skills-Hall-i2423.html).

Spiralen

Location: Denmark

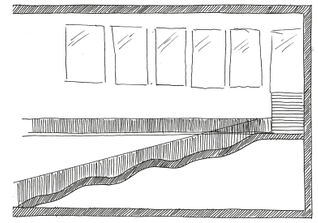
Gymnastikförbundet et al. (2020) are presenting the idea of combining different heights with access to several heights along the way, in a way of using more than the floor area. The project Spiralen is one of the examples they present (LOA Fonden & Johansen, n.d.) showing a wavy ramp from the first floor to the second. Its letting the communication become interesting and fun and add something special to the room.

The inspiration:

I see this type of element as something that can bring both a character, support other functions in the design, become a supportive activation tool and release floor area, as well as it divides the room (Närhälsan Västra Götalandsregionen, 2019).

Figure 13

Sketch of Spiralen



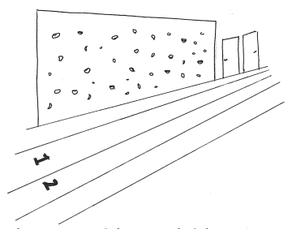
Note. Sketch based on *Spiralen, Kalundborg, Danmark* [Photography], by LOA Fonden & Johansen, R., n.d., Framtidens Idrottshall. In Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB, *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall*, (https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf.).

Corridor inspiration

Gymnastikförbundet et al. (2020) are presenting two other examples showing activation in corridors in the pictures by Unisport (n.d.a.) and Unisport (n.d.b.). Boverket (2021) present one picture by Zwenger & Tidningen LÄRA (n.d.) on the same topic.

Figure 14

Sketch of corridor inspiration



The inspiration:

Inspiration in the way of how it conceptually can be used. What type of activations it can be.

Note. Sketch based on *no name* [Photography], by Unisport, n.d.a., Framtidens Idrottshall, (https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf) In Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB, *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall,* (https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf), *No name* [Photography], by Unisport, n.d.b., Framtidens Idrottshall, (https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf), In Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB, *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall*, (https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf), & *Klättervägg i korridoren* [Photography], by Zwenger, U., & Tidningen LÄRA, n.d., Boverket, (https://www.boverket.se/sv/samhallsplanering/arkitektur-och-gestaltad-livsmiljo/arbetssatt/skolors-miljo/byggnaden-och-utemiljon/rorelseframjande-miljo/rorelseframjande-inomhusmiljo/), In Boverket. *Rörelsefrämjande inomhusmiljö i skolan*. Retrieved September 14, 2023, from (https://www.boverket.se/sv/samhallsplanering/arkitektur-och-gestaltad-livsmiljo/arbetssatt/skolors-miljo/byggnaden-och-utemiljon/rorelseframjande-miljo/rorelseframjande-inomhusmiljo/).

Summary, reflection, conclusions - Physiotherapy

1. Ground texture and levels (Movahed et al., 2023; F. Mattsson, personal communication, February 1, 2024; E-J. Isestig; Närhälsan Västra Götalandsregionen, 2019, personal communication, February 13, 2024).
2. The facilities must be designed for the patient and the staff. To do this by working with colours children would enjoy but at the same time is comfortable to work in (A. Näs, personal communication, January 25, 2024; E. Schubert Hjalmarsson, personal communication, December 29, 2023)
3. To see the physical activation design from the physiotherapy in a way of making it easy to see an environment you are welcome to outside physiotherapy (Shannon et al., 2021).
4. Work with close access in one floor as long as possible and strategically place functions on a second floor (if needed) that could be excluded from the patient flow (A. Näs, personal communication, January 25, 2024; E. Schubert Hjalmarsson, personal communication, December 29, 2023; L. Bernhardsson, personal communication, January 23, 2024)
5. Higher roof (L. Bernhardsson, personal communication, January 23, 2024)
6. You have the possibility to work with integrated tools but also physical objects (Roşca et al., 2022; Generation Pep Sweden, n.d.b; E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019). Many of them are good for the balance (Roşca et al., 2022).
7. Decide the journal taking is done in office and communication room to leave the room flexible (A. Näs, personal communication, January 25, 2024; L. Bernhardsson, personal communication, January 23, 2024; E. Schubert Hjalmarsson, personal communication, December 29, 2023).

Summary, reflection, conclusions and ”into design” of Study visit Physiotherapy

Main aspects from Capio

1. The two entrances where a bit confusing. Only have one entrance that is accessible or make it visibly clear so you don’t have to wonder where to go if there are two entrances.
2. Treatment rooms with indirect daylight through frosted glass and placing the physical activation along the facade.
3. Having the stair to the upper floor directly after the entrance creates a flow with a lot of back and forth. Making you pass through dirty zones and cross passages of incoming patients. Would have been better if the stair was closer to waiting area.
4. The types of furnitures could be used with the intention to encourage being active instead of sitting.
5. The activation area is like a gym but with one flexible area.

Main aspects from IFK

1. The treatment rooms are visibly hidden from the entrance and you avoid the feeling of physiotherapy when you only get the impression of a gym.
2. Zones for different intensity and activities divides the space (E-J. Isestig, personal communication, February 13, 2024; A. Näs, personal communication, January 25, 2024; Närhälsan Västra Götalandsregionen, 2019). Open area that has defined sections (A. Näs, personal communication, January 25, 2024).
3. Not having everything in one floor helps with creating the division in the room but becomes an obstacle as well when it comes to natural accessibility.
4. Colours together with lightning (A. Näs, personal communication, January 25, 2024), design on furniture and furnishing details has an affect on the atmosphere. Be aware of this when taking decisions.
5. Gym with daylight and treatment rooms with indirect daylight.

Main aspects from Östra

1. The rooms are organised along two parallel double-sided corridors creating rooms with parallel use (E. Schubert Hjalmarsson, personal communication, December 29, 2023).
2. The treatment rooms are similar and could be used a bit flexible as well (E. Schubert Hjalmarsson, personal communication, December 29, 2023).
3. It is a colourful colour palate that strengthen the intention of designing for the children.
4. The test room, movement room and training hall with gym are rooms with specific focus on movement and where the clinical feeling disappears. Something that will make you aware of your own body (E. Schubert Hjalmarsson, personal communication, December 29, 2023).
5. Making space for pattern and tools on the ground is a way of integrating the treatment tools in design (E. Schubert Hjalmarsson, personal communication, December 29, 2023; E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019; Gymnastikförbundet et al., 2020; Unisport, n.d.a.).

Reflection, comparisons or conclusion between projects

- All projects have the same sort of standard equipment in the treatment room. But the hospital has more storage in the rooms and the same goes for the special tools.
- Östra is the only reference project designed for children.
- The private physiotherapy clinics works more with the open spaces and zones and is more designed like gyms. Östra has all functions separated in different rooms and corridor area.
- Closed rooms probably easier creates privacy for the children.
- All the projects have treatment rooms that aren’t placed in facade.
- Östra got a gym with the equipment like the private clinics but it is in a smaller scale and they incorporate the physical activation in other forms with defined purposes.
- IFK and Capio works with darker or neutral colours.

Summary, reflection, conclusions - Physical activation

1. Observation space (Carlén, 2021; C. Klüft, personal communication, October 25, 2023; Movahed et al. 2023; Generation Pep Sweden, n.d.e.)
2. Be aware of wheelchair users (F. Mattsson, personal communication, February 1, 2024) and how their reach is limited and how the hight on things depends (Movahed et al., 2023) for example by the age on the user group.
3. Physical movement could also be to improve fine motor skills (Movahed et al., 2023; E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019), which some children needs to develop (R. N. Johansson, personal communication, February 7, 2024).
4. Even if the children wants to be active in different ways, these activity options should be so close the parents could have an eye on them (R. N. Johansson, personal communication, February 7, 2024; Movahed et al., 2023; E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019) and doing that by creating zones is an option (R. N. Johansson, personal communication, February 7, 2024).
5. Parallel connections improves the flows and gives options when it comes to play environments (Movahed et al., 2023)
6. VR or use technology, since it can attract children (C. Klüft, personal communication, October 25, 2023, Boon et al., 2020) and be a tool for the staff (Boon et at., 2020).
7. The building should have activations that meets the movement categories (Boon et al., 2020).
8. Place for parents and child (Wang et al., 2023; Movahed et al., 2023)
9. Outdoor environment could be a tool (C. Klüft, personal communication, October 25, 2023; Movahed et al., 2023)

Summary, reflection, conclusions and ”into design” of Study visit physical activation

Main aspects from Noblaskolan

1. The school yard is only available when the teachers open the locked doors to the stairs leading up to the roof (F. Mattsson, personal communication, February 12, 2024). Creates a reflection on the control of availability.
2. The linked elements makes a flow in activation from station to station, but also provide a natural path. Related to Isestigs notions (E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019).
3. It is important to reflect over equipment, play tools and materials safety (E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019).
4. Creating playfulness by experimenting with ground texture and patterns (E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019; Gymnastikförbundet et al., 2020; Unisport, n.d.a.).
5. The design for activation is made both from play ground equipment and by playing with volumes like adding hills on the roof. Meets possible strategies mentioned by Isestig (E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019).

Main aspects from Case studies

1. Corridor integrations, running track (Unisport, n.d.a.; Unisport, n.d.b.; Boverket, 2021; Zwenger & Tidningen LÄRA, n.d.; Gymnastikförbundet et al., 2020; Närhälsan Västra Götalandsregionen, 2019; Generation Pep Sweden, n.d.b.; Brittin et al., 2015; Movahed et al., 2023)
2. Ramp system (Gymnastikförbundet et al., 2020; LOA Fonden & Johansen, n.d.; Movahed et al., 2023)

Study visits Physiotherapy & Physical activation summary

- Make treatment rooms general since you don’t know what diseases or physical conditions that will be treated, which also make it possible for future changes (E. Schubert Hjalmarsson, personal communication, December 29, 2023).
- Avoid the clinical feeling by working with a pleasant colour palette (A. Näs, personal communication, January 25, 2024; E. Schubert Hjalmarsson, personal communication, December 29, 2023; E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019; R. N. Johansson, personal communication, February 7, 2024) and hide treatment rooms from entrance or waiting room.
- Combine the zones (E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019) and open spaces (R. N. Johansson, personal communication, February 7, 2024) with closed rooms. Still offer privacy (IFK and Capio).
- Don’t lose the close contact between treatment room and active physio area (A. Näs, personal communication, January 25, 2024; L. Bernhardsson, personal communication, January 23, 2024).
- Prioritize active rooms towards windows over the treatment rooms.
- Incorporation of treatment tools in design, like floor, ceiling and walls (E-J. Isestig, personal communication, February 13, 2024; E. Schubert Hjalmarsson, personal communication, December 29, 2023; Geration Pep Sweden, n.d.b.; Närhälsan Västra Götalandsregionen, 2019; Unisport n.d.a.; Unisport, n.d.b.; Zwenger & Tidningen LÄRA, n.d.; Gymnastikförbundet et al., 2020).
- The multi-functionality from the movement room is a room where the physiotherapy becomes playful (E. Schubert Hjalmarsson, personal communication, December 29, 2023). It is a specific function that can work in symbiosis with the intention the physical activation part of the building has.
- If more than one floor is used the communication must be placed in a location making a suited flow between patient, staff and activities (L. Bernhardsson, personal communication, January 23, 2024)
- Let the outdoor environment be available 24/7 when the indoor needs to be controlled.
- Play with the transition between activities (E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019)
- Corridor integrations, running track (Unisport, n.d.a.; Unisport, n.d.b.; Boverket, 2021; Zwenger & Tidningen LÄRA, n.d.; Gymnastikförbundet et al., 2020; Närhälsan Västra Götalandsregionen, 2019; Generation Pep Sweden, n.d.b.; Brittin et al., 2015; Movahed et al., 2023)
- Ramp system (Gymnastikförbundet et al., 2020; LOA Fonden & Johansen, n.d.; Movahed et al., 2023).

Context of the project - Trollhättan

Personal relation

The reason for choosing Trollhättan is simple. It is the city I know the best. I can take advantage of that I would already have a bigger understanding for the context of the site, that will come further on, than I would have over a new place.

About Trollhättan

Trollhättan consist of several districts. Some of them moving from south to north is Sylte, Lextorp, Kronogården, Skoftebyn, Eriksro, Karlstorp, Centrum, Håjum, Egna Hem, Stavre, Sandhem, Strömslund, Björndalen, Skogshöjden. Each with its own character in typology, structure, and status. Some has more in common than others and some are more segregated than others. Something that may will be interesting in choosing the specific site.

The nature and its topography are part of the experiences of the city. From Gamle Dahl in the end of Skoftebyn, can you follow the canal that enters the city from its way from Gothenburg, by the locks all the way through the city centre, on its way to Vänern. In the steep openings where the Trollhättefallen connects to the canal you could walk along the track Edsvidsleden.

Already when you enter the city a big sign spread the words of an "outdoor recreation municipality". It is not a self-named title, but a competition result where Naturvårdsverket is one of the actors (Naturvårdsverket, 2023; REBLJU, 2022). The rest of the actors are Sveriges Fritids- och Kulturchefsförening and Svenskt Friluftsliv (Naturvårdsverket, 2023; REBLJU, 2022). Naturvårdsverket (n.d.) describes the reason for that Trollhättan in 2022 receiving the title was a combination of planning and action. They also present that it is part of the local politics decision of having an outdoor recreation strategy (Naturvårdsverket, n.d.; REBLJU, 2022).

This gives signs of a strong active life. One example is "Trollhättan action week" that attract skiers from all over the world with Allianssloppet (Trollhättan Action Week, 2023) and they arrange a race every school start for the children (Klassjoggen, 2023).

Even if Trollhättan already has a lot to offer I see this project as one that can contribute to Trollhättans work with activation and strengthen the concept even more.

Finding specific location

In the early stage, several different positions and alternatives have been in the discussion for where in Trollhättan the project will be placed. Should it be connected to an existing primary care or health facility or somewhere else? Should it be put in connection to Capio (1.) and build up on their health promotion as described by generation Pep (Generation Pep Sweden, n.d.c).

Other ideas to place it are at a new area at Innovatum (2.), Knorren (3.) or at Myrtuveparken (4.) (L. S. Larsson, personal communication, January 17, 2024).

An interview with the plan architect Hjalmar Oskarsson at Trollhättans Stad Stadsbyggnadsförvaltningen was held to receive other perspectives as well as nuanced ones of what should be considered.
The goal with the interview was to get an idea of how Trollhättan Municipality reflects when it comes to position, functions, plot and be a help in the decision making but also to see the possibilities. Therefore, were several questions put together. Among other things, questions concerning his thoughts about aspects like communication and centrality etc. (L. S. Larsson, personal communication, January 17, 2024). At the same time, I let him hear my ideas and give his opinions about the previously presented sites.

L. S. Larsson (personal communication, January 17, 2024) explained some additional reflections to the plan architect.

> *I see the advantages of having a good outdoor environment next to it that could contribute with physical activity and could strengthen the functions on the inside of the building and vice versa. Communication feels important and how it is easy to access the building and its functions. It is suiting with supporting functions in its surrounding that could contribute with flexible solution and shared distribution.*

H. Oskarsson (personal communication, January 19, 2024) gives his input and sees the potential with the Knorren-area (3.) in the future but points out the possible limitations. Underlay material would be the only reference for relating the new building to the surrounding and there would be no physical objects to adapt to, except the new roads (H. Oskarsson, personal communication, January 19, 2024). H. Oskarsson (personal communication, January 19, 2024) agrees about the benefit with co-exploitation and how communication and connections should be thought through.
Oskarsson present Kopparholmen (5.) as a potential plot since it has a "plan notice" and has become a free area after a demolishment. When it comes to size it is about 2000 sqm but has a green area one block away (H. Oskarsson, personal communication, January 19, 2024).

According to the data and plans they have for Kronogården it can be an option. H. Oskarsson (personal communication, January 17, 2024) explains how statistic show how it is more children dense in this area compared to the rest of Trollhättan (Underlag Kronogården, Lextorp, n.d.). If this area is chosen and for example the plot Skördetröskan (6.), it is also a way of meeting noted health problems (H. Oskarsson, personal communication, January 17, 2024; Underlag Kronogården, Lextorp, n.d.). In the discussion about a plot between the Centre and Kronogården around the area of Slättbergshallen Oskarsson presented Barnsköterskan (7.) as another possible site. There are functions around you could see a cooperation with. The site is 4 times bigger than Kopparholmen and they want to use it in the future as a shared space between a kindergarten and care facility (H. Oskarsson, personal communication, January 19, 2024).

If Barnsköterskan is chosen it would be next to the plot where the Capio care facility is located.

When it comes to the thought about a plot at Sylte, he suggests two plots next to each other or ways of reorganizing the use of the plots. The plot where the kindergarten Myrtuvan (8.) is located is one of them because of demolishing plans. The area has a lot of the functions for cooperation and communication the project is looking for. When it comes to the parents, he feels the area has opportunities for them as well. It is also closer related to Kronogården then placing it at Innovatum, which he connects to the statistic he brought up, and that the need for this type of building is likely more useful at Sylte than Innovatum (H. Oskarsson, personal communication, January 19, 2024).

As an addition to the discussion about placement it is important to reflect over which ones you are reaching out to with the placement of the building and how it won't help the most in districts with wealthy status, but no matter what, active transport should be an easy choice (C. Klüft, personal communication. October 25, 2023). In the report of Wang et al. (2023) are they referring to the fact, based on statistic, that encouragement would be extra important when it is areas with for example people with lower economy.

Figure 15

Map of Trollhättan

Note. Map of Trollhättan with the site which have been part of the discussion BASED ON *GIS data*, by Lantmäteriet, 2024a. ©Lantmäteriet

Scale 1:50000

Proposed plots

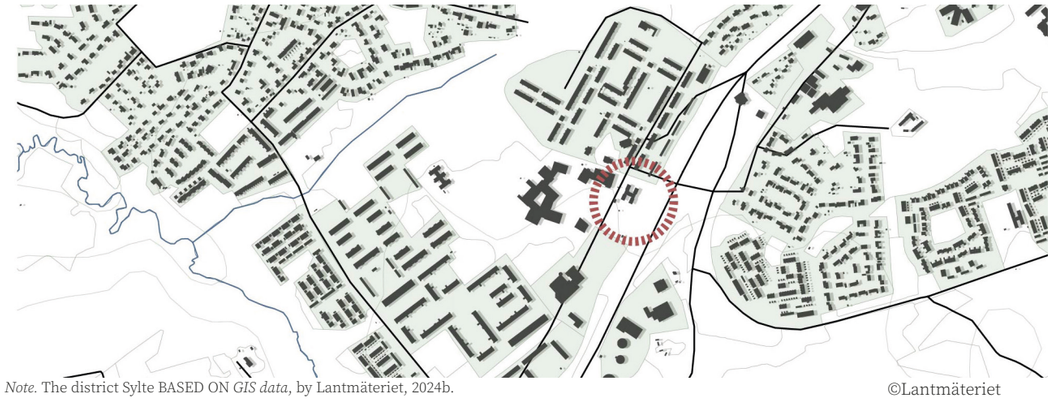
Suggested plots

Final plot

Finding specific location

Figure 16

The district Sylte



Note. The district Sylte BASED ON *GIS data*, by Lantmäteriet, 2024b. ©Lantmäteriet

Scale 1:15000

Why a plot at Sylte ?

H. Oskarsson proposed (personal communication, January 19, 2024) several possible sites during the interview. There are many aspects contributing to why the proposed site at Sylte could be suited for a physiotherapy and physical activation facility.

Sylte is a district on the outskirts of Trollhättan but boarders to one of the older districts Skoftebyn and is easily linked to Lextorp and Kronogården. Kronogården, parts of Lextorp and to some extent Sylte are seen as the most segregated districts in Trollhättan from the eyes of many inhabitants in Trollhättan.

The topic about segregation is important and this project could be a way of working with the integration. It was important to find a site not appearing to be isolated. To create the diversity of people I believed you need a plot somewhere on the boarders between different districts that invites people from both directions of the segregated and the integrated areas, where maybe income and ethnicity becomes noticeable. In the context of and my perception of Trollhättan, I believe the building would lose a bit of it purpose if it was placed in the middle of Kronogården, since it would only attract the ones living there, even though H. Oskarsson (personal communication, January 19, 2024) points out some aspect making it relevant, for example how it is quite close the central parts. The same goes for if the building was placed in the western and northern parts of Trollhättan and would be too far away from the segregated areas. I believe Sylte is one of those sites on the boarder that can let people in different district meet. Despite it is being on the outskirts of Trollhättan the bond to Skoftebyn and the segregated districts still exist. At the same time does H. Oskarsson (personal communication, January 19, 2024) mention the suitable communication the site has. Something that also could invites the central parts of Trollhättan as well.

This communication is possible with help from collective traffic (Carlsson & Franzén, 2017a) and especially one bus line that stops at two stops almost next to the site. The line goes from Lextorp, through Kronogården, through central Trollhättan, past the outskirts of Skoftebyn and finally turns around in the end of Sylte. Which create suitable conditions to invite many parts (Carlsson & Franzén, 2017a). With the driveway and exit from the E45 highway does the communication become even extra strong and simplify the access to the area both from the northern and south-eastern districts. Wang et al . (2023) describes how the promotion of activation becomes better when the access to it in the urban scale is good, which speaks for the benefits of this site.

From looking at the site at Sylte H. Oskarsson (personal communication, January 19, 2024) sees its multifunctional purpose.

The site is also suitable since the newly built Sylteskolan (School) will be the nearest neighbour. The old Sylteskolan was demolished a few years ago and is now rebuild for both, kindergarten, elementary school and high school. The youth club is joint to the gymnastic hall (Google, n.d.e.), which also is new. If the new building starts out from the purpose of meeting people with varying capacities Sylteskolans special school (HANSJO, 2024) could take advantage of the project and use it in their occupancy during school time. Something that is supported by Chen (2013) when describing how the school has an opportunity to promote health. Having the occupancies close to each other would facilitate it. As well does Shannon et al. (2021) describe opportunities that would benefit from that.

You have Myrtuveparken on the backside of the school (Carlsson & Franzén, 2017a). Its gravel field is used by the school during outdoor sport lecture. The gravel and asphalt paths were used as jogging paths during my time at the school. The park has recently, around the same time as the school was built, been completed with an enclosed sport cage and an outdoor gym, which could be the result from the changes Carlsson & Franzén (2017a) mentioning in the descriptions (Carlsson & Franzén, 2017a; Carlsson & Franzén,2017b). The park is growing into the forest (Carlsson & Franzén, 2017a). Wang et al . (2023) explain based on research how diversity of activation is beneficial in urban scale.

South of the school you have everything from primary care, dentist, pharmacy, ICA Supermarket, BVC (Children primary care) and between school and supermarket, you have the library (Carlsson & Franzén, 2017a; Carlsson & Franzén, 2017b).

These functions, the communication, the connection between areas with different character and how there already are some programs that attract people during their free time, makes it a suited place. The site has the primary care a block away and the school just next to it which makes it possible for collaborations. The youth club is for the older children. This could be a complement for the younger.

The plot - Kv. Ollonborren, Sylte 4:8

Sylte 4:8 has several different plot or blocks inside its property (Lantmäteriet, n.d.). One of the blocks are Kv. Ollonborren and another one is Sylteskolan (Struve & Ydeskog, 1968). Kv. Ollonborren will be the plot for the project. A newer detail plan doesn't exist for the plot, but there have been changes for the other blocks in the property, which is described in two plan descriptions from 2017 (Carlsson & Franzén, 2017a; Carlsson & Franzén, 2017b), but is not controlling Kv. Ollonborren. They are discussing the zone for the school (Carlsson & Franzén, 2017a; Carlsson & Franzén, 2017b) and the new road network (Carlsson & Franzén, 2017a;H. Oskarsson, personal communication, January 29, 2024).

The plot has been used for a kindergarten and a parking space for the school. The parking is still in use. When it comes to the kindergarten it is only the building left, because the occupation is no longer active in it (H. Oskarsson, personal communication, January 26, 2024). H. Oskarsson clarifies that since the kindergarten got another place for its occupancy, the discussions on rebuilding are no longer relevant, but more likely a demolishment (H. Oskarsson, personal communication, January 26, 2024). Which means there are no definite plans for the plot today. Since the 1968's city plan being the current leading document for the block it is unlikely changing it would be declined considering the plan not being up to date. This thesis project could be a way of investigating what a detail plan proposal for kv. Ollonborren may result in (H. Orskarsson, personal communication, January 26, 2024).

Newly taken photos shows how the demolishment already have started, which means this project wouldn't be the reason for demolishing anything in the future, since the decision already was taken. Instead, it could take advantage of the site becoming available.

A major part of the outdoor environment is directed towards southwest and along the site in west. Several trees create shadows in south. It is a narrow feeling along the east side of the building due to the high paling. Entrances are from a parking on the north side of the building and on the south connected to the bigger parking.

The plot is quite flat where the building is placed and its closest area. The hight difference between the road and the plot occurs to be bigger the closer you get the southwesters corner (Carlsson & Franzén, 2017a). The outdoor environment consists of sandboxes, simpler playground equipment and a green hill with a slide.

Figure 17

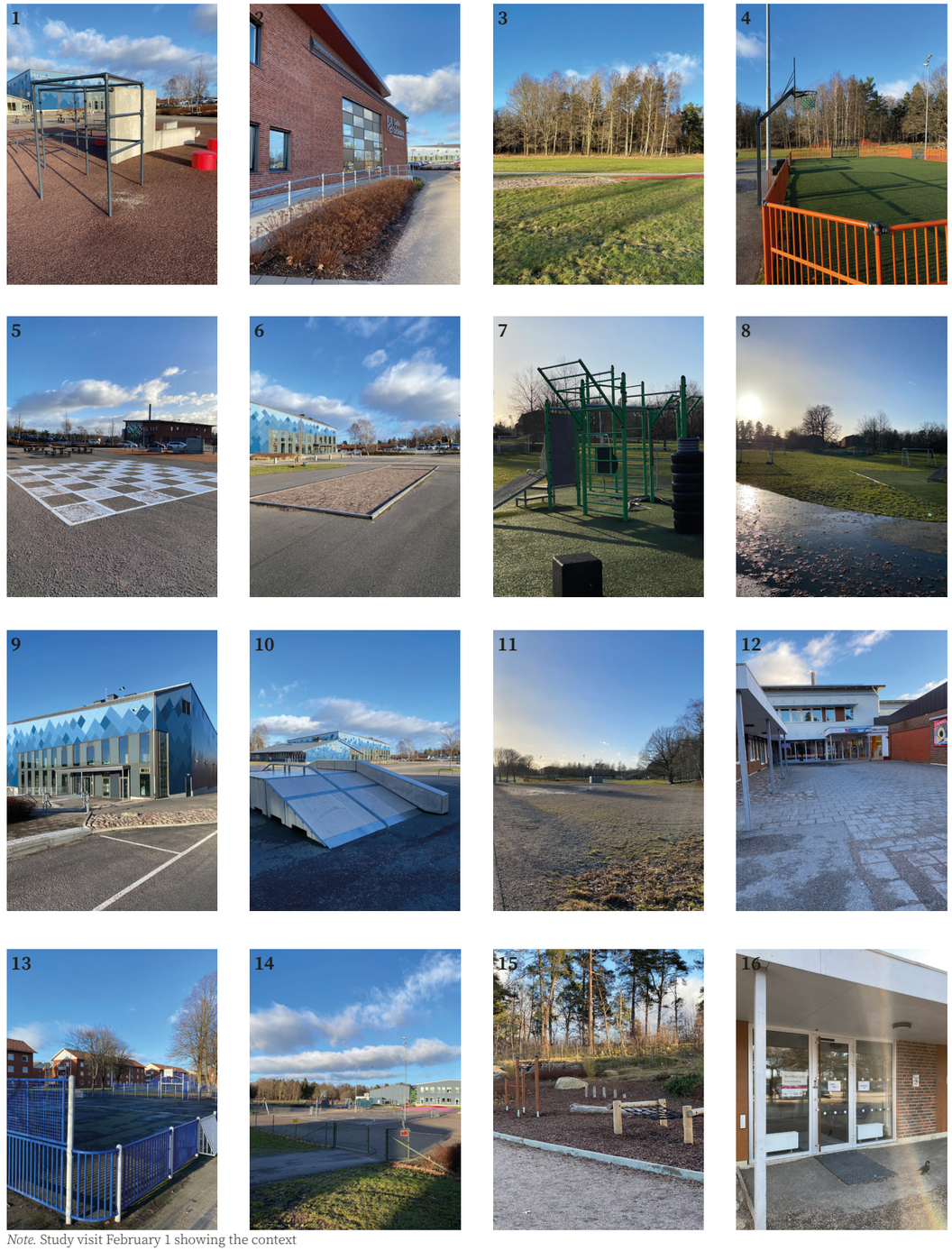
Demolishion of Myrtuvan förskola

Note. Study visit February 1, 2024 shows the demolition.

The plots nearest context

Figure 18

Picture collage of context

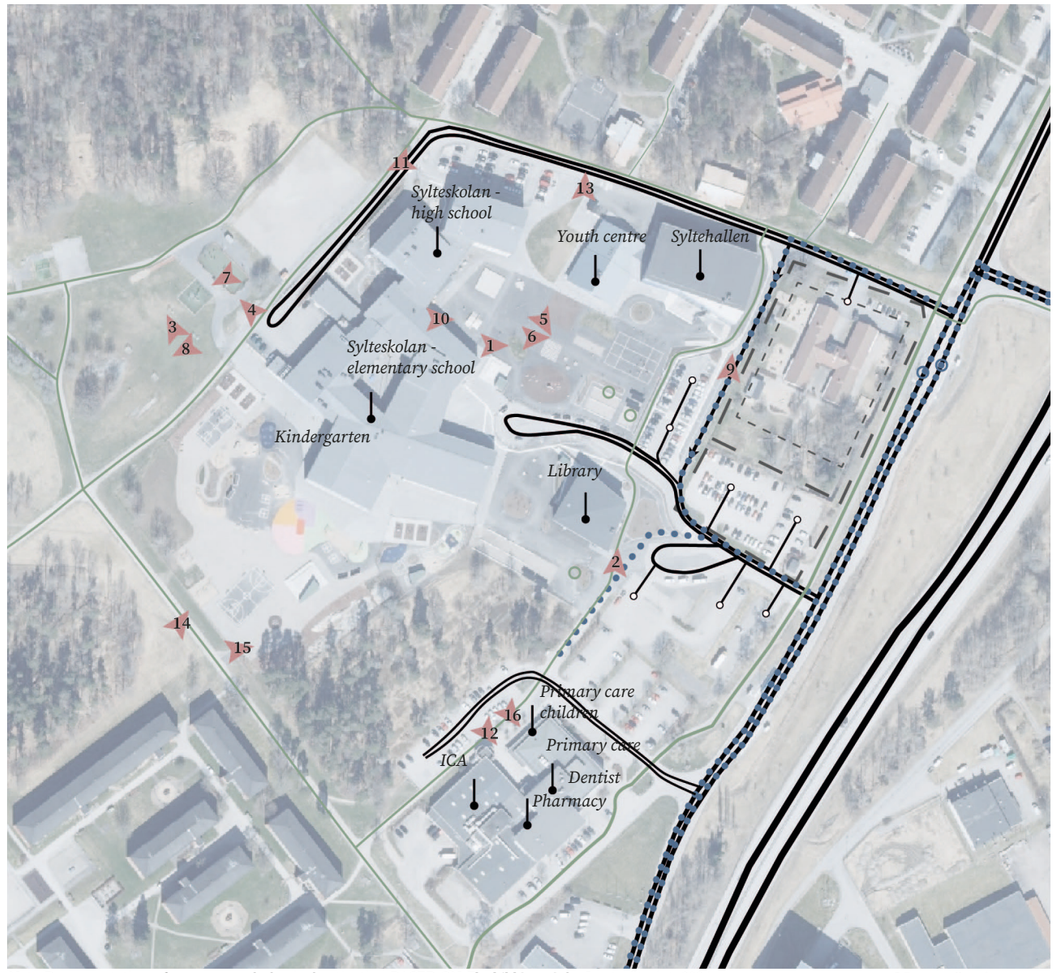


Note. Study visit February 1 showing the context

The plots nearest context

Figure 19

Site analysis



Note. Documentation of program and physical activation BASED ON *Flygbild* [map], by Lantmäteriet, 2024c. ©Lantmäteriet

Road · *Bike / walking* · *Bus* · *Photo* · *Building* · *Parking* · *Bike parking* · *Bus stop*

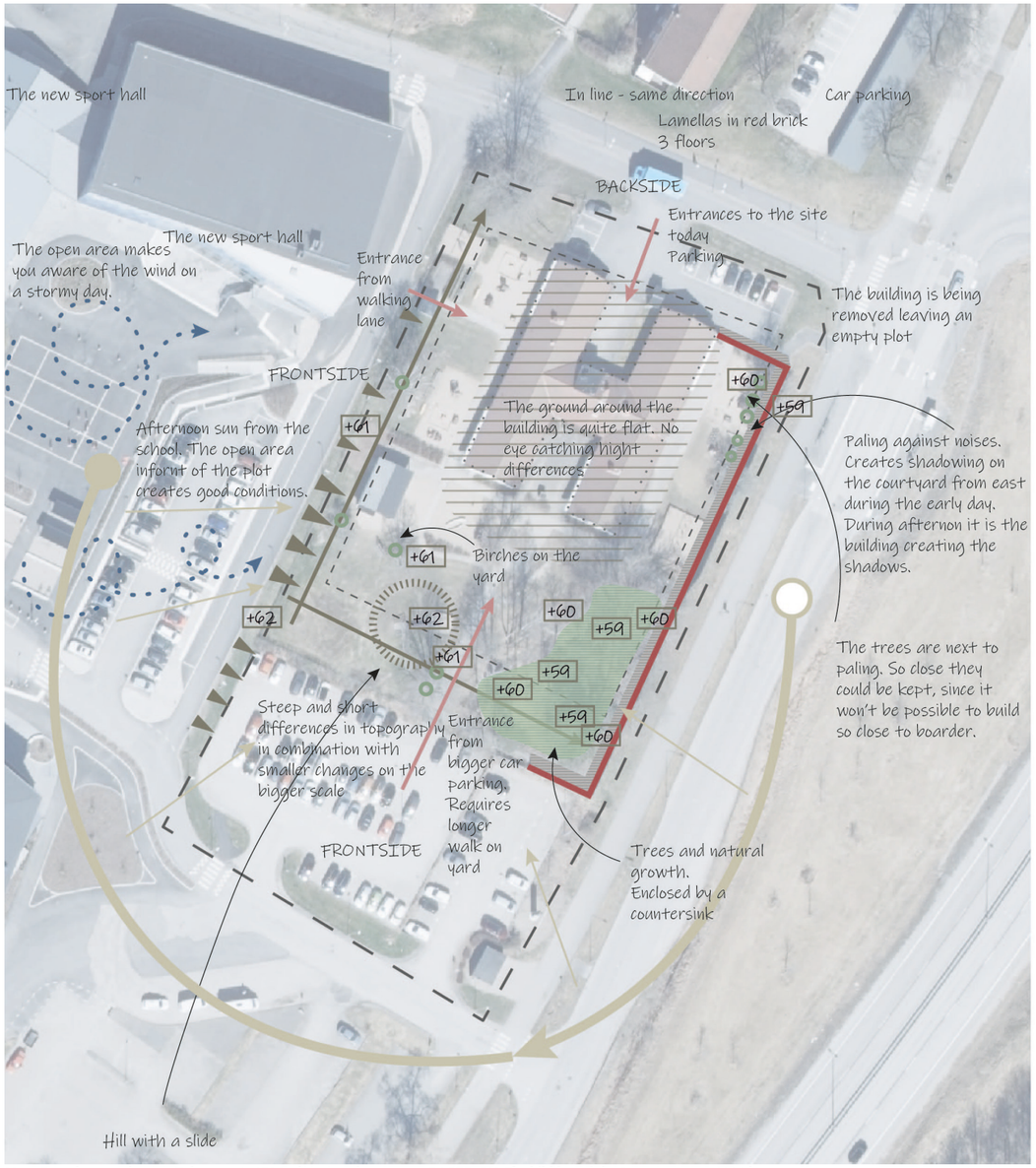
Picture legend

1. Parkour with soft ground texture on school yard
2. The new library. Brick architecture with details around windows
3. Murtuveparken. Park with activities. Long jump pit
4. Box with plastic grass for football. 4 goals and 2 basket ball hoops
5. Painted chess pattern och school yard. Out of picture an extra undefined painted game field
6. Possible boule field
7. Outdoor gym in the park
8. Football goals in the park
9. The entrance to the sport hall - Syltehallen
10. Ramps for skateboarding on the school yard
11. Sport field with gravel as ground texture.
12. Square in front of dentist, primary care, pharmacy and supermarket
13. A ball field belong to the residential buildings
14. A view over the school yard for the younger children. The park in the background
15. Obstacle course in a ”natural environment” of the school yard
16. Entrance to the Children Primary Care (BVC) next to the square.

The plot - Kv. Ollonborren, Sylte 4:8

Figure 20

Site Analysis



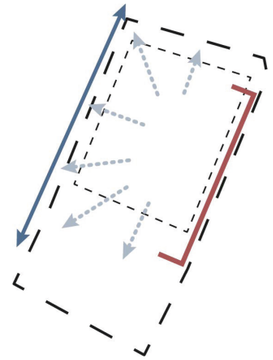
Note. Based on study visit February 1, 2PM, showing the context BASED ON *Flygbild* [map], by Lantmäteriet, 2024d. ©Lantmäteriet

The plot - Kv. Ollonborren, Sylte 4:8

How to use the site?

Figure 21

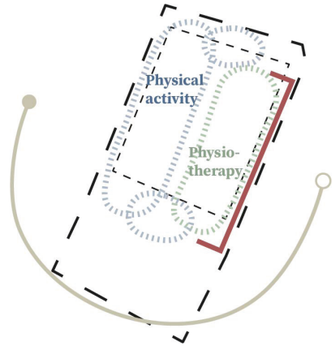
Site Analysis



Open /closed depending on direction

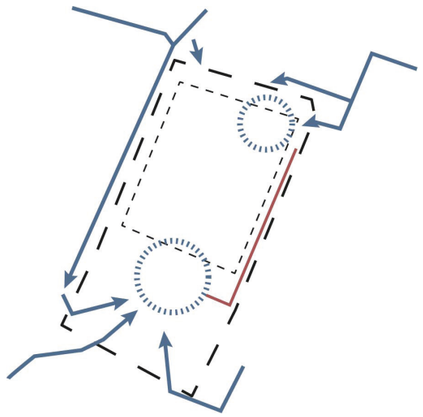
The paling creates an barrier

The site opens up towards the inner roads, parking and school.

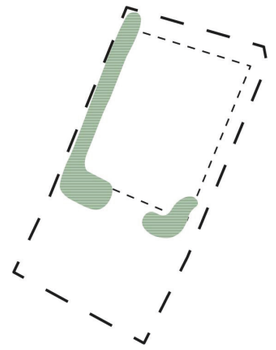


Placement of the functions in relations to which part of the site that is more private or public.
Trees - Natural protection from sun.

The functions on the eastern side on the plot may need to use the hight to get more sunlight because of the shadowing from the paling.



Natural entrances or meetings with the building.
Main entrance placement.
Making use of already existing connections.
Shorten barrier or make corner of building visible to make use of view from road and bus stop.



Natural path for active outdoor environment.

Possible parallel path to take.

Relevant zone.

Note. 4 different analysis of how the site can be used.

The plots nearest context - site analysis & documentation

The nearest context is a strong reason for choosing the plot and because of all its programs, but also that the site has good preconditions for physical activity. Some features and functions are already planned out. It is necessary to understand what is already offered on the site to make it possible for the new building to contribute with something else.

Syltehallen

Before the school and its gymnastic hall was rebuilt the school shared a smaller and a bigger hall. The two were connected and both on school property. Outside school hours it was also used for different sport practices, for example the local football clubs. During the renovation the two halls were replaced with a new and developed hall.

This new hall consists of a big hall room with two flexible walls folding from the roof. In this way could three lectures be hold at the same time (Kraftstaden fastigheter, n.d.; V. Weiselius, personal communication, February 1,2024; M. Lööf, personal communication, February 1, 2024). A grandstand stretches along the long side of the hall. It is included in the sectioning of the hall room, which give each hall its private grandstand when the hall is being divided.

From the entrance you could reach all floors. A stair up to the top floor leads to the grandstands. Straight ahead from the entrance you would enter the big hall room. In the basement one stair down all the dressing rooms are located together with a teacher's office.

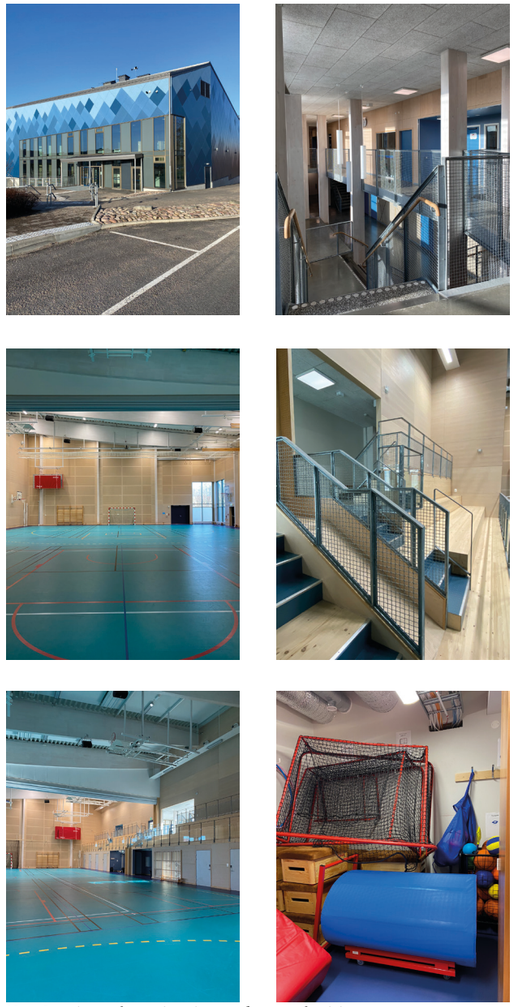
What seems to be quite unique for this hall is the amount of dressing room. One is for the staff (M. Lööf, personal communication, February 1, 2024), but the other twelve are dedicated to the pupils (V. Weiselius, personal communication, February 1,2024; M. Lööf, personal communication, February 1, 2024). Only the boys or girls from your own class will use the dressing room and the students that will use their third of the hall after the class before will not use the same room (V. Weiselius, personal communication, February 1,2024). This creates separate flows between classes and these separate flows also work for the use of the hall being sectioned, when it comes to entrance and access to equipment rooms (V. Weiselius, personal communication, February 1,2024; M. Lööf, personal communication, February 1, 2024).

The sport hall also leans or shares functions with the youth club which it is connected to. The entrance room of the youth club has a kiosk which could be opened if it is an arrangement in the sport hall during a weekend (M. Lööf, personal communication, February 1, 2024).

The visible equipment in the hall is:
5 basketball fields on the short side of the hall.
1 basketball field on the long side.
Indoor handball/ football goals
4 beams
4 rings
3 Mattress elevators
minimum 10 benches.
8 wall bars
Several equipment rooms.
1 rehabilitation room. About 3x3,5sqm with some minor gym equipment for student that can't participate in original lecture.

Figure 22

Pictures of Syltehallen



Note. Interior and exterior pictures from study visit

The plot - Kv. Ollonborren, Sylte 4:8

Figure 23

Pictures of site 24/3

Note. Entrance from parking and view over the yard during demolishing

Site OUTPUT

1. Keep the backside of today's building as the backside for the new one. It has natural flows from traffic and could be more hidden from public views.
2. Try to keep the trees that are close to the plot boarder since it is unlikely the building will be placed so close.
3. The south-eastern corner has changes in topography and natural greenery. To keep more of the trees and the natural changes in the landscape most of this area should be kept.
4. The main entrance should be from the south since the main parking is there. A parking in the north would be suitable for staff as well as a staff entrance.
5. Opening up by removing the fence would make the access easier and invite people. More inviting entrances to the yard is preferable.
6. The new school and library works with blue boards as facade material as well as red bricks. The older lamellas are in red orange bricks with wooden panels meeting the gabled roof and the kindergarten was covered in wooden panels. To meet the new and old may it be relevant to work with the same sort of exterior materials and matching colours. Wood, brick, red and blue. Avoiding the boards the school uses will also make an contrast and taking down the scale.
7. To get privacy for treatment rooms and to some extent the physiotherapy, these rooms and functions should primary be placed towards east or in a way you can avoid insight. Public functions are relevant to be placed towards the front side, the north eastern and north-western corner where people from the outside passes by the building.
8. Outside activities are best placed along street in west.
9. Be aware of the sunlight that may go straight into building from south west during day. Covers may be needed.
10. Keeping the paling

People in the building

The age groups differs within the building. The rooms are not focusing on the age but rather physical capacities. It is up to the parents or the child themselves to decide whether the functions are appropriate or not. Recommended age spans can guide but stills allows children up to 15 in en activation room, but the design is more adjusted for younger children in the age of 6-12 in mind.

Physiotherapy 0-18

Activation area open for everyone child.
Recommended for children in the age of 3 - 15

Physiotherapist

Staff in physical activation

Supporting parent to child in physiotherapy

VR-room
age 10-15

Parent and child at group activity

Mum and baby at group work out

Functions

Program activities and use

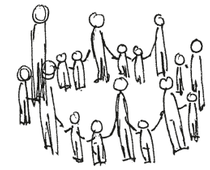
Creating a program with rooms and activities to provide space for parents and the older children is a way of making space for the whole family, when the younger children uses the physical activation space, and is based on the studies performed by researchers and outcomes from interviews. Having the space for that in the program is a way of working with the benefit of the inspiration the parents can provide their children described by Wang et al. (2023) and Chen (2013), and as an interpretation of the reflections from the interview with Klüft (p. 26 or 27).

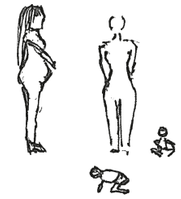
Shannon et al. (2021) described the benefit of group workout. Therefore that is something to be included in the activation program in the building as well as affecting the room division.

Presenting the possible programs in the building is inspired by Schultz (2023).

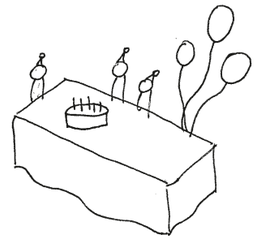
Figure 24

Activities





- *”Mum-workout” with their babies*
- *Group workout - children and parents - during evenings and weekends*
- *Kid-practise during weekends*
- *Free play (Carlén, 2020; Carlén 2021)*
- *Birthday parties*
- *Special school - lectures (Schultz, 2023)*



Activity → Function → Room

Note. Activity to room inspiration BASED ON *New Public Landscape* [Matter space structure studio project, Chalmers University of Technology], by R. Carlén, 2020, Chalmers, (https://projects.arch.chalmers.se/regina-carlen/), *Using Architecture to Promote Physical Activity: Designing activity space to encourage Sweden's most sedentary, with a special focus on high school girls* [Master Thesis, Chalmers University of Technology], by R. Carlén, 2021, Master's Thesis 2021 Archives, (https://projects.arch.chalmers.se/regina-carlen-2/) & *Integrating Wisdom - Promoting wellness through the design of an intergenerational preschool* [Master Thesis, Chalmers University of Technology], by L. Schultz, 2023, Master's Thesis 2023 Archives, (https://projects.arch.chalmers.se/wp-content/uploads/2023/06/schultzlinn%C3%A9a_20595_2788081_Schultz_Linn%C3%A9a_Healthcare_MT-2023-Booklet-.pdf).

Programme

Physical activations program

Activity → Function

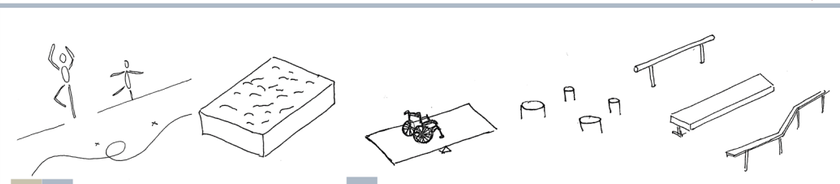
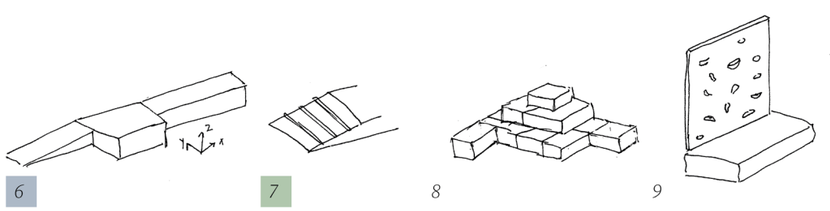
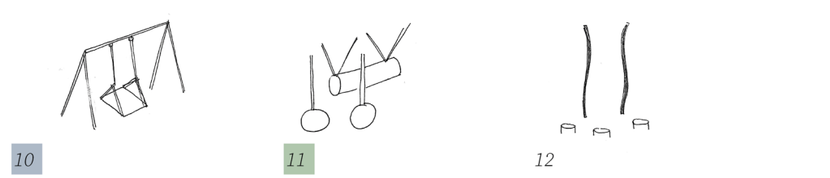
What type of movement, activations and functions should be available in the building? The movement categories that Boon et al. (2020) is talking about and is presented in the theory p.24 are examples of ways children move. The movement categories mentioned by Boons is included together with aspects presented by C. Klüft (personal communication, October 25, 2023) and other verbs in a way of understanding and describing what activities could be done. What is mentioned in this report as movement categories based on Boon et al. (2020) and what that include in activities are very similar to different types of verbs and activities presented by Carlén (2020). She document different movements in her project to sort out what type of movement and activities you can do with your body as an way of visualizing what to make space for when designing. I see her type of documentation as important to make use of since it is a guidance for the planning of the design for the different movements and a tool for me to compile different functions to be able to perform the movements in this building project.

Eva- Johanna Isestig explain during the interview how looking at the possible ways of movement and how that can be combined with other things in a product is a way of designing (E-J. Isestig, personal communication, February 13, 2024). That shows an awareness and reflection over the possible movement the design could create or an reflection of what design could be investigated to provide a specific movement.
In this way know what the functions should provide by reflecting over these verbs Boon et al. (2020) present as a tools for setting the activities in the building and the spaces the rooms must give. The different functions or strategies to meet the movement category is a mix of examples and inspiration from the references where they have explained how they affect the body or how it should be used, or where I have reflected or made the conclusions in which way their examples and designs affect, or could affect the body or parts of it, if it is not mentioned. The inspiration from the references comes from the case studies, study visits, literature, wishes, explanations and examples presented in literature and things you should think of. These are now being compiled and investigated by implementing elements they already propose, personal interpretations of the needs they present, inspiration from interesting solutions and elements in reference projects where I see it could serve a movement category, in a way of using the advice from Boon et al. (2023).

A personal reflection and conclusion about intensity, accessibility, and difficulty level (Movahed et al., 2023) has set the level division as an answer to the way of working with diversity explained by Movahed et al. (2023). In this way try to find functions for different physical capacities (Movahed et al., 2023) in several of the movement categories, to gather the functions the room eventually could have (Boon et al., 2020).

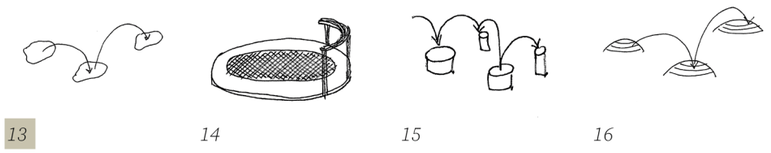
Table 3

Activitis turning into function - program

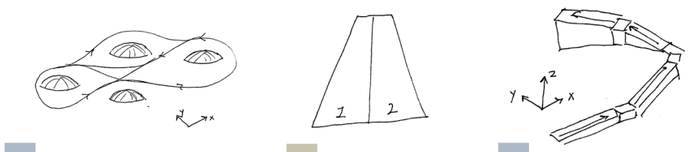
Movement Category (Movahed et al., 2023)	Functions Scale of advance, intensity and accessibility *Low threshold* → *Advanced threshold*
Balance (Boon et al., 2020; Roşca et al., 2022; Study visit Östra sjukhuset; Generation Pep Sweden, n.d.b.; Närhälsan Västra Götalandsregionen, 2019; Study visit Noblaskolan; Movahed et al., 2023; Carlén, 2020; Carlén, 2021)	 1 2 3 4 5
Climb (C. Klüft, personal communication, October 25, 2023; Movahed et al., 2023; Närhälsan Västra Götalandsregionen, 2019; C.F. MØller Architects, n.d.; Zwenger & Tidningen LÄRA, n.d.; Carlén, 2020; Carlén, 2021; Gymnastikförbundet et al., 2020; LOA Fonden & Johansen, n.d.; Unisport, n.d.b.)	 6 7 8 9
Swing (C. Klüft, personal communication, October 25, 2023; Movahed et al., 2023; Study visit Östra sjukhuset; C.F. MØller Architects, n.d.)	 10 11 12

Low threshold → *Advanced threshold*

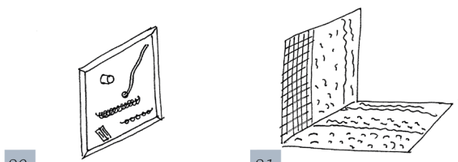
Jump
(Generation Pep Sweden, n.d.b.; Carlén, 2020; Carlén, 2021; R. N. Johansson, personal communication, February 7, 2024; Study visit Östra sjukhuset;)


13 14 15 16

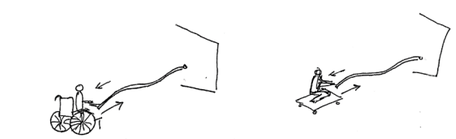
Relocation
(Boon et al., 2020; Carlén, 2020; Carlén, 2021; F. Mattsson, personal communication, February 1, 2024; Movahed et al., 2023; Gymnastikförbundet et al., 2020; LOA Fonden & Johansen, n.d.;Study visit Östra sjukhuset; Unisport, n.d.a)


17 18 19

Stimulation
(Västra Götalandsregionen, ,2019; Movahed et al., 2023; R. N. Johansson, personal communication, February 7, 2024)


20 21

Pull


22 23

Accessible activity *Function in movement room* *Activation in corridors*

Note. Different activities and their resulting functions to the activation rooms BASED ON Design Strategies for Promoting Young Children's Physical Activity: A Playscapes Perspective , by B. Boon, M. C. Rozendaal, M. M. van den Heuvel-Eibrink, J. van der Net, M. van Grotel, & P. J. Stappers, 2020, *International Journal of Design*, *14*(3), 1-18., *New Public Landscape* [Matter space structure studio project, Chalmers University of Technology], by R. Carlén, 2020, Chalmers, (https://projects.arch.chalmers.se/regina-carlen/), *Using Architecture to Promote Physical Activity: Designing activity space to encourage Sweden's most sedentary, with a special focus on high school girls* [Master Thesis, Chalmers University of Technology], by R. Carlén, 2021, Master's Thesis 2021 Archives, (https://projects.arch.chalmers.se/regina-carlen-2/), C. Klüft, personal communication, October 25, 2023, *Aarhus Gymnastics and Motor Skills Hall,* by C.F. MØller Architects., n.d., cfmoller. Retrieved February 28, 2024, from (https://www.cfmoller.com/p/Aarhus-Gymnastics-and-Motor-Skills-Hall-i2423.html), *Mural Arkitektur Rörelsebana*, by Generation Pep Sweden, n.d.b, Generation Pep. Retrieved September 15, 2023, from (https://generationpep.se/sv/hur-vi-arbetar/samarbetsinitiativ/mural-arkitektur-rorelsebana/), *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall*, by Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB., 2020, (https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf), F. Mattsson, personal communication, February 1, 2024, *Spiralen, Kalundborg, Danmark* [Photography], by LOA Fonden & Johansen, R., n.d., Framtidens Idrottshall. In Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB, *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall*, (https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf), *Promoting Health through Accessible Public Playgrounds*, by M. Movahed, L. Martial, T. Poldma, M. Slanik, & K. Shikako, 2023, August, Children, 10(8), p1308, 14p., (https://doi.org/10.3390/children10081308), *Barn & ungas väntrum: Vägledning för er som vill skapa rum inom vårdmiljön utifrån barn och ungas vilkor*, by Närhälsan Västra Götalandsregionen., 2019, Elanders, (https://isestig.se/eva-johanna/barn_och_ungas_vantrum_Isestig.pdf), R. N. Johansson, personal communication, February 7, 2024, Physical activity design for Balance Rehabilitation in Children with Autism Spectrum Disorder, by A. M. Roşca, L. Rusu, M. I. Marin, V. Ene Voiculescu, & C. Ene Voiculescu, 2022, *Children*, *9*(8), Article number 1152., (https://doi.org/10.3390/children9081152), *No name* [Photography], by Unisport, n.d.a., Framtidens Idrottshall, (https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf). In Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB, *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall*, (https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf), *No name* [Photography], by Unisport, n.d.b., Framtidens Idrottshall, (https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf). In Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB, *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall*, (https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf), *Klättervägg i korridoren* [Photography], by Zwenger, U., & Tidningen LÄRA., n.d., Boverket (https://www.boverket.se/sv/samhallsplanering/arkitektur-och-gestaltad-livsmiljo/arbetssatt/skolors-miljo/byggnaden-och-utemiljon/rorelseframjande-miljo/rorelseframjande-inomhusmiljo/). In Boverket. *Rörelsefrämjande inomhusmiljö i skolan*. Retrieved September 14, 2023, from (https://www.boverket.se/sv/samhallsplanering/arkitektur-och-gestaltad-livsmiljo/arbetssatt/skolors-miljo/byggnaden-och-utemiljon/rorelseframjande-miljo/rorelseframjande-inomhusmiljo/), Study visit Östra sjukhuset & Study visit Noblaskolan.

Programme list

Function → Room

Physiotherapy

Back room
- *Staff dressing room*
- *Staff room*
- *Meeting / conference room / conversation room*
- *Staff toilet*
- *Office*
- *Room for dictation*
- *Mail & copy*
- *Storage*
- *Cleaning*
- *Waste*
- *Laundry*
- *Wash room (Movahed et al. 2023; Östra)*
- *Back office*

Treatment area
- *Toilet*
- *Accessible toilet*
- *Reception / check-in*
- *Waiting area*
- *Entrance*
- *Wardrobe*
- *Dressing room patients*
- *Gym*
- *Hall / bigger free activation area*
- *Movement room (Östra)*
- *Water Rehabilitation?*
- *Treatment room 3x4 sqm*
- *Test room (Östra)*

Meeting - physiotherapy and physical activation
- *Stimulation room*
- *Active Waiting area (Närhälsan Västra Götalandsregionen, 2019)*
- *Free movement room with sections for functions.* →
  - *Balance (movement category)section*
  - *Climbing section*
  - *Swing section*
  - *Jump section*
  - *Relocation section*
  - *Stimulation section*
  - *Pulling section*

Physical activation
- *Video game room (A. Chen)*
- *VR*
- *Free movement room with zones*
- *Group workout room*
- *”Mum-workout” room*
- *Outdoor activity*
- *Staff area*
- *Office*
- *Staff toilet*
- *Staff dressing room*
- *Staff room*

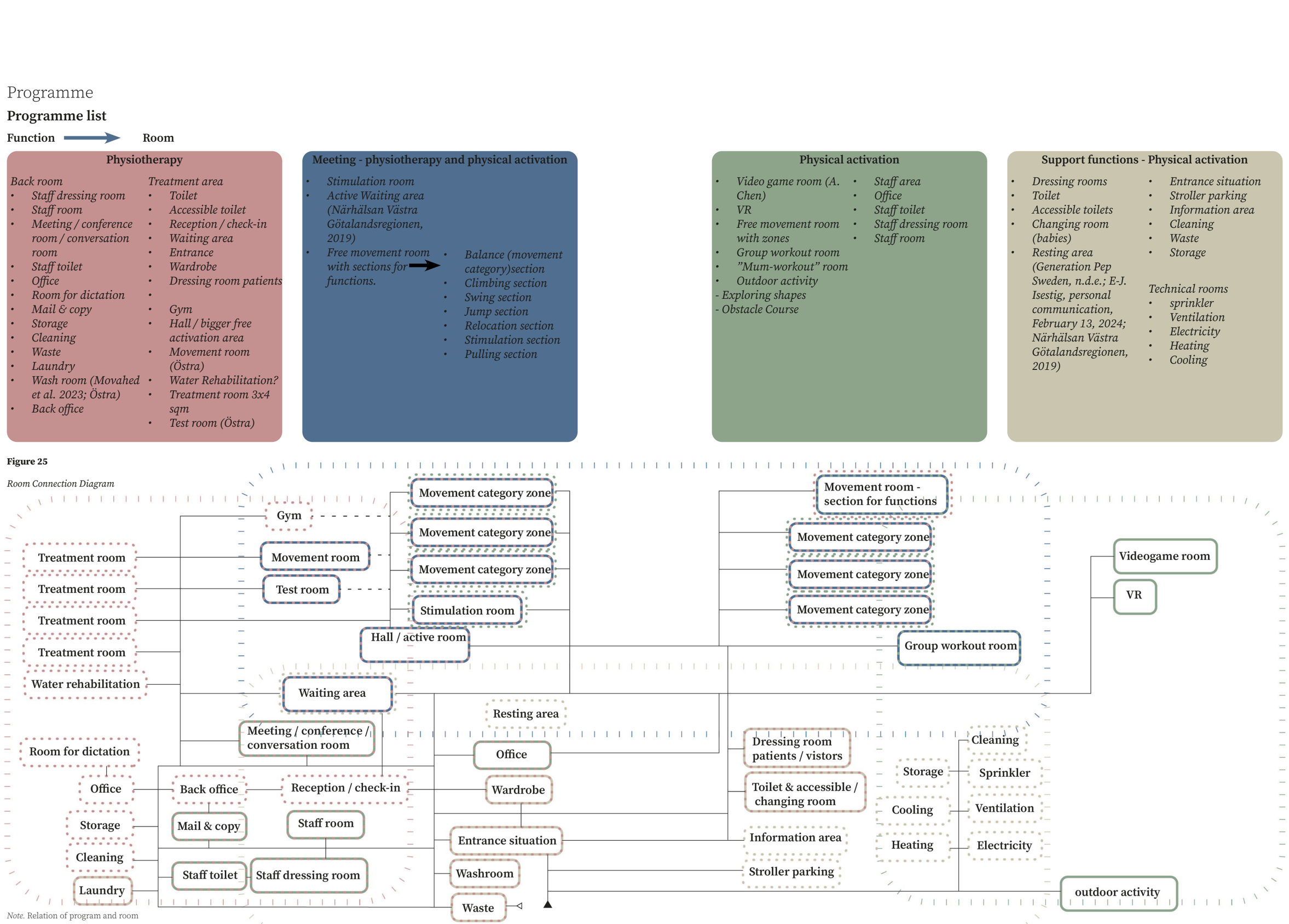
- Exploring shapes
- Obstacle Course

Support functions - Physical activation
- *Dressing rooms*
- *Toilet*
- *Accessible toilets*
- *Changing room (babies)*
- *Resting area (Generation Pep Sweden, n.d.e.; E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019)*
- *Entrance situation*
- *Stroller parking*
- *Information area*
- *Cleaning*
- *Waste*
- *Storage*

Technical rooms
- *sprinkler*
- *Ventilation*
- *Electricity*
- *Heating*
- *Cooling*

Figure 25

Room Connection Diagram



Note. Relation of program and room

Compilation of the OUTPUT

Sustainability

Social sustainability
1. Health promotion by offer an environment where you gets invited to be physical active.
2. Rehabilitating by offer physiotherapy or habilitation in the sense of improving physical health.
3. Inclusion - Everyone are welcome and the building is aiming to support the individual no matter of disability.
4. Adaptation for different physical levels. Let the building offer activities or elements where intensity level and difficulty level goes from low to higher in different fields (Movahed et al., 2023).
5. Accessible spaces & accessible options - giving the building a general accessibility but also different options that are available and still letting you be included in the play.

Ecological sustainability
1. A bearing construction in wood
2. Options for extension.

Economic sustainability
1. Flexible rooms in the way of general usage when it comes to treatment rooms and how some rooms can serve different things depending on the current needs. Sharing room but controlling the access by several doors depending on time.
2. Co-exploitation -> making it useful for more than one occupancy, is inspired by Schultz (2023) way of combining occupancies, both applied when it comes to combining physiotherapy and physical activation in this context, but also when inviting more type of functions. It will be an addition to the special school that can lend space during specific times. To contribute to patient flow the physiotherapy could collaborate with Trollhättans primary care facilities.

Function & brief

1. Combine equipment with free volumes (E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019).
2. Let the outdoor environment be available 24/7 when the indoor needs to be controlled.
3. Play with the transition between activities (E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019).
4. The multi-functionality from the movement room is a room where the physiotherapy becomes playful (E. Schubert Hjalmarsson, personal communication, December 29, 2023). It is a specific function that can work in symbiosis with the intention the physical activation part of the building has.
5. Don't lose the close contact between treatment room and active physio area (A. Näs, personal communication, January 25, 2024; L. Bernhardsson, personal communication, January 23, 2024)
6. VR or use technology, since it can attract children (C. Klüft, personal communication, October 25, 2023; Boon et al., 2020) and be a tool for the staff (Boon et at., 2020).
7. The building should have activation that meets the movement categories (Boon et al., 2020).
8. Physical movement could also be to improve fine motor skills (Movahed et al., 2023; E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019), which some children needs to develop (R. N. Johansson, personal communication, February 7, 2024).
9. Place for parents and child (Wang et al., 2023; Movahed et al., 2023)
10. Be aware of wheelchair users, and how their reach is limited and how the hight on things depends (Movahed et al., 2023) for example by the age on the user group (E-J. Isestig, personal communication, February 13, 2024; (F. Mattsson, personal communication).
11. Observation space (Carlén, 2021; C. Klüft, personal communication, October 25, 2023; E-J. Isestig, personal communication, February 13, 2024; Movahed et al. 2023; Närhälsan Västra Götalandsregionen, 2019)
12. Functions that attracts several ages and capacities (Movahed et al., 2023).

Architecture and design / health promotion

1. Make treatment rooms general since you don't know what diseases or physical conditions that will be treated, which also make it possible for future changes (E. Schubert Hjalmarsson, personal communication, December 29, 2023).
2. Avoid the clinical feeling buy working with a pleasant colour palette (A. Näs, personal communication, January 25, 2024; E. Schubert Hjalmarsson, personal communication, December 29, 2023; E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019) and hide treatment rooms from entrance or waiting room.
3. Incorporation of treatment tools in design, like floor, ceiling and walls (E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019; Unisport. n.d.a.; Unisport, n.d.b; Zwenger & Tidningen LÄRA, n.d.; Gymnastikförbundet et al., 2020).
4. Prioritize active rooms towards windows over the treatment rooms.
5. If more than one floor is used the communication must be placed in a location making a suited flow between patient, staff and activities (L. Bernhardsson, personal communication, January 23, 2024).
6. Combine the zones (E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019) and open spaces (R. N. Johansson, personal communication, February 7, 2024) with closed rooms. Still offer privacy but avoid a to formal feeling (IFK; Capio).
7. Even if the children wants to be active in different ways, these activity options should be so close the parents could have an eye on them (R. N. Johansson, personal communication, February 7, 2024; Movahed et al., 2023; E-J. Isestig, personal communication, February 13, 2024; Närhälsan Västra Götalandsregionen, 2019) and doing that by creating zones is an option (R. N. Johansson, personal communication, February 7, 2024)
8. The facilities must be designed for the patient and the staff. To do this by working with colours the children would enjoy but at the same time is comfortable to work in (A. Näs, personal communication, January 25, 2024; E. Schubert Hjalmarsson, personal communication, December 29, 2023)
9. Parallel connections improves the flows and gives options when it comes to play environments (Movahed et al., 2023)

Site

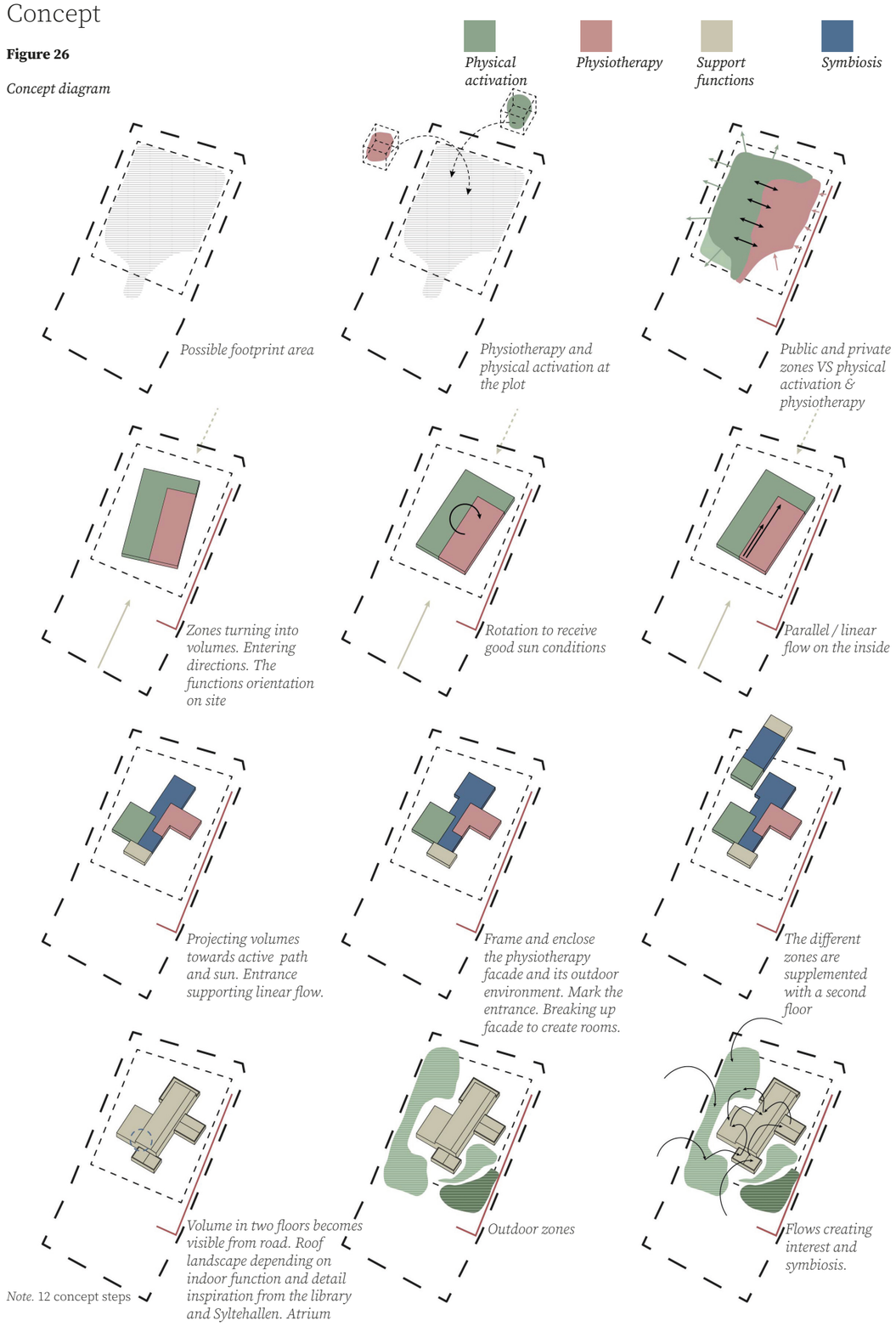
1. Keep the backside of today's building as the backside for the new one. It has natural flows from traffic and could be more hidden from public views.
2. Try to keep the trees that are close to the plot boarder since it is unlikely the building will be placed so close.
3. The south-eastern corner has changes in topography and natural greenery. To keep more of the trees and the natural changes in the landscape most of this area should be kept.
4. The main entrance should be from the south since the main parking is there. A parking in the north would be suitable for staff as well as a staff entrance.
5. Opening up by removing the fence would make the access easier and invite people. More inviting entrances to the yard is preferable.
6. The new school and library works with blue boards as facade material as well as red bricks. The older lamellas are in red orange bricks with wooden panels meeting the gabled roof and the kindergarten was covered in wooden panels. To meet the new and old may it be relevant to work with the same sort of exterior materials and matching colours. Wood, brick, red and blue. Avoiding the boards the school uses will also make an contrast and taking down the scale.
7. To get privacy for treatment rooms and to some extent the physiotherapy, these rooms and functions should primarily be placed towards east or in a way you can avoid insight. Public functions are relevant to be placed towards the front side, the north eastern and north-western corner where people from the outside passes by the building.
8. Outside activities are best placed along street in west.
9. Be aware of the sunlight that may go straight into building from south west during day. Covers may be needed.
10. Keeping the paling

Main Material

Concept

Figure 26

Concept diagram

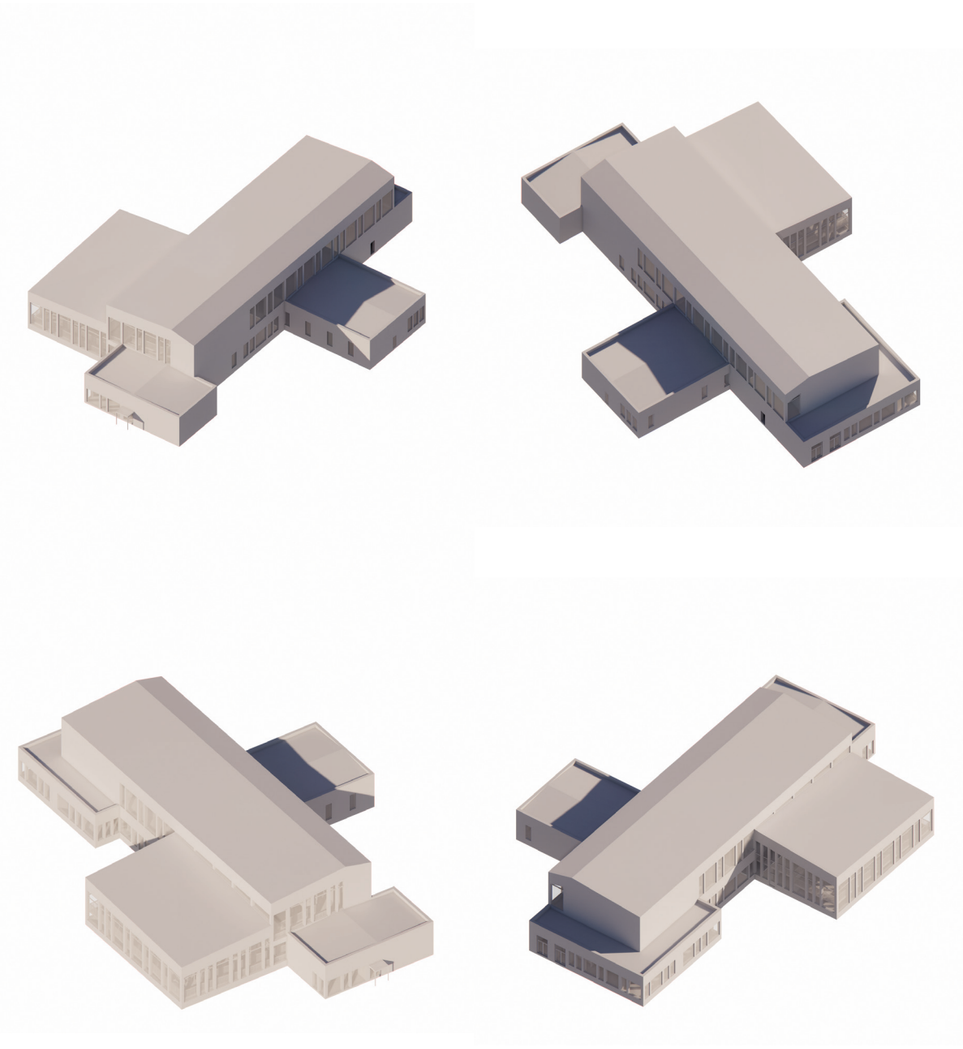


Note. 12 concept steps

Typology

Figure 27

Volume diagram

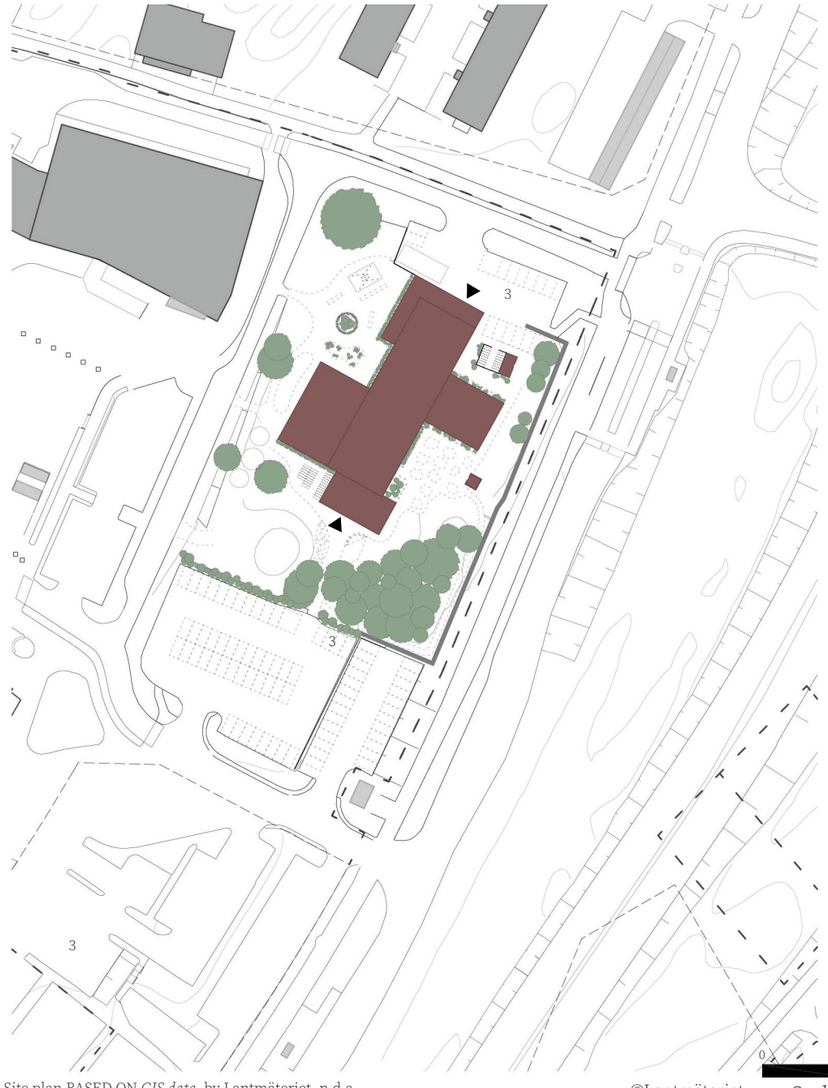


Note. Volume overview from different directions

Site plan

Figure 28

Site plan



Note. Site plan BASED ON *GIS data,* by Lantmäteriet, n.d.a.

The building is slightly rotated from the plots direction in a way of working with the sunlight and privacy towards the physiotherapy.

The trees position on the plot have made it possible to keep almost every one of them. The removed ones are replaced with more greenery around building.

The southern parking space is a natural path to the main entrance. It has four reserved parking lots on the parking, which it shares with the school during weekdays. More parking is provided in the northern part of the plot by keeping the old parking to the kindergarten and adding some new ones. The delivery solution the kindergarten had is the same, except it is now supplied with a dedicated parking lot.

One block away, south of the plot, is another parking space that could be used in need of more space, or if possible make a new division of the parking spaces in an agreement with the school.

The development of the yard have resulted in more access points from the surrounding roads inviting people passing by.

Site plan - the plot

Figure 29

Site plan

Note. Site plan BASED ON *GIS data,* by Lantmäteriet, n.d.a.

The outside environment has different characters depending on position. To support the physiotherapy department on the inside are an outdoor physiotherapy area (10.) placed in the private section enclosed by the projected and displaced volumes, with good access to the inside and protected from too much insight. Since the building being slightly rotated from the entrance path, it helps to keep the privacy towards the physio area.

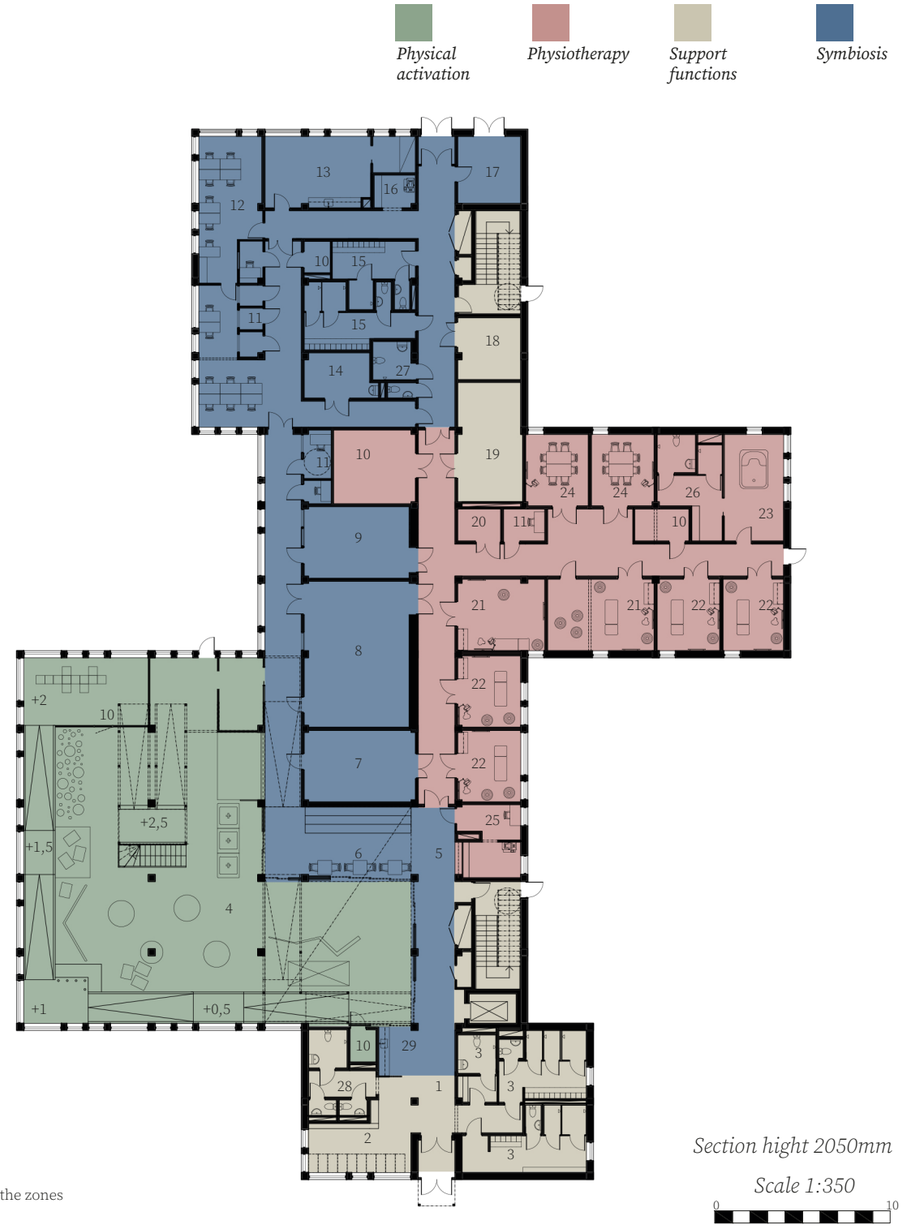
The entrance area (9.) provides an parallel walking path with a serpentine path between obstacles. Accessible parking space (4.) and bike parking (6.) are close to entrance. The area transitions into an activation space along the path (8.) stretching by the activation on the inside. Island encircled by the path could be part of an obstacle course, becoming an alternative way to walk instead of the inner street, and connecting the main entrance to a little square (7.) with accessible swing, seating areas and greenery. It leaves the rest of the yard to its current state with natural greenery and trees (11.) and the bigger hill and lawn (12.).

1. Electricity room
2. Outdoor storage
3. Parking space
4. Accessible parking
5. Delivery
6. Bike parking
7. Square
8. Outdoor obstacle course
9. Entrance square
10. Outdoor physiotherapy
11. Kept natural green area
12. Hill and lawn

Floor plan

Figure 30

Entrance floor



Note. Floor plan with the zones

1. Entrance
2. Stroller parking & Lockers
3. Dressing room, female/ male/ accessible
4. Physical activation room
5. Reception Physiotherapy
6. Waiting area
7. Movement room
8. Training hall
9. Gym
10. Storage
11. Dictation room
12. Open and closed office landscape
13. Staff room with resting room
14. Cleaning / washing / laundry
15. Dressing room staff
16. Mail & copy
17. Garbage room
18. District heating room
19. District cooling room
20. Cleaning physiotherapy
21. Test room
22. Treatment room
23. Water therapy room
24. Meeting room / extra treatment room
25. Back office
26. Dressing room water therapy
27. Staff toilets
28. Toilet visitor
29. Trinette / break area

The entrance floor is a combination of support functions, physiotherapy department, physical activation area, and a shared area in between. The shared area are supporting a collaboration between staff in the two programs by collecting the staff area in one place, as well sharing activation space between the physiotherapy and physical activation, creating a symbiosis.

The shared activation area (7., 8., 9.)between physiotherapy department and physical activation room are accessed from both department in a way separating the flows and controlling who are able to use the rooms at the time.

The entrance situation with all dressing room serves all the visitors. A linear flow with ramifications into different parts naturally leads all visitors to, or pass the physical activation area (4.). Since physiotherapy patient must pass to reach reception (5.), waiting area (6.) and physiotherapy department, makes the asset to physical activation noticed.

The waiting area (6.) is multifunctional and with its connection to the physical activation it can be both calm and active, as an interpretation of E-J Isestig (personal communication, February 13, 2024) and Närhälsan Västra Götalandsregionen (2019) descriptions of active waiting area.

Glulam beams and pillars in combination with CLT-walls are meant to be the bearing construction. The grid is based on the dimensions of the treatment rooms, which controls the placement of pillars in y-axis. The distance between pillars in x-axis is based on the division of the grid matching the corridors and bearing structure to the facade division, as well as the construction on floor 1.

The double corridors separates the flow of staff and enable the physiotherapy department to be a closed unit, but still making the shared activation spaces available.

The open and shared office landscape creates interaction between the staff from the different functions, but still offers secrecy for the physiotherapy department by having closed sections. The space support flexible office work depending on task, but to avoid disturbance are dictations room in different sizes provided.

An opening in the joists makes the ramp system in the activation room visible, as well letting in more light.

The atrium and the activation room could be closed of by sliding raster divider, leaving it more light and see through, open as closed, and makes it easier to control the access.

Figure 31

Entrance perspective

Note. Rendered in Enscape through SketchUp model.

Floor plan

Figure 32

Floor 1

1. Mezzaninen physical activation room
2. Common area
3. Toilet visitor
4. VR room
5. Storage
6. Active corridor
7. Training hall
8. Training hall
9. Storage
10. Ventilation

Note. Floor plan with the zones

Floor 1 consist of functions the whole family can use. Even if the entrance floor would be locked during the weekend would floor 1 still support the whole family, since it consist of functions supporting group workout and older siblings as a way of meeting the theories.

Whit the VR rooms are a different type of physical activation provided. Suitably for older children when parents and siblings participates in a group work out session in the training halls. The VR- room's size supports the physiotherapy department and could be used for treatment rooms in a rearrangement.

With changing needs it is also possible to open up and turn the two training halls to one big instead.

The corridor in the facade is a way of open up the floor plan towards Myrtuvevägen and make the inside visible from the bridge over E45 as an attempt to create interest, and providing the training hall with windows from two directions. The corridors placement would make it conceivably to add an extra floor on the physiotherapy department in the projecting volume if needed in the future.

The opening in the floor plan connects it to the entrance floor as well as it integrates the ramp system from entrance floor and the mezzanine. The mezzanine make space for parts of the activation with fixed tools for pulling. With sliding raster panels are there options to make the ramp system available or not.

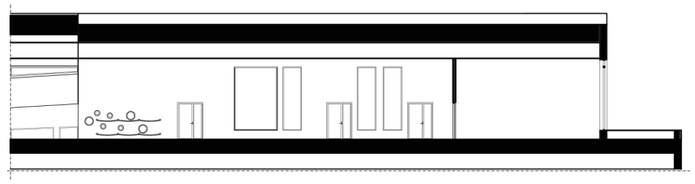
Figure 33

Floor 1 - Perspective corridor

Note. Rendered in Enscape through SketchUp model.

Figure 34

Floor 1 - Section DD zoom in corridor

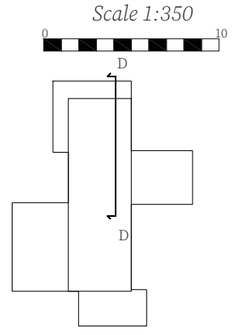


Note. Section with focus on corridor

Like several of the resources describing options for activations in corridors mentioned earlier in the thesis is this corridor doing an attempt on that.
The wider distance between the walls makes room for a running track or more seating area along the windows.

With a play of windows could children have a sneak peak on the room inside while they are taking on the obstacle rope course.

A seating spot is built in along the corridor, where you could sit and wait before the group workout.



Exterior perspective

Figure 35

Entrance perspective

Note. Rendered in Enscape through SketchUp model and finalized in Photoshop

Figure 36

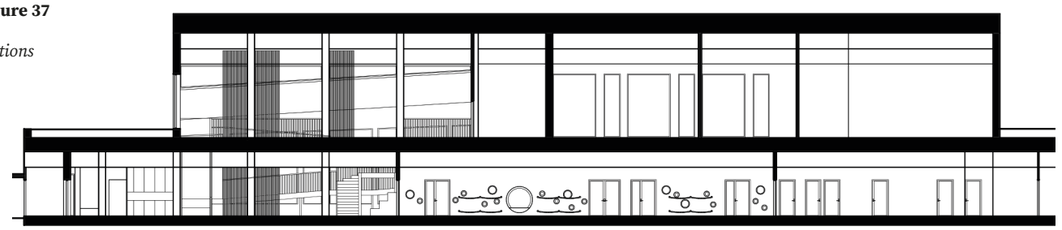
Entrance perspective

Note. Rendered in Enscape through SketchUp model and finalized in Photoshop

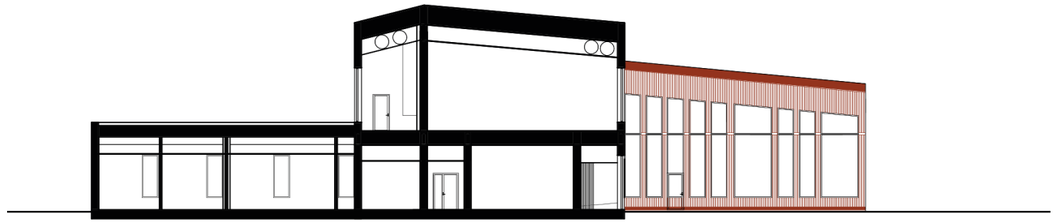
Sections

Figure 37

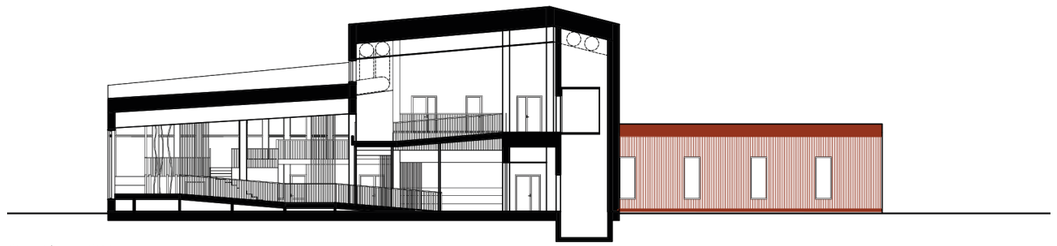
Sections



Section AA



Section BB



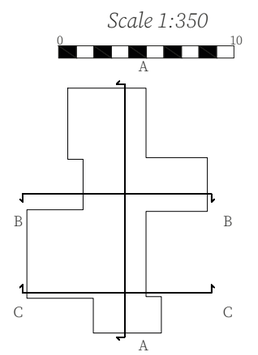
Section CC

Note.3 sections

The top floor offers a higher ceiling high due to the training halls.

The estimation of the dimension of beams have been done through calculations on Svenskt trä (2021). The top floor has a higher beam to compensate the longer span to avoid pillars in the training hall.

Ventilation is hidden with lower ceiling in the corridors making room for higher windows in facade, due to smaller dimensions on the pipes.



Façades

Panel

Red panel with laths covers the whole facade in a way of creating contrast to the new blue school façades and the brick library. At the same time connect to the previous kindergarten in wood and the wooden details on the neighbouring brick lamellas. The red reflects upon the red shades in the brick.

The north western corner where the ventilation is located will have integrated openings behind the panel to camouflage the supply and exhaust air.

Openings

The windows are 700 mm from the floor creating an alignment in facade, except the windows at the entrance that are placed directly on the floor to create a contrast to define it.

The windows shifting between single or double width, within the limits of the pillar structure adding a playfulness.

To create privacy but still let in light into the training hall connected to the physiotherapy are every second lath continuing over the windows. It will also be a way of creating more shade towards the training halls with windows towards north west that will get parts of the afternoon sun.

Façades

Roof

Neighbouring roofs are gabled with sharper and softer angel. Both Syltehallen and the library are playing with a tilting irregular roof at the entrance. To connect to this idiom is an interpretation done at the projecting activation room making it tilt in two directions.

The main roof have the gabled design but in a displaced position due to the bearing construction and span on the top floor.

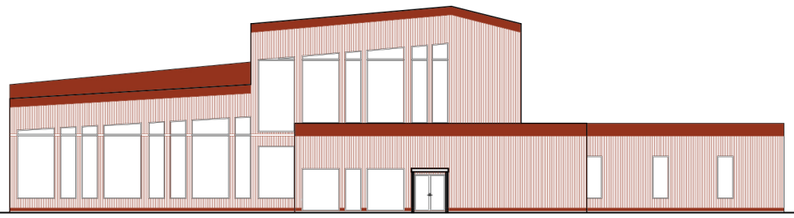
Since a lot is happening with these roofs are the rest of it hidden behind panel.

The roof has the same colour as the facade.

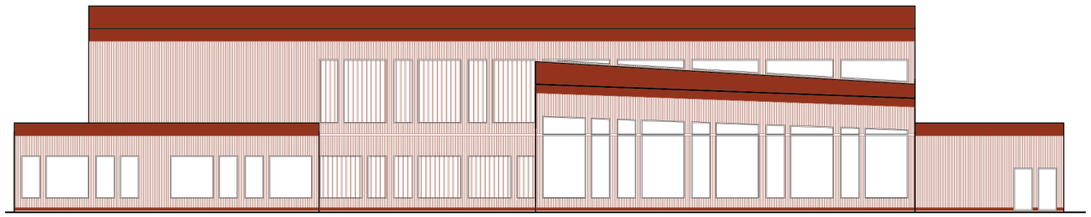
Facade South West

Figure 38

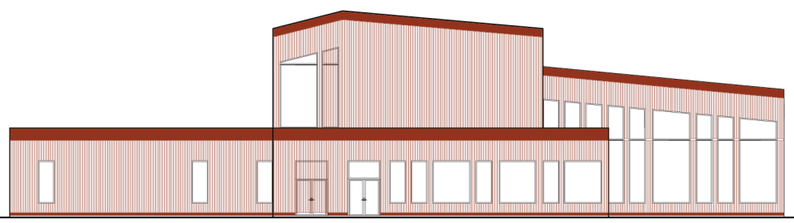
4 Façades



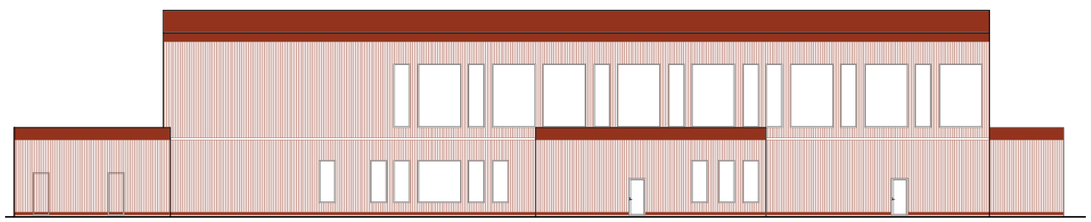
Facade North west



Facade North East



Facade South East



Scale 1:350

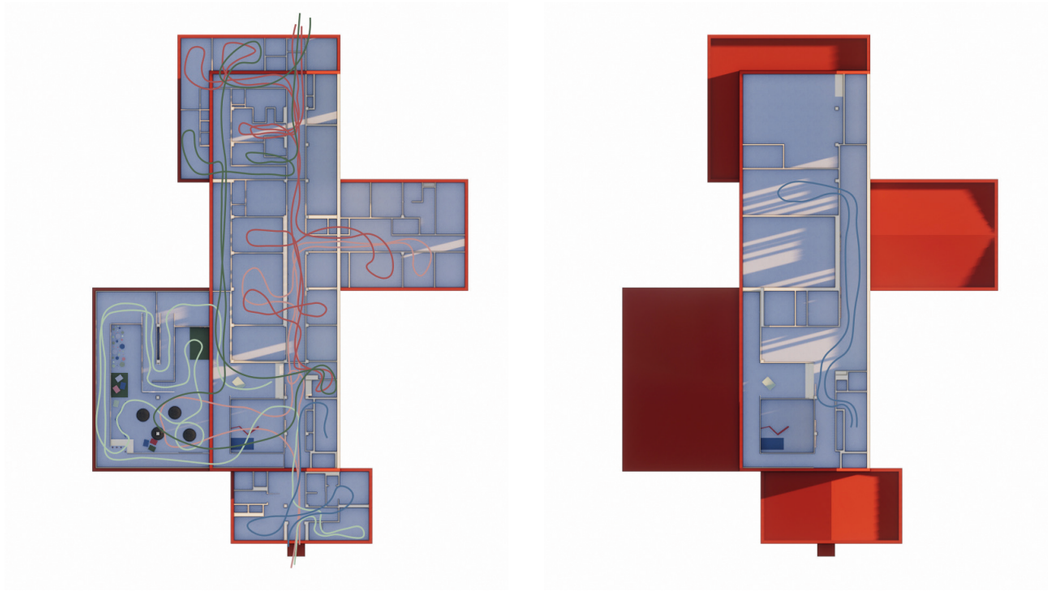
Note. 4 façades

Scale 1:350

Diagrams

Figure 39

Flow diagram



Child physiotherapy

Child physical activation

Parent / child group workout

Staff physiotherapy

Staff physical activation

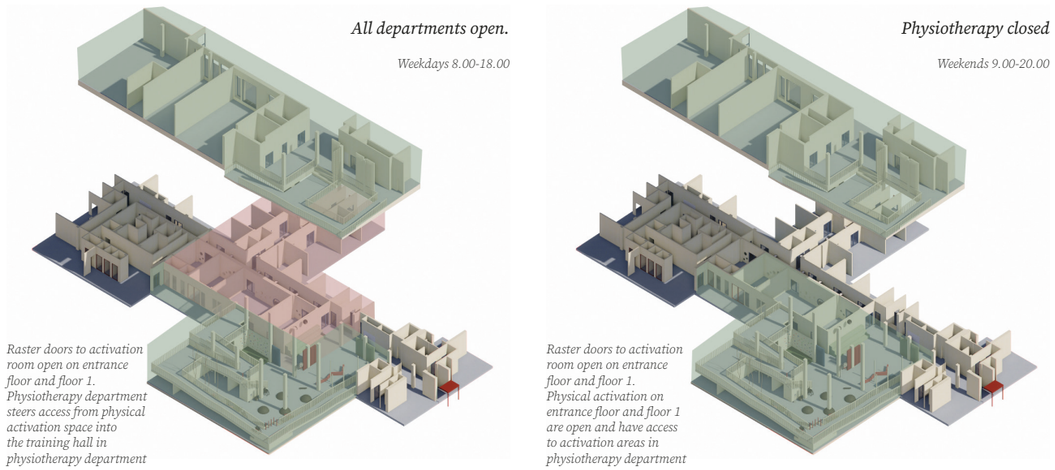
Note. Rendered in Enscape through SketchUp model and finalized in Photoshop. Flows based on inspiration from *Social Bridges - Intergenerational Housing* [Master Thesis, Chalmers University of Technology], by Sterner, B, 2023, Master's Thesis 2023 Archives. (https://projects.arch.chalmers.se/wp-content/uploads/2023/06/sternerbeatrice_49984_2789918_Sterner_Beatrice_Healthcare_MT-2023-Booklet.pdf).

Figure 40

Diagram - Access - open or closed rooms

Physical activation

Physiotherapy



Note. Rendered in Enscape through SketchUp model and finialized in Photoshop. Closed or open access based on inspiration from *Integrating Wisdom - Promoting wellness through the design of an intergenerational preschool* [Master Thesis, Chalmers University of Technology], by L. Schultz, 2023, Master's Thesis 2023 Archives. (https://projects.arch.chalmers.se/wp-content/uploads/2023/06/schultzlinn%C3%A9a_20595_2788081_Schultz_Linn%C3%A9a_Healthcare_MT-2023-Booklet-.pdf).

Diagrams - Generality, flexibility & sustainability

Figure 41

Diagram - Possible changes over time

Options for change

Entrance floor after rearrangements

Adding walls to divide rooms. Changing the use from meeting room to treatment room.

Floor 1 after rearrangements

Changing VR -room to treatment room and storage

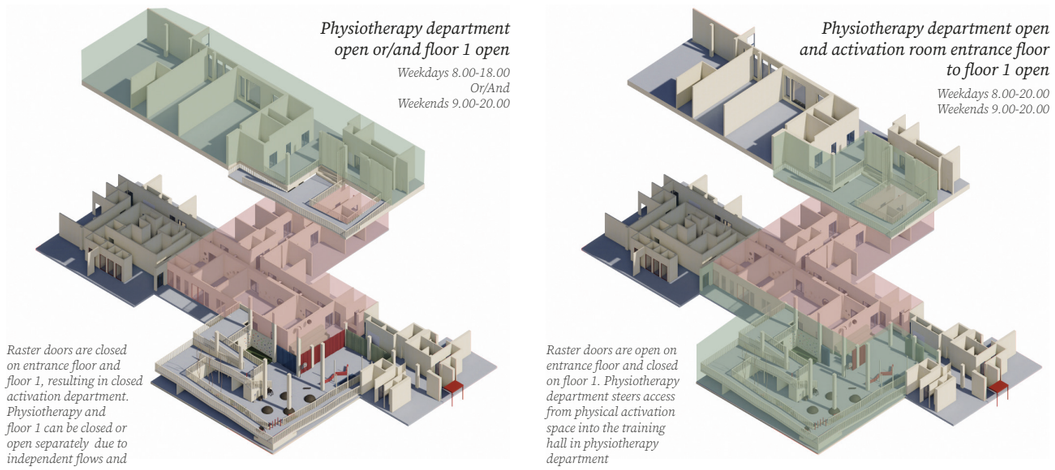
Entrance floor after extension

Removing one meeting room and adding a stair to a new top floor in physiotherapy

Floor 1 after extension

A new floor in physiotherapy with natural access to floor 1. Offers more of the symbiosis on floor 1 by using training halls.

Note. Possible changes



Focus - Physiotherapy

Floor plan

Figure 42

Floor plan zoom in

Note. Floor plan zoom in

The waiting area is placed outside the department to be more integrated with the other functions and share space following the theory presented by Närhälsan Västra Götalandsregionen (2019).

Entering the corridor to the department offers an obstacle rope course on the wall together with the openings into the room
The standard test rooms are facing the courtyard possible to reach by an internal door.

The test rooms have more floor area. One of them could be divided into regular treatment room with storage if the needs are different.

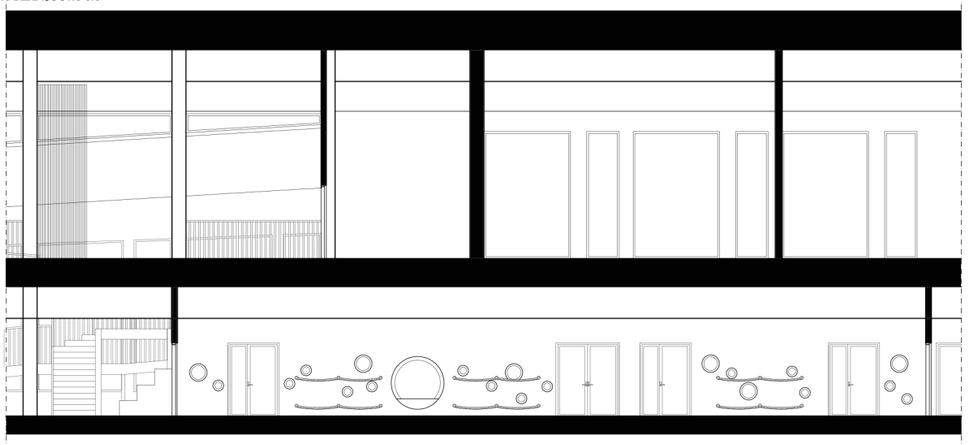
All wall surfaces in the physiotherapy, and the building as a whole, are covered in CLT contributing with warmth. Colours are added in details, like the green frames of the circular windows in the corridor.

Focus - Physiotherapy

Section AA zoom in

Figure 43

Section AA zoom in



Note. Focus on the corridor

Figure 44

Entrance perspective

Note. Rendered in Enscape through SketchUp model.

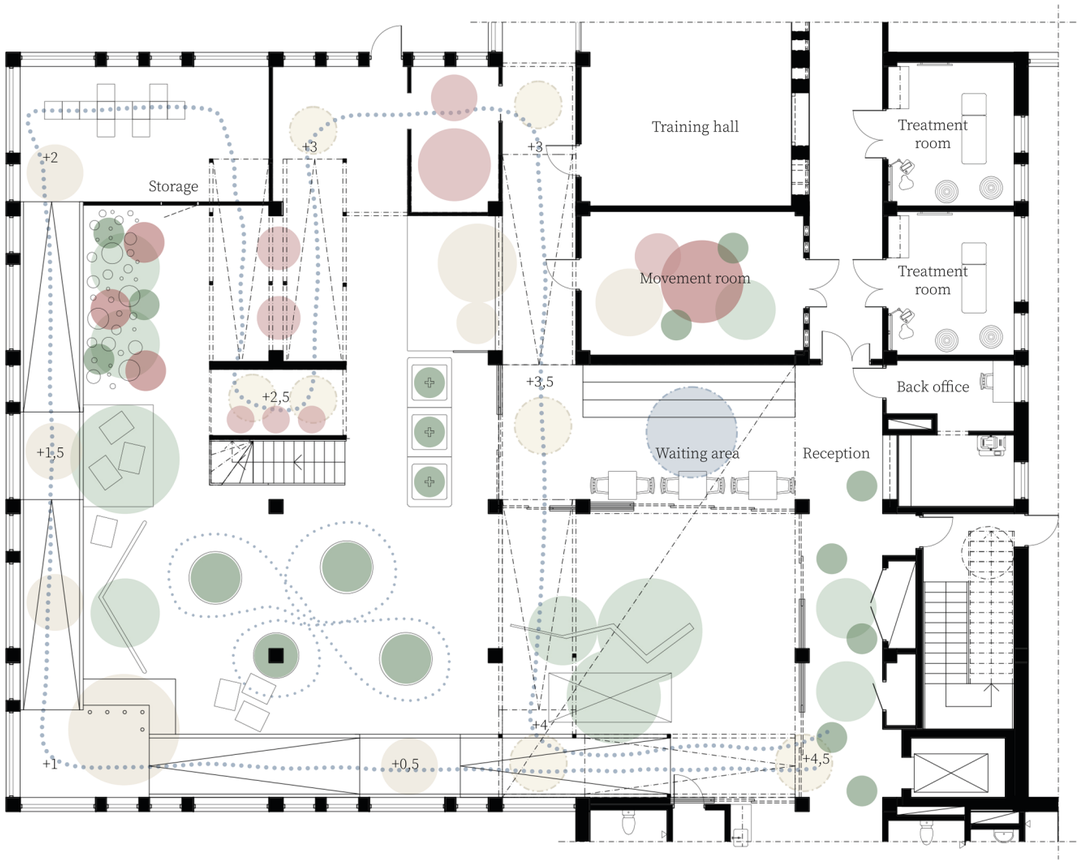
The same strategy as applied on the first floor from the research is given more space in the corridor in the physiotherapy department.
The circular windows is a way of sneak peaking into the activation when climbing and letting in some daylight to the corridor, without putting the children on display.

Focus - Physical activation

Floor plan

Figure 45

Floor plan zoom in



Note. The colourful bubbles and lines represent the topics below

Section hight 2050mm

Scale 1:175

0 5

Balance

The balance is spread through the room. Some functions support several movements not only balance. It is optional to place more balance in corridor as inspiration from the previously mentioned different references.

Climb

The ramps as an accessible way of changing z-axis position Movahed et al. (2023), Gymnastikförbundet et al. (2020) and LOA Fonden & Johansen (n.d.).

Swing

The options are both on the inside and outside.
On the inside are they available in both activation room and movement room.

Jump

Endless of possibilities. It is combined with balance and swing as well as on its own.

Relocation

Takes place on the floor and on the ramps

Stimulation

Placed in protected areas under the ramp to create more privacy.

Focus - Physical activation

Section

Figure 46

Physical activation room - perspectives

Note. Rendered in Enscape through SketchUp model.

Section CC zoom in

Figure 45

Section CC zoom in

Note. Section trough ramp showing relations

Scale 1:175

0 5

Pull

Placed upon the mezzanine.

The different movement categories and their functions are spread through the room and build upon previous compilation of research (Table 3).

The space under the ramps are used for storage and different activities that works with lower ceiling.

The little zone close to the fire escape provide circulation but is possible to close together with the sliding rasters.

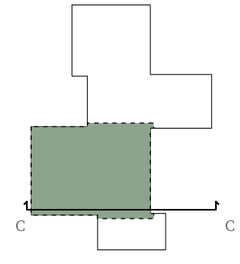


Figure 48

Physical activation room - perspective 1

Note. Rendered in Enscape through SketchUp model.

Figure 49

Physical activation room - perspectives 2

Note. Rendered in Enscape through SketchUp model.

Figure 50

Physical activation room - perspectives 3

Note. Rendered in Enscape through SketchUp model.

Figure 51

Physical activation room - perspectives 4

Note. Rendered in Enscape through SketchUp model.

Discussion

How could the built environment include and integrate physical activation and physiotherapy to improve physical health of children?

How can the integration between physical therapy and physical activation take place and how can possible strategies combine them?

What should a children physiotherapy department consist of and what design do kids with special needs, need for the habilitation?

What is needed in inclusive design for children to be active with parents and other children no matter of disabilities, in consideration of participation, will and promoting being active?

Answer to question

If the project would work in reality can't be stated before it is tested. But based on the theory and the interpretation of it in design shows how it theoretically could work. Since a lot are related to the theory have the project done its best to face it.
If the real building would result in a non desirable result, the obvious answer would be that more research on the topic would be needed to keep investigating the symbiosis in the future, or see where in the design it got lost.

The theory provided theoretical solutions to parts of the research question, but it is through the compilation and interpretation from all theoretical and practical theory together the overall result can be evaluated.

This proposal shows how the health improvement could be done by the symbiosis of physiotherapy and physical activation. By sharing parts of the facility will there be options for the visiting children to move between physiotherapy design and the general activities in the activation spaces. Due to the availability of accesses the flows can be controlled.
The sharing of space becomes an sustainable benefit as well, by saving square meters.

It is about to find something that suit every child. The theory presented by Movahed et al. (2023) gave a very valuable theoretical answer to the last questions, which relevancy also becomes integrated in the others. Variation in as many aspects as possible is of importance, since that will reach out to even more people (Movahed et al., 2023).

By creating place for activity functions, advanced or simpler ones, are there more options for everyone (Movahed et al., 2023).

Contribution

This thesis is giving a proposal to a building combining physiotherapy and physical activation by adding an interpretation of the symbiosis. No other physical projects have been found where a physiotherapy department and physical activation department have been combined, even though there are projects within the field like Aarhus Gymnastics and Motor Skills Hall (C.F. Møller Architects, n.d). This will hopefully bring a new perspective or inspiration, and if there are any similar project it could contribute to a comparing evaluation.

The health improvement has in this project good precondition, since the concept of the whole building supports it. The majority of the inside is specified for the movement and has the supporting functions to keep the occupancy going within the building with all its focus on bringing physical activation close.

The building gives the preconditions to see possible collaborations within and between occupancies.

By creating the symbiosis will the exchange of experiences emerge between the visitor and between the staff in the different departments, which can strengthen the focus on physiotherapy in the activation room

Theory reflection

For this thesis the theory has been used in a way of creating an understanding for the topics in physiotherapy and physical activation. Therefore, are a lot of the theory about the physiotherapy profession. Without an understanding for their work field and profession it becomes more difficult to design. The several interviews with physiotherapist and study visits at physiotherapy facilities was a way of gather the functions and qualities this type of care building needs. The contact with the physiotherapists gave me their personal reflections about their profession and experiences and wishes about physio and activation facilities, that may would have been difficult to gather through academic papers. Their experiences and expertise should be seen as very valuable for the understanding of the needs of the design and for the people working in them.

Mainly all literature references are about making space for physical activation, but describes it differently. Still, they contribute by describing what the design needs in their context or what different activities and different play tools can generate. It gives an understanding for "What could that be in this building design?" and "If these things are ways of working with accessibility in playgrounds, those strategies would be relevant for the inside as well" (Movahed et al., 2023). They also become an inspiration and a tool in what the building design should include and provide space for, example the movement categories described by Boon et al. (2020), that could be brought in to the design, but leaves it open for me to reflect how it can be visualised in this building design.

Method reflection

To gather all theory from all directions have been a big part of the method. Without the interview a lot of the individuals personal reflections and experiences would be missing. When having the input from literature, interviews and cases could the documentation of theory, strategies, activities, functions, programs etc. be compiled. When starting sketching it was a way of putting all pieces together from the theory finding way of integrating as much as possible.

The program was used as blocks to investigate the rooms location and relation to each other. The decisions were evaluated with pros and cons, to accommodate different opinions and solutions when they were working against each others.

Time plan evaluation

The time plan had to be revised several times and reflected over frequently in relation to the current state. Processing the material after interviews was very time consuming. The lack of time is also something that I personally believe is in combination with the ambition level. As an help have a planer with daily and weekly overviews supported the work situation.

Development & Future work

The ambition has always been to create a solid and worked through material with the intention of making it anchored to reality, compiling a project that would work and feel realistic in its possibility of being built. I see the importance of having a collaboration with professionals within engineering, ventilation, electricity etc. and creating the full understanding for this as a complex building, finding solutions and making decisions based on expertise advice and not personal assumptions of translating the regulations and dimension calculations. Since the preconditions of having the expertise's available in this thesis process was very limited, I understand there are room for more optimal solutions that could be developed in a possible future state and making this concept closer a finished proposal.

Project references, literature and bibliography

Literature and references

Aarhus Gymnastics and Motor Skills Hall / C.F. Møller. (2010, June 20). ArchDaily. Retrieved February 28, 2024, from https://www.archdaily.com/65069/aarhus-gymnastics-and-motor-skills-hall-c-f-m%25c3%25b8ller-architects

Beckung, E., Carlberg, B. E., & Rösblad, B. (2013a). Fysioterapeutiska insatser för barn och ungdom. In E. Beckung, E. B. Carlberg & B. Rösblad (Ed.), *Fysioterapi för barn och ungdom: Teori och tillämpning* (pp. 13-20). (2nd ed.). Studentlitteratur AB.

Beckung, E., Carlberg, B. E., & Rösblad, B. (Ed.). (2013b). *Fysioterapi för barn och ungdom: Teori och tillämpning* (2nd ed.). Studentlitteratur AB.

Boon, B., Rozendaal, M. C., van den Heuvel-Eibrink M. M., van der Net, J., van Grotel, M., & Stappers, P. J. (2020). Design Strategies for Promoting Young Children's Physical Activity: A Playscapes Perspective. *International Journal of Design*, *14*(3), 1-18

Boverket. (2021, November 16). *Rörelsefrämjande inomhusmiljö i skolan*. Retrieved September 14, 2023, from https://www.boverket.se/sv/samhallsplanering/arkitektur-och-gestaltad-livsmiljo/arbetssatt/skolors-miljo/byggnaden-och-utemiljon/rorelseframjande-miljo/rorelseframjande-inomhusmiljo/

Brittin, J., Sorensen, D., Trowbridge, M., Lee, K. K., Breithecker, D., Frerichs, L., & Huang, T. (2015, July 31). Physical Activity Design Guidelines for School Architecture. *PLoS ONE*, *10*(7), 1-30. DOI: 10.1371/journal.pone.0132597

Capio Ortho Center Göteborg. (n.d.a.). *Kontakta oss*. Retrieved May 20, 2024, from https://capio.se/hitta-mottagning/specialistvard/rehab-specialistvard/ortho-center-rehab-gbg/

Capio Ortho Center Göteborg. (n.d.b.). *Välkommen till Ortho Center Rehab Göteborg*. Retrieved May 20, 2024, from https://capio.se/hitta-mottagning/specialistvard/rehab-specialistvard/ortho-center-rehab-gbg/

Carlsson, L., & Franzén, J. (2017a, August). *Detaljplan för del av Sylte 4:1 m.fl.*. Trollhättans Stad Stadsbyggnadsförvaltningen. https://detaljplaner.lantmateriet.se/

Carlsson, L., & Franzén, J. (2017b, January). *Ändring av detaljplan för Sylteskolan Del av Sylte 4:8*. Trollhättans Stad Stadsbyggnadsförvaltningen. https://detaljplaner.lantmateriet.se/

C.F. Møller Architects. (n.d.). *Aarhus Gymnastics and Motor Skills Hall*. cfmoller. Retrieved February 28, 2024, from https://www.cfmoller.com/p/Aarhus-Gymnastics-and-Motor-Skills-Hall-i2423.html

Chen, A. (2013, November 20). Top 10 Research Questions Related to Children Physical Activity Motivation. *Research Quarterly for Exercise & Sport*, *84*(4), 441-447. https://doi.org/10.1080/02701367.2013.844030

erika kim. (2010, June 18). *c.f. moller: aarhus gymnastics and motor skills hall*. designboom. Retrieved February 28, 2024, from https://www.designboom.com/architecture/cf-moller-aarhus-gymnastics-and-motor-skills-hall/

Fysioterapeuterna Sektionen för habilitering och pediatrik. (2016). *Vad gör en barnfysioterapeut?* [Information brochure]. https://www.fysioterapeuterna.se/globalassets/_sektioner/habilitering-och-pediatrik/aktuellt/infobroschyr-2016.pdf

Generation Pep Sweden. (n.d.a). *Om Generation Pep*. Generation Pep. Retrieved September 15, 2023, from https://generationpep.se/sv/hur-vi-arbetar/om-oss/

Generation Pep Sweden. (n.d.b). *Mural Arkitektur Rörelsebana*. Generation Pep. Retrieved September 15, 2023, from https://generationpep.se/sv/hur-vi-arbetar/samarbetsinitiativ/mural-arkitektur-rorelsebana/

Generation Pep Sweden. (n.d.c). *Capios BVC-satsning*. Generation Pep. Retrieved September 15, 2023, from https://generationpep.se/sv/hur-vi-arbetar/samarbetsinitiativ/capios-bvc-satsning/

Generation Pep Sweden. (n.d.d). *Pep Parker i Sverige*. Generation Pep. Retrieved September 15, 2023, from https://generationpep.se/sv/hur-vi-arbetar/samarbetsinitiativ/pep-park/

Generation Pep Sweden. (n.d.e.). *Pep Park*. Generation Pep. Retrieved April 22, 2024, from https://generationpep.se/sv/verktyg/pep-park/

Generation Pep Sweden. (n.d.f.). Pep skola. Retrieved May 7, 2024, from https://www.pepskola.se/

Generation Pep Sweden. (n.d.g.). Pep förskola. Retrieved May 7, 2024, from https://generationpep.se/sv/pepforskola/

Google. (n.d.a.). [Context around Capio Ortho Center Göteborg]. Retrieved February 22, 2024, from https://www.google.se/maps/@57.7054326,11.9922956,198m/data=!3m1!1e3?entry=ttu

Google. (n.d.b.). [Context around IFK Kliniken rehab/GLTK]. Retrieved February 22, 2024, from https://www.google.se/maps/@57.7005395,12.0243331,205m/data=!3m1!1e3?entry=ttu

Google. (n.d.c.). [Context around Drottning Silvias barnsjukhus]. Retrieved February 22, 2024, from https://www.google.se/maps/@57.7206899,12.0482141,635m/data=!3m1!1e3?entry=ttu

Google. (n.d.d.). [Context around Noblaskolan Billdal]. Retrieved February 22, 2024, from https://www.google.se/maps/@57.6004836,11.9510126,206m/data=!3m1!1e3?entry=ttu

Google. (n.d.e.). [Älvan fritidsgård]. Retrieved February 25, 2024, from Google. (n.d.e.). [Älvan fritidsgård]. Retrieved February 25, 2024, from https://www.google.se/maps/@58.2567969,12.2783817,203m/data=!3m1!1e3?entry=ttu

Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB. (2020). *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall*. https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf

HANSJO. (2024, January 11). *Anpassad grundskola*. Trollhättans Stad. Retrieved February 25, 2024, from https://www.trollhattan.se/startsida/utbildning-och-barnomsorg/grundskola/grundskolor/anpassad-grundskola/

Henriksson, H., Alexandrou, C., Henriksson, P., Henström, M., Bendtsen, M., Thomas, K., Müssener, U., Nilsen, P., & Löf, M. (2020). MINISTOP 2.0: a smartphone app integrated in primary child health care to promote healthy diet and physical activity behaviours and prevent obesity in preschool-aged children: protocol for a hybrid design effectiveness-implementation study.*BMC Public Health*, *20*, Article 1756, 1-11. https://doi.org/10.1186/s12889-020-09808-w

IFK Kliniken rehab. (n.d.). *IFK Kliniken Rehab*. Retrieved February 22, 2024, from https://www.ifkkliniken.com/

Klassjoggen. (2023). *Klassjoggen*. Retrieved October 15, 2023, from https://klassjoggen.se/

Lantmäteriet. (n.d.). *1581K-S_IV/1968* [City plan]. Lantmäteriet. Retrieved March 3, 2024, from https://detaljplaner.lantmateriet.se/

LOA Fonden & Johansen, R. (n.d.). *Spiralen, Kalundborg, Danmark* [Photography]. Framtidens Idrottshall. In Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB, *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall*. https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf

Kraftstaden fastigheter. (n.d.). *Syltehallen*. Kraftstaden. Retrieved February 25, 2024, from https://www.kraftstaden.se/fastigheter/syltehallen/

Mains, S. M. (2020, April 3). *Aarhus Gymnastics & Motor Skills Hall*. Danish Association of Architectural Firms. Retrieved February 28, 2024, from https://www.danskeark.com/content/aarhus-gymnastics-motor-skills-hall

Maude, P. (2010). Physical literacy and the young child. In M. Whitehead (Ed.), *Physical Literacy Throughout the Lifecourse* (pp.100-115). Routledge. https://doi.org/10.4324/9780203881903

Movahed, M., Martial, L., Poldma, T., Slanik, M., & Shikako, K. (2023, August). *Promoting Health through Accessible Public Playgrounds*. Children, 10(8), p1308, 14p. https://doi.org/10.3390/children10081308

Naturvårdsverket. (2023, August 23). *Sveriges friluftskommun*. Retrieved October 14, 2023, from https://www.naturvardsverket.se/amnesomraden/friluftsliv/sveriges-friluftskommun

Naturvårdsverket. (n.d.). *Trollhättan är Sveriges friluftslkommun 2022*. Retrieved October 14, 2023, from https://www.naturvardsverket.se/amnesomraden/friluftsliv/sveriges-friluftskommun-2022/

Noblaskolan. (n.d.). *Noblaskolan Nya Hovås*. Retrieved February 22, 2024, from https://noblaskolan.se/nya-hovas/

Närhälsan Västra Götalandsregionen. (2019). *Barn & ungas väntrum: Vägledning för er som vill skapa rum inom vårdmiljön utifrån barn och ungas vilkor*. Elanders. https://isestig.se/eva-johanna/barn_och_ungas_vantrum_Isestig.pdf

REBLJU. (2022, October 05). *Trollhättan är Sveriges friluftskommun 2022*. Trollhättans Stad. Retrieved October 14, 2023, from https://www.trollhattan.se/startsida/nyheter/aktuella-nyheter/trollhattan-ar-sveriges-friluftskommun-2022/

Roşca, A. M., Rusu, L., Marin, M. I., Ene Voiculescu, V., & Ene Voiculescu, C. (2022). Physical activity design for Balance Rehabilitation in Children with Autism Spectrum Disorder. *Children*, *9*(8), Article number 1152. https://doi.org/10.3390/children9081152

Salvo, D., Garcia, L., Reis, R. S., Stankov, I., Goel, R., Schipperijn, J., Hallal, P. C., Ding, D., & Pratt, M., (2021, October). Physical activity promotion and the united nations sustainable development goals: Buildings synergies to maximize impact. *Journal of Physical Activity and Health*, *18*(10), 1163-1180. https://doi.org/10.1123/jpah.2021-0413

Shannon, J., Legg, D., & Pritchard-Wiart, L. (2021). Do peadiatric physiotherapists promote community-based physical activity for children and youth with disabilities? A mixed-methods study. *Physiotherapy Canada*, *73*(1), 66-75. https://doi.org/10.3138%2Fptc-2019-0043

Struve, T. & Ydeskog, K-E. (1968, March). *Förslag till Stadsplan för Sylte i Trollhättans stad* [City plan]. Trollhättans Stad. Retrieved March 3, 2024, from https://detaljplaner.lantmateriet.se/

Trollhättan Action Week. (2023). *Om Alliansloppet*. Retrieved October 15, 2023, from https://www.alliansloppet.se/alliansloppet/

Underlag Kronogården, Lextorp. (n.d.). *Underlag Kronogården, Lextorp* [PowerPoint]

Unisport (n.d.a.). *No name* [Photography]. Framtidens Idrottshall. https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf. In Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB, *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall*. https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf

Unisport (n.d.b.). *No name* [Photography]. Framtidens Idrottshall. https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf. In Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB, *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall*. https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf

Verbeke, J. (2013). This is Research by Design. In M. Fraser. (Ed.), *Design Research in Architecture* (pp. 137- 159). Ashgate.

Västra Götalandsregionen Sahlgrenska Universitetssjukhus. (2023, November 20). *Arbetsterapi och fysioterapi barn*. Retrieved January 19, 2024, from https://www.sahlgrenska.se/omraden/omrade-1/verksamhet-neurologi-och-psykiatri-barn/enheter/arbetsterapi-och-fysioterapi-barn/

Västtrafik. (n.d.a.). [Suggested Tram line and stops in the area by Västtrafik To Go app]. Retrieved February 22, 2024.

Västtrafik. (n.d.b.). [Suggested Tram line and stops in the area by Västtrafik To Go app]. Retrieved February 22, 2024.

Västtrafik. (n.d.c.). [Suggested Tram line and stops in the area by Västtrafik To Go app]. Retrieved February 22, 2024.

Västtrafik. (n.d.d.). [Suggested Tram line and stops in the area by Västtrafik To Go app]. Retrieved February 22, 2024

Wang, Y., Steenbergen, B., van der Krabben, E., Kooij, H.-J., Raaphorst, K., & Hoekman, R. (2023, June 20). The Impact of the Buil Environment and Social Environment on Physical Activity: A Scoping Review. *International Journal of Environmental Research & Public Health*, *20*(12), p6189, 36p. https://doi.org/10.3390/ijerph20126189

Zwenger, U., & Tidningen LÄRA. (n.d.) *Klättervägg i korridoren* [Photography]. Boverket. https://www.boverket.se/sv/samhallsplanering/arkitektur-och-gestaltad-livsmiljo/arbetssatt/skolors-miljo/byggnaden-och-utemiljon/rorelseframjande-miljo/rorelseframjande-inomhusmiljo/. In Boverket. *Rörelsefrämjande inomhusmiljö i skolan*. Retrieved September 14, 2023, from https://www.boverket.se/sv/samhallsplanering/arkitektur-och-gestaltad-livsmiljo/arbetssatt/skolors-miljo/byggnaden-och-utemiljon/rorelseframjande-miljo/rorelseframjande-inomhusmiljo/

Master thesis and student projects

Alm, E. (2024). Redstone Hotel [Student project in ACE515 2024, Chalmers University of Technology]. https://chalmers.instructure.com/courses/26419/files/3142448/download?download_frd=1

Inspiration description:
Inspiration of how to work with a grid.

Carlén, R. (2020). *New Public Landscape* [Matter space structure studio project, Chalmers University of Technology]. Chalmers. https://projects.arch.chalmers.se/regina-carlen/

Inspiration description:
Different movements and level of free activity.

Carlén, R. (2021). *Using Architecture to Promote Physical Activity: Designing activity space to encourage Sweden's most sedentary, with a special focus on high school girls* [Master Thesis, Chalmers University of Technology]. Master's Thesis 2021 Archives. https://projects.arch.chalmers.se/regina-carlen-2/

Inspiration description:
Inspiration for the mapping, presentation of the documentation and analysis could be taken from Carlén (2021) master thesis when she is mapping the intersection between school and possible exercise areas as a way of finding the spot. She presents it on a map and picks the specific site after choosing city as well. In the same way I want to document relevant facilities to add the physiotherapy and physical activation to, does Carlén (2021) create a view over the physical activation situation on her site. The way she documents her sites qualities is an inspiration for me while writing about Trollhättan. The intention for the mapping is not to show an intersection (Carlén, 2021) but rather collect information and standing points that can strengthen a decision.

Dahlman, H. (2019). *Cut* [Master Thesis, Chalmers University of Technology]. lib.chalmers. https://eds.s.ebscohost.com/eds/detail/detail?vid=1&sid=c0fbe997-7de0-470d-b799-cdbe9a7b94b9%40redis&bdata=JnNpdGU9ZWRzLWxpdmUmc2NvcGU9c2l0ZQ%3d%3d#db=cat09075a&AN=clpc.oai.edge.chalmers.folio.ebsco.com.fs00001000.b98fdd2f.7393.4f34.82e6.a9135f62e840

Inspiration description:
Inspiration for the time plans and its visualisation.

Gabrielsson, L., & Peterson, S. (2023). *Unlocking Tibro – Rethinking Collaboration and Value Making in Rurban Areas* [Master Thesis, Chalmers University of Technology]. Master's Thesis 2023 Archives. https://projects.arch.chalmers.se/wp-content/uploads/2023/06/petersonsofia_27742_2791670_Gabrielsson-Peterson_Linnea-Sofia_Rurban-Transformation_MT-2023-Booklet.pdf

Inspiration description:
Inspiration for the time plans and its visualisation.

Gimfjord, J. N. (2023). *Walls of Our Public Realm – A study of frontage use an design in relation to location* [Master Thesis, Chalmers University of Technology]. Master's Thesis 2023 Archives. https://projects.arch.chalmers.se/wp-content/uploads/2023/06/gimfjordnielsenjohanna_50213_2792823_Gimfjord-Nielsen_Johanna_SEU_MT-2023.pdf

Inspiration description:
Inspiration of definition list. She uses a scale that she created. I think that is a good way of illustrating a value.

Schultz, L. (2023). *Integrating Wisdom - Promoting wellness through the design of an intergenerational preschool* [Master Thesis, Chalmers University of

Technology]. Master's Thesis 2023 Archives. https://projects.arch.chalmers.se/wp-content/uploads/2023/06/schultzlinn%C3%A9a_20595_2788081_Schultz_Linn%C3%A9a_Healthcare_MT-2023-Booklet-.pdf

Inspiration description:
This project is an inspiration in working with one building that could be used by more than one occupancy and how it adapts depending on time changing the occupancies use of the space and activities. Another thing that is helpful is the structure of the site analysis and how she shows her sites and the finial decision by zooming in from urban to plot. Diagram of use connected to time will be a tool.

Sterner, B. (2023). *Social Bridges - Intergenerational Housing* [Master Thesis, Chalmers University of Technology]. Master's Thesis 2023 Archives. https://projects.arch.chalmers.se/wp-content/uploads/2023/06/sternerbeatrice_49984_2789918_Sterner_Beatrice_Healthcare_MT-2023-Booklet.pdf

Inspiration description:
Inspired by the structure of presenting study visit and case study in booklet. How to complement text with picture or figure.
The way she present program and gives a clear description of the buildings components will be a guide for this project. She present deepened drawings or in this case axonometrics on 3 chosen rooms. The floor plan becomes big in scale and these 3 selected parts of the building are done in detail. I think it is really good way of working with the different scales, give a better understanding, give a detailed view and create delimitations to focus on some parts. This is something I will take with me. 3 also seems like a good number. A good example of a good abstract.

Physical Reference Projects

- Östra Sjukhuset
- Ortho Center Rehab Göteborg
- IFK Kliniken Rehab/GLTK
- Noblaskolan F-5
- Aarhus Gymnastic and Motor Skills Hall
- Spiralen

Tools in design and construction

Arkitekterna Krook & Tjäder. (2023). *CLT HOTEL - Area distribution program 80 keys* [Course materails ACE515 2024]. https://chalmers.instructure.com/courses/26419/files/2988554/download?download_frd=1

Bodin, A., Hidemark, J., Stintzing, M., & Nyström, S. (Ed.). (2019). Arkitektens handbok (11th ed.). Studentlitteratur.

Borgström, E., & Fröbel, J. (2017). *KL-trähandbok* (1st ed.). Föreningen Sveriges Skogsindustrier.

Fröbel, J. (Ed.). (2018). *Lathunden* (6th ed.). Föreningen Sveriges Skogsindustrier.

Gross, H. (Ed.). (2016). *Limträhandbok Del 1* (5th ed.). Föreningen Sveriges Skogsindustrier.

Svenskt trä. (2021, May 28). *Pulpettaksbalkar och balkar.* byggbeskrivningar.se. Retrieved April17, 2024, from https://www.byggbeskrivningar.se/dimensionering/pulpettaksbalkar-och-balkar/

Swedish Standards Institute. (2006). *Building design - Housing - Interior dimensions* (SS 91 42 21:2006).

Figure references

Figure 2
Time plan diagram BASED ON Dahlman, H. (2019). *Cut* [Master Thesis, Chalmers University of Technology]. lib.chalmers. https://eds.s.ebscohost.com/eds/detail/detail?vid=1&sid=c0fbe997-7de0-470d-b799-cdbe9a7b94b9%40redis&bdata=JnNpdGU9ZWRzLWxpdmUmc2NvcGU9c2l0ZQ%3d%3d#db=cat09075a&AN=clpc.oai.edge.chalmers.folio.ebsco.com.fs00001000.b98fdd2f.7393.4f34.82e6.a9135f62e840 & Gabrielsson, L., & Peterson, S. (2023). *Unlocking Tibro – Rethinking Collaboration and Value Making in Rurban Areas* [Master Thesis, Chalmers University of Technology]. Master's Thesis 2023 Archives. https://projects.arch.chalmers.se/wp-content/uploads/2023/06/petersonsofia_27742_2791670_Gabrielsson-Peterson_Linnea-Sofia_Rurban-Transformation_MT-2023-Booklet.pdf

Figure 9
Söderström Larsson, L. (2023). *Design narrative - symbiosis through collage* [Sketch]. BASED ON Roşca, A. M., Rusu, L., Marin, M. I., Ene Voiculescu, V., & Ene Voiculescu, C. (2022). Physical activity design for Balance Rehabilitation in Children with Autism Spectrum Disorder. *Children*, *9*(8), Article number 1152. https://doi.org/10.3390/children9081152, Shannon, J., Legg, D., & Pritchard-Wiart, L. (2021). Do paediatric physiotherapists promote community-based physical activity for children and youth with disabilities? A mixed-methods study. *Physiotherapy Canada*, *73*(1), 66-75. https://doi.org/10.3138%2Fptc-2019-0043, Generation Pep Sweden. (n.d.b). *Mural Arkitektur Rörelsebana*. Generation Pep. Retrieved September 15, 2023, from https://generationpep.se/sv/hur-vi-arbetar/samarbetsinitiativ/mural-arkitektur-rorelsebana/
& Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB. (2020). *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall*. https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf

Figure 12
BASED ON C.F. Møller Architects. (n.d.). *Aarhus Gymnastics and Motor Skills Hall* [Photography/Drawings], cfmoller. Retrieved February 28, 2024, from https://www.cfmoller.com/p/Aarhus-Gymnastics-and-Motor-Skills-Hall-i2423.html

Figure 13
BASED ON LOA Fonden & Johansen, R. (n.d.). *Spiralen, Kalundborg, Danmark* [Photography]. Framtidens Idrottshall. In Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB, *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall*. https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf

Figure 14
BASED ON Unisport (n.d.a). *No namn* [Photography]. Framtidens Idrottshall. https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf. In Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB, *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall*. https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf, Unisport (n.d.b). *No namn* [Photography]. Framtidens Idrottshall. https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf. In Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB, *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall*. https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf, Zwenger, U., & Tidningen LÄRA. (n.d.) Klättervägg i korridoren *No namn* [Photography]. Boverket. https://www.boverket.se/sv/samhallsplanering/arkitektur-och-gestaltad-livsmiljo/arbetssatt/skolors-miljo/byggnaden-och-utemiljon/rorelseframjande-miljo/rorelseframjande-inomhusmiljo/. In Boverket. *Rörelsefrämjande inomhusmiljö i skolan*. Retrieved September 14, 2023, from https://www.boverket.se/sv/samhallsplanering/arkitektur-och-gestaltad-livsmiljo/arbetssatt/skolors-miljo/byggnaden-och-utemiljon/rorelseframjande-miljo/rorelseframjande-inomhusmiljo/

Figure 15
BASED ON Lantmäteriet. (2024a) *GIS data*.

Figure 16
BASED ON Lantmäteriet. (2024b) *GIS data*.

Figure 19
BASED ON Lantmäteriet. (2024c) *Flygbild* [map].

Figure 20
BASED ON Lantmäteriet. (2024d) *Flygbild* [map].

Figure 24
BASED ON INSPIRATION Carlén, R. (2020). *New Public Landscape* [Matter space structure studio project, Chalmers University of Technology]. Chalmers. https://projects.arch.chalmers.se/regina-carlen/,
Carlén, R. (2021). *Using Architecture to Promote Physical Activity: Designing activity space to encourage Sweden's most sedentary, with a special focus on high school girls* [Master Thesis, Chalmers University of Technology]. Master's Thesis 2021 Archives. https://projects.arch.chalmers.se/regina-carlen-2/ & Schultz, L. (2023). *Integrating Wisdom - Promoting wellness through the design of an intergenerational preschool* [Master Thesis, Chalmers University of Technology]. Master's Thesis 2023 Archives. https://projects.arch.chalmers.se/wp-content/uploads/2023/06/schultzlinn%C3%A9a_20595_2788081_Schultz_Linn%C3%A9a_Healthcare_MT-2023-Booklet-.pdf

Figure 28
BASED ON Lantmäteriet. (n.d.a.) *GIS data*.

Figure 29
BASED ON Lantmäteriet. (n.d.b.) *GIS data*.

Figure 39
BASED ON INSPIRATION Sterner, B. (2023). *Social Bridges - Intergenerational Housing* [Master Thesis, Chalmers University of Technology]. Master's Thesis 2023 Archives. https://projects.arch.chalmers.se/wp-content/uploads/2023/06/sternerbeatrice_49984_2789918_Sterner_Beatrice_Healthcare_MT-2023-Booklet.pdf

Figure 40
BASED ON INSPIRATION Schultz, L. (2023). *Integrating Wisdom - Promoting wellness through the design of an intergenerational preschool* [Master Thesis, Chalmers University of Technology]. Master's Thesis 2023 Archives. https://projects.arch.chalmers.se/wp-content/uploads/2023/06/schultzlinn%C3%A9a_20595_2788081_Schultz_Linn%C3%A9a_Healthcare_MT-2023-Booklet-.pdf

Table references

Table 1 BASED ON Fysioterapeuterna Sektionen för habilitering och pediatrik. (2016). *Vad gör en barnfysioterapeut?* [Information brochure]. https://www.fysioterapeuterna.se/globalassets/_sektioner/habilitering-och-pediatrik/aktuellt/infobroschyr-2016.pdf & Västra Götalandsregionen Sahlgrenska Universitetssjukhus. (2023, November 20). *Arbetsterapi och fysioterapi barn*. Retrieved January 19, 2024, from https://www.sahlgrenska.se/omraden/omrade-1/verksamhet-neurologi-och-psykiatri-barn/enheter/arbetsterapi-och-fysioterapi-barn/

Table 2 BASED ON Västra Götalandsregionen Sahlgrenska Universitetssjukhus. (2023, November 20). *Arbetsterapi och fysioterapi barn*. Retrieved January 19, 2024, from https://www.sahlgrenska.se/omraden/omrade-1/verksamhet-neurologi-och-psykiatri-barn/enheter/arbetsterapi-och-fysioterapi-barn/, Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB. (2020). Framtidens idrottshall – Konceptprogram för Framtidens idrottshall. https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf & LOA Fonden & Johansen, R. (n.d.). *Spiralen, Kalundborg, Danmark* [Photography]. Framtidens Idrottshall. In Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB, *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall*. https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf

Table 3
Boon, B., Rozendaal, M. C., van den Heuvel-Eibrink M. M., van der Net, J., van Grotel, M., & Stappers, P. J. (2020). Design Strategies for Promoting Young Children's Physical Activity: A Playscapes Perspective. *International Journal of Design*, *14*(3), 1-18.,
Carlén, R. (2020). *New Public Landscape* [Matter space structure studio project, Chalmers University of Technology]. Chalmers. https://projects.arch.chalmers.se/regina-carlen/,
Carlén, R. (2021). *Using Architecture to Promote Physical Activity: Designing activity space to encourage Sweden's most sedentary, with a special focus on high school girls* [Master Thesis, Chalmers University of Technology]. Master's Thesis 2021 Archives. https://projects.arch.chalmers.se/regina-carlen-2/,
C.F. Møller Architects. (n.d.). *Aarhus Gymnastics and Motor Skills Hall*. cfmoller. Retrieved February 28, 2024, from https://www.cfmoller.com/p/Aarhus-Gymnastics-and-Motor-Skills-Hall-i2423.html,
Generation Pep Sweden. (n.d.b). *Mural Arkitektur Rörelsebana*. Generation Pep. Retrieved September 15, 2023, from https://generationpep.se/sv/hur-vi-arbetar/samarbetsinitiativ/mural-arkitektur-rorelsebana/,
Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB. (2020). *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall*. https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf,
LOA Fonden & Johansen, R. (n.d.). *Spiralen, Kalundborg, Danmark* [Photography]. Framtidens Idrottshall. In Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB, *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall*. https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf,
Movahed, M., Martial, L., Poldma, T., Slanik, M., & Shikako, K. (2023, August). *Promoting Health through Accessible Public Playgrounds*. Children, 10(8), p1308, 14p. https://doi.org/10.3390/children10081308,
Närhälsan Västra Götalandsregionen. (2019). *Barn & ungas väntrum: Vägledning för er som vill skapa rum inom vårdmiljön utifrån barn och ungas vilkor*. Elanders. https://isestig.se/eva-johanna/barn_och_ungas_vantrum_Isestig.pdf,
Roşca, A. M., Rusu, L., Marin, M. I., Ene Voiculescu, V., & Ene Voiculescu, C. (2022). Physical activity design for Balance Rehabilitation in Children with Autism Spectrum Disorder. *Children*, *9*(8), Article number 1152. https://doi.org/10.3390/children9081152,
Unisport (n.d.a.). [Photography]. Framtidens Idrottshall. https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf. In Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB, *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall*. https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf,
Unisport (n.d.b.). [Photography]. Framtidens Idrottshall. https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf. In Gymnastikförbundet, Basketbollförbundet, Volleybollförbundet, Innerbandyförbundet, Handbollförbundet & White Arkitekter AB, *Framtidens idrottshall – Konceptprogram för Framtidens idrottshall*. https://whitearkitekter.com/se/wp-content/uploads/sites/3/2020/08/Framtidens-idrottshall_WhiteArkitekter_200814.pdf,
Zwenger, U., & Tidningen LÄRA. (n.d.) *Klättervägg i korridoren* [Photography]. Boverket. https://www.boverket.se/sv/samhallsplanering/arkitektur-och-gestaltad-livsmiljo/arbetssatt/skolors-miljo/byggnaden-och-utemiljon/rorelseframjande-miljo/rorelseframjande-inomhusmiljo/.
In Boverket. *Rörelsefrämjande inomhusmiljö i skolan*. Retrieved September 14, 2023, from https://www.boverket.se/sv/samhallsplanering/arkitektur-och-gestaltad-livsmiljo/arbetssatt/skolors-miljo/byggnaden-och-utemiljon/rorelseframjande-miljo/rorelseframjande-inomhusmiljo/