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FOOD & CRISIS

Urban food resilience in times of crisis.
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A Design Proposal for a Campus Park in Oslo

by Max Ekholm

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Sincerely,
Max Ekholm, 2022-01-31

Disclaimer

This is a master's thesis project by Max Ekholm, student of landscape architecture at the Swedish University of Agricultural Sciences. The design proposal presented in this project has nothing to do with the planned development in Diakonhjemmet, Oslo.

Abstract

As humans we tend to think a lot about food, and in our part of the world food is something that many people take for granted. At the same time the global population is growing, and urbanization is increasing in a rapid pace. What happens when a crisis emerges, and the food system is interrupted? What happens when food is running low? Does everyone have enough food to eat when a crisis interrupts the fragile system that we are dependent on today?

The project is set in a campus park in Oslo, Norway. The purpose of the project is to investigate the possibility of designing a resilient urban park that can transition into producing food in the event of a crisis, without losing the aesthetical values in times of non-crisis. The design proposal is heavily influenced by the attained knowledge from literature regarding urban farming and urban farming in times of crisis, as well as information gained from a profound site analysis. Hence, the project has used a method of Research for design as a main tool to try to answer the purpose and question at issue. In the presentation of the result a narrative design approach has been used to visualize the park design through different events and circumstances. Furthermore, the presentation of the design proposal is divided into two parts, displaying the park in two different scenarios.

In part 1 the park design is presented with its strong resilient framework towards possible crises that can affect the access of food in Oslo. This approach led to a strategy where the park is divided into three different focus areas that emerged during the design development. The three focus areas are all contributing tools in the framework for resilience. The three focus areas involving the Community Hub, the Water reservoirs or water ponds, and the Community garden, have all been designed with a role to play for resilience as well with convincing aesthetical and architectural values. Part 2 shows the park design during a possible future crisis scenario, and how the park design and user experiences changes during such times.

In summary, this project aims to investigate the possibility of designing a resilient urban park that can transition into producing food in the event of a major crisis, without losing the aesthetical values in times of non-crisis.

Keywords: Urban farming, resilience, food security, crisis, landscape architecture

Sammanfattning

Introduktion och bakgrund

Som människor spenderar vi en stor del av våra liv med att tänka på mat, prata om mat, tillaga och slutligen äta maten. Idag är mat något som många av oss tar för givet, vi förväntar oss nästan att det vi vill ha till lunch idag ska finnas att köpa på närmsta mataffär. Men vad händer när detta fragila system rubbas? Vad händer när gränserna stänger för import på grund av ett yttre hot? Vad händer när maten börjar ta slut? Kan alla äta sig mätta även i händelse av en större kris som följer exempelvis ett krig, en naturkatastrof eller en betydligt dödligare pandemi än den vi genomlever när detta skrivs?

Som det ser ut idag är många av Europas länder nettoimportörer av livsmedel, och många av de länder som beräknas som nettoexportörer har en relativt ensidig produktion där de producerar stora mängder livsmedel av en och samma sort. I en värld som blir allt mer urbaniserad och där människor bor längre från den faktiska produktionen av livsmedel blir de urbana livsmedelssystemen väldigt sköra. När en sådan lokal, nationell eller till och med global kris inträffar, kan det orsaka störningar och i värsta fall helt uteblivna transporter av livsmedel till städerna. Ett exempel, eller en förvarning på hur detta scenario skulle kunna se ut kom i kölvattnet av den första vågen av Covid-19. På grund av osäkerhet kring det nya viruset och den nära framtiden beslutade många länder att stänga sina gränser, andra stater valde till och med att stoppa export av värdefulla råvaror för att säkra den egna tillgången. Lyckligtvis uteblev de stora konsekvenserna gällande tillgången på mat i de flesta fall då transporterna fortsatte att gå efterhand. Men man behöver inte se längre bak i tiden än ca 80 år för att se hur känsligt livsmedelssystemet är i Norden. Under 1900-talets världskrig odlades bland annat potatis, kål och kålrot i urbana parker i hela Skandinavien.

Under sommaren 2018 skickades på begäran av den svenska regeringen tillsammans med MSB (Myndigheten för Samhällsskydd och Beredskap) informationshäftet ’Om kriget eller krisen kommer’ ut till alla svenska hushåll. Syftet var att förbereda och informera Sveriges befolkning om hur man bör agera i händelse av bland annat krig, större naturkatastrofer eller andra kriser. Bland andra exempel på vad en större samhällskris skulle kunna innebära fastnade jag vid två punkter på listan. ”Det blir svårt att laga och förvara mat” och ”Mat och andra varor kan ta slut i affärerna” -(MSB, 2018. S.4.). För mig personligen var det vad jag såg som den största faran i ett krisscenario. Om maten inte räcker till spelar ingenting annat någon roll.

I detta projekt ämnar jag leverera ett gestaltningsförslag för Diakonhjemmet Campuspark i Oslo, i syfte att snabbt och enkelt kunna ställa om till att bli ett center för urban matproduktion i händelse av kris och katastrof.

Teoretisk bakgrund

Enligt Förenta nationerna (2018) kommer den urbana befolkningen öka från ca 55% av jordens befolkning till närmare 70% inom bara några decennier vilket betyder att närmare 7 miljarder människor kommer bo i urbana områden. Wiskerke (2015) menar att städer täcker omkring 2% av jordens landyta, detta betyder att omkring 70% av jordens befolkning kommer att bo och leva på en oerhört liten yta. Broto (et al, 2012.) går till och med så långt att beskriva städer som ’parasiter’ på landskapet eftersom städernas ekologiska fotavtryck är oerhört stort utan att ge något tillbaka. I exemplet om livsmedel sker den absoluta majoriteten av all produktion utanför städerna, medan livsmedlen faktiskt i högre grad konsumeras i urbana områden på grund av den stora befolkningen. Denna beroendeställning mellan stad och landsbygd, ett livsmedelssystem där landsbygden producerar och städerna konsumerar har visat sig skört. När transporterna av livsmedel till urbana områden av en eller annan anledning inte fungerar riskerar stor del av befolkningen att lida av svält. Detta exemplifierades tydligt redan under 1900-talets båda världskrig (Thusen, 2015. Stockholmskällan, 2021). Ett mer aktuellt exempel är många länders agerande under de tidiga månaderna av den pågående coronapandemin. På grund av osäkerhet kring den nära framtiden valde många länder att stänga sina gränser för att hålla smittan ute, vissa länder valde även att stoppa exporten av viktiga varor och livsmedel för att säkra den egna tillgången i första hand (Pulighe & Lupia 2020).

Syfte

I det här examensarbetet kommer jag undersöka möjligheten att gestalta en urban park som kan ställa om till att producera mat i händelse av en större krissituation utan att förlora estetiska värden i tider av icke-kris. Jag ämnar gestalta en park som svarar till platsens och dess användares behov i icke-kris såväl som i kris.

Frågeställning

Hur gestaltas Diakonhjemmet Campuspark på ett estetiskt tilltalande vis till resiliens och för att enkelt kunna ställa om till att producera mat under och efter kris?

- Hur förändras parkens användning och utseende vid en sådan omställning?

Målgrupp

Jag hoppas att jag med detta projekt kan inspirera landskapsarkitekter, planerare och politiker till att stärka säkerheten gällande tillgång av mat i händelse av nationell eller global kris. Vidare hoppas jag att projektet även kan inspirera vidareutveckling av Diakonhjemmets park och andra urbana parker när det handlar om att skapa resilienta och socialt hållbara urbana rum i händelse av kris och katastrof.

Metod

I processen att genomföra detta arbete har en rad olika metoder använts, men det är en metod som av Lentzholzer (et al. 2016) presenteras som "Research for Design", som har varit den övergripande metod som hållit arbetet samman. Kortfattat beskriver Lentzholzer (ibid.) metoden som "all typ av bakgrundsinformation som ligger till stöd för gestaltningen av en produkt eller en process" (Lenzholzer et al., 2016, p. 55. översatt av författaren). Eftersom gestaltningen av parken inte helt låtit sig styras av litteraturen eller platsanalysen, har arbetet använt sig av den av Milburn & Brown (2003), så kallade 'Intuitiva modellen', i själva gestaltningsarbetet. Den 'intuitiva modellen' syftar till en gestaltningsprocess där designern låter sig inspireras, men inte styras av den research som görs inom projektets ramar, det vill säga den teoretiska och praktiska vetskap om platsen och projektets syfte som designern tillgodogör sig under projektets gång.

Vidare har som tidigare nämnts en litteraturgenomgång genomförts för att samla kunskap och referenser som inspirerat den slutgiltiga gestaltningen. Litteraturgenomgången har i huvudsak fokuserat på urban odling och hur urban odling kan användas som medel för att skapa en resilient park i Diakonhjemmet. Litteraturgenomgången har tillsammans med en utförlig platsanalys, där bland annat platsens omgivning, historia, mikroklimat och vattenförhållanden undersökts, legat till grund till en SWOT-analys. SWOT-analysen har i sig använts som det främsta underlaget för att applicera parkens programpunkter i ett mer platsspecifikt program som tillsammans med skissarbetet legat till grund för det slutliga gestaltningsförslaget.

Termen 'Resiliens' som ett ledord genom projektet har varit viktig för att belysa projektets syfte. Termen används för att beskriva ett föränderligt och flexibelt system, som i händelse av kris kan adaptera och fungera även när yttre förutsättningar förändras.

I arbetet med bildmaterialet, för att illustrera de olika scenarion som presenteras, har jag att valt arbeta efter ett narrativ där läsaren får följa en karaktär över en tidsperiod som sträcker sig över en dryg tioårsperiod. Detta för att narrativ ger en frihet att spekulera kring de olika scenarion som kan tänkas utspela sig om en större kris uppenbarar sig. Narrativet är även tänkt att få läsaren involverad och hjälpa läsaren att själv tänka sig in i hur det skulle vara att vara på platsen under narrativets givna förutsättningar.

Litteratur

I litteraturgenomgången avhandlas i huvudsak två ämnesområden; urban odling och resiliens. I början av literaturkapitlet ges emellertid en utförlig bakgrund för hur det globala matsystemet fungerar och varför det ser ut som det gör. Detta för att ge en introduktion till det system som i händelse av kris, riskerar att rubbas. I det förstnämnda, urban odling, avhandlas en rad olika exempel på hur urban odling fungerar idag och hur urban odling fungerar och har fungerat i kristider. Bland annat behandlas olika metoder för hur livsmedel produceras i en urban miljö idag. I kapitlet behandlas bland annat metoder som den toppmoderna stadsodling som ska hjälpa Singapore att bli mer självhushållande och metoder som de så kallade 'community gardens' där själva skörden är en viktig del, men inte är hela orsaken till att de existerar. Vidare ges direkta exempel på hur urban odling använts i Skandinavien under 1900-talets världskrig som ett sätt att dryga ut de stränga matransonerna som implementerades under krigen.

Gestaltningsprocess

Processen startades med att studera kartor och de fåtal bilder som fanns tillgängliga på internet från platsen. Tillsammans med en litteraturgenomgång lades grunden för det program som kom att forma gestaltningsförslaget, som tagits fram i detta projekt. För att inte förslagets form skulle bli allt för statiskt bundet till parkens program, skissades de första förslagen fram med stora pennor i bläck för att på så sätt frigöras från en, i ett tidigt skede, onödig detaljeringsnivå. Tillsammans med platsanalysen kom litteraturen att forma ett program, för att kunna skapa det ramverk som parken behöver för att skapa resiliens mot en kris gällande matförsörjning. Allt eftersom mer kunskap om platsen och dess omgivning kom fram i och med mer analys, började tre fokusområden att utformas, som av författaren ansågs extra viktiga i syftet att skapa en välfungerande och estetiskt attraktiv park. De tre fokusområdena, 'The Community Hub', Vattenreservoarerna och 'The Community Garden' har legat i fokus då de tillsammans utgör parkens ryggrad och svar på parkens program. 'The Community Hub' som till sin utformning inspirerats av jordkällarnas integrering i landskapet, skissades fram till en byggnad som sammansmälts i det omgivande landskapet. Vattenreservoaren utvecklades från att vara en plantbädd, i syfte att lagra och rena vattenmassor, till att bli just en reservoar som kan lagra vatten till parkens odlingsareal och dessutom bli ett estetiskt tillägg. Till en början utvecklades 'The Community Garden' från idén om att skapa en urban åkermark, men efter insikt om skalan på den tänkta åkern togs beslutet att bryta ner skalan, genom att lägga till gångvägar som slingrar sig genom åkern.

Fig. 0.0.1. Skisser från gestaltningsprocessen

Gestaltningsförslag/ resultat

Kapitlet som avhandlar det slutliga gestaltningsförslaget är uppdelat i två delar för att skilja mellan parkens funktion och utseende i normaltillstånd och i kristid. I den första delen presenteras parkens program och parkens gestaltningsprinciper. Syftet är att lyfta fram parkens ramverk för att skapa resiliens mot en möjlig matkris.
I del två presenteras hur parken kan tänkas se ut under kristid. Här presenteras visionsbilder och diagram som visar på parkens transformation till att producera betydligt större mängder mat.

Fig. 0.0.2. Visualisering av 'The Community Garden'

Fig. 0.0.3. Visualisering av den södra éntren under kristid.
Till vänster planteras sena sorter av potatis och till höger står plantor av tidigare potatis som närmar sig skörd.

14e September, 2023.
Du är på en promenad med med din mamma som är på besök i Oslo. Du visar stolt upp fälten av grönsaker och annat ätbart som du och gruppen du deltar i varit med och planterat. Trots att det är mitten av september är det fortfarande varmt i luften. Sommaren har faktiskt varit varm, väldigt varm. Under hela juni och juli låg temperaturen stadigt över 20 grader och under knappt två veckor i mitten av juli kom temperaturen dagligen upp i nära 35 grader. Som grädden på moset regnade det inte på nästan hela sommaren. Lyckligtvis lyckades du och dina vänner hålla grödorna vid liv tack vare de båda vattenreserverna som anlagts i parken.

17e Maj, 2027
Det har gått ett år sedan kriget bröt ut. Trots att Norge hittills hållit sig undan direkt konflikt ligger luften tung. För exakt ett år sedan utropade regeringen undantagstillstånd. På självaste 17e Maj. Mycket har hänt sedan dess, gränserna stängdes och eftersom Norge förlitat sig på import av stora delar av sin livsmedelskonsumtion, har parken närmast utvecklats till en institution dit människor från hela Oslo tar sig, för få eller köpa fröer och grödor samt låna verktyg för att komma igång med hemmabruk.
Vad som tidigare var gräs- och ängsytor har nu blivit odlingsmark för lättodlade saker som potatis och kålrot. Till och med samlingscentrets, eller 'Hubbens' tak är täckt av potatisplantor.

Fig. 0.0.4. Axonometrisk flygvy av parken

Diskussion

Gestaltningsförslaget som presenterats har på många sätt inspirerats av och är på vissa sätt ett direkt svar på den research som gjorts inom projektets ramar. Denna innefattar den litteratur och analys som behandlats under projektets gång. Baserat på detta vill jag påstå att gestaltningen och således projektets resultat svarar till dess syfte och frågeställning.

Jag har skapat en park med förutsättningar att övergå till att producera mat i kristid, lära människor om trädgårdsskötsel, både före, under och efter kris, samt skapa ett socialt nav där människor kan mötas för att dela kunskap och erfarenhet. Parkens gestaltning och funktioner skapar ett ramverk för resiliens i praktisk mening, genom att ge utrymme för livsmedelsproduktion i stor skala i kristid, givet parkens gränser. ’The Community Hub’ och ’The Community Garden’ kommer också med andra fördelar av sociala, pedagogiska och hälsomässiga karaktärer, vilket ytterligare gör parkens design motståndskraftig mot en kris.

Slutsats

- Det är möjligt att gestalta urbana grönområden med en tilltalade estetik, som i kristid kan ställa om till att producera mat.
- Eftersom detta är ett konceptuellt gestaltningsförslag, är det svårt att svårt att säga om parkens gestaltning och dess funktioner kommer att fungera för att skapa en social resiliens. Community gardens är ett effektivt verktyg för att främja detta syfte, men det är viktigt att den är välförankrad hos de tilltänkta användarna.

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1. Introduction

Chamomille flowers in Diakonhjemmet
Photo: Private

1. Introduction

Background

As humans we spend a lot of our lives thinking about food, talking about food, preparing, and handling food. As for today food is something that many people take for granted, we can just go to the local supermarket and buy whatever we want for breakfast, lunch, and dinner. But what happens when a major event occurs that interrupts that fragile urban food system? What happens when the import of food to the cities is canceled? What happens when we no longer can buy whatever we want to eat at our local supermarket?

As for today many western countries are net importers of food (FAO, 2018) and as the population is getting more and more urbanized (UN, 2018), more people live far away from direct sources of food. Hence, urban areas and urban food systems are much more fragile to major negative events and catastrophes such as war, extreme weather, and pandemics. When a national or even global crisis occur, and the borders closes the transportation of food is affected. In 2020, when the Covid-19 pandemic swept around the globe many nations kept their borders closed and some even stopped export of valuable nutritious resources to secure their own need. The absolute food crisis never ensued this time, but one does not have to look back further than 80 years for a catastrophe that lasted for years and heavily changed the daily life for many people around the world. Are we more prepared for a similar event today? Regarding food security in urban areas in Scandinavia the answer is no.
During the Second world war most urban green areas in Oslo and Stockholm had some sort of food production, mostly used for potatoes, kale, and rutabaga.

In the summer of 2018, the Swedish Civil Contingencies Agency (MSB) sent out the brochure "If Crisis or War Comes" to all Swedish households at the request by the Swedish government. The brochure was to prepare the Swedish people on how to act in the events of serious accidents, extreme weather, major IT attacks and military conflicts (MSB, 2018). In the brochure MSB gave examples of how crises could lead to problematic challenges for the Swedish population regarding things that most people take for granted. Among the big variation of expected challenges, I stopped at two sentences regarding food and food supplies.
"It becomes difficult to prepare and store food" and The shops may run out of food and other goods MSB (2018. P.4).
For me personally that was the most essential part of the brochure. Without anything to eat or drink nothing else matter.

MSB provides a list of food that could work as a base of preparation for every household. However, I started thinking of the possible event of a protracted crisis or war and how the urban population would get through times like that. Hence, I started thinking of wars in the 20th century and remembered something that I heard in school many years ago; Victory Gardens. An initiative from the US Government during the Second world war to secure the food rations and to prevent starvation among the American population.
How would this type of initiatives look like in the 21st century and how do we secure food supplies in urban areas for the possible event of war and other major crises?
My interest in urban food systems or foodscapes developed further when I did an exchange semester at Wageningen University and Research in the Netherlands. During my semester I took a course called Foodscapes Urban Lifestyles and Transitions. In this course we designed a neighborhood with food as an underlying theme and did an investigation of the urban foodscape of Wageningen. During this course I started to understand how complicated the modern urban food network is and how vulnerable it is.
In this project I will deliver a design proposal for Diakonhjemmet park in Oslo that will provide every mean possible to transform into a hub of food production in the event of a major crisis.

Theoretical background

The human population is getting more urban (Wiskerke, 2015). As for today more than half of the human population lives in urban areas (United Nations, 2018), something that is unique in human history (Wiskerke, ibid.). And it does not look like the trend is going to change direction. In fact, one can assume the opposite. In 2018, 55% of the population lived in urban areas and by 2050 that number is expected to grow to just under 70% (United Nations, 2018). The total population on earth is also increasing as technology develops. In 2050 the human population is estimated to have increase by about 25% from about 7,8 billion people to 10 billion (United Nations, 2021). This means that almost 7 billion people will be living in urban areas (Wiskerke, 2015). Furthermore, cities cover as little as 2% of the planet's surface. Hence, almost 70% of all people on earth, equal to an estimation of 7 billion people will be constricted in an extraordinary small part of the global surface (Ibid.).
With a growing number of urban residents, it is safe to say that this has enormous consequences on the urban food systems (Wiskerke, 2015). As the cities are getting bigger so are their demand for energy and food, which has led to a perspective of cities as "parasites" on the surrounding landscapes, since they are extremely demanding on energy and food supplies without producing any or almost nothing of it themselves. Instead, cities produce waste and a growing ecological footprint (Broto et al, 2012). Wiskerke (2015) points out that food policy is often discussed within the rural policy-making, even though most food produced, are consumed in the cities due to an predominant urban population.
This dependency of rural production of food to feed the more and more urban population has proved to be very vulnerable. When the borders close or the transportation of food and goods for some other reason cannot reach the urban areas, many people risk starvation. During the world wars in the first half of the 20th century, this was made clear for the urban population of many Scandinavian cities (Thusen, 2015. Stockholmskällan, 2021). A more current example is the now still ongoing pandemic that shocked the world in early 2020. In the early phases of the Covid-19 pandemic many countries took precautions to prevent the virus of spreading by closing its borders, some even stopped their exportation of certain goods to secure their own food security (Pulighe & Lupia 2020).

Introduction to the site

The site chosen for this project is Diakonhjemmet park in Oslo, Norway. The Park is part of a larger area that shares the same name, Diakonhjemmet, and is located about four kilometer north-west of the city center. Diakonhjemmet is not only the name of the area, foremost it is an independent foundation within the Church of Norway that works within several fields, with the purpose of spreading the deacon within the church and society, locally and internationally. To realize the mission of deacon, Diakonhjemmet gives a large service offer containing public education, health, and care (Diakonhjemmet, 2021). Within the area there is a hospital, a nursing home, a center of higher education, pharmacies, a library, daycares, and housing for students as well as ordinary people.

The Park is a hilly landscape of lawns and trees wedged in between the Hospital and a nursing home for elders. Due to the bland expression, it is not well used and works mainly as a transportation route between the hospital, university, and the big parking lots south of the park. The big parking lots lies in the southeast corner of of the design area and have space for up to 160 cars. To the east, there is a hill with well-preserved oak trees towers above the park, contributing vastly to the biodiversity in the area. A playground is located in the center of the park, directly connected to the pathway that stretches through the park. On the opposite side of the pathway there is a few pallet collars with edible vegetables and root-crops.

Surroundings

As mentioned above the design area lies not far from the city center, therefore there is a big variety of services, both public and private with a close connection to Diakonhjemmet. About one kilometer south of Diakonhjemmet park lies the well renowned Vigelandsparken and a Vestre Cemetery. North of the site, Oslo University has its headquarters. Directly connected to the west of the site there is a housing area with villas.

Why Diakonhjemmet?

During my internship at Henning Larsen Architects in Copenhagen I worked with a design manual for the public space in Diakonhjemmet, Oslo. I worked with a team of landscape architects in Copenhagen and Oslo, developing design concepts for the area, nonetheless the park. Hence, I felt a connection to the site, even though I had never visited it. Hours of studying maps as well as developing suggestions for further development in the design manual also gave me a pretty good understanding of the area even before I started this project.

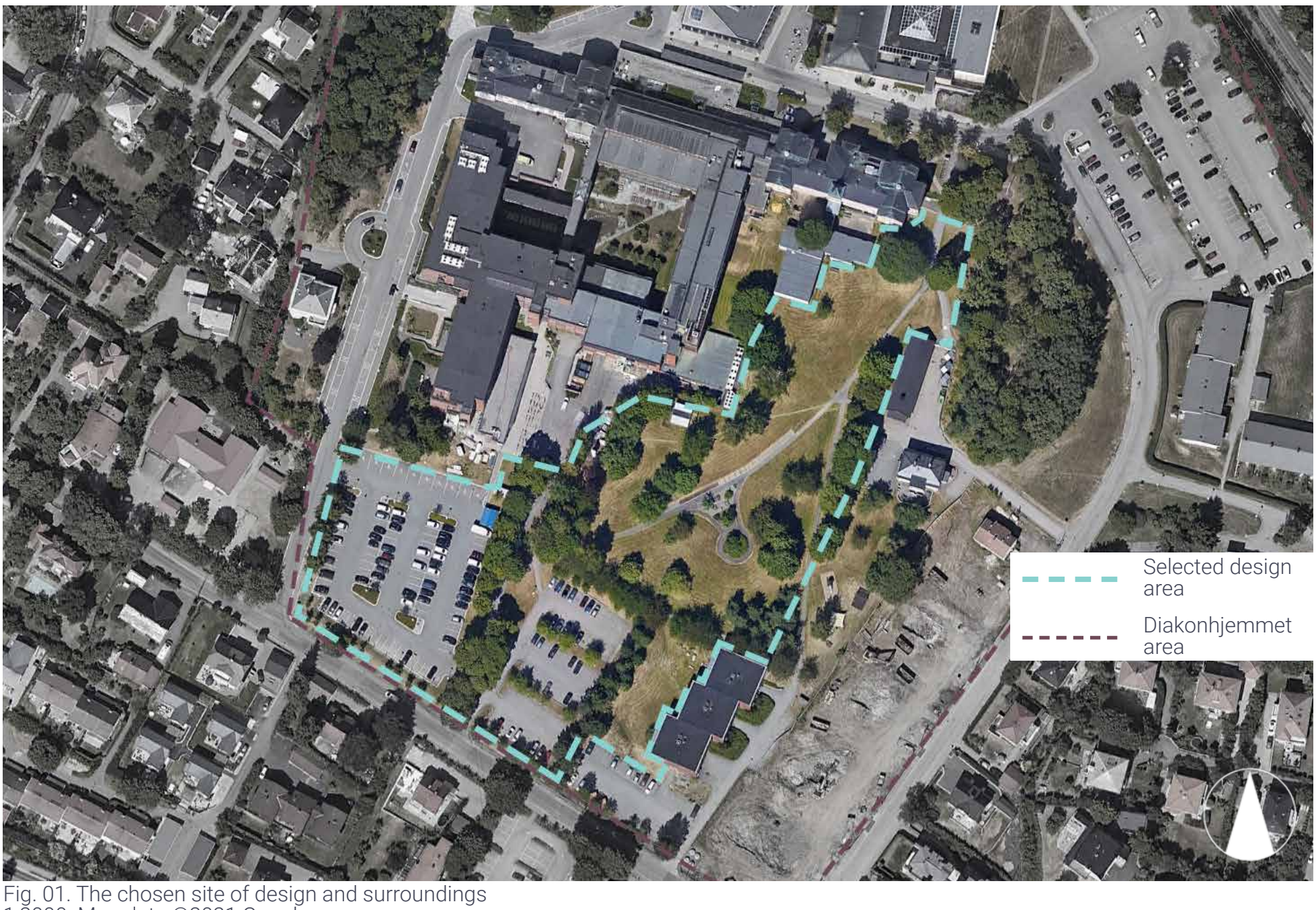


Fig. 01. The chosen site of design and surroundings
1:2000. Map data ©2021 Google

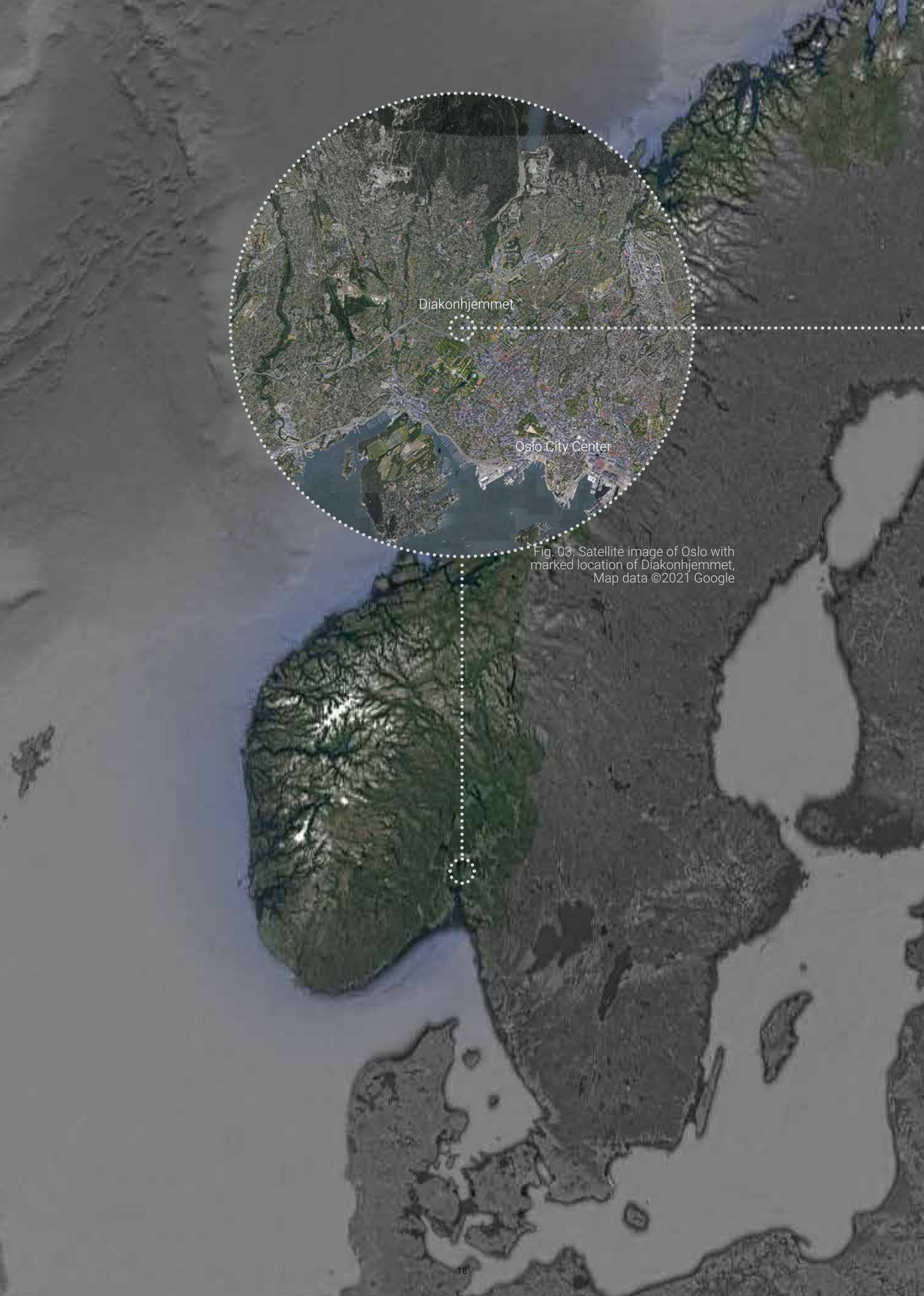


Fig. 03. Satellite image of Oslo with marked location of Diakonhjemmet, Map data ©2021 Google

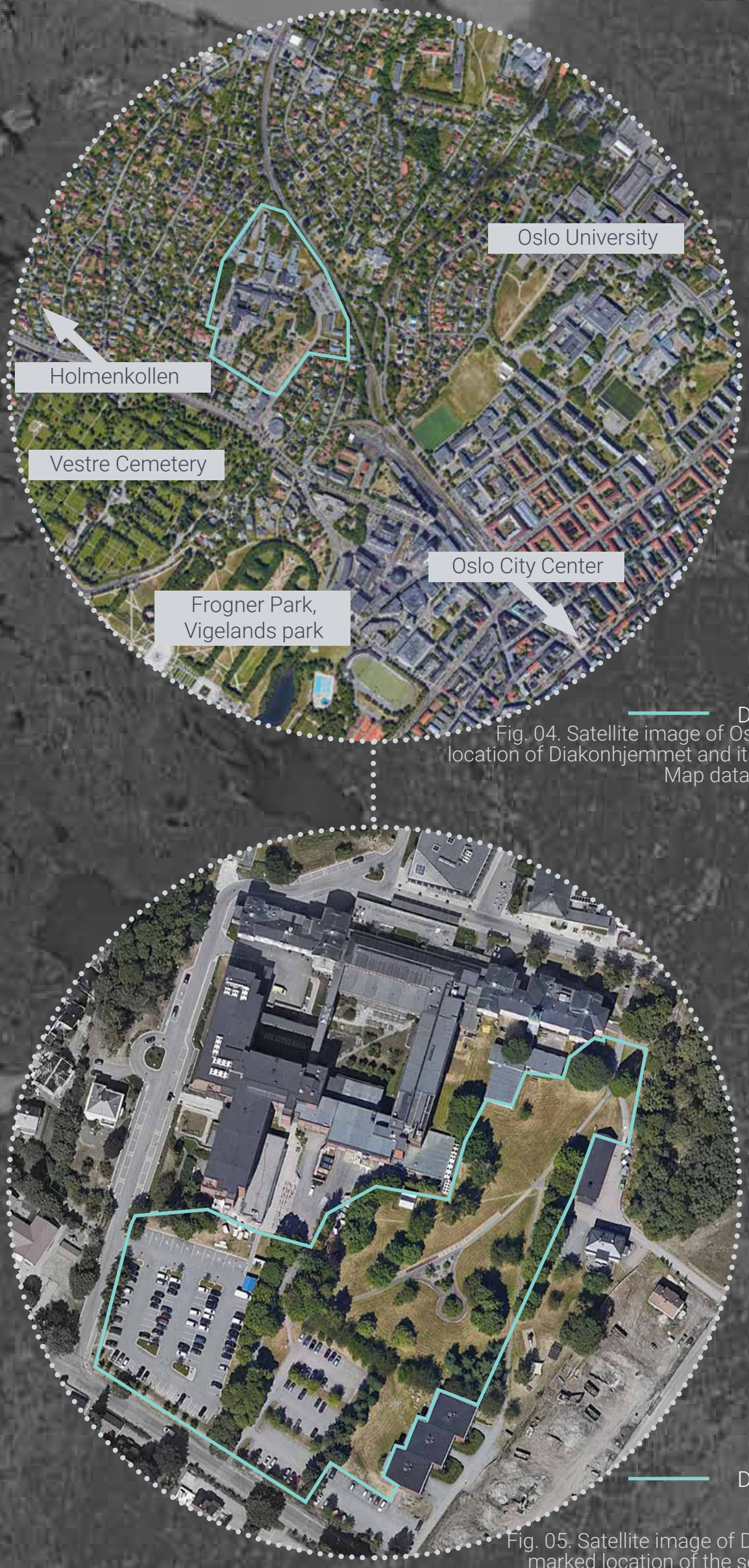


Fig. 04. Satellite image of Oslo with marked location of Diakonhjemmet and its surroundings, Map data ©2021 Google

Fig. 05. Satellite image of Diakonhjemmet with marked location of the selected design area, Map data ©2021 Google

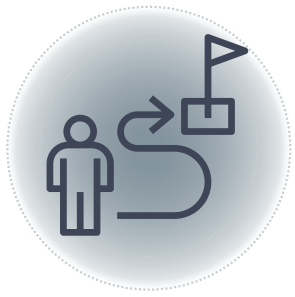
Diakonhjemmet

- Situated circa 4 km northwest of Oslo Central Station
- The selected design area ≈ 19000m^2
- Surrounded by various users and functions

Fig. 02. Satellite image of Scandinavia with marked location of Oslo, Map data ©2021 Google

Purpose

In this project I will investigate the possibility of designing a resilient urban park that can transition into producing food in the event of a major crisis, without losing the aesthetical values in times of non-crisis. I intend to design a park that answers the requirements of the site and its users in times of non-crisis as well as in times of crisis.



Question at issue

How can Diakonhjemmet campus park be designed in an aesthetically appealing way to resilience and easily be transitioned into producing food during and after crisis?

- How does the use and appearence of the park change in such a transition?

Target group

This project aims to function as inspiration for landscape architects and urban planners as well as politicians regarding measures for urban food security in the event of national or global catastrophes. The project also aims to function as inspiration for future development of Diakonhjemmet park and other urban parks when it comes to resilient park designs for catastrophic events as well as social sustainable urban green space.

Limitation

Advantageous soil and soil materials are presented, however more advanced issues regarding the chemistry and precise section drawings of the plant beds are not presented in this project. Neither is calculations of possible future timelines regarding flows and floods of water, the project is based on what today is referred to as extreme weather.
The project does not consider any specific contemporary, nor speculated future political events that could lead to conflict.
The choice of vegetation occurs regarding contemporary conditions, not speculated future conditions caused by e.g., climate change. Furthermore, the project will not provide a complete plant design for the whole park; however complete plant selections is provided for selected focus areas.
Geographically, the design is limited to Diakonhjemmet park in Oslo, Norway. Other closely connected parks and adjacent public areas are considered in the analysis of the park and influenced the design but is not part of the selected design area.

Definition of terms

Resilience

Resilience as a term differs depending on what field it is used. According to the Cambridge Dictionary (2021) it is a term describing the ability to quickly return to its usual shape after being bent, stretched or pressed. Another definition from the same source describes it as “to return quickly to previous good condition after problems”. Walker (et al. 2002) defines resilience as the potential of a system to remain and maintain its functions as well as reorganizing after a disturbance or a change. However, Walker (ibid.) also claims that one has to define what the system has to be resilient towards to define its resilience. Therefore, in this project I will define Resilience as my designs ability to adapt and function in times of crisis that heavily affects food and social stability.

Crisis

Crisis or crises are defined here based on the definition from The Cambridge Dictionary (2021) as an “extremely difficult or dangerous point in a situation”. More specific for the project that implies crises caused by a disastrous event, that is, events or situations where the normal state is disturbed to the negative.

Urban Farming

Urban farming refers to agricultural practices in urban areas and their surrounding regions. Hence, there are many different approaches to urban farming, including community gardening, rooftop farming, vertical farming and other new technologies (Lu, 2019). When using the term, I make no differentiation between commercial, public or private farming.

Community

Describes a group of people considered to be a unit based on their common interest (Cambridge Dictionary, 2021). In this project the term is commonly used to describe a group of people that come together and form a community around food and farming.

Diakonhjemmet today

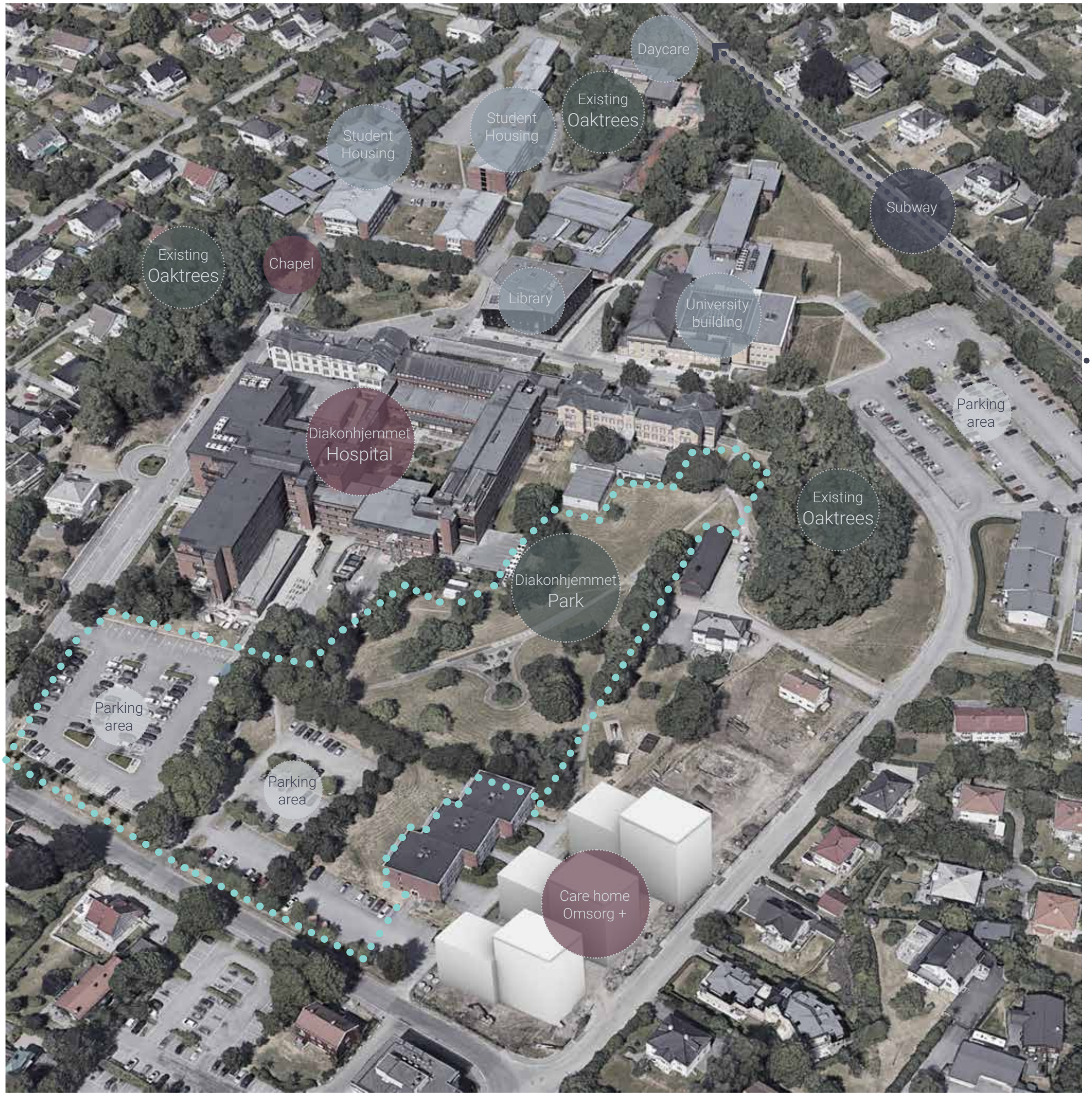


Fig. 06. Isometric image of Diakonhjemmet with marked location of the selected design area as well as surrounding features. Note that the Care home is added to this image as it exists today.
Map data ©2021 Google

The site

Diakonhjemmet is not only the name of a foundation, but also an area just outside central Oslo containing a hospital, a nursing home, a care home, a pharmacy, two schools for higher education/ universities and housing for ordinary people as well as students of the VID university. Located about five kilometers north-west from Oslo Central Station and just next to Frognerparken/ Vigelandsparken it has an attractive location in the City of Oslo.

Diakonhjemmet tomorrow

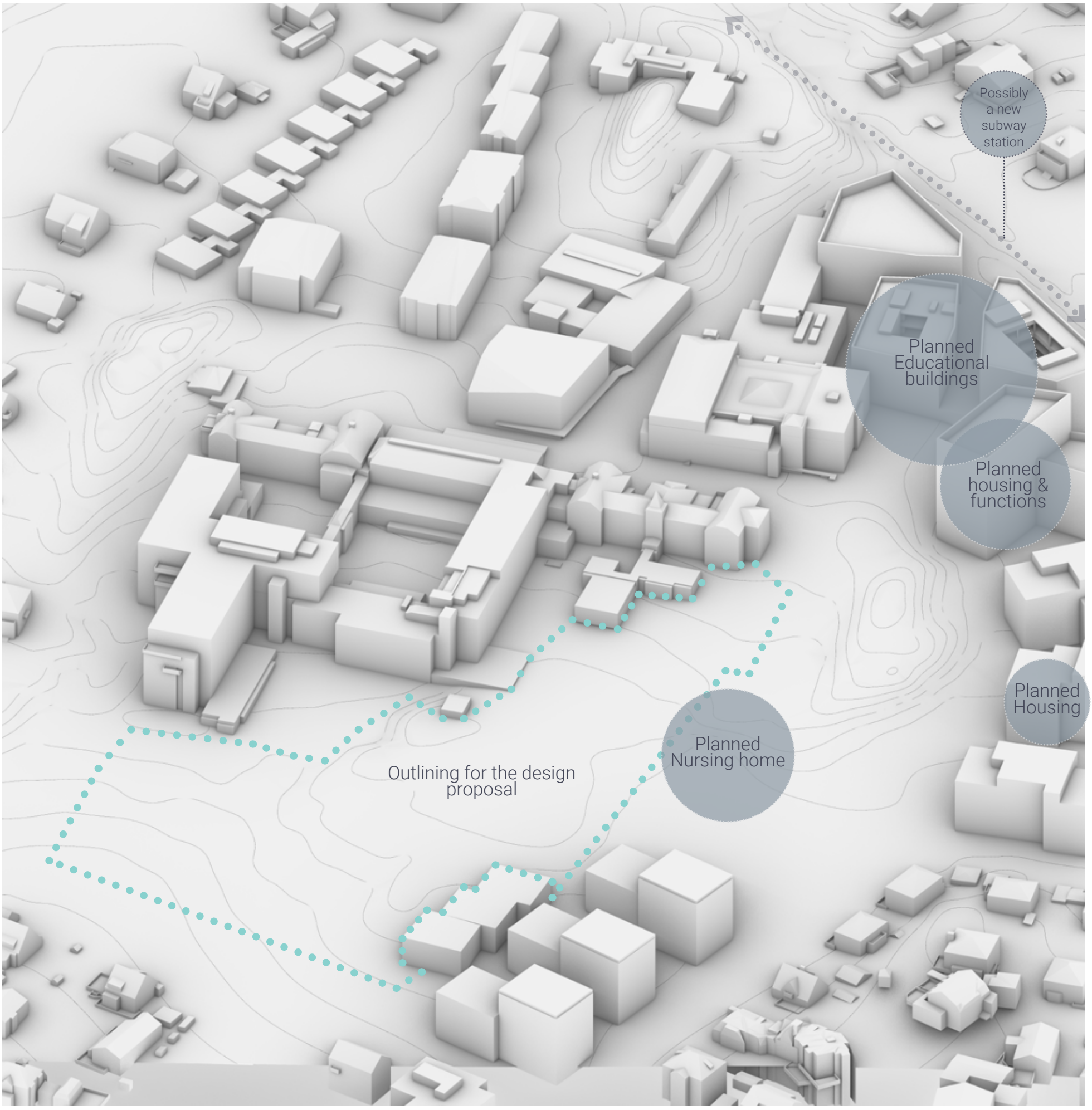
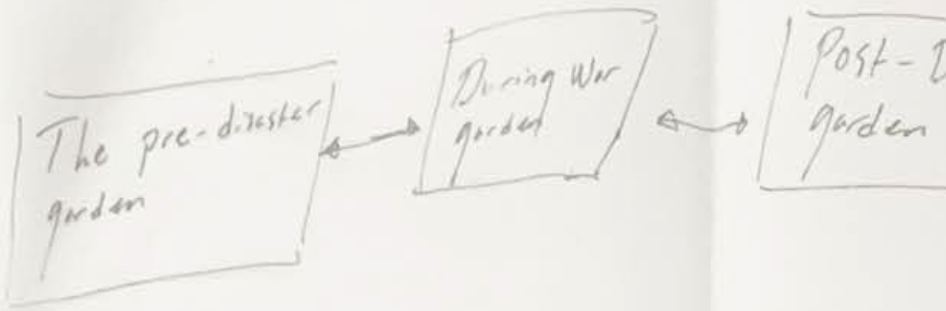
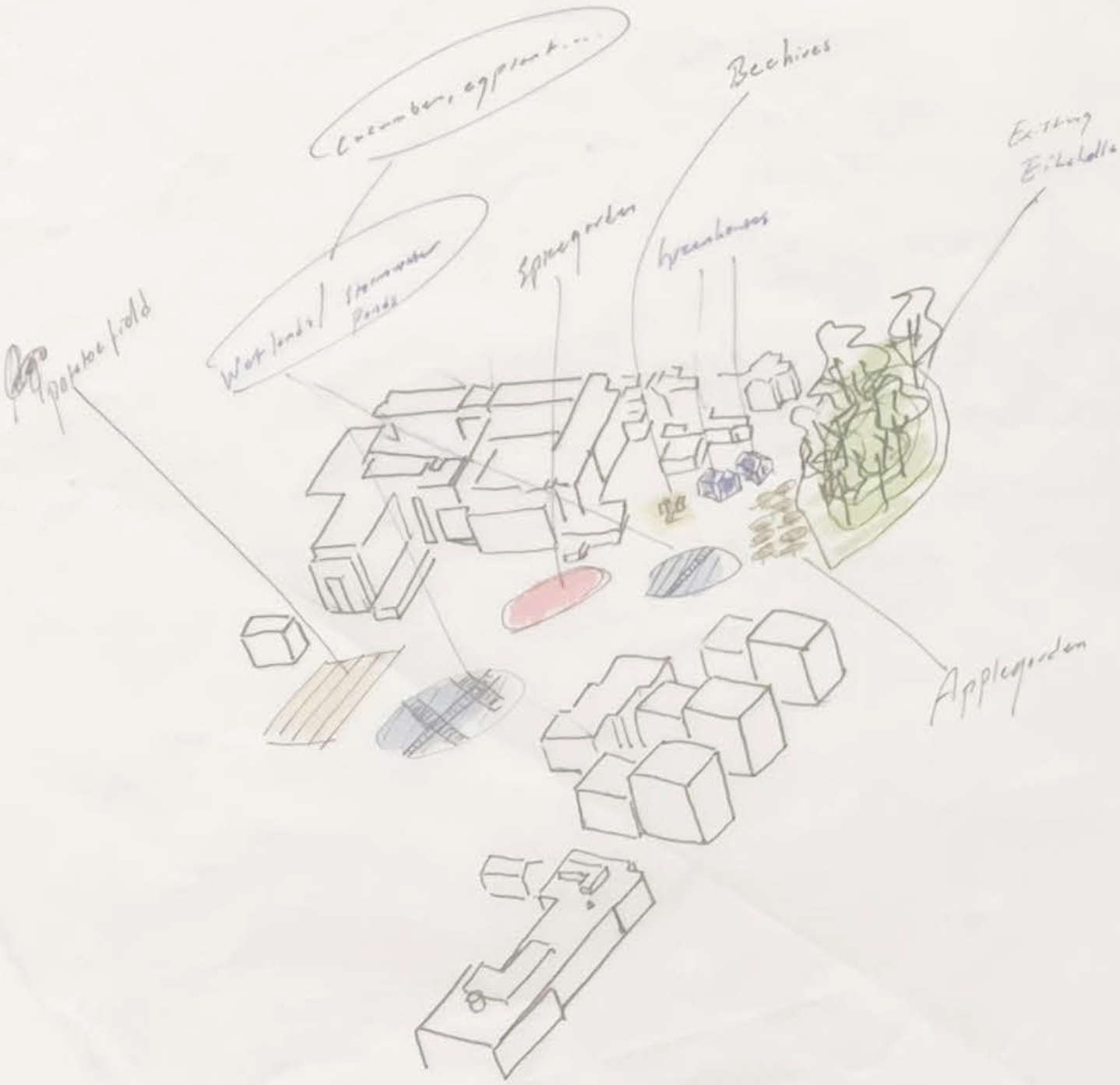


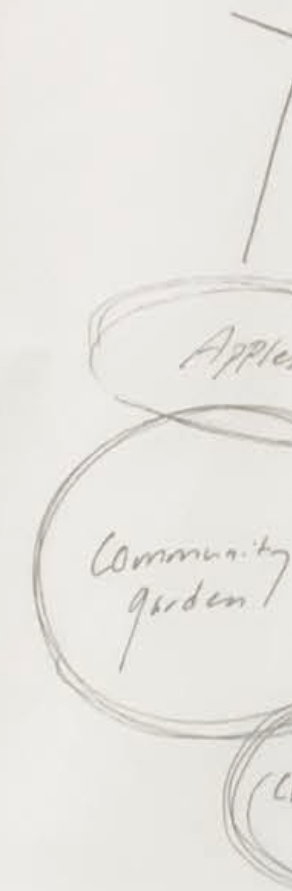
Fig. 07. Isometric model of Diakonhjemmet with marked location of the selected design area and future exploatation of the area.

Planned development

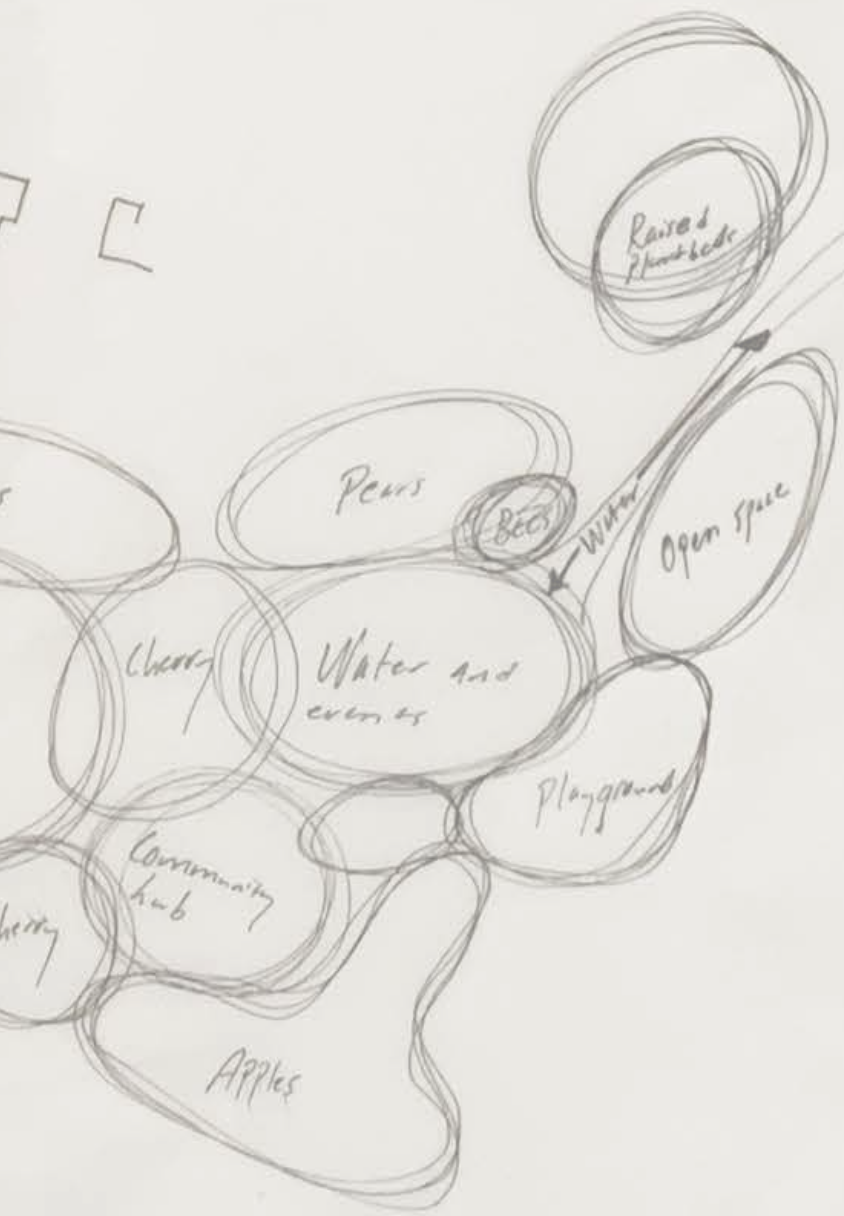
Right now, the area is going through a phase of massive changes due to developments decided in a zoning plan for the area from 2019 (Oslo Kommune, 2019). For instance, they plan to build new student housing, about 255 new apartments for sale and new buildings for businesses, services and education. Diakonhjemmet aims to strengthen the bonds to the city and become an obvious node of north-western Oslo (Diakonhjemmet Hage, 2018). In addition to the buildings there is plans for a new subway station connected to the new university premises, making Diakonhjemmet more accessible (ibid.).


The pre-disaster garden
During War garden
Post-D garden


Cucumber, eggplant...
Beehives
Existing Eucalyptus
Wetland/ Stormwater Ponds
Spice garden
Greenhouses
potatoe field
Applegarden


Apple
Community garden

2. Methods


Pears
Beers
Water
Open space
Cherry
Water and events
Playground
Community hub
Apples

2. Methods

Research for design

The design presented in this project is heavily inspired by knowledge conducted from the literature study regarding urban farming, resilience during crisis and a historic review of urban farming during crises, as well as the knowledge conducted from the site analysis. Thus, following the definition of 'Research for design' presented by Lenzholzer et. al., (2016) as; "all types of research that support the design product or design process" (Lenzholzer et al., 2016, p. 55). In this project I have used this method to collect knowledge that can add value to the design in the purpose of answering the main question at issue. Lenzholzer (ibid.) describes it further by stating that the result of 'Research for design' is material that can "inform the design process" (Lenzholzer et al., 2016, p. 55). For me that means the knowledge that I received through the literature review and the site analysis. My design is influenced by the information gathered; however, it is not a direct reflection of the research, nor the site analysis, but aims to be a subjective answer to the questions at issue.

To apply the collected knowledge into a design, I have used two models of landscape design based on research as a completion to the general method of Research for Design. The models are presented by Jansson, Vicenzotti, Diedrich (2019), in their article about 'Landscape design based on research' and is based on the models given in Milburn & Browns 'The relationship between research and design in landscape architecture' (2003).

'The intuitive model'- "Research inspires Design", describes an "intuitive response to research-based knowledge." (Jansson, et al. 2019. p. 23). This model was mainly used in the early stages of the design, as a tool to sketch and try out different solutions inspired by the already gathered information I had about the site.

The adaptive model'- "Research translates into Design", is presented as a more site-bound model compared to the intuitive model and was used in a latter phase of the project when I had collected even more knowledge from the literature and from the site analysis.

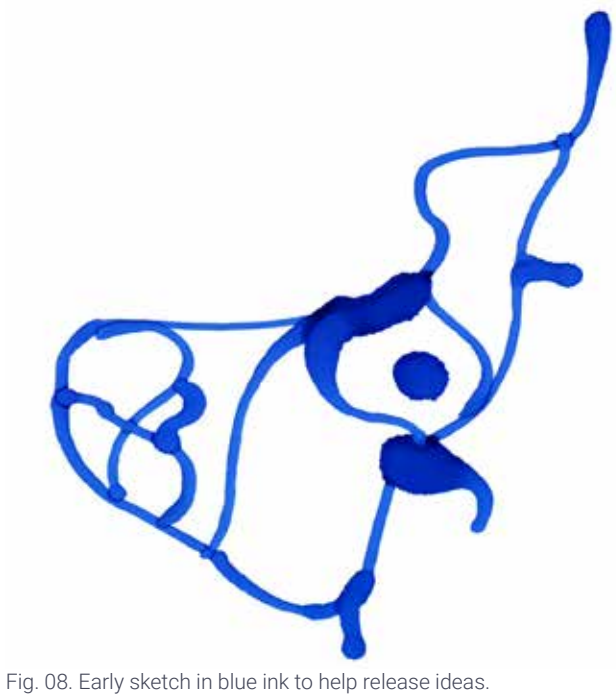


Fig. 08. Early sketch in blue ink to help release ideas.

Fig. 09. Sketches of the Community Hub.

Literature review

Various literature such as articles, books and reports are used as arguments for the applied design choices of the park to create a resilient design proposal for Diakonhjemmet park.

The purpose of the literature is to create a base of evidence for the narrative timeline of Dia-konhjemmet before, during and post a disastrous event.

To start with, and to provide a background to the complexity of the topic, I decided to examine how the global food system functions and how food system that the urbanization and global food trade, could play a problematic role in times of crisis. Onwards, I have scaled it down, step by step getting closer to how urban farming can be used and have been used in times of crisis in a Norwegian con-text.

The literature review provides examples and suggestions for how urban farming can be used and has been used to create resilient urban space, in terms of food security. Starting with general examples of different methods of urban farming such as community gardens and high tech-nologic green houses, and how urban farming has been used as a tool for resilience in times of cri-sis. Further, I have investigated how urban farming has been, and is used for educational purposes in Scandinavia, in the last century. The last part of the chapter contains a short review of how urban farming was used in Scandinavia during the first and second world war.

To further describe site specific challenges regarding cultural heritage and the values connected to Diakonhjemmet, internal documents from Diakonhjemmet foundation has been used.

Fig. 10. Some of the litterature used in the project.

Site analysis

Site visit

A site visit was conducted in November 2021 to collect personal experience from the site and its surroundings. During my stay in Oslo, I visited the park twice, once in the afternoon and once in the morning. The main purpose in advance of my site visit was to examine the sense of space in the park. How big and how small do certain areas feel and how will my design affect them? By sketching ideas on and doing simple measurements on site I tried to get a further understanding of the park and how my previous design ideas could be implemented. Another important

question I investigated was how people seem to use the Park. How did they move through the park and where did they go? Did they go straight through, or did they stop by somewhare in the park?

I also made a basic inventory of the trees and other vegetation in and in close connection to the park. Particularly interesting for me was the pallet collars located in the centre of the park. I did not know about them in advance since they were not visible in the aerial views and maps, I had studied in forehand. The pallet collars contained edible plants and was placed there in connection to the nursery home.

To document my visit, I photographed the park and its surroundings as well as interesting details in it. Some of the hundreds of pictures taken are printed in this document without any major edits, others have been used for illustrations but most of them has been used to refresh my memory of the park during the design of the park.

Microclimate

The microclimate analysis was conducted to create a valid design proposal. The microclimate analysis was made in Rhinoceros, Grasshopper, using the Ladybug Tool (2021) and contains analyzes of sun hours, wind conditions and perceived comfort of the site based on Lawsons (1978), comfort classification. The analysis was used as a tool to evaluate where certain functions would be placed, e.g. where the best location would be for growing crops. The analysis has been performed for several different seasons and several different times of the day.
Further, a rainwater analysis was conducted with data from the Norwegian Center for Climate Services (2020) and Scalgo Live (2021).

SWOT-analysis

To sort and arrange the overall analysis of the park from the site visit, map studies and microclimate analysis, a SWOT-analysis has been made. SWOT is an acronym for Strenghts, Weaknesses, Opportunities and Threats and is used as a method to evaluate a system. The method is used in many different scales where the 'system' can be everything from a region to a product or a bank loan (Sarsby, 2016).
In this project this means that the internal factors are Strengths and Weaknesses, are something that are present in Diakonhjemmet today, and that the external factors are Opportunities and Threats that can arise or be developed later, based on the internal factors.

The four categories can be divided into two columns, helpful aspects, and harmful aspects.

- Helpful: Strengths and Opportunities
- Harmful: Weaknesses and Threats.

Furthermore, the four categories can be divided into internal and external factors.

- Internal: Strengths and Weaknesses
- External: Opportunities and Threats.

(Sarsby, 2016)

A Narrative Design Approach

This project uses a Narrative Design approach to tell stories through diagrams and especially the visualizations.
The design aims to be resilient throughout different events that does not take place at the same time. A narrative design approach becomes more useful to create a common thread throughout the changes of the park design, caused by the different prerequisites on the site, that is induced by the crisis scenario presented. Using a narrative also provides space for speculation of the user experiences during different time periods, as stories engages the reader to put her- or himself into the presented events of the narrative (Danko, 2006). The narrative provides a timeline that put light on the resiliency of the park, how the design changes and how the experience of the park will change caused by major crisis that heavily effects the food system.
"Storytelling, like designing, is a creative process of selecting and organizing chaotic events that enables us to discern how diverse elements come together to form meaningful experiences." – Danko (2006, p. 12)

Resilience as a guiding term

"Across different disciplines, notions of resilience include stabilizing a system, bringing it back to a previous state, coping with and adapting to new conditions" (Wesener, 2020. p. 80). In this project I have used the term ´Resilience´ as Tidball and Krasny (2013) refers to as human activities, to create, restore and develop local social-ecological systems. More specific, how the park design and its functions could have a positive effect on stabilizing the urban food system and the social wellbeing of a community during and after the crisis.

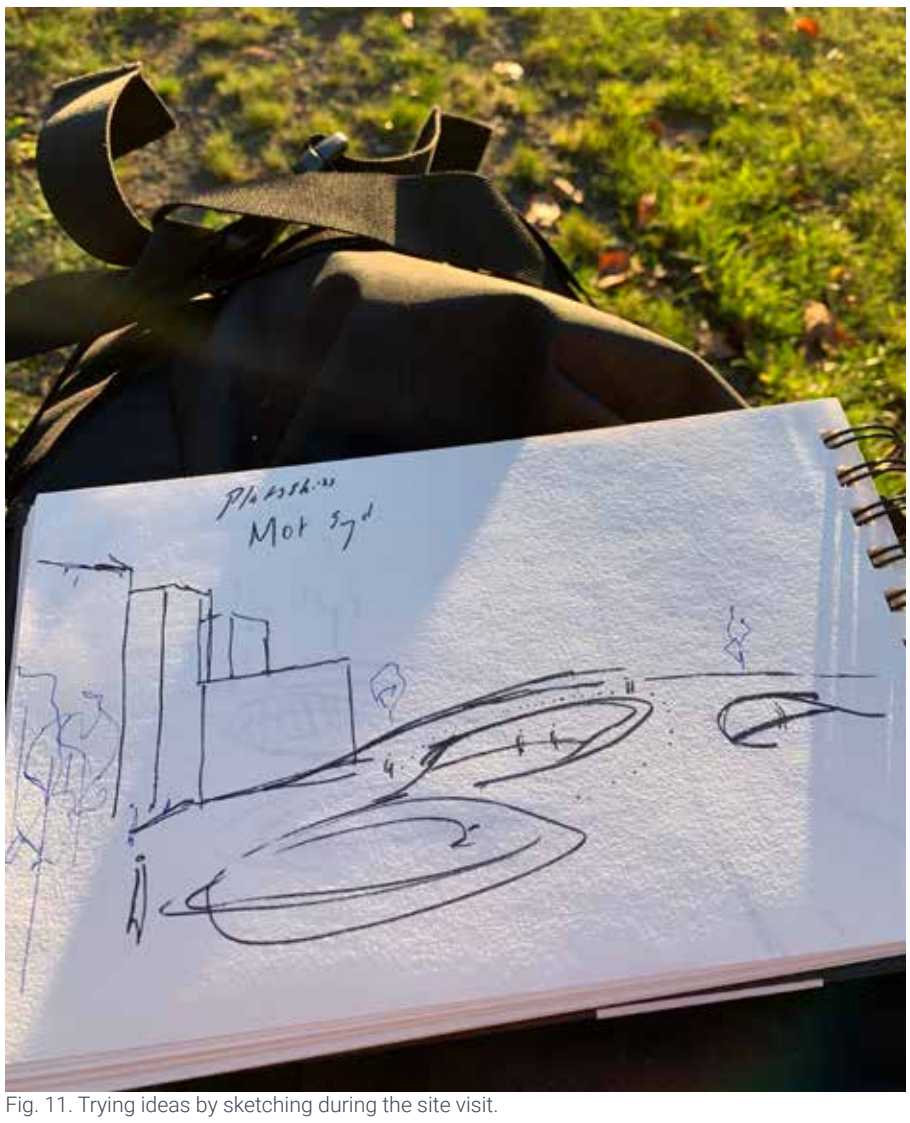


Fig. 11. Trying ideas by sketching during the site visit.

3. literature

Potato planting at Volvat, about 500 meters from Diakonhjemmet Park., on the 17th of May 1940

Photo: Esther Langberg
Original: Oslo Bymuseum

3.1.
Introduction

A globalized food-network

According to the United Nations (2018) about 55% of the human population now lives in urban areas and is expected to increase to about 68% in less than 30 years, hence the ecological footprint of cities will increase (Wiskerke 2015). While the trend of globalization and urbanization has had many positive effects by connecting people all over the world, making it easier to share and spread culture and ideas, it has had a devastating effect on the local economic ecosystem and local food resiliency. The globalized consumerism has led to a separation of the consumer and the producer; hence the consumer does no longer see the direct consequences of his/her consumerism. The global food industry has negative effects on a global scale because of the depletion of finite resources, pollution of natural environments and accumulation of waste (Grewal & Grewal 2012).

The loss of fresh food

By not preparing cities for a possible war or other catastrophe, there's a risk of emerging "food deserts" (Goode 2015). The term food desert implies to the risk in low income urban areas where the citizens do not have access to affordable and healthy food, hence faces the risk of a number of health issues (Cummins & Macintyre 2002).

The Covid-19 Pandemic as a catalysator?

In early 2020 an outbreak of a new coronavirus in Wuhan, China started to fill the news tabloids. As the virus spread and developed from a local epidemic into a global pandemic, today known as the "Covid-19 pandemic" it became more clear how vulnerable many cities were and still are for imposed lockdowns and possible food crises. As many cities are places for consumption of food and goods more than production of the same, cities are almost completely dependent on the import of energy, goods, and food (Pulighe & Lupia 2020). The covid-19 pandemic has put a light on how fragile big cities are to unexpected global issues. When the virus spread, city lockdowns and other major restrictions were imposed to control the virus. Lockdowns and closed businesses led to an awareness of the importance of a functioning system of food production, transport, and distribution (ibid).

> "City lockdown and business shut down have led to increasing awareness of the vital importance of the essential ecosystem goods and services that urban inhabitants benefit from, recognizing that food availability is one of the primary needs." (Pulighe & Lupia 2020. p. 1).

The pandemic also had consequences on the global trade of food and food related goods, pushing the issue of outsourced food production into the light even further. In the early stages of the pandemic in the spring of 2020, Russia, one of the biggest grain exporters in the world, set new restrictions on export of wheat to secure their national food security. Kazakhstan, Serbia and Vietnam did also set restrictions on some of their most common food related exports. The European Union on the other hand went in another direction when the Union lowered its safety standards for imported vegetables and fruits from India to secure import (ibid.).

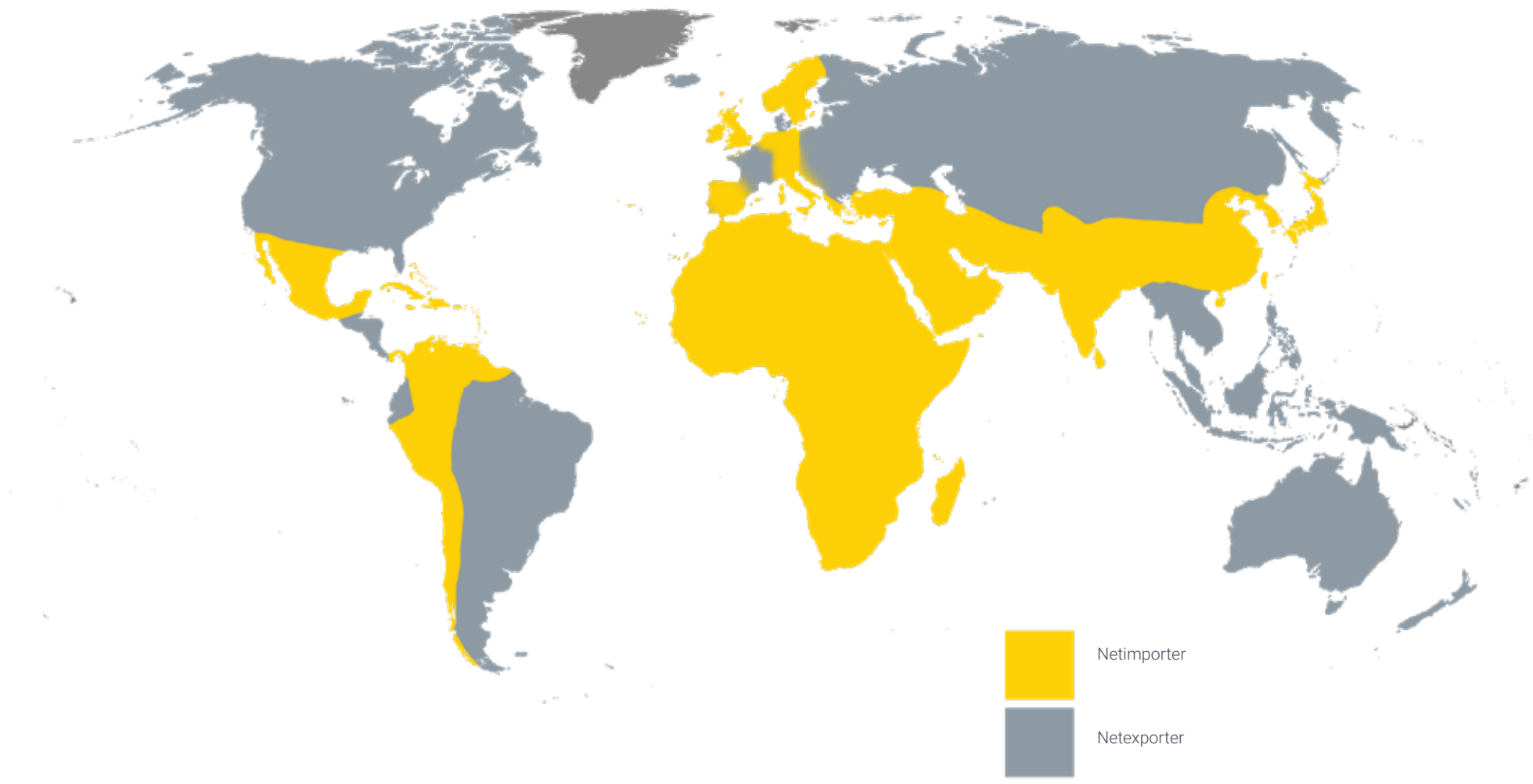


Fig. 12. Schematic figure of the global food network.
Source: FAO, 2018

3.2.
Resilience through farming

Resilient greening during crisis

In the book, 'Greening in the Red Zone: Disaster, Resilience and Community Greening' from 2013, Tidball and Krasny (2013) claims that humans, in the event of disaster, conflict or stress, turn to greening as a source of resilience. According to Tidball and Krasny (ibid.), resilient greening refers to human activities, community based as well as individual, to create, restore and develop local social-ecological systems. This is often done through nature-connecting activities such as community gardening, community forestry and by improving habitat for wildlife. Although, in some instances greening probably have a more symbolic meaning to it, there is plenty of examples where greening as an act of resilience is more direct.

Resilience in the aftermath of war and conflict

A good example of resilience through gardening is how survivors of almost two decades of political and racial conflicts in Liberia turned to 'Road side Gardens'. In the reverberation after the protracted civil wars that ravaged the country and tormented the population in from the late 1980s to 2003 many people claimed urban space, especially along the roads, for cultivation of vegetables and legumes. For some the gardening has been empowering in itself, and for others it has developed into a source of income, albeit on a small scale. In addition to the direct values of gardening as a source of nutrition and income, the gardens have also had a positive impact on the community building (Holder, 2013). Another example took place in The Balkans during the 'Balkan wars' in the 1990's. In the midst of war, the self-reliance of food production of vegetables and small livestock in Sarajevo, Bosnia, grew from approximately 10% to about 40% in only two years during the blockade that started in 1992 (Sommers & Smit (1994).

However, the most famous example is the *Victory Gardens* or *Gardens for victory*. During the second world war gardens providing fresh fruits and vegetables to the American citizens started to emerge around the United States. The government initiative called "Victory Gardens" was implied to secure that every American citizen would not go hungry due to the ongoing war. During these years of war, Americans were encouraged to plant gardens to produce food in the backyards of their homes, in public parks and in pots to plant in urban space. At its most approximately 40% of the vegetable produced came from civilian initiatives and households, the Victory Gardens (Goode 2015).

Resilience in the aftermath of natural disasters

Another example is the urban community gardens that emerged in the aftermaths of the disastrous earthquakes that hit Christchurch and Canterbury, New Zeeland, in 2010 and 2011. The latter killing almost 200 people, leaving over 7000 injured and causing major damages to the town, demolishing around 80.000 households (Wesener, 2020). "Gardens can help mitigate food shortage when the supply chains are interrupted... Community gardens also help people withstand and recover from natural disasters by providing relevant social and mental health services." (Wesener, 2020. P. 77-78). Wesener (ibid.) claims that community gardens boost team work, solidarity and social capital in the event of crisis and connects the urban gardens in the aftermath of Hurricane Katrina that hit New Orleans in 2005 to the similar gardens the appeared after the earthquakes in New Zeeland. "..community gardens encouraged community empowerment and helped counteract socio-economic injustice in deprived urban areas" (Wesener, 2020. p. 78). The urban community gardens grew organically from public based efforts in both New Zeeland and in New Orleans. However, the government stayed out of the initiatives in New Orleans, and did not much to help, while the city council in Christchurch published guidelines for community gardens, encouraging the initiatives (ibid.).

Fig. 13. Compost bins in Rhichmond Community Garden, Christchurch, New Zealand
Photo: Michal Klajban

Fig. 14. Rhichmond Community Garden, Christchurch, New Zealand
Photo: Michal Klajban

Community gardens

"Community gardens are a place for planting, growing, and harvesting food, as well as the locus for many other life processes; sharing and trading; for meeting and play; for making and building; for dreaming and worship." (Rees & Melix, 2019, p.93).

Urban gardening, especially collective gardening can promote a sense of community. Patel (1991) argues that gardening brings people together across "social, economic and racial barriers" and that creates a link between people of all ages and backgrounds. This statement is supported by Trevor Hancock (2001) in an article on building community capital. "As a general rule, 'green' community economic development projects and strategies, which by definition are concerned with building ecological and economic capital, are also likely to increase human and social capital" (Hancock, 2001, p. 278). Further, Hancock (2001) argues that community gardens create social communities and capital, because unlike allotment gardens, they are developed and managed by the community itself. This creates stronger bonds between people within the community, also in ethnically diverse areas, as knowledge, not only about the farming itself, but also how to use the harvest and recipes are shared. Rees & Melix (2019) argues that the most successful community gardens emerge organically, initiated by the local citizens.
That community gardens have social benefits for communities is further supported by a case study in South-Eastern Toronto in 2007. Wakefield (et al. 2007) investigated the health benefits of urban community gardens through a series of interviews with community gardeners in an area characterized by high rates of poverty and ethnic diversity. "Community networks and social support were developed through the gardens. The gardens were seen by many as a place where communication with people from other cultures could begin, using food and shared experience as a starting point for understanding" (Wakefield et al. 2007, p.100).

Health benefits with community gardens

Among all benefits of urban community gardens, the health benefits are probably the most mentioned. However, health contains many variables but can utterly be divided into mental health and physical health. Undoubtedly, they intervene with each other, in this project they are simply divided by practical reasons.

Physical health

"It's a form of exercise, relaxation...getting away...- from the TV, uh...a way to produce something with your hands... it's nice to see something grow that you started. The garden and me, we're like old friends. I just like to plant, to go and make myself useful and busy. In here [touching chest], that's what I need." – Gardener interview (Wakefield et al. 2007).

Wakefield (et al. 2007) claims that one of the most central benefits mentioned by gardeners was the accessibility of fresh wholesome food. The access of fresh nutritious vegetables is important given the assumption that "higher consumption of vegetables and fruits is known to promote health and prevent disease" (Wakefield et al. 2007, p.97). For many elderly people, working in a garden can provide good and valuable exercise as the garden requires maintenance, thus requiring physical activity from the gardener (ibid.). Hancock (2001) claims that the transportation of food produced in community gardens also comes with health benefits as many transport their harvest by foot or cycling. On a bigger scale, because of the transportation of food from these community gardens often using systems of transportation by foot, cycling or by public transportation contains low emissions of fossil fuels. Thus leading to positive long term effects on public health (Hancock, 2001).

Mental health

"...sometimes when you are stressed out... when you go to the garden, you feel different. It helps you hold onto life" - Gardener (Wakefield et al. 2007).

Being in gardens and nature has many mental health benefits (Ulrich, 1999). This is also supported by the community garden participants in Wakefields (et al. 2007) survey, as many answered that going to the garden gave the opportunity to connect with nature. The partitioners found it relaxing and calming (ibid.). Furthermore, community gardens have a positive effect on the mental health for the community as a whole, because of the strengthened bonds between the people taking part in the garden. Yet again, on an individual level, many described the positive feelings linked to show off on what they had grown (ibid.).

Educational benefits with community gardens

Hancock (2001) argues that community gardening also provides people with new skills that could enhance their employability. "One community garden in Santa Cruz, California, was actually set up for and with homeless people and has helped them with the access to food, job skills, social networks and links to the neighboring residents" (Hancock, 2001, p. 279). In a survey presented in Leigh Hollands article 'Diversity and connections in community gardens: a contribution to local sustainability' (Holland, 2004), the participants were asked what they got out of being engaged in a community garden. The results showed that skills and educational benefits were among the top answers together with community development and health related benefits (Holland, 2004). In New Zeeland, following the earthquakes in 2010 and 2011, the community gardens also had various educational purposes, from "how to grow your lunch" to how to manage the water supply for your garden (Wesener, 2020).

Reference project - Øens Have, Copenhagen

Øens Have is a semi-urban garden, organic restaurant and a space for events on Refshaleøen in Copenhagen. Øens Have is part of a group of initiatives around the city to provide fresh, local food in an urban environment (Øenshave.dk 2021). The garden is a community garden open for anyone to join and as a reward one can take part of the harvest. The restaurant is located in edge of the garden and cooks vegetarian food based on what is grown in the garden.

The garden looks like a typical land of agriculture and has many similarities to the American Victory Gardens from the 1940s. The plants, beets and vegetables are divided into rows of different themes with narrow paths in between each other to make every plant accessible to cultivate and harvest without damaging the other plants.
As a aesthetical detail, every sixth row is planted with flowers, completely for decorative purposes (Chef at the restaurant, 211003). In the garden they also produce honey from beehives and the latest addition to the site is the chicken coop located in the middle of the garden.

Fig. 15. Rhubarbs in Øens Have.
Photo: private

Fig. 16. Rows of cabbage, kale among other vegetables in Øens Have.
Photo: private

Fig. 17. The spicegarden and the chicken coop, Øens have
Photo: private

Fig. 18. Rows of vegatbles and the watering system in Øens Have.
Photo: private

Fig. 19. Rows of cabbage, kale among other vegetables in Øens Have.
Photo: private

3.3.
Contemporary urban farming

"Food production in the cities can take many forms, including home gardens, community gardens, market gardens, school gardens, rooftop gardens, windowsill gardens, aquaculture, and urban farms.." - Grewal & Grewal (2012, p.2)

Indoor Urban Farming

New solutions to produce food in an urban environment are developing as technology takes a further leap into modern food production.
"Findings from field-scale studies and reviews suggest that various forms of smart and innovative urban agriculture, such as vertical indoor farming, greenhouses, aquaponics, soil-less hydroponics, and aeroponics, result in high yields of horticultural products up to 140 kg/m2/year. The most advanced systems can theoretically satisfy large strata of the population requirements of vegetable products (i.e., micronutrients and fiber) " (Pulighe & Lupia 2020).

Indoor is also less vulnerable for weather- and insect-related issues due to the protected environment indoors compared with ordinary outdoor farming (Pulighe & Lupia 2020).

Vertical farms

Although high tech indoor farms are high demanding when it comes to energy supply, they require much less land to produce the same amount of food. A modern vertical farm using hydroponic technology uses less water and can produce the same amount of food as a conventional farm using 10-20 times less space. "it is not just the horizontal space that can be used effectively as in traditional farming. The biggest advantage of VF over conventional farming is that it is not restricted to one plane" (Kalantari et al. 2018, s.15). Meaning that a vertical farm is capable to produce up to 20 times more food using the same space as a conventional farm (WUR, 2021), making vertical farming suitable for urban areas.

Ambitious goals using urban farming

In Singapore, this technology plays major part of the 30-by-30 initiative. Singapore has a 100% urban population and less than 1% of the total land use in this mid pacific country is used as traditional farmland, thus Singapore is importing nearly 90% of its food supply. The 30-by-30 is an initiative by the Singapore Food Agency (SFA) and seeks to increase the domestic food production to about 30% of Singapore's nutritional needs by 2030 (Our Food Future, 2021). The 30-by-30 initiative is a way to increase the food security in Singapore and to create a more resilient food system if the food import faces disruptions (ibid.).

However the amounts of food that can be produced in these scales is dependent on what type of crops one wants to grow as the size of the plant matters when it comes to how many layers of crops that can be stocked on top of each other (Beacham, A. et al. 2019). Thus lettuce and other leafy plants are more suitable for multi-level towers of vertical growing surfaces (ibid.).

Fig. 20. Vertical hydroponic garden in Finland.
Photo: ifarm.fi

3.4.
Educational Gardens

Skolehager - Norwegian Edible School gardens

Norway has a long tradition of edible school gardens, the so called "Skolehager" have been around since the early 20th century and are still a common occurrence in Norwegian schoolyards. The gardens were established after the Norwegian independence from the Swedish-Norwegian Union that kept the two countries bound together under the same monarch until 1905. The purpose was to teach Norwegian children the craftmanship needed for an edible garden and proved to be very successful. Although they were established long before the big wars that ravished Europe in the first half of the 20th century, the gardens provided a welcome addition of food for many families around Norway during the wars. In many areas the students could bring plenty of vegetables, potatoes, and legumes from the harvest (Skolehager i Norge, 2021).

Today there is almost 50 school gardens around Norway stretching from the very south to the very north of the country. In Oslo alone there is around 15 active school gardens activating hundreds of children. The gardens differ in scales where the smallest ones contain just a few pots of plants, and the biggest ones are big as football fields and are used mainly for educational purposes within the field of natural sciences and food production. The interest have grown and in 2019 an initiative by Økologisk Norge called "Grow the Future – More school gardens in Norway" (Skolehager I Norge, 2021, translated by author), set the goal of establishing 40 new school gardens, in a three year time period between 2020 and 2023 (ibid.).

Fig. 21. Children working in Greitmyra school garden ca 1910

Photo: Unknown
Original: Oslo Bymuseum

Fig. 22. Children in the midst of the cauliflower harvest, Greitmyra school garden, ca 1975-1980

Photo: Henrik Ørsted
Original: Oslo Bymuseum

Botanical Garden - The Kitchen garden

Urban gardens do not only have the purpose to produce food. Some gardens, as the Kitchen Garden in Uppsala has an educational purpose. The Kitchen Garden, as a part of The Botanical Garden aims to represent a classical botanical garden with plants that traditionally have been used for medical and/ or food related practices. The Kitchen Garden carries the tradition of the Botanical Garden as a source of plants for medical purposes that goes back to the foundation of the first Botanical Garden in Uppsala, founded in 1655 (Uppsala linneanska trädgårdar, 2021).

Today the The Kitchen Garden displays a big variety of vegetables and medical plants, both plants that are still in use and some that are displayed out of ethno-biological purposes (Kårehed, 2021). As part of Uppsala University, the garden is well used by students within the field of e.g. biology and botany. In addition, students of Landscape Architecture at SLU are not an unusual feature in the garden. According to Jesper Kårehed, Garden curator at The Linnean Gardens of Uppsala (211201, e-mail correspondence) the garden also hosts workshops and activities regarding e.g. inoculation and determination of apples and other plants.

Fig.23. The Kitchen garden in Uppsala Botanical Garden

Photo: Jesper Kårehed, Uppsala linnean gardens, Uppsala University

Fig.24. The Kitchen garden in Uppsala Botanical Garden

Photo: Jesper Kårehed, Uppsala linnean gardens, Uppsala University

3.5.

Urban farming in Scandinavia during war

Food rations and cultivated parks

In April 1940 Norway was invaded by Nazi Germany and within a few months Norway was occupied by the German Wehrmacht, until the German capitulation in May 1945 (Thusen, 2015). However, rations on coffee and sugar were implied already in the autumn of 1939 as the Norwegian government took precautions as a cause of the German invasion of Poland and the Soviet annexation of the Baltic countries. After the German invasion on the 9th of April, 1940, other goods as flour, milk, meat and soap got rationed to make sure that whatever products available were to be distributed so that the Norwegian citizens would not starve (ibid.). Already in the spring of 1940, people in the bigger cities as Oslo started farming their private gardens and going together to plow and use public parks and green space for food production. Some households and workspaces began to breed rabbits, hens, and pigs as a source of meat (Oslo Museum, 2020. Thusen, 2015). But it was potatoes that were the most important. Potatoes contains high amounts of carbohydrates and vitamins, and without it many families would have faced starvation (ibid). Potatoes together with rutabaga made the rations on bread and other goods last longer and was a main source of energy during the war, served in almost every meal, regardless of the social class (ibid.).

In Sweden, the first and second world wars caused a short supply of food in many cities. Even though Sweden remained outside of direct conflict, the wars prevented import and export of goods and food due to closed borders (Stockholmskällan, 2021). Food was not enough for everybody which led to many people being starving. Thus, authorities had to imply rations to distribute the food available in a way to prevent starvation (ibid.). Another action made was the transformation of parks into farmlands. During the first and second world war, parks in Stockholm was transformed into farmlands of vegetables, beets, potatoes, and small livestock (ibid.). The lawns were plowed for potatoes and the flowerbeds filled with cabbage.

Fig. 26. Askim, Norway 1940-1945. People queing for meat and fish during World War II.
Photo: unknown
Original: Oslo Museum

Fig. 27. Elderly woman working in a garden in Ullevål, Oslo. 1943
Photo: Rigmor Dahl Delphin
Original: Oslo Museum

Fig. 25. Potato planting at Volvat, about 500 meters from Diakonhjemmet Park., on the 17th of May 1940.
Photo: Esther Langberg
Original: Oslo Museum

Fig. 28. Call for potato cultivation, at Berzelii Park during the First World War. Stockholm 1914-1919.
Photo: Unknown
Original: Stockholm stadsmuseum

Fig. 29. Cabbage cultivation in Karlaplan's flower beds during the First World War. Stockholm 1917.
Photo: Malmström, Axel (1872-1945)
Original: Stockholm stadsmuseum

Fig. 30. Instruction on how to set potatoes. Observatorielunden, Stockholm 1943
Photo: unknown (Aftonbladet)
Original: Stockholm stadsmuseum

Fig. 31. Children at the collection point for picked potatoes on Bogstad Golf Course's area, Oslo 1940.
Photo: unknown
Original: Oslo Museum

Fig. 32. Men picking potatoes at Ola Narr/ Tøyen Park during the World War II. Oslo 1940.
Photo: unknown
Original: Oslo Museum

Fig. 33. Turnip piled on a municipal cultivation field during the war. Sign with the text: "Show compassion and protect the field". Sinsen, Oslo 1940.
Photo: unknown
Original: Oslo Museum

Fig. 34. Elderly man in a vegetable garden. Frognerparken, Oslo 1942.
Photo: unknown
Original: Oslo Museum

Fig. 35. Lush and fresh potatoes. Sign with the text: "Show compassion and protect the field." Torshovsdalen, Oslo 1940.
Photo: unknown
Original: Oslo Museum

3.6.

Acquired knowledge for the design

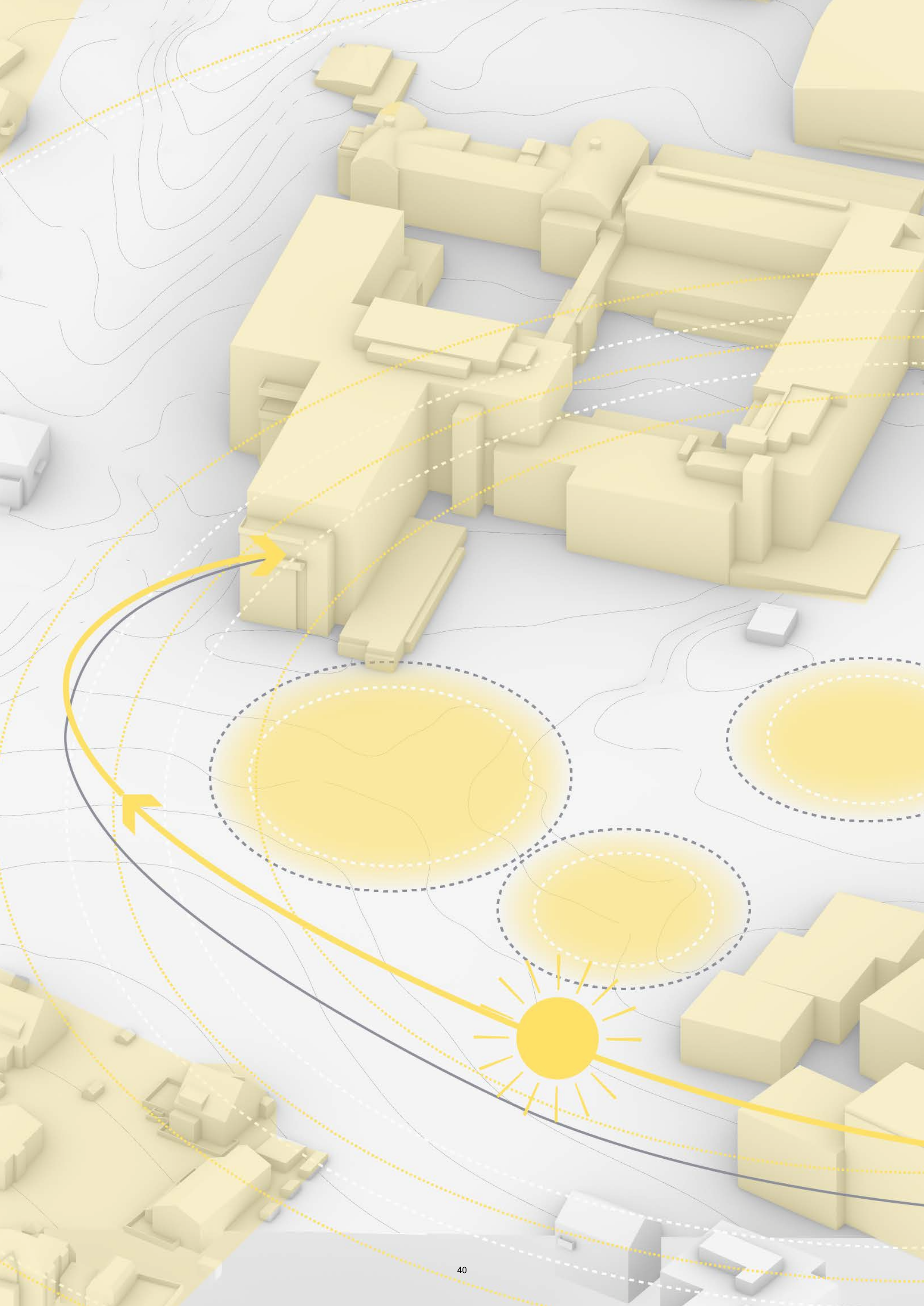
Based on the literature presented in this chapter, I have concluded that to truly create resilience I not only have to create a park with a physical ability to transform, but a park that can act as a destination. The destination would work as a meeting point to further develop social connections, something that I have understood is equally important as the actual product of the urban farms. The sense of community and belonging, as well as a sense of purpose are all traits that are important for resilience. Especially in the recovering period during or after a crisis. Hence, social community through a community center is a powerful tool in the endeavor towards a resilient park. Therefore, I am convinced that the park needs some sort of social center where people can meet and share experiences.

According to the sources regarding community gardens, the social factor is a big contributor to why people engage in these types of gardens. A community garden would therefore not only work as a physical tool towards food resilience in the park, but also a tool for social resilience.

Further, I found the part of the educational gardens around Norway interesting and is something that I will bring with me to the design proposal, especially since they are educating the young how to garden, a trait that would be very important in a long-term crisis.

Other knowledge I will bring with me is the examples of urban farming in Scandinavia during the wars in the first half of the 1900-hundreds. Saved non-programmed space e.g., meadows or lawns, can, in the event of crisis, be transformed into crop fields. Hence, provide the opportunity to increase the production capacity in the park during crisis.

Although I realize that the technology is new and energy consuming, I think that indoor vertical farming could help the park establish itself as a food park. Particularly in times of non-crisis.



4. Site analysis

4.1.

Context and connections

Suroundings

Diakonhjemmet lies wedged between the city, some major green areas and far streched residential areas with villas.

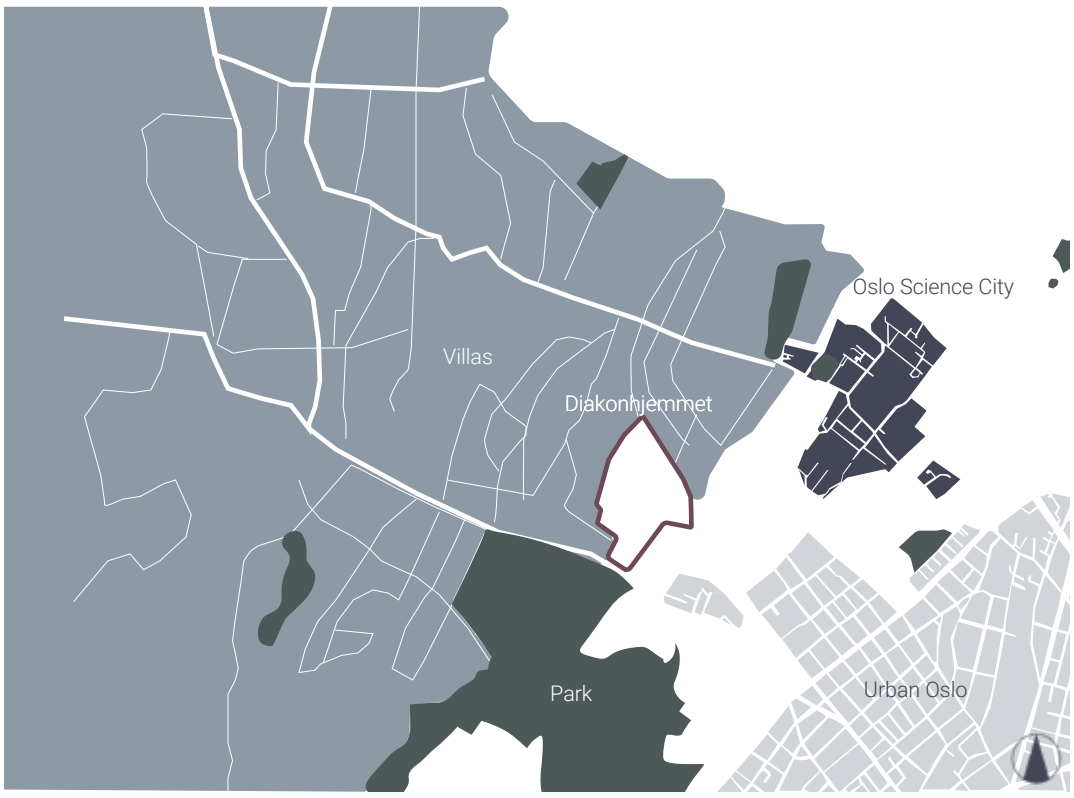


Fig. 36.

Public transport

Diakonhjemmet lies inbetween Ring 2 and Ring 3, the public transport network that holds Oslo together. Hence it is well connected to Oslo with public transport. Within a few hundred meters there's three metro stations.

Metro station

Fig. 37.

By car

For now, the easiest way to travel to Diakonhjemmet is by car. In the south the area is directly connected to Sørkedalsveien that leads straight into the city center.

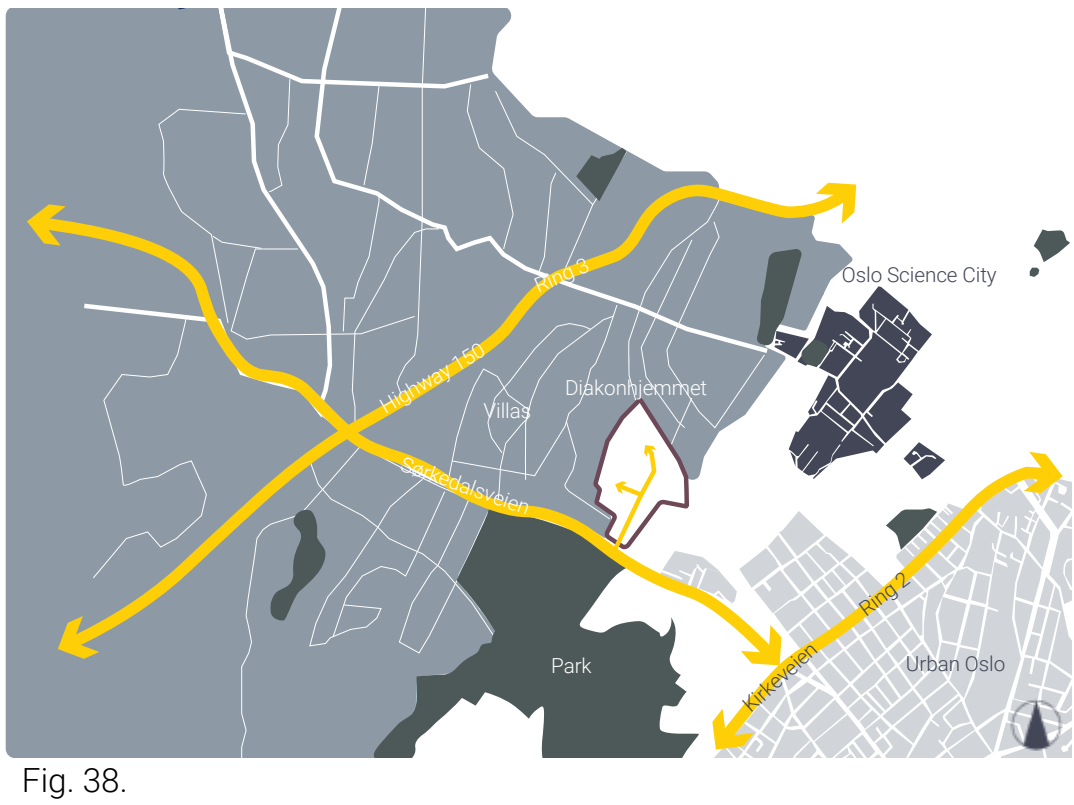


Fig. 38.

Mobility in Diakonhjemmet

Once inside it is still easy to travel by car or by bike. However the park is best accessed by pedestrians. The elevated park is not at all open for cars and bicyclists tend to use other routes than through the park. Hence the Park is quite calm and pedestrian friendly, due to the seclusion from other modes of transport.

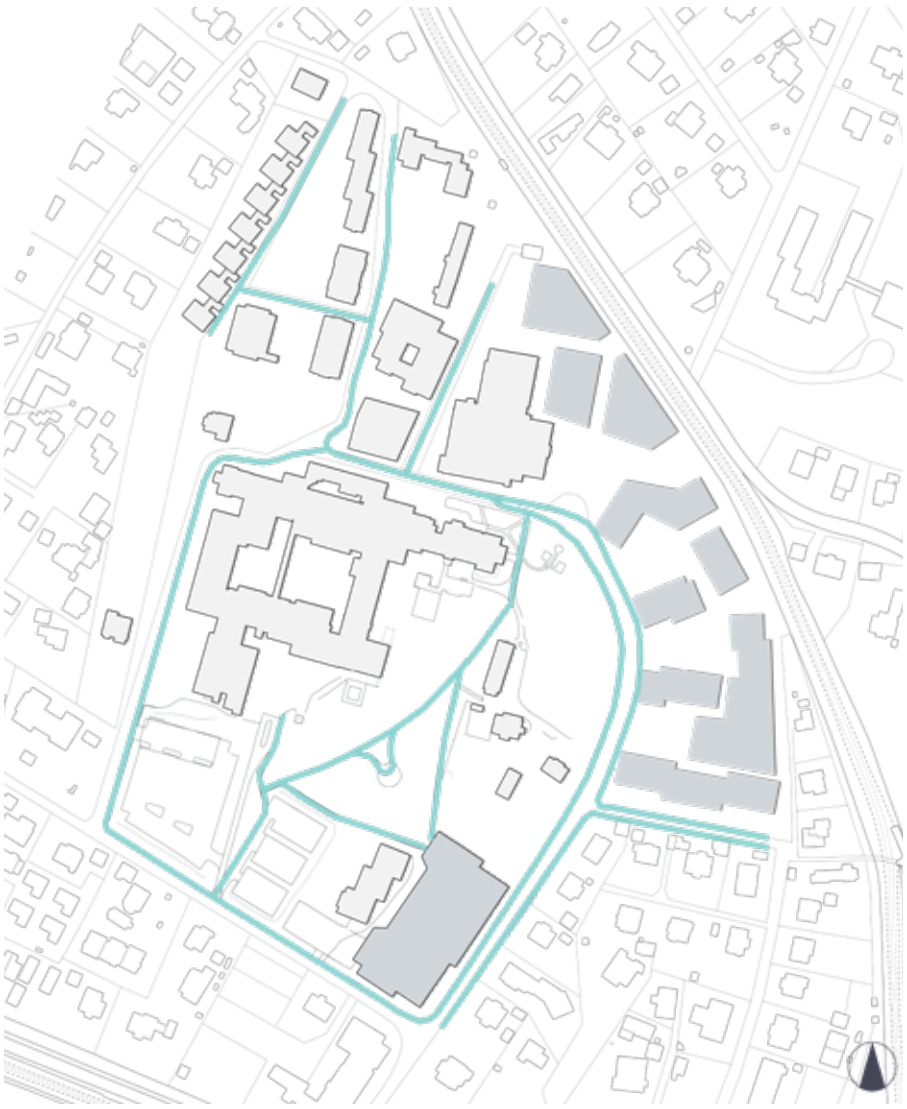


Fig. 40. Pedestrians in Diakonhjemmet 1:2500

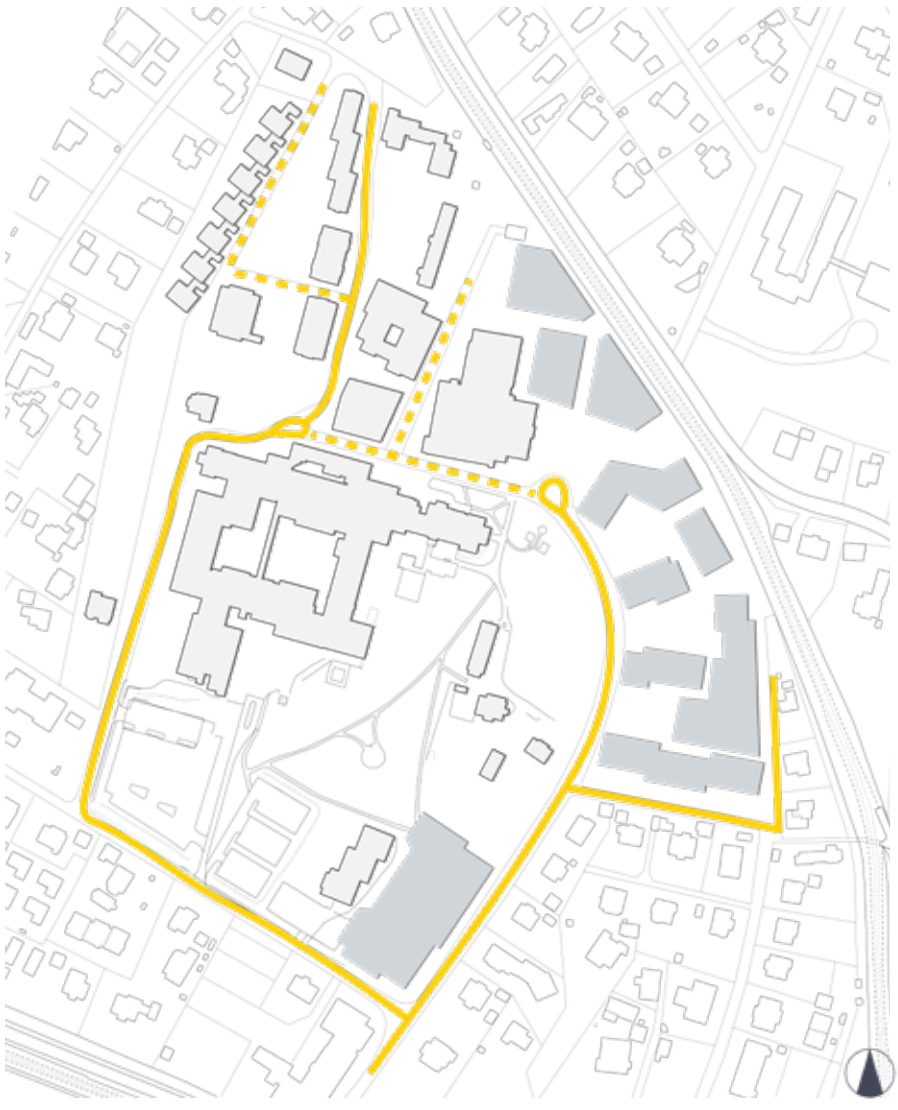


Fig. 39. Car routes inside Diakonhjemmet. 1:2500

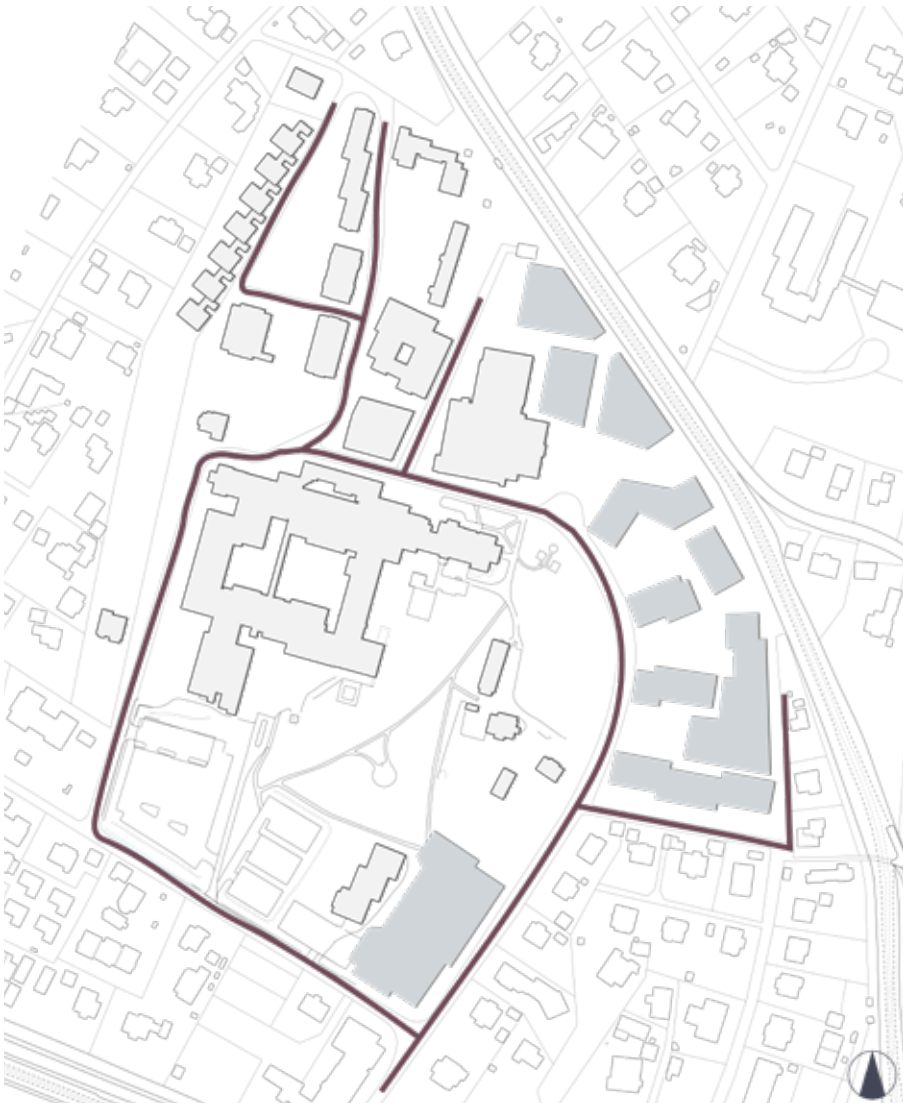


Fig. 41. Bikeways inside Diakonhjemmet. 1:2500

4.2.

Site visit

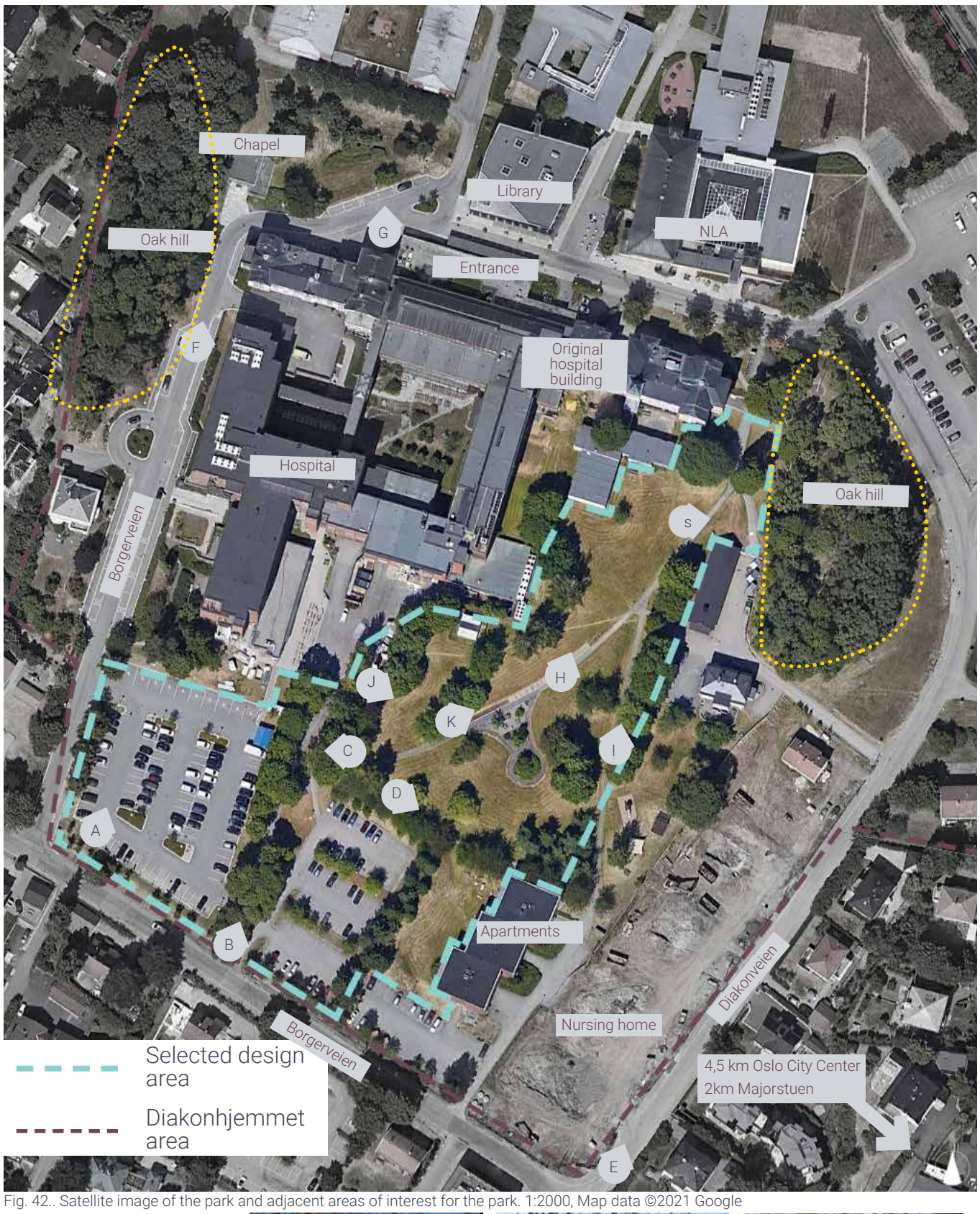


Fig. 42.. Satellite image of the park and adjacent areas of interest for the park. 1:2000, Map data ©2021 Google

A. The western parking area

B. Historical road and avenue.

C. The western parking area seen from above

D. Significant hills separating park and parking lots

E. The nursing home (not seen in plan)

A late but important visit

As the site visit was postponed from the summer of 2021 to November 2021 due to travel restrictions caused by the Covid-19 pandemic, many phases of the design had allready started when the site visit was conducted. However, the site visit brought a much broader understanding of the site, as the sense of space and room differs a lot between visualisations in ones mind and the actual feeling of being in the park.

F. A chapel integrated in the landscape

G. Apple trees

H. A hilly landscape.

I. Pathway connecting the nursery and the hospital. One of the original hospital buildings in the background

J. Pallet collars and a playground

K. Pathway cutting frough the park

L. Oak hill

An elevated landscape

At first sight I was surprised how elevated and hilly the landscape was. From looking at maps and cunducting a 3D model I knew it was elevated, but I did not grasp how different it felt being there in comparisment to how it looked. For instance the main part of the park today is elevated by

a few meters in comparison to the parking lots (see B, C, D and H). The hills is recurring through the area with the three oak-clad hills (see Fig. 44.) as the main componants. However, also the park has some elevations. The park itself is leaning from north to south, the old hospital building to the parking lots (see I), giving the visitor a good overview of the park
In addition, a few, from the look of it, artificial hills are added to the park (see D. and H.) These hills and slopes provides a sence of space. However the placements of the same splits the park in smaller parts that makes the experience of the park confusing.

Built enviroment

As I first came to the site I arrived from the south along Diakonveien and saw the newly inaugurated nursing home that I knew was coming but did not know was already built (see E.). Further, the hospital is, divided into different parts as the extensions are very different from the original two hospital buildings. The newer extensions has a dark, red brick facad and is more box-like (see A and I.) in its appearence while the older buildings have a plastered facad in yellow and a typical late-1800 appearance see (see I.).
Other important buildings are the apartment buildings in the south-eastern corner of the park. They are smaller than I expected and has a lawn used by the residents, separating the buildings and the parking lots (see Fig. 44.). The lawns seemed to be well used as I saw arrangements for barbequeing and playing tools placed on the grassy surface.
Further up north, outside of my immidiate design area I found the Diakonhjemmet Chapel, integrated in the landscape (see F.). Not far from the chapel lies the NLA library and the main entrance to the hospital (see Fig. 44.).

Vegetation

The most eye-catching and by far most valuable for the biodiversity in the area is the oak-hills. The oak trees rises above the park (see Fig. 44 and L.) creating a natuaral wall that frames the park together with the hospital.
Another important element is the historical avenue (see B.) which splits the two parking areas. From a conversation with arborists Kristin Moldestad and Chanette Hoffmann (oral source, 211112) which I met during my visit to the Park, the almost 100 year old maple trees are in bad shape and do not have many years left.

Connectivity and Mobility

The mobility through and in connection to the park differs between different groups of people and what type of transportation they use to get to Diakonhjemmet. I arrived to the area by bike from Diakonveien which connects to Sørkedalsveien that leads to Majorstuen and Oslo City Center. My observation was that most students came that way in the morning and left towards the city center in the afternoon. As many students uses bicyle or public transport their main entrance route to Diakonhjemmet goes via Diakonveien.
Diakonveien is also the main entrance for car users. It is also these people that mainly use the walkway that extends through the park. They simply walk through the park to and from their car. The other pathway through the park connects the nursery home to the hospital and is thus a main route between the two.

Fig. 43. Connections. Satellite image. 1:4000, Google Earth

Arriving by car

Arriving by public transport or bicycle

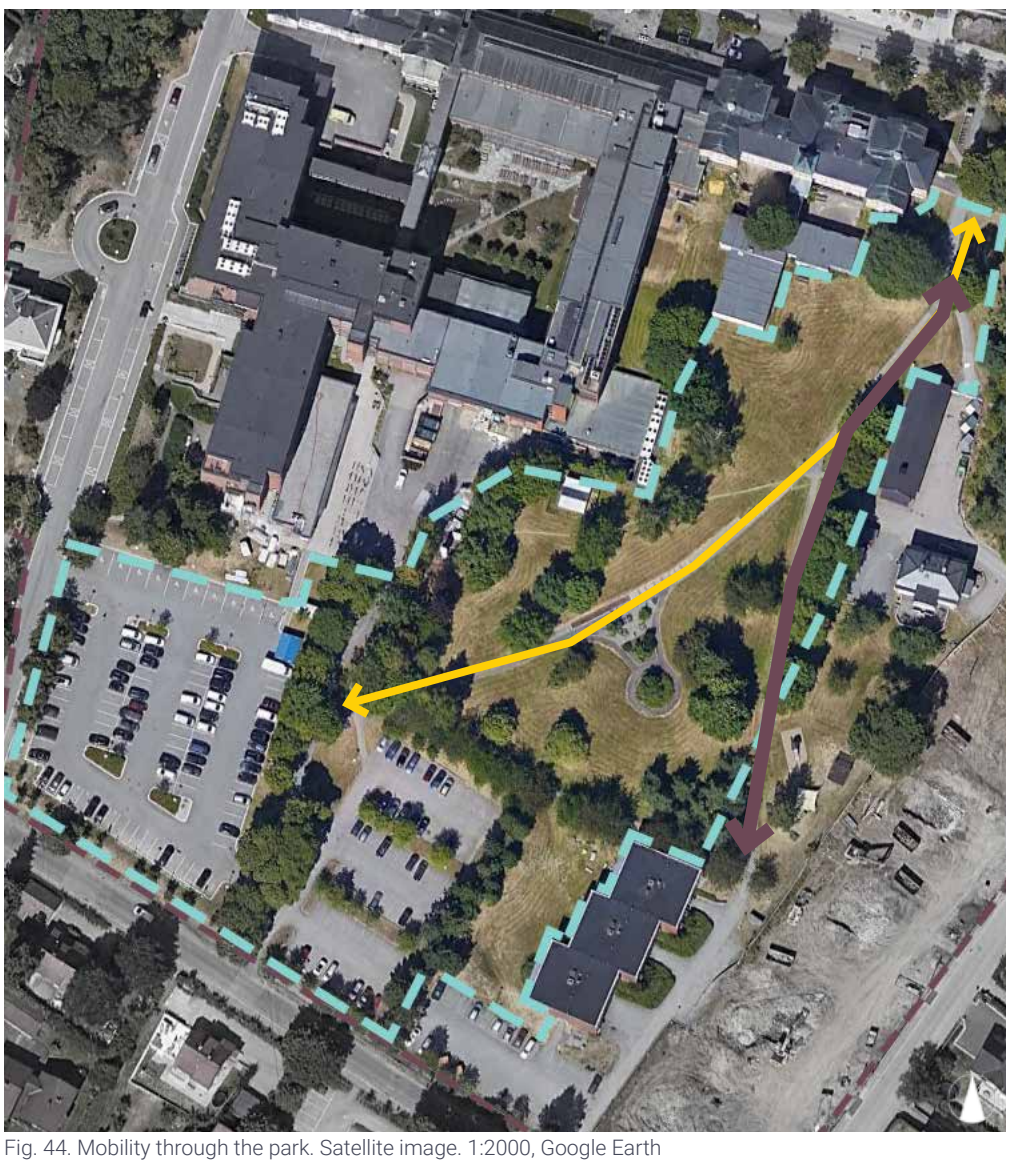


Fig. 44. Mobility through the park. Satellite image. 1:2000, Google Earth

Connection between nursery home and hospital

To and from cars

4.3.

History to present

- Farming in Diakonhjemmet

Fig. 45. Diakonhjemmet in 1903. Photo: Anders Beer Wilse
Original: Oslo Bymuseum

Fig. 46. Cultivated fields in front of Diakonhjemmet Hospital. 1961. Photo: Truls Teigen
Original: Oslo Bymuseum

Fig. 47. Diakonhjemmet hospital in 1966. Photo: Leif Ørnelund
Original: Oslo Bymuseum

Historic usage of the landscape

As can be seen in the pictures above, big parts of the lands that are today Diakonhjemmet park, has been cultivated to produce food. The earliest sources that prove this is the photograph by Anders Beer Wilse in 1903 (Fig. 47). In a historic map of Kristiania (previous name of Oslo) from 1900, Diakonhjemmet is marked with the two original buildings, still visible at the site (Fig. 50). The buildings are surrounded by what can be interpreted as open space and/or farmlands. Thus, there is implications of early agriculture in the area. However, it is just an assumption that the land has been used for agricultural purposes before Diakonhjemmet established itself at the site. The crop fields are visible all the way in to the 1960's as signs of plowing is clearly visible in photography's from 1961 (Fig. 48). Although, when the new hospital buildings appear in pictures from 1966 the land that is now Diakonhjemmet Park, is no longer cultivated (Fig. 49).

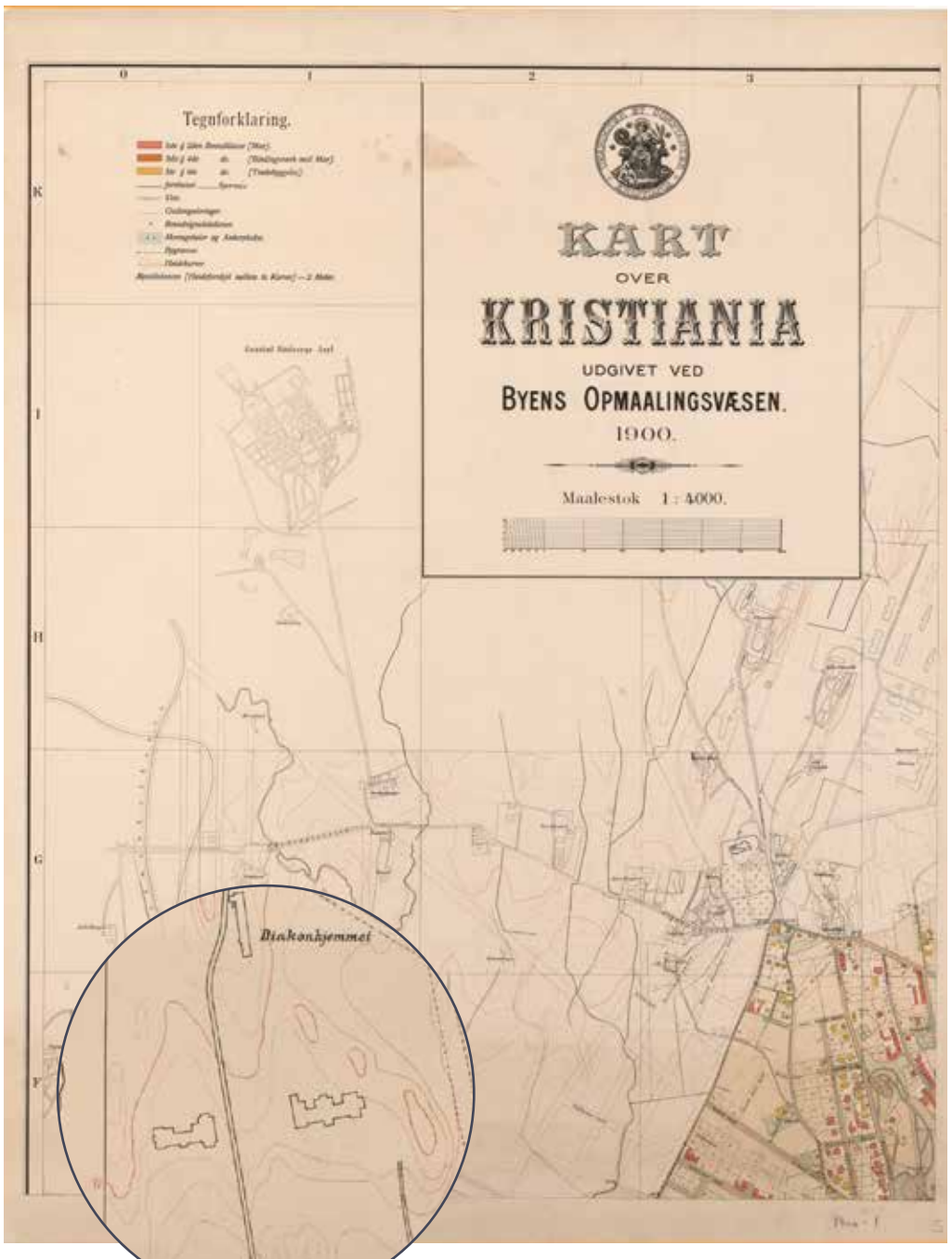


Fig. 48. Historic map of Oslo. Zoom in on Diakonhjemmet.
Original format unknown.
Original: Oslo Kommune, Byarkivet

Edibles in the Park today

Today the once big farmlands connected to Diakonhjemmet is long since vanished. However, the tradition lives on, but in a much more restricted and smaller scale with a few pallet collars are placed in the center of the park. Every plant in the collars is edible and though the scale of the production is very small they provide a valuable hint on what plants and vegetables that can be planted in Diakonhjemmet park. The pallet collars together with historical references of fields of for example potatoes and rutabaga are a good indication farming in bigger scale can work in the area.

Among the plants found in the pallet collars are carrots, garlic, different sorts of kale, chamomile, and potatoes. Furthermore, there is two beehives for locally produced honey on the oak hill just next to the park.

Fig.49. Kale with a layer of frost

Fig.50. Unknown plant and garlic

Fig.51. Carrots in november

Fig.52. Cauliflower

Fig. 53. Pallet collars in Diakonhjemmet Park, November 2021

Fig. 54. Kale with a layer of frost

Photo: Private

4.4.

Microclimate

The analyzes show the actual conditions at Diakonhjemmet - where is the sun, where is the wind, how is the space experienced in terms of comfort and contribute to an efficient disposition of the various rooms and functions of the park and its surroundings.
In the top right corner on this page one can see an analysis of the solar conditions showing the total sunlight hours of the site in an average year. In the bottom left there is two maps showing an analysis of comfort in the spring and in the autumn, and in the bottom right there is a wind rose, showing the most common wind- directions and speed in Oslo.
These types of analysis show me which areas that are more favorable for stay and activity, as well as where certain types of plants can grow and prosper. At the same time, they also show me where the more problematic areas of the project site are. For example, where the winds are strong, where the number of sun hours are low and where the average comfort is low.
In summary, these analyzes guide me in my design to make the park as comfortable and nice as possible for the people, plants and fauna that would use it.
The simulations have been made with Ladybug Tools (2021), a plugin for Rhinoceros 3D and Grasshopper.

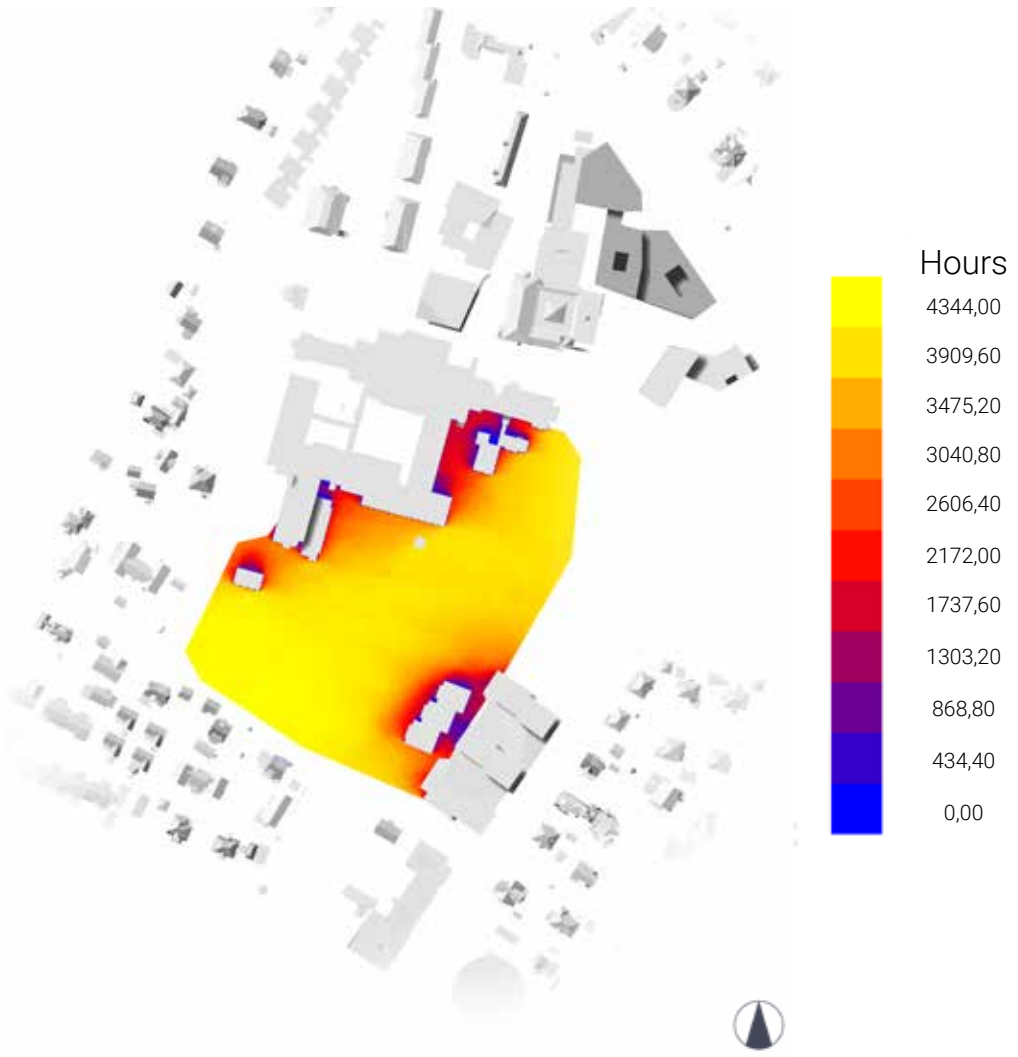
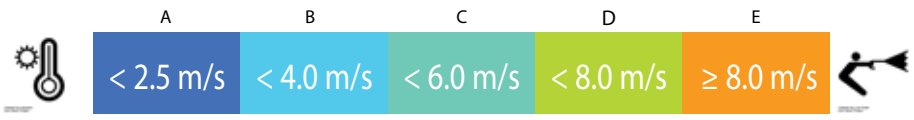
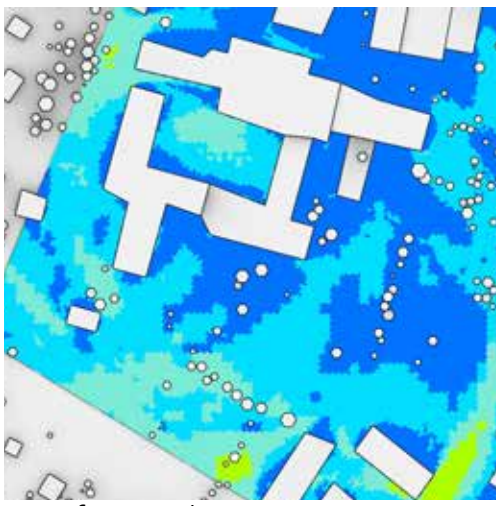
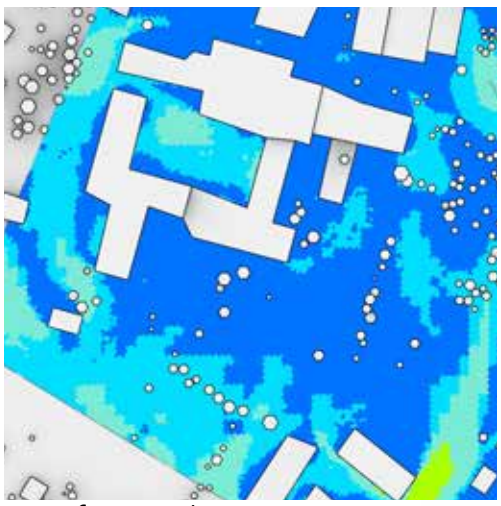
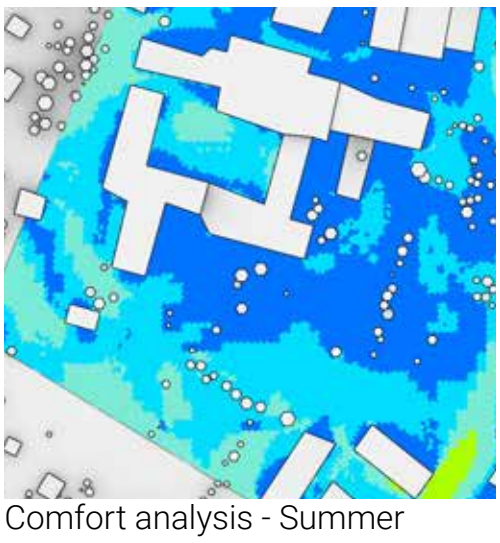


Fig. 55. Sunlight hours diagram
Average hours of sun in Diakonhjemmet 1 JAN - 31 DEC




Comfort analysis - Winter


Comfort analysis - Spring


Comfort analysis - Summer

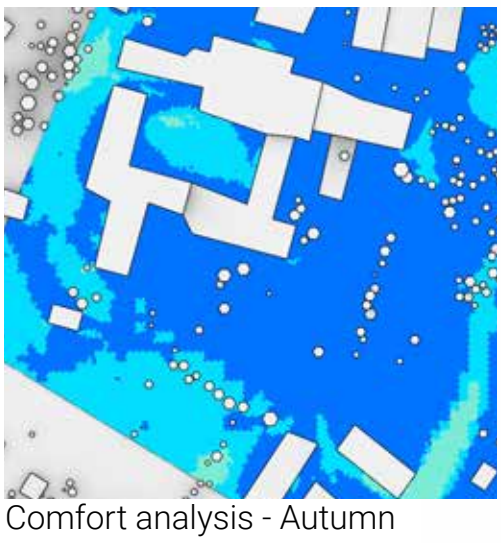

Comfort analysis - Autumn

Fig. 56. Average comfort throughout the year. The diagrams are based on Lawsons (1978) wind comfort classification.

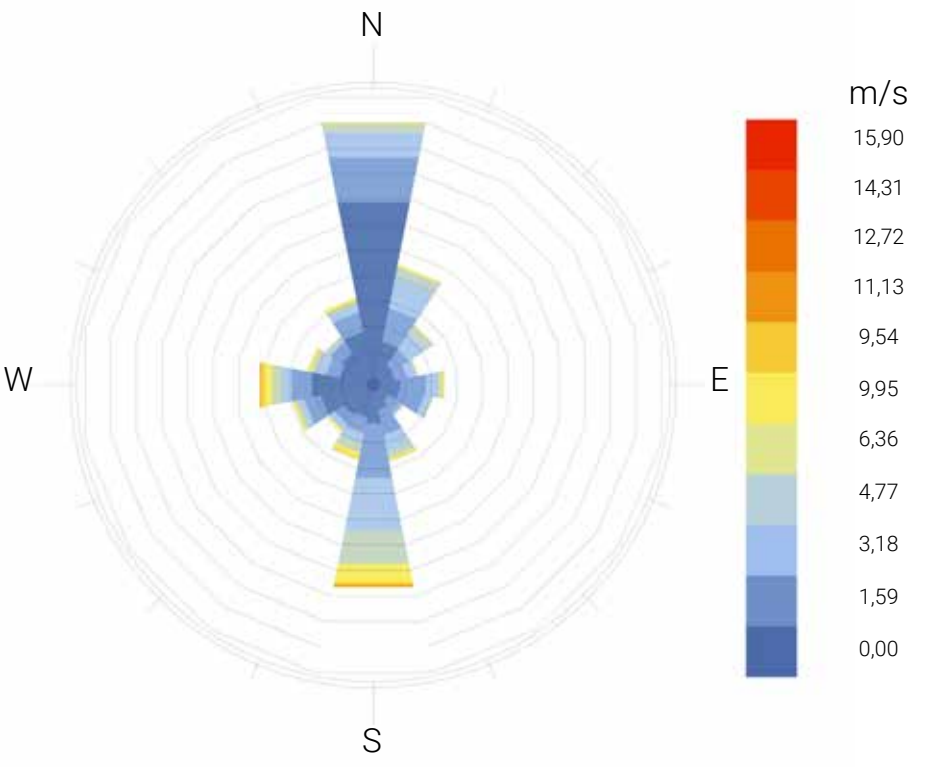


Fig. 57. Wind-Rose diagram
Average wind directions and wind speed (m/s) 1 JAN - 31 DEC
Calm for 6,91% of the time = 605 hours / year
Each circle showes frequency of 1,7% = 151 hours

4.5.

Water

Water, rain and flooding

According to the NOU (Norges Offentlige Utredninger) 2015:16, the average annual rainfall has increased since the seventies. During the period between 1971 and 2000 the average annual rainfall increased with 9% on a national basis and the number is expected to rise even more in the coming decade. According to NOU (2015:16) there will be an increase of another 7-23% in the next 60 years. The wide span is dependent of different scenarios of global temperature rise. However, a rise of temperature is expected and so is the expected rainfall. In the Oslo region, the increase of rainfall is even higher than the national average with an expected rise of 5-15 % to 2045 and 5-30% in 2085 (ibid.).

Extreme rainfall

With higher volumes of rainwater in general, the events of extreme rainfall will increase as well. In NOU (2015:16), extreme rainfall is referred to as rains belonging to the so called 0,5 percentile. This means rainfalls that occur less than one time per 200 rainfalls. To measure rainfalls, the rain volume is measured in millimeters per 24 hours (mm/d) or in millimeters per hour (mm/h) (ibid.). In Oslo this means rain volumes that exceeds 21-40 mm/d. Extreme rainfalls tends to be locally concentrated and can cause immense floods due to the vast volumes of rainwater in a short time. The diagrams below show different events of extreme rainfall and how often they occur according to the Norwegian Centre for Climate Services (NCCS) (2020). However, these numbers are expected to rise by approximately 40% due to climate change (NCCS, 2020).

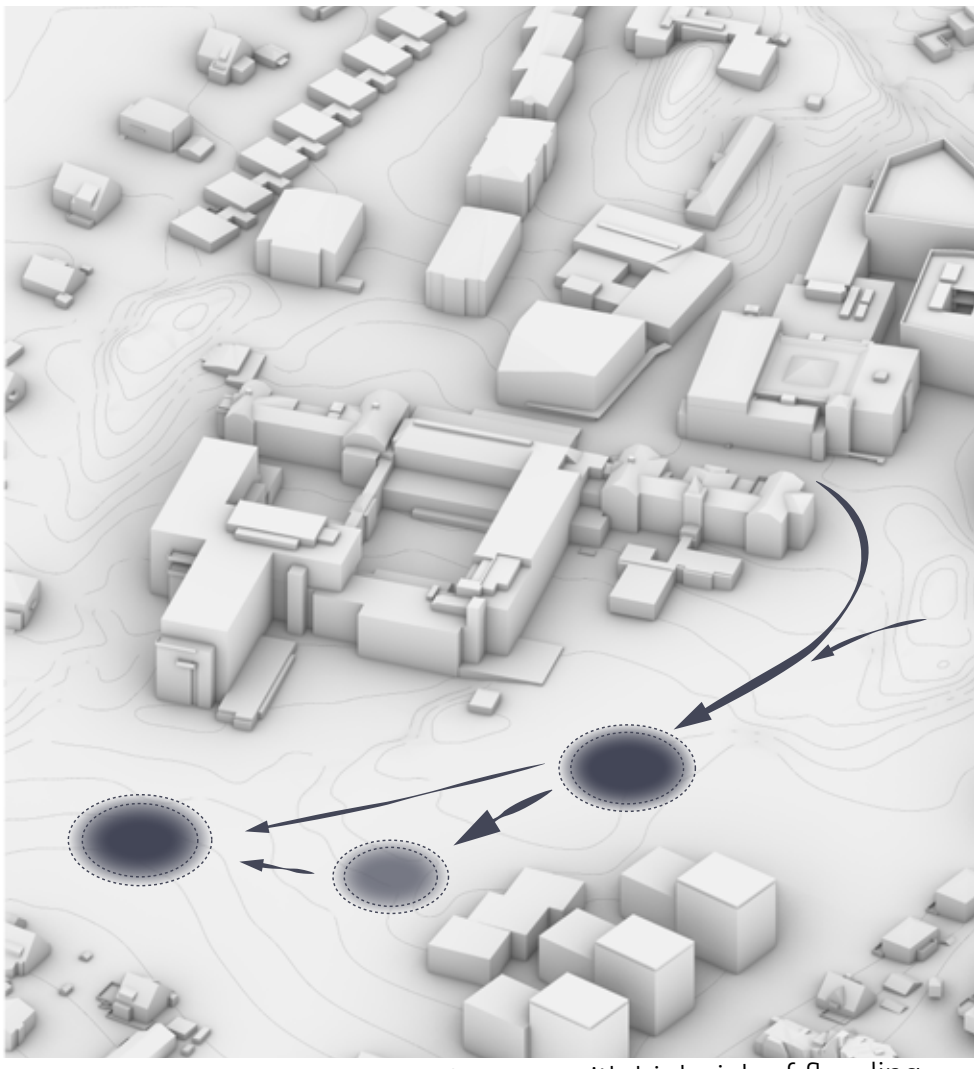


Fig. 58. Water flow diagram with areas with high risk of flooding

The IDF (Intensity-duration-frequency) curves to the right show the amount of rainfall in mm or l / (s * ha) that comes during a certain duration in number of minutes. Each curve represents a repetition interval in number of years, and the actual amount of rainfall occurs statistically once during this interval.

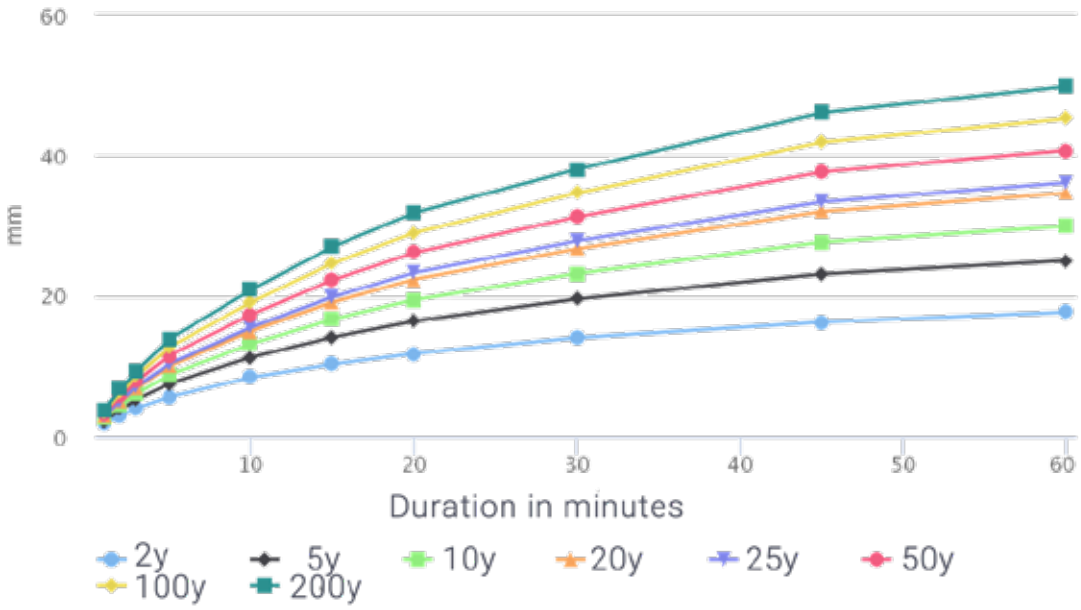


Fig. 59. IDF-curve for Oslo - Blindern Plu, 94 meters above sea level. (NCCS, 2020).

The diagrams below show the flooded areas and waterflows during a few selected extreme rainfalls. Weather data: Scalgo Live

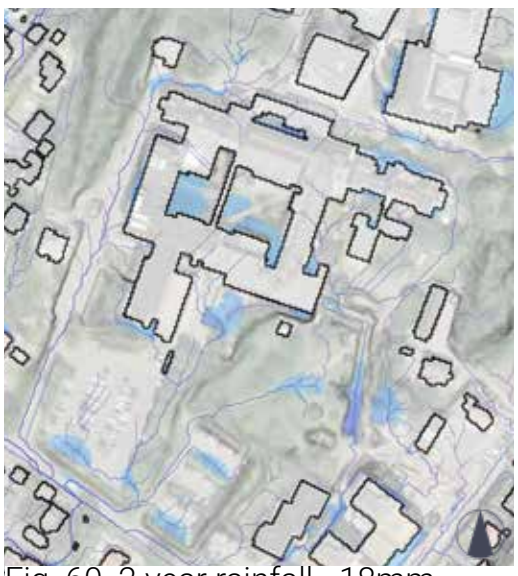


Fig. 60. 2 year rainfall - 18mm

Fig. 61. 50 year rainfall - 40mm

Fig. 62. 200 year rainfall - 50mm

4.6.

SWOT Analysis - based on the site analysis

Fig. 63.

Fig. 64.

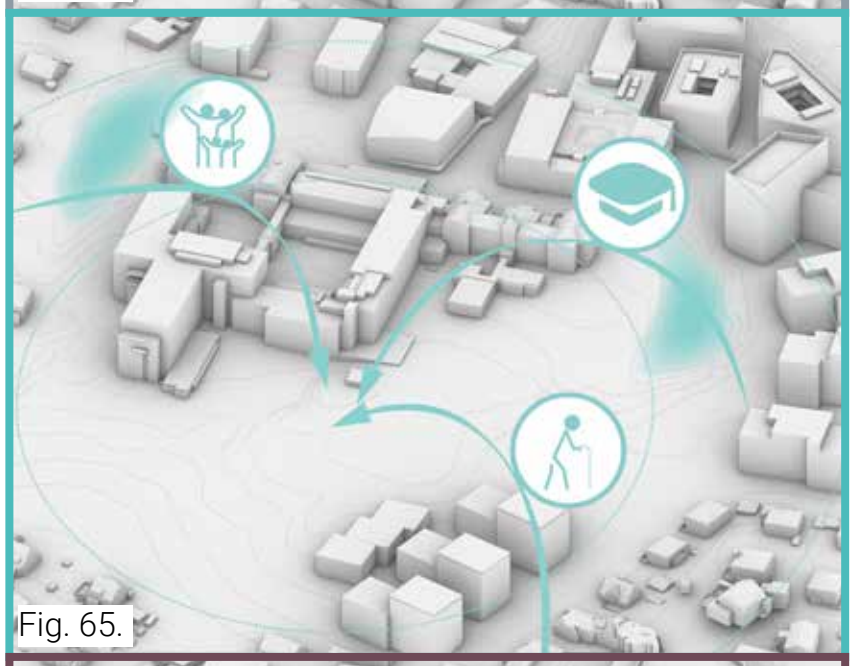


Fig. 65.

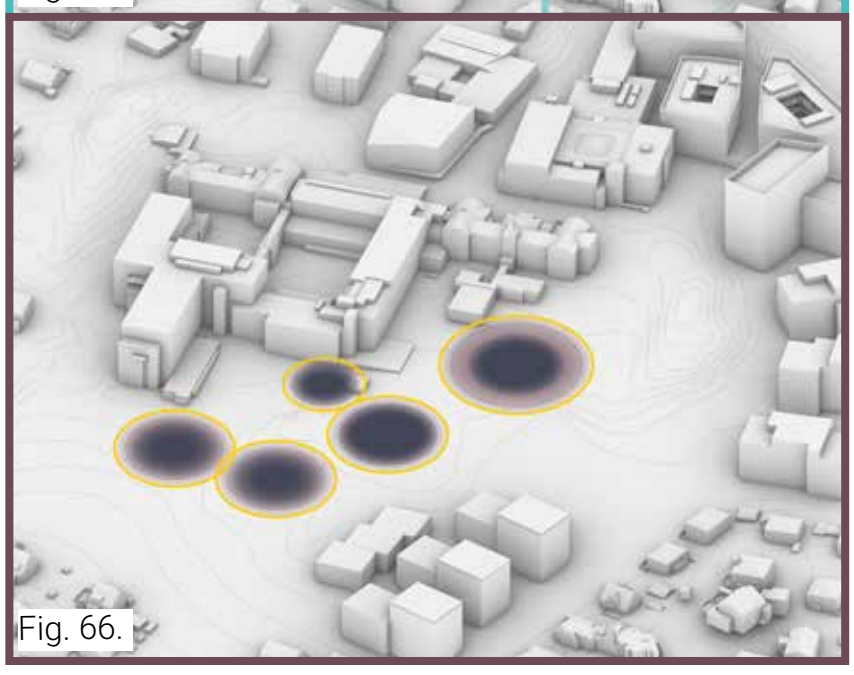


Fig. 66.

Strengths

- Open space
- Good microclimate
- Close connection to housing, university, daycare and hospital

Weaknesses

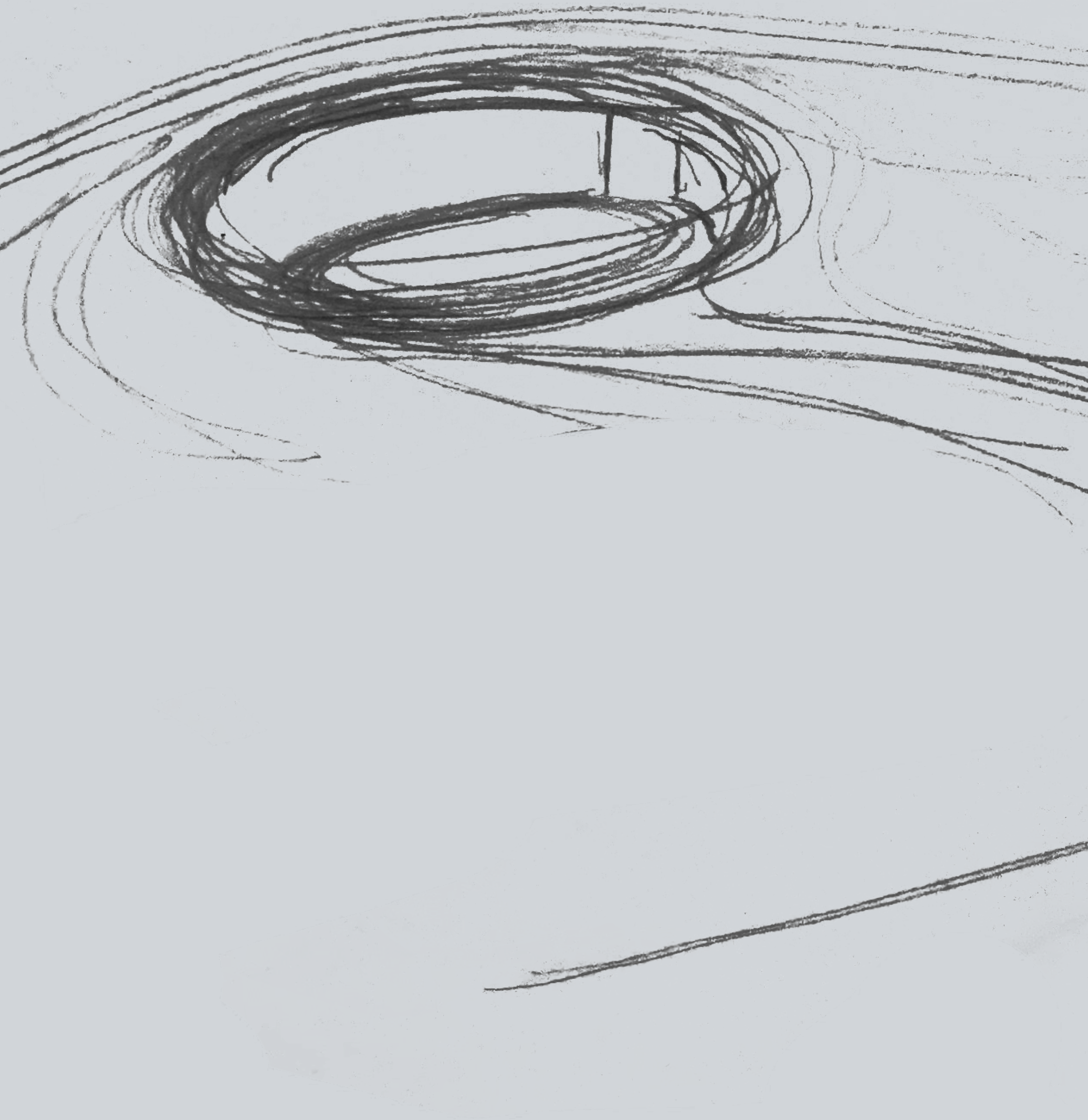
- Parking lots
- Lack of character
- No clear target points
- Lack of entrances
- Dead facades towards the park

Opportunities

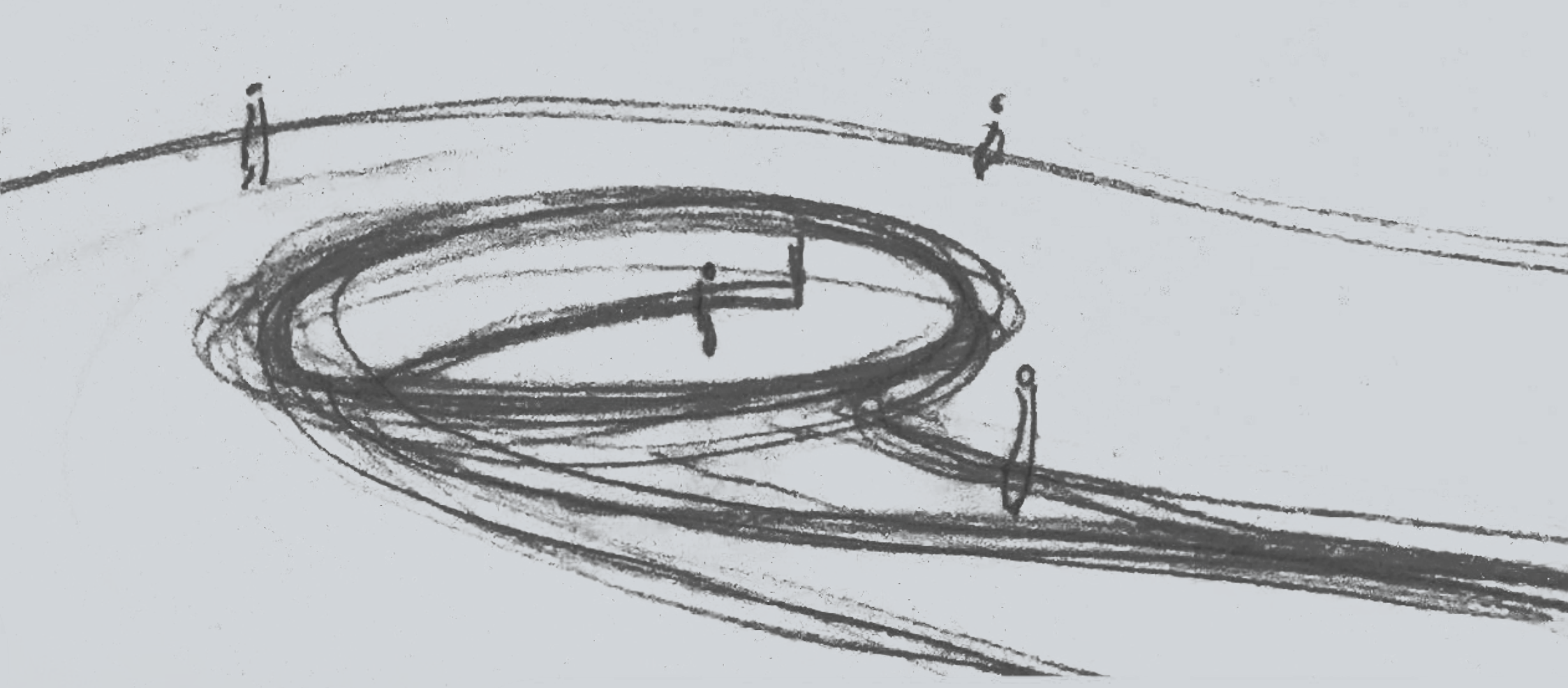
- Variety of users
- Elevated landscape
- The microclimate

Threats

- Risk of flooding
- Risk of drought



5. Design process



5.1.

First sketches

The sketching has been a predominant part of the design process in this project. By skecthing both by hand and in Rhinoceros 3D software, I have tried out different shapes and tactics in all scales of the design. From the early programming to the more detailed design in the endphase.

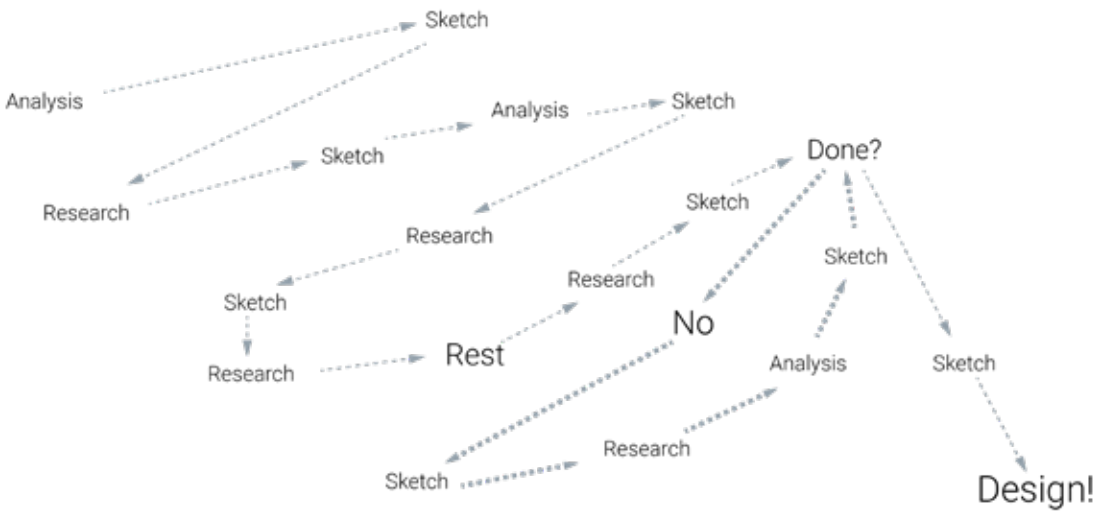


Fig. 67. Sketching process

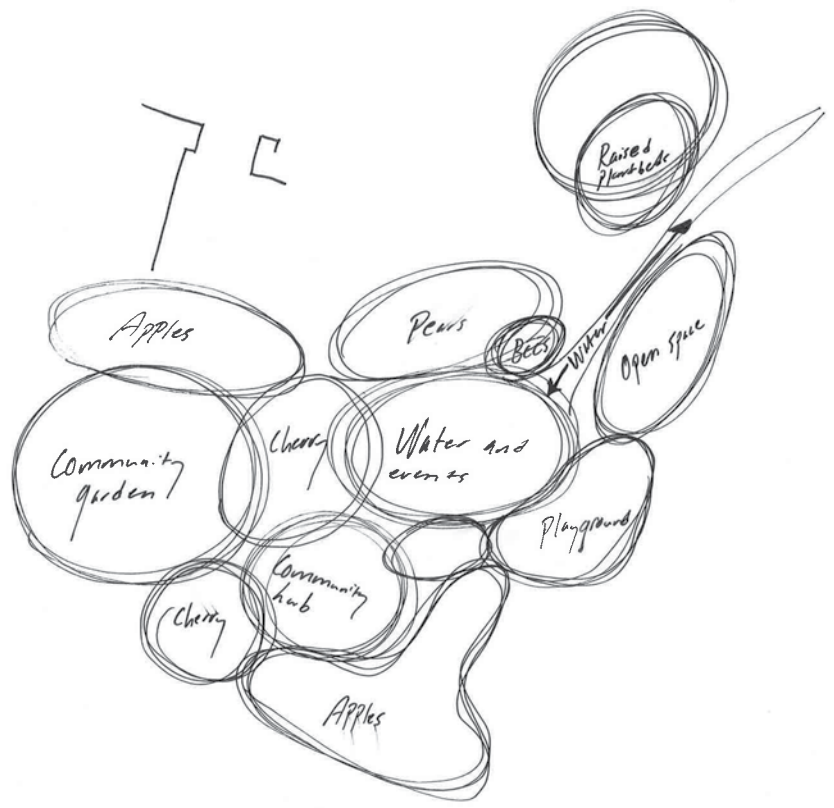


Fig. 68. Early programming

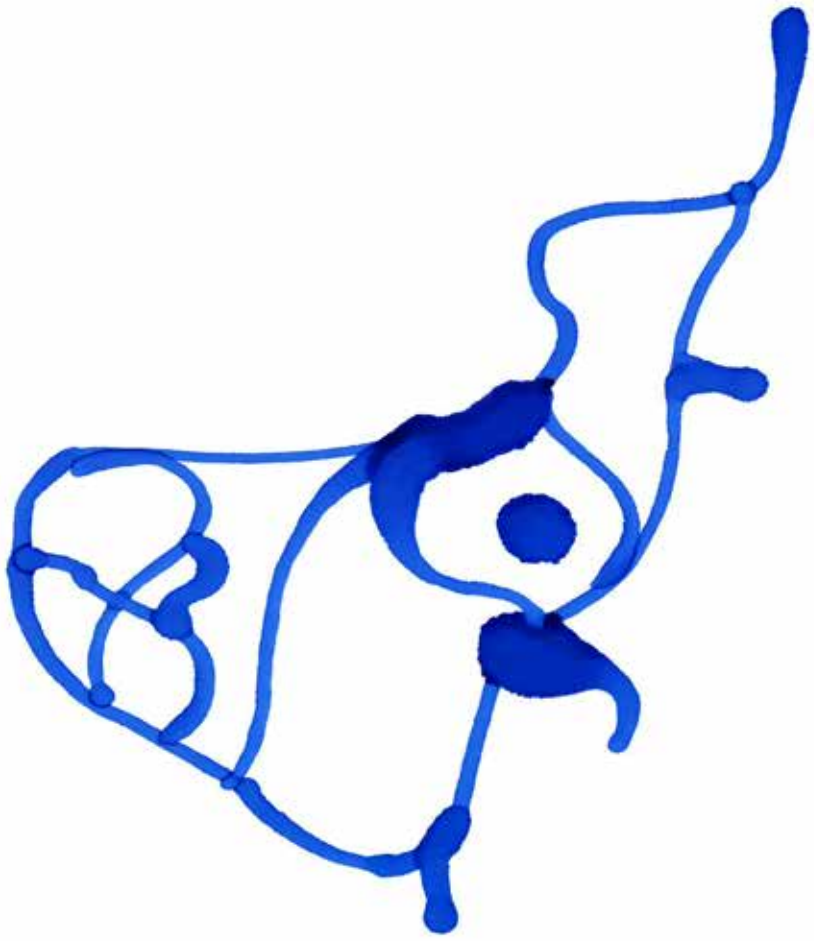


Fig. 69. Walkways and mobility flow

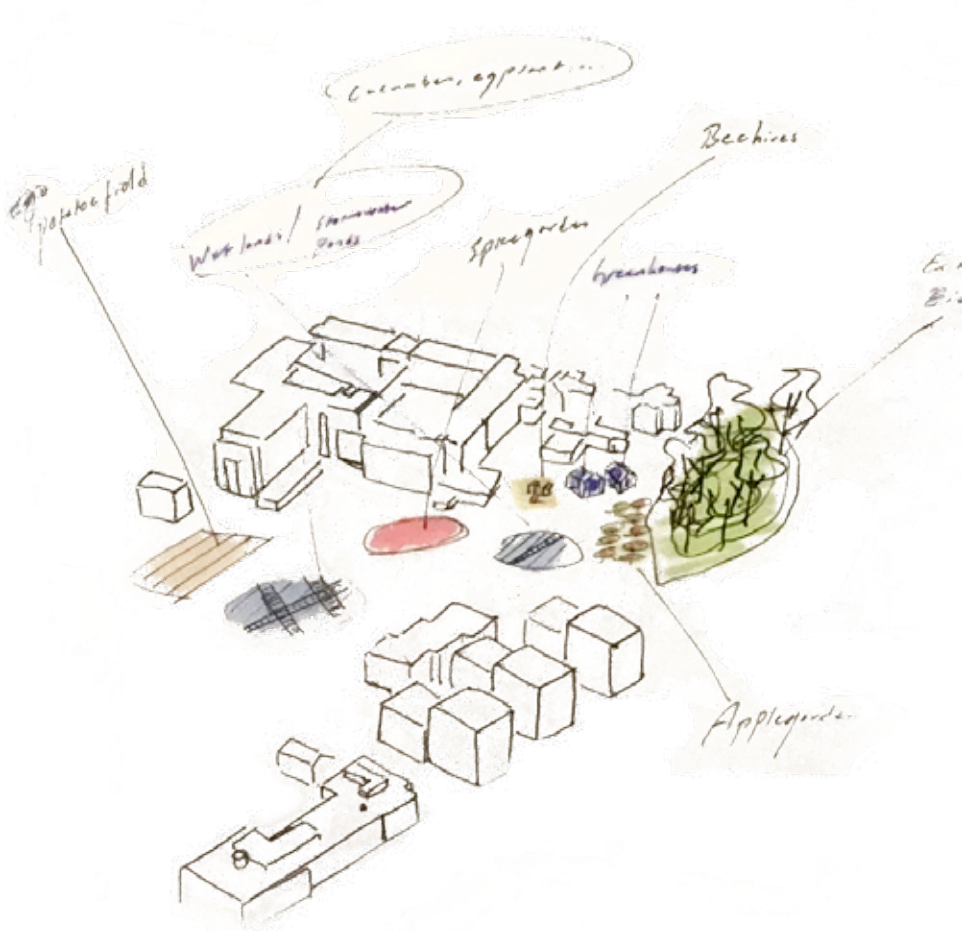


Fig. 70. Early axonometric sketch with program

5.2.
First draft of design

The first real draft of the design was made a few weeks into the project. Before that I mainly did smaller sketches focusing on strategies such as flows or programming.
The design proposal below is the product of those sketches and the first analysis of the site. As seen in the skecth below the three focus areas have already emerged. However in different shapes than the final proposal. The Community hub here was heavily influenced by a visit to Øens Have in Copenhagen and therefore do not have the characteristic shape that it got later on. Another big difference between this proposal and the final one is the amount of trees in the park. At an early stage I wanted the park to be packed by fruit trees. Something that changed when I started thinking about how the park actually would transform in crisis. The proposal below lack the capacity to transform into a big cropfield due to all trees.
Note that the water did not have a real function other than collecting rainwater. This sketch was made before I did a real rainwater analysis, hence there is only one water pond/ reservoir. The Community Garden is also totally out of scale as I did not fully understand the size of the park before my site visit in November 2021.

Fig. 71.
First draft of the design.
1.1000/A3

5.3.
Focus areas

After a first round of reading literature and early site analysis, by studying the site from satellite images, as well as the first microclimate analyses three focus areas started emerging in my sketches. As I saw the need for:
1. some sort of centerpoint in the park.
2. space for water management and water distribution.
3. space for food production.

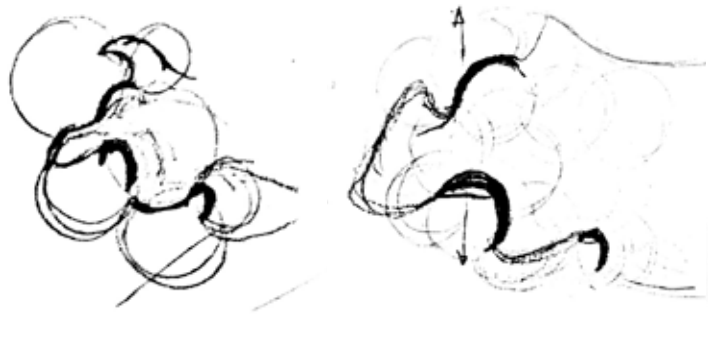
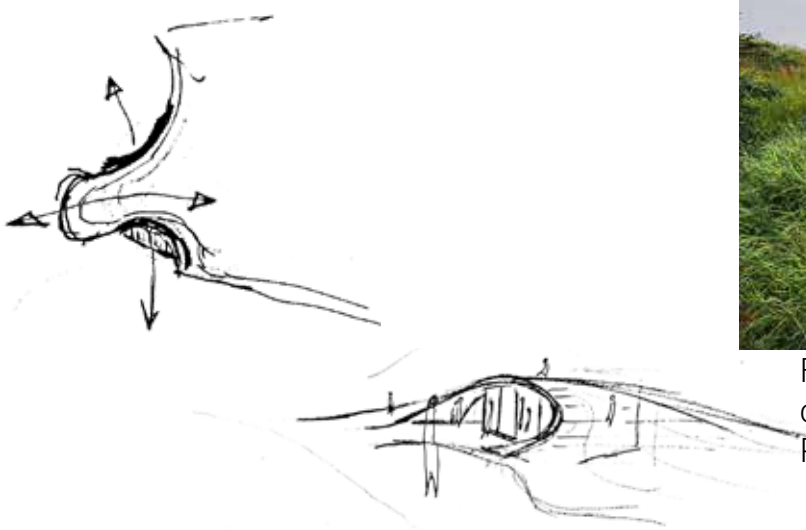


Fig. 72. Sketches of camouflaged restaurants and root cellars



Passing through and passing over

1. The community hub

A place and space where people would go to because they want to, not a place they have to walk past or walk through. After my visit to Øens Have in Copenhagen I wanted to add some sort of restaurant or café that would be able to serve dishes made by the harvest of the park.
The initial idea to integrate this centerpoint in the landscape was inspired by the shape of traditional root cellars. The root cellars are often well covered by the landscape and well camouflaged from the air. Since root cellars are very well connected to food and works event without electricity they would fit the park well for a post- crisis purpose. The roof will be covered by vegetation that easily be replaced in favour of edible plants such as potatos and rutabaga.

Fig. 73. Root cellar covered by grass
Photo: Patrick Mueller

Fig. 74. Root cellar covered in snow
Photo: Private

2. Water reservoir and water feature

After my initial analysis of rain, waterflows and extreme water falls, I understood that I had to add some sort of water management to the park. Inititally in the shape of a plant bed that could clean the water and store it. However, after input from my supervisor Lars Johansson and Hildegun Varhelyi, the plantbeds changed into a reservoir where water could be stored and then used for the crops and vegetables planted in the park.

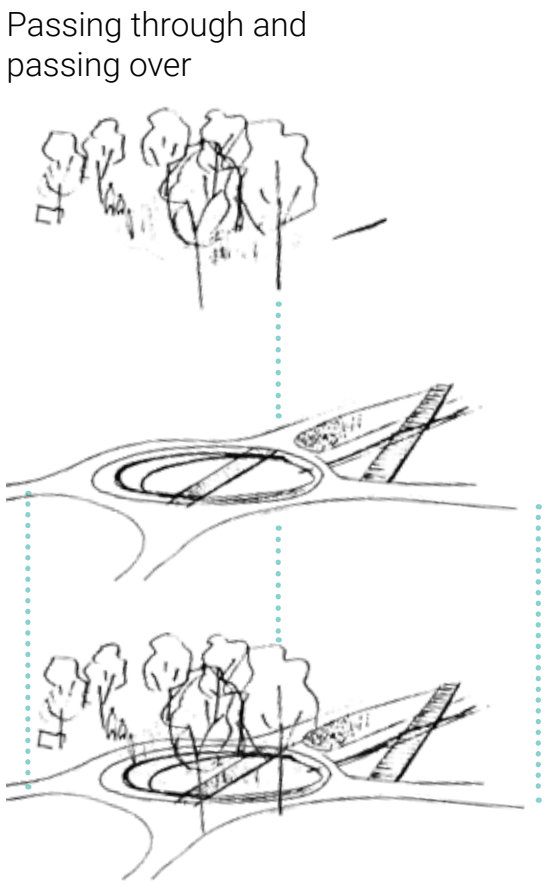


Fig. 75. Exploded axonometric sketch of the water reservoir

Fig. 76. Sketch showing the function of the water ponds/ water reservoirs

3. The Community Garden

As part of a creating a framwork for food resilience in the park I wanted to create a garden in the park where people can come and develop skills and share knowldedge among eachother when it comes to urban farming. After reading articles about community gardening, as a measure of resilience in aftermaths of war and natural disasters, I have been even more convinced of the purpose of a well functioning community garden. Both as a tool before crisis, and especially how it will work after or during a crisis. The initial sketches was much more inspired by traditional crop fields, however after my site visit I realized how big the old parking lots were and decided to cut the scale of the plantation by adding organic walkways trhough the garden.

Fig. 77. Gardening

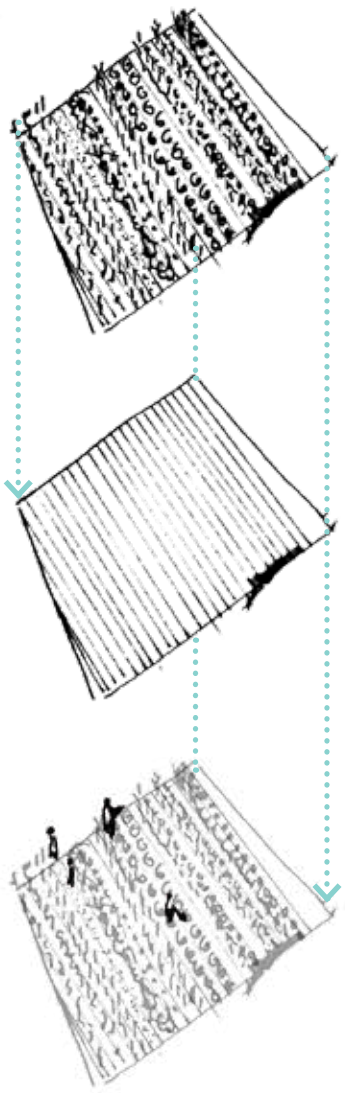


Fig. 78. Initially the community garden undertook the shape of a traditional cropfield.

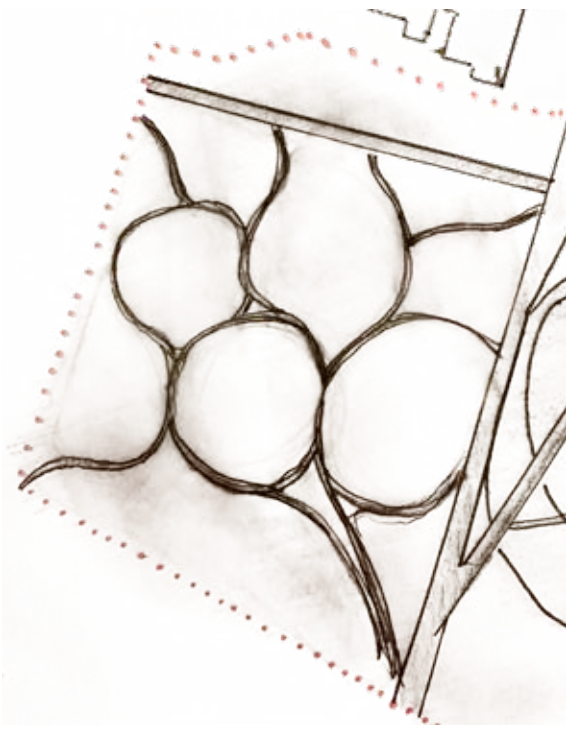


Fig. 79. Walkways cutting the community garden in smaller pieces

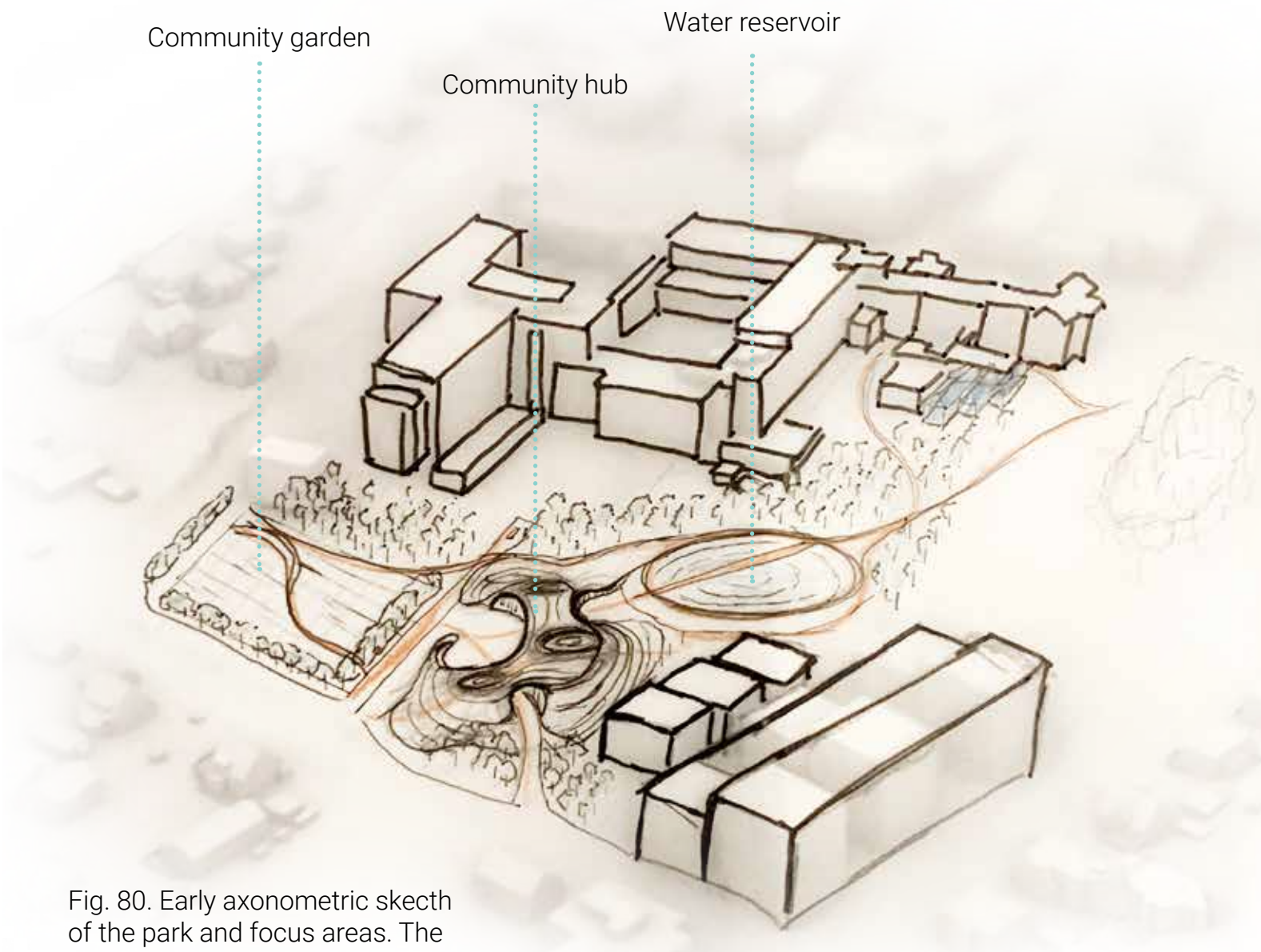


Fig. 80. Early axonometric skecth of the park and focus areas. The whole park is covered by trees.

Prologue

The following chapter is divided into two parts. Part I handles the general park design and how it is designed to create a framework for resilience in terms of crisis. Part II deals with future crisis scenarios and how the park copes with the challenges presented. What happens in the park and how does the park change? Both parts are presented with diagrams, to describe the design and the park functions. Throughout, this chapter you will also follow a narrative timeline, connected to some of the images, where you as a reader will follow the park development as a character, through different scenarios.

6.1. Design proposal

Part I - A Framework for Resilience

6.1.1.

A Framework for Resilience

Program

Destination and meeting

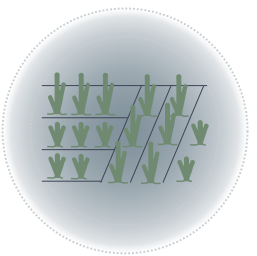
Social resilience is very dependent on interpersonal meetings, and social interactions. Therefore it is important to create rooms for meetings where people can exchange experiences before, during and in the aftermath of crisis.

An educational center

Space for education is important to prepare for crisis. An educational center can prepare people with knowledge on how to grow a resilient garden in their backyard or community gardens. The center could also have cooking classes.

A restaurant and/ or community kitchen

A restaurant, with food grown in the park, can attract people from other parts of Oslo as well as local residents. During crisis the restaurant can work as a public kitchen or a community restaurant to prevent starvation.

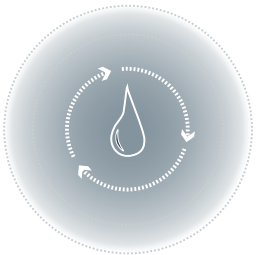


Make space for urban farming

Locally produced vegetables from a community garden, as well as high technologic greenhouses, can produce food for the café/ restaurant, as well as the participants in the community garden. In crisis the garden can act as a secure source of food for the hospital.

A playful landscape

An edible garden with vegetables, strawberries and other things open for display. Children from the local communities as well as children visiting the hospital are always welcome to the park to play and learn about gardening.



Rainwater management

By making space for water management and extreme weather, the park can help the local community to manage the risk of floods. The water can also be reused for the community garden. Further, water elements can be used as aestetical features.

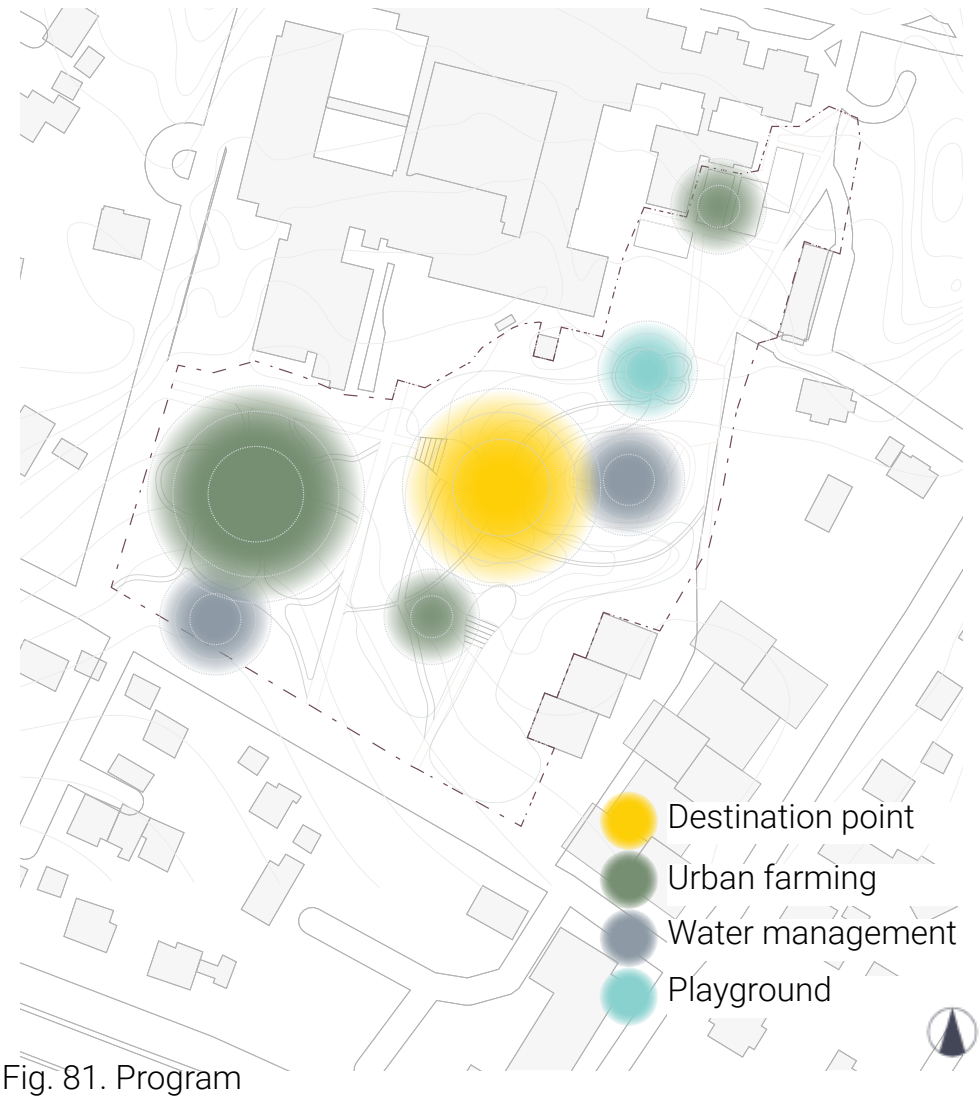


Fig. 81. Program

Fig. 82. Program with functions

Fig. 83. The Community Garden

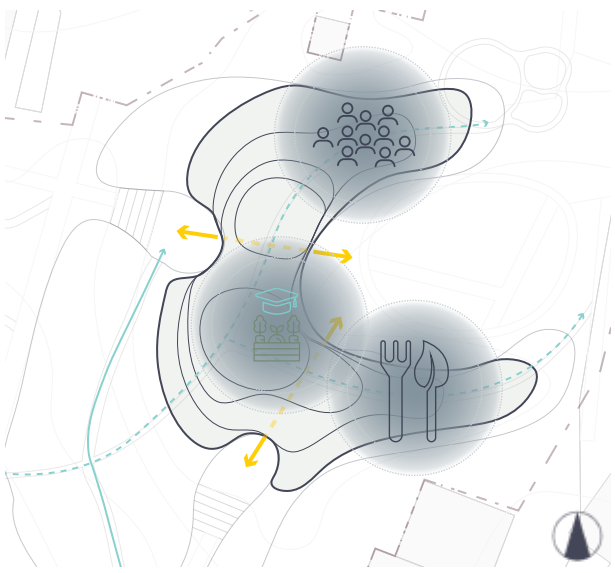


Fig. 84. The Community Hub

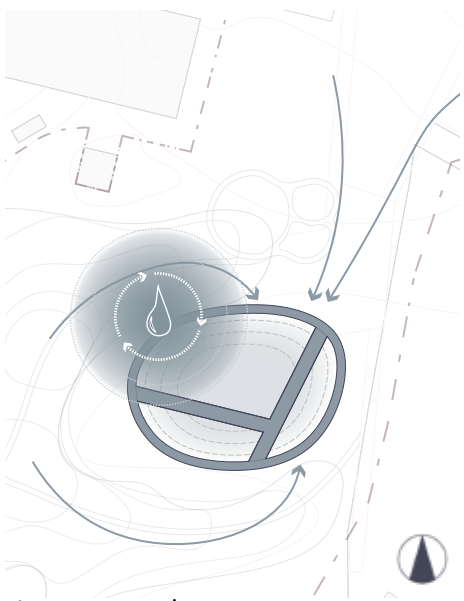


Fig. 85. Water reservoir

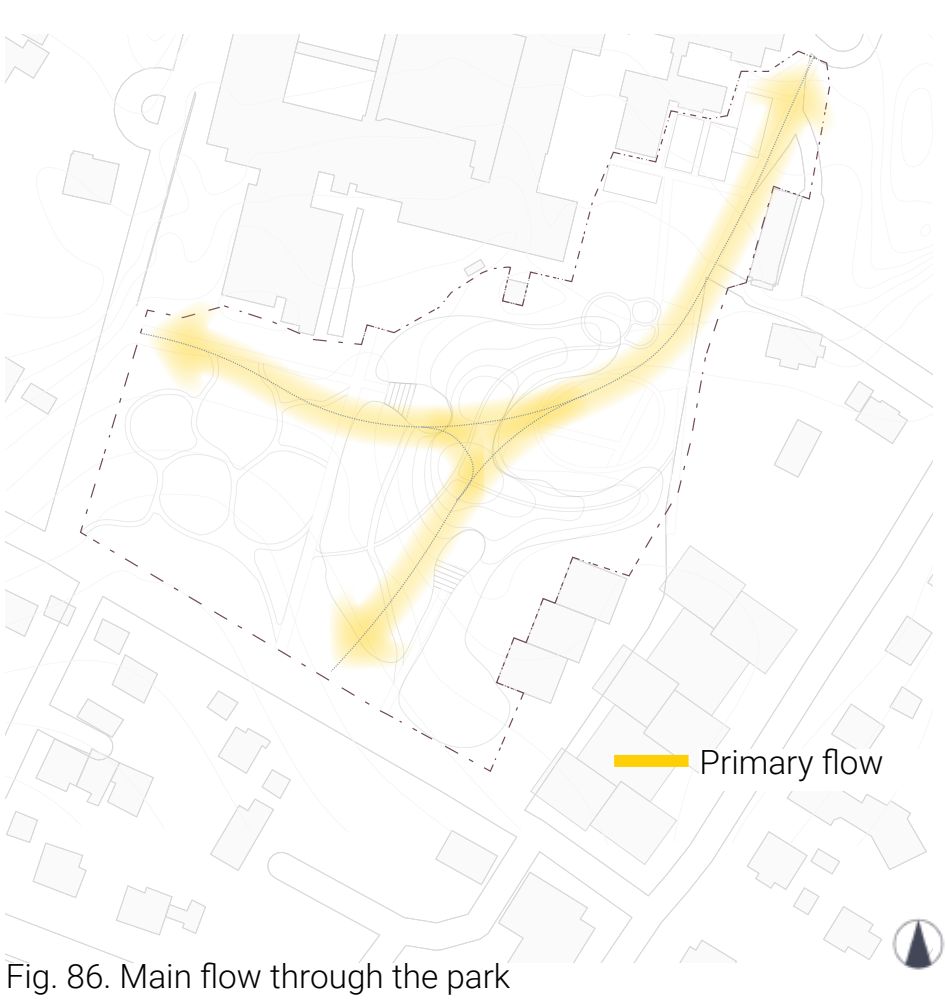


Fig. 86. Main flow through the park

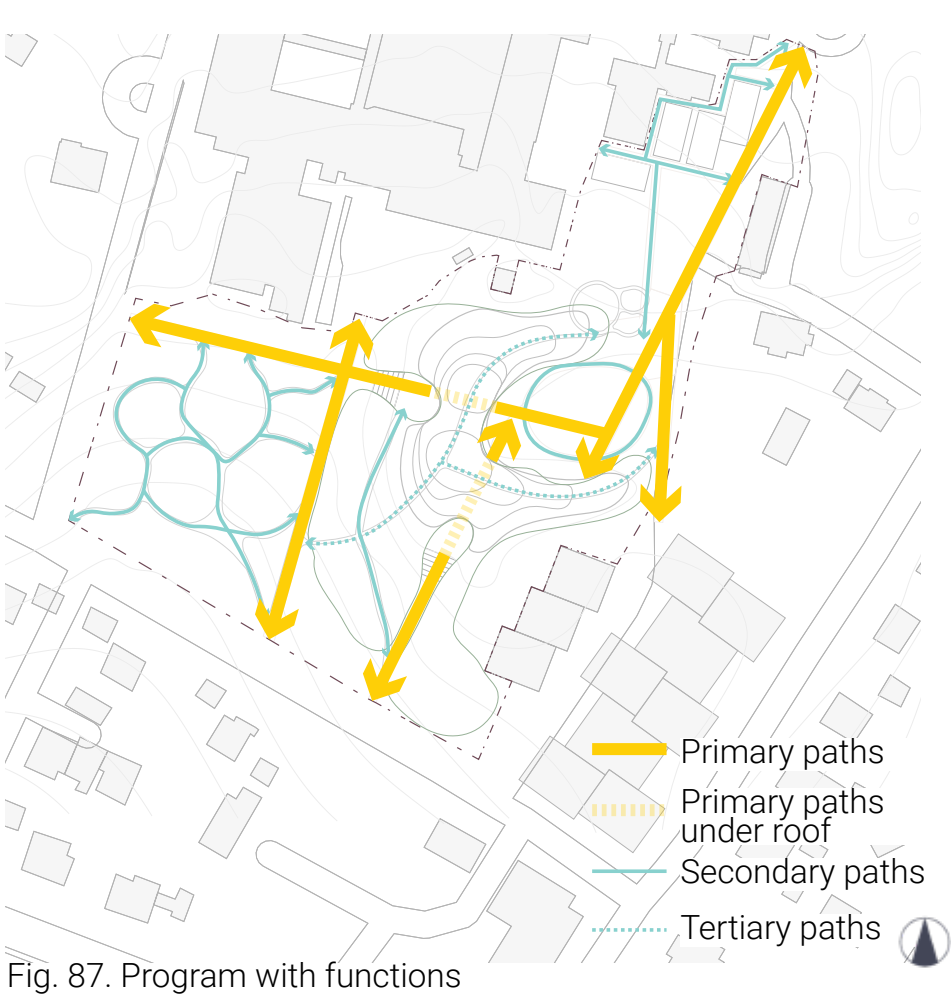


Fig. 87. Program with functions

6.1.2.

The park

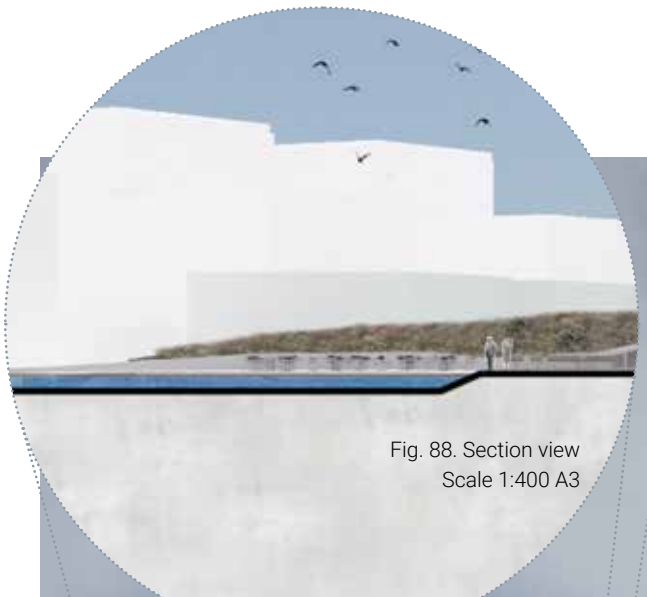


Fig. 88. Section view
Scale 1:400 A3

Fig. 89. Section view
Scale 1:400 A3

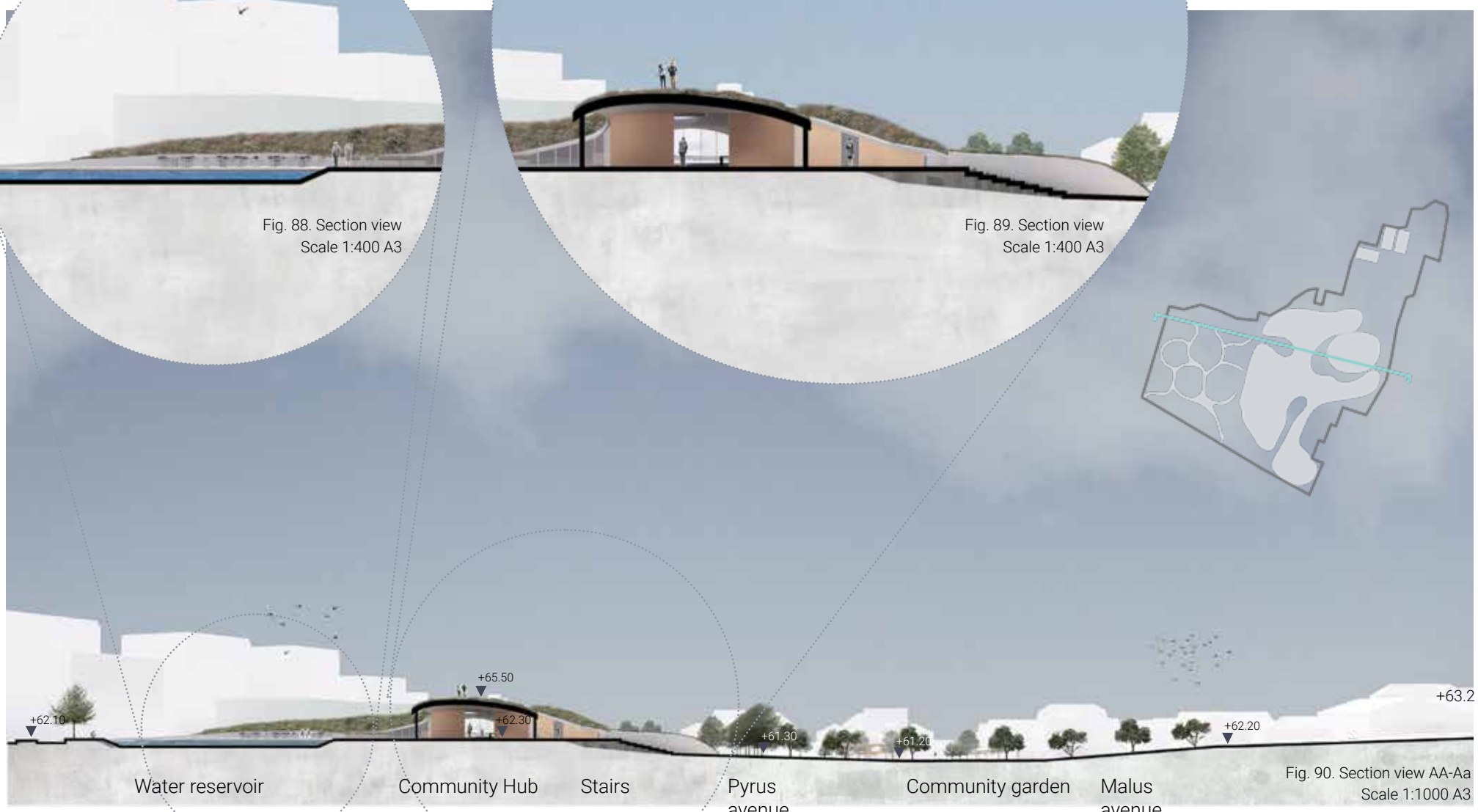


Fig. 90. Section view AA-Aa
Scale 1:1000 A3

Fig. 91. Section view
Scale 1:400 A3

Fig. 92. Section view BB-Bb
Scale 1:1000/A3

Fig. 93. Plan 1:1000/A3

6.1. Design proposal

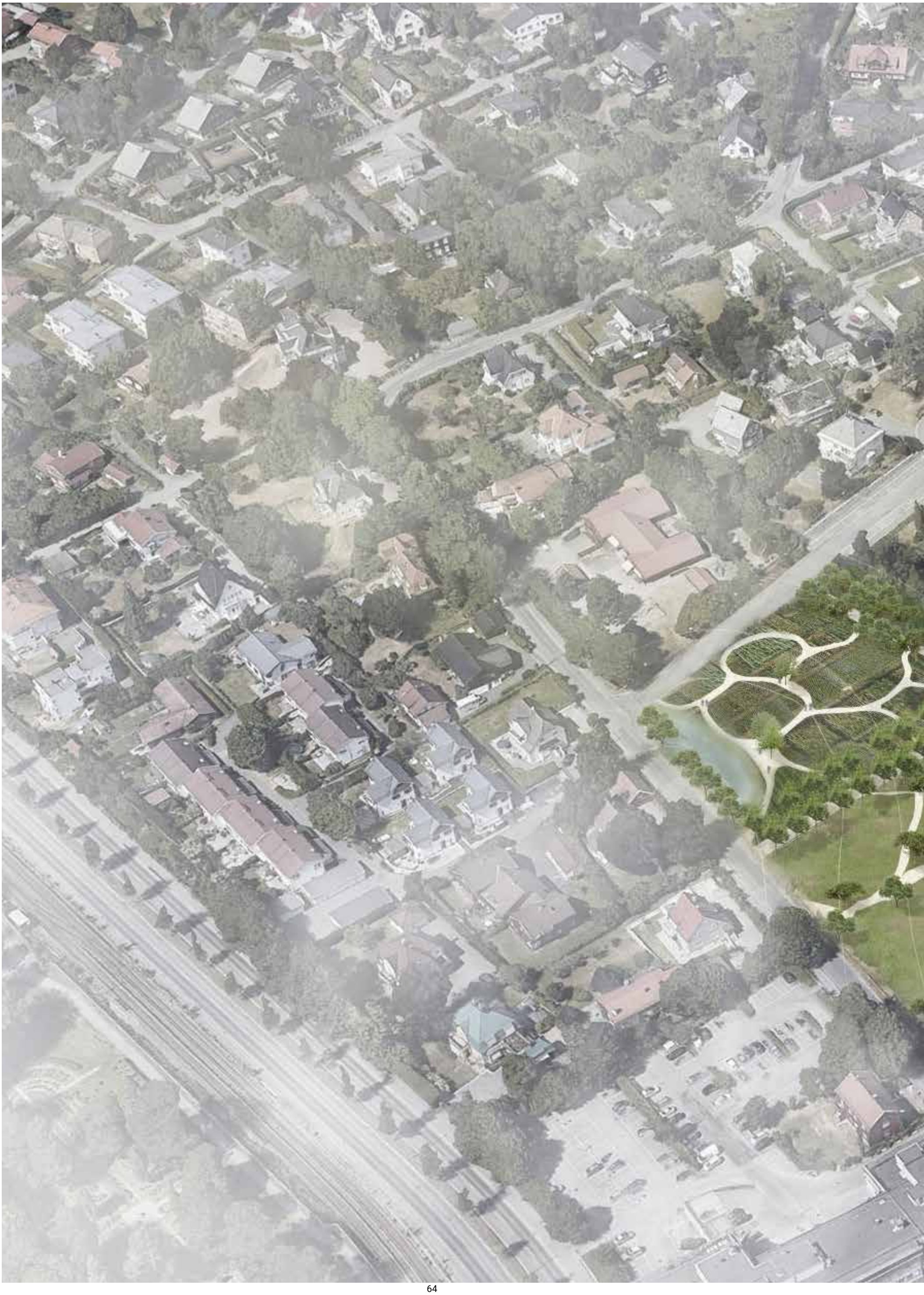


Fig. 94. Axonometric view of the park

6.1.3.

The Community hub

Integrated into the landscape

Inspired by the current landscape and old fashioned root cellars, the community hub is entirely intergated into the landscape. Seen from above, it blends in almost completely with the surrounding hilly landscape of Oslo. The same feeling is supposed to hit the visitors as the community hub, from certain angles looks just like any other hill. Yet, from other angles it opens up with a welcoming hug.
The roof is covered by a meadow like layer of plants that can be replaced by potatos or other plants in times of crisis.

Fig. 95. Passing thorugh and over the community hub

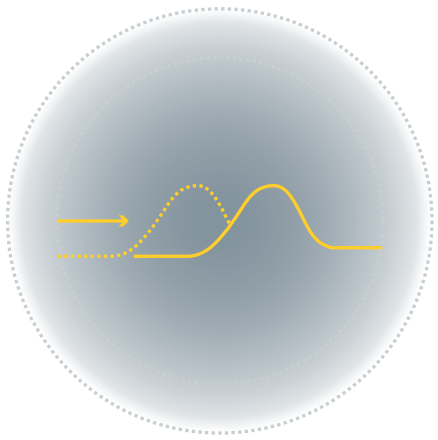


Fig. 96. Remodeling the landscape

Fig. 97. Integrated into the landscape

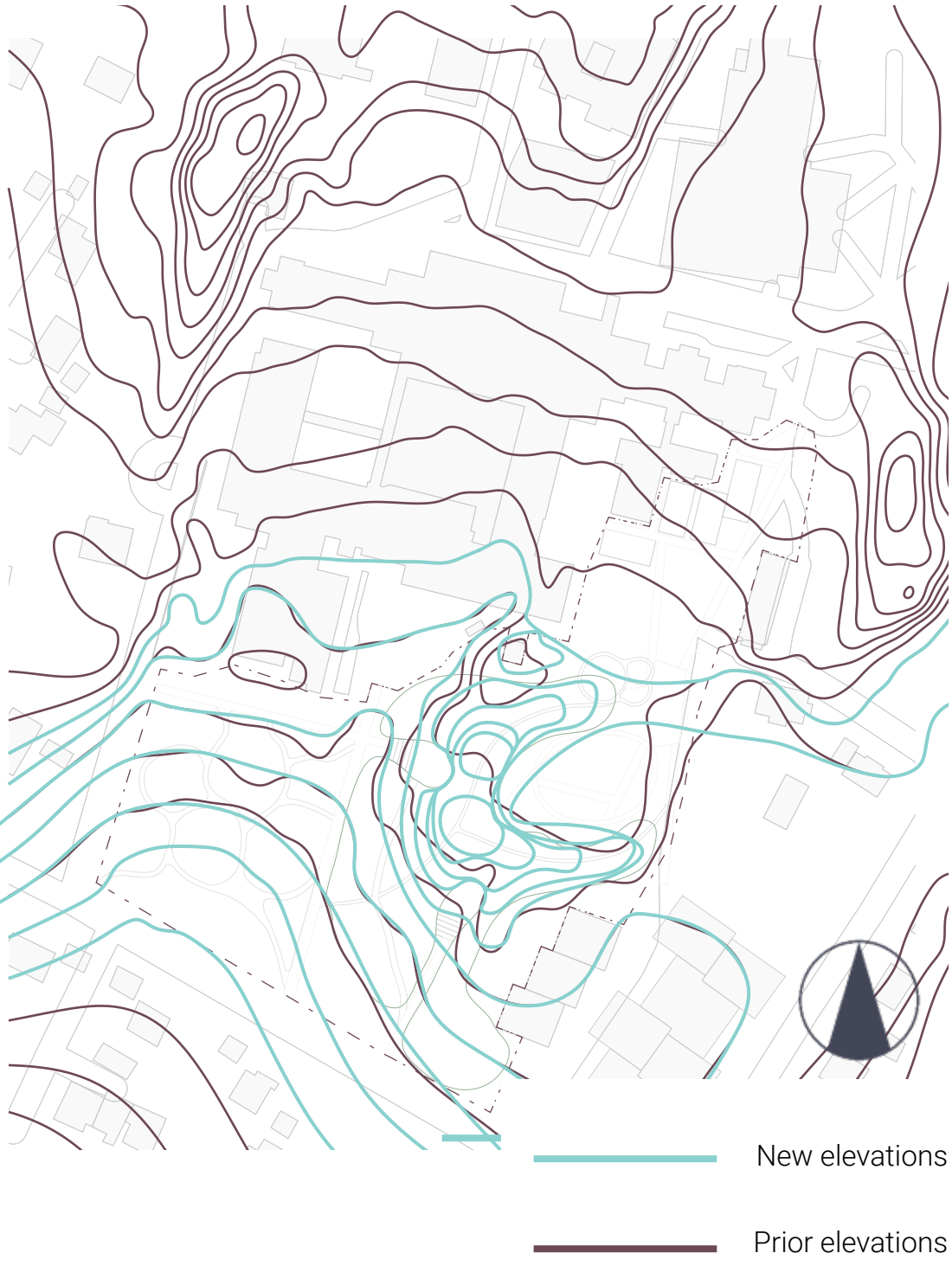


Fig. 98. A remodeled landscape

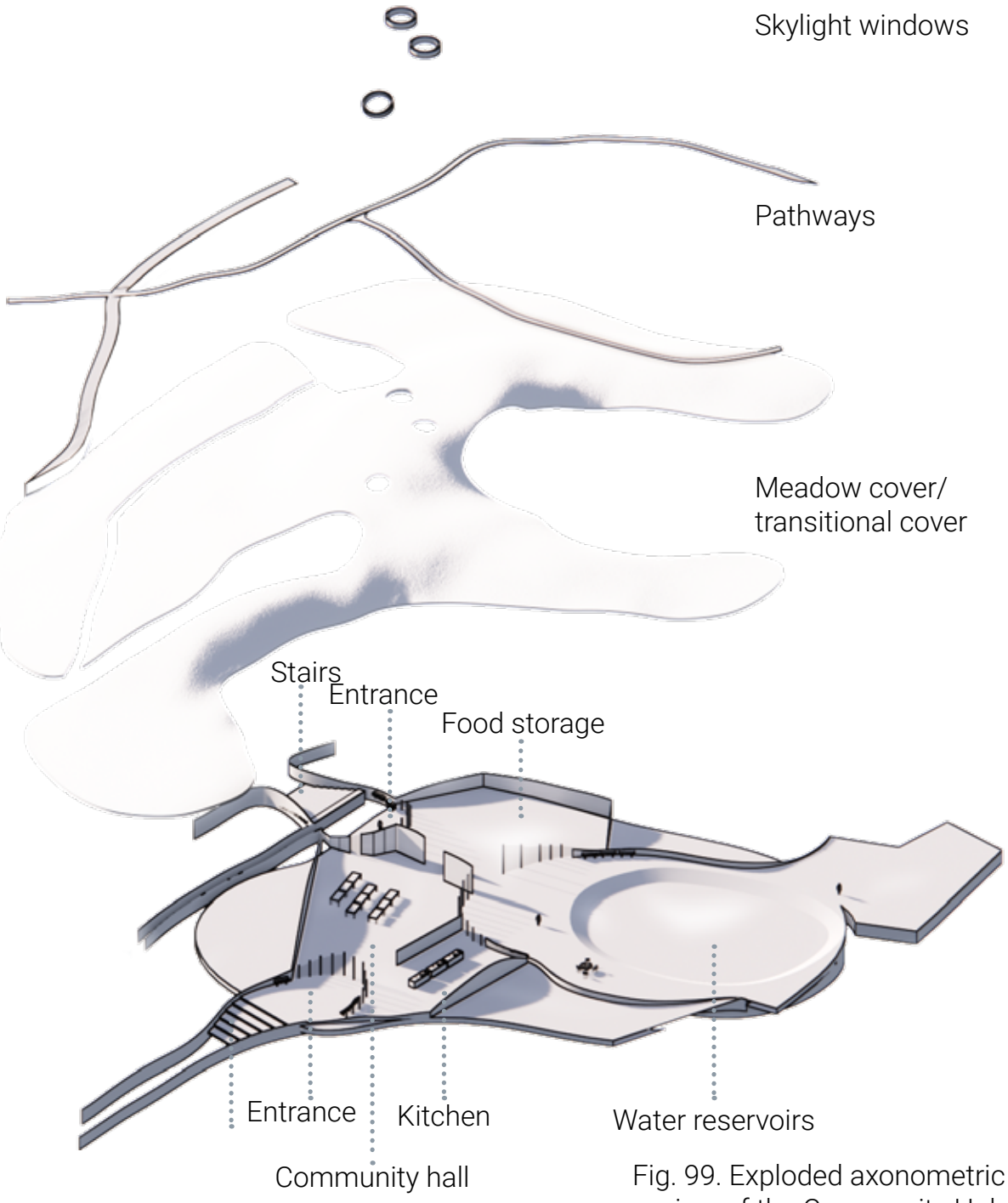


Fig. 99. Exploded axonometric view of the Community Hub

Fig 100. Inside the Community Hub

June 20th 2023.
It's an early evening in Diakonhjemmet Park, you are a student at the University and has made plans to meet two friends at the Community Hub Café to have a snack and a Coffee before you are all heading towards a concert in Oslo Centre. You are a bit late, but you can see your friends sitting outside the café. The Community Hub has become a place where you meet not only to get a cup of coffee, but you have just recently started taking evening classes in gardening. For the most part the classes are outside in the garden, but before every session you meet at the Hub. At first you were hesitant, you thought that it would be way to time consuming and you don't have a very big interest in gardening to start with, but your friend Lise convinced you that it is a perfect way to get your mind of other stuff. In addition, you have already brought home some rhubarb that you made into a delicious pie.

Fig. 101. View from the plaza towards the water reservoir and the Community Hub

6.1.4.

Rainwater

Rainwater management

The Park has the capacity to handle big amounts of rainwater thanks to the two water ponds that will collect and hold rainwater not only from the Park but also from the surrounding areas. The Ponds are placed according to the rainwater analysis.

Rainwater as a resource

The Ponds will not only handle rainwater to protect the Park and surrounding areas from flooding but will also work as water reservoirs to secure the water supply for all plants and vegetables. In addition the ponds/ water reservoirs adds an aestethical value to the park. The boardwalks connects the plaza and the community hub.

Fig 102. Collecting and mitigating rainwater

Fig 103. Boardwalk through and around

Fig. 104. Using the collected rainwater

6.1.5.

Community Garden

Design

The Community Garden is designed inspired by rural cropfields with big plots of vegetables, beets and herbs. The garden is surrounded by different types of apple trees and pears, which creates an open rectangular room. Inside the garden there is only a few cherry trees, mainly for a decorative purpose, as the space is supposed to be kept open to opimize the amount of sun that reaches the garden.
To improve the accessability and to bring down the scale of the space a network of paths squirms through the garden. The pergolas are added for the vertical plants such as cucumbers and to offer shade.

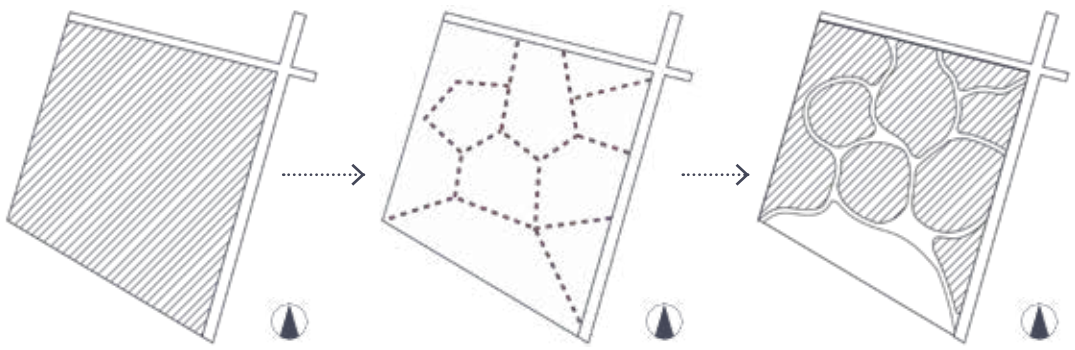


Fig. 105. The Scale of the garden is brought down with pathways

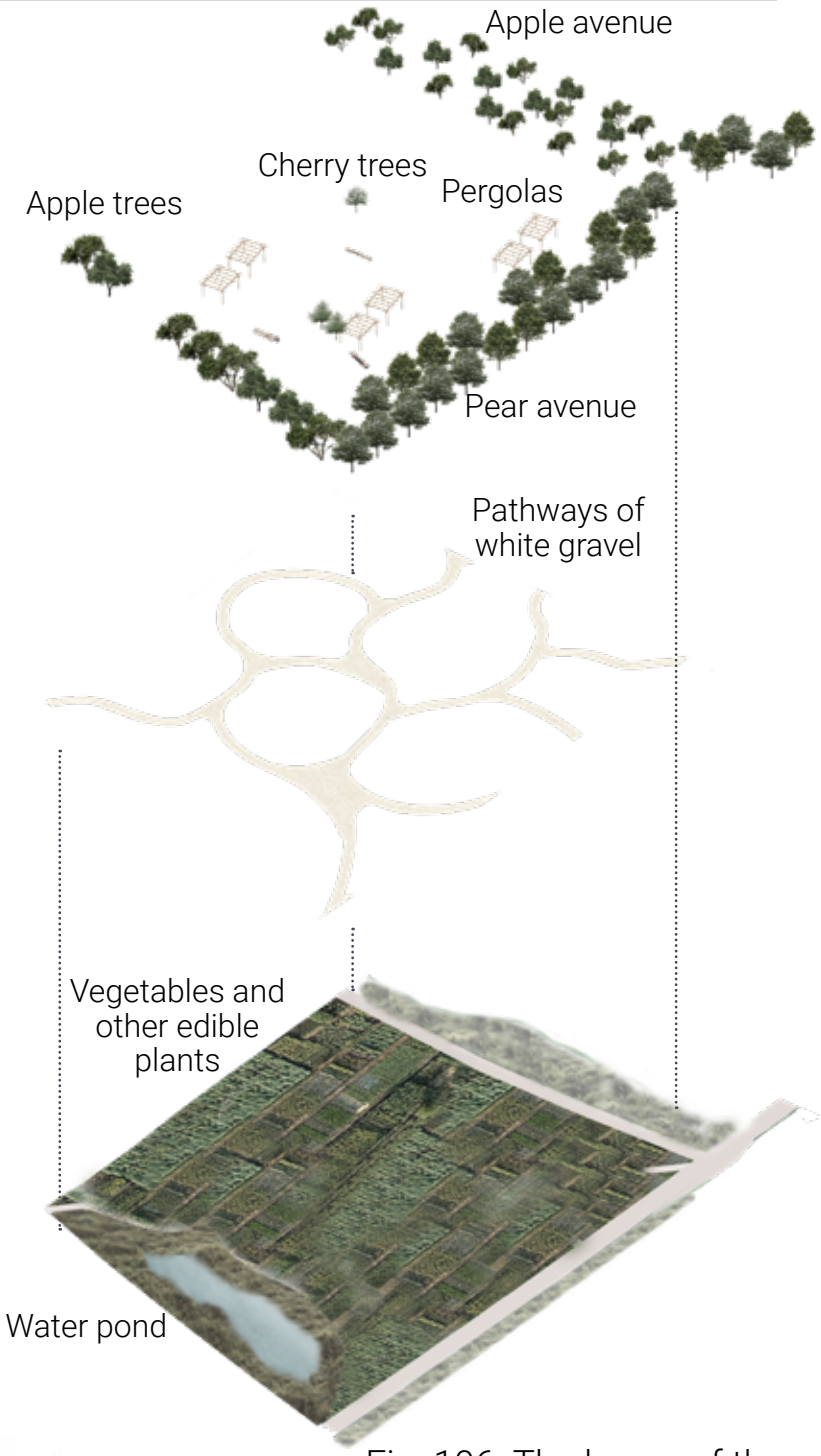
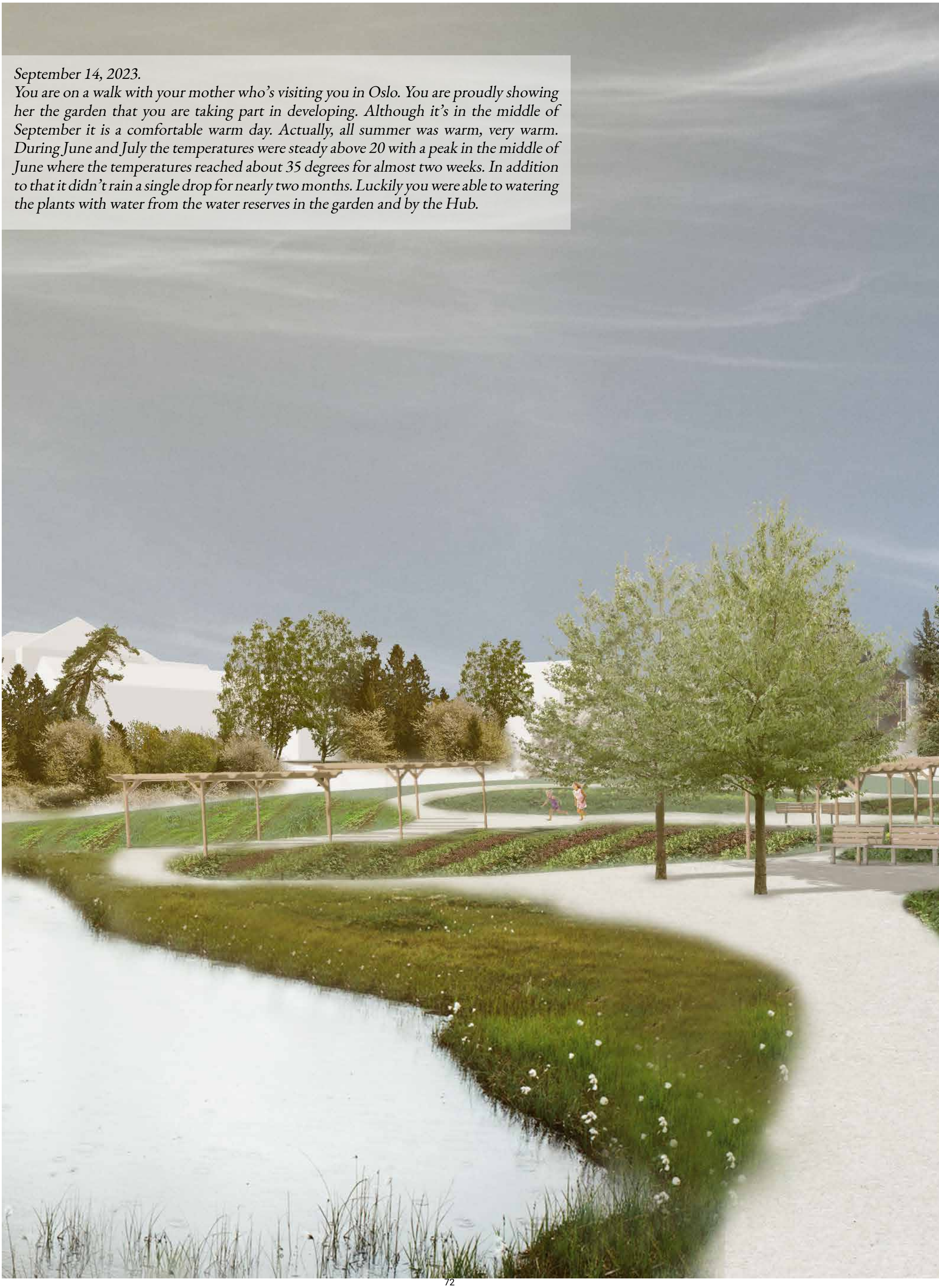


Fig. 106. The layers of the Community Garden

Fig. 107. Axonometric view of the Community Garden

September 14, 2023.
You are on a walk with your mother who's visiting you in Oslo. You are proudly showing her the garden that you are taking part in developing. Although it's in the middle of September it is a comfortable warm day. Actually, all summer was warm, very warm. During June and July the temperatures were steady above 20 with a peak in the middle of June where the temperatures reached about 35 degrees for almost two weeks. In addition to that it didn't rain a single drop for nearly two months. Luckily you were able to watering the plants with water from the water reserves in the garden and by the Hub.



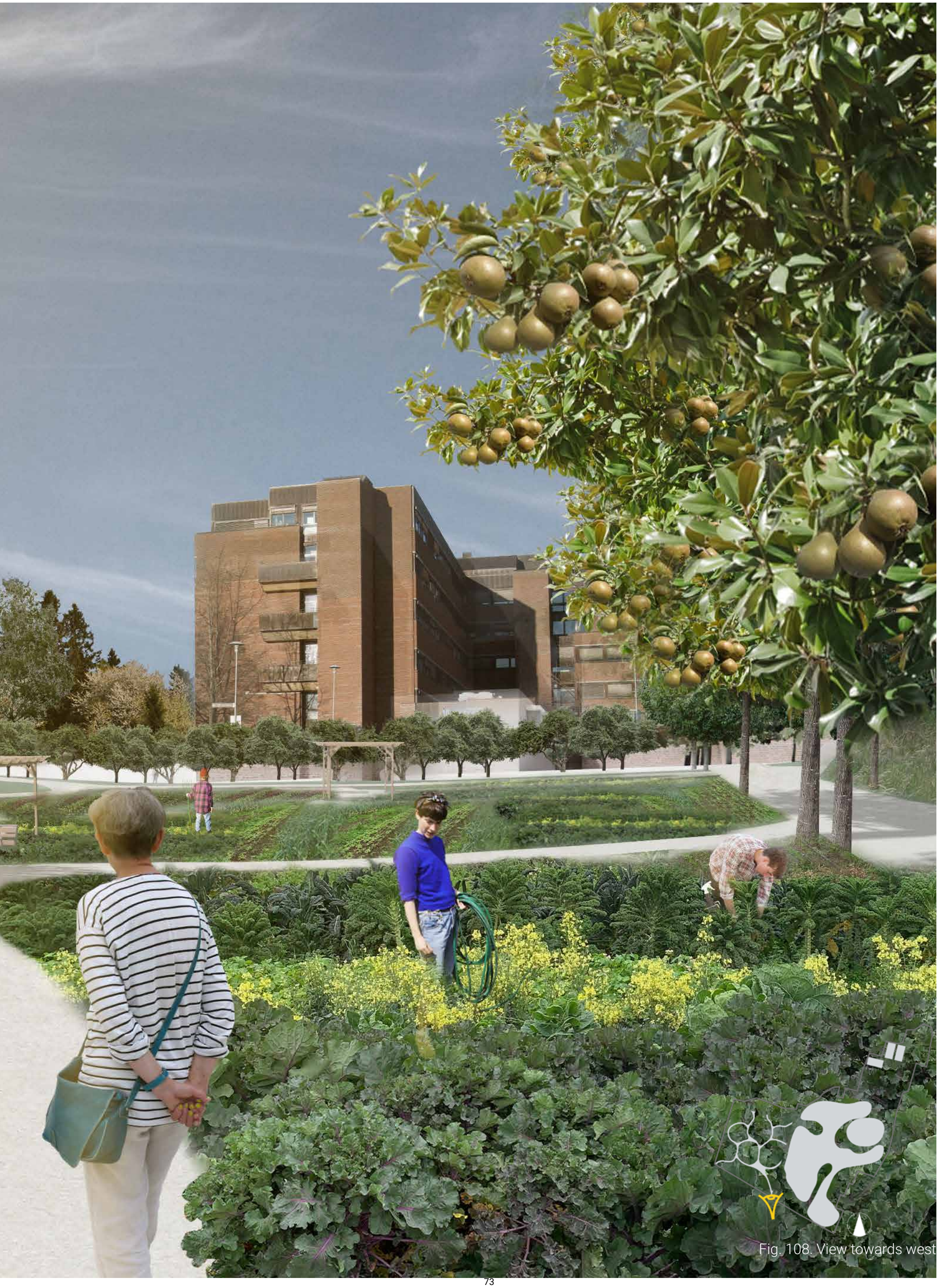


Fig. 108. View towards west

6.1.6.
Suggested plants

Here are a list of proposed plants that would fit the Community Garden. The diagrams are divided into different categorize based on what kind of plant it is and how it is used. Each plant are presented with its biomial name and common name and in what position and type of soil they prefer. Each plant also have a schedule on approximitly when they are supposed to be wplanted and harvested according to general Norwegian Conditions.
Sources: Grønnsaker (Tønsberg & Ingegretsen, 2018) and Urter og Spislige Blomster (Tønsberg & Ingegretsen, 2018).

Vegetables and legumes

Biomial name	Common name	Position: Sun	Position: Half shade	Position: Shade	Soil: Drained	Soil: Porous	Soil: Solid	Soil: Nutritious	Soil: Warm	Soil: Moisty
Aspargus officinalis	aspargus	●			●		○	●		●
Brassica oleracea var botryis ´Gypsy´	cauliflower	●					○	●		●
Brassica oleracea var. Capitata	cabbage	●					○	●		●
Brassica oleracea var. Gennifera	brussel spouts	●					○	●		●
Brassica oleracea var. Italica	broccoli	●					○	●		●
Brassica oleracea var. Sabellica	kale	●	◑				○	●		●
Cucumis sativus ´Diamant´	cucumber (pickled)	●						●		●
Cucumis sativus ´Femspot´	cucumber	●						●		●
Cucurbita maxima	pumpkin	●			●			●	●	
Cucurbita pepo	squash	●						●		
Lysopersicon esculentum	tomato	●			●			●	●	
Phaseolus	beans	●						●		●
Pisum sativum	peas	●						●		●
Raphanus sativus	radish	●	◑					●		●
Rheum rhabarbarum	rhubarb	●	◑					●		

Fig. 109. Plant scheme with vegetables and legumes

Sallads

Beta vulgaris var. Vulgaris	mangold	●	◑					●	●	
Eruca sativa sun. Vericaria	rucola	●	◑					●		●
Lactuca sativa var. Capitata	sallad	●	◑					●		●
Spinacia oleraccea	spinach	●	◑					●		●

Onions and garlic

Allium cepa var. Ascalonicum	Shalott	●			●			●		
Allium porrum	Leek	●			●			●		
Allium sativum	Garlic	●			●			●		

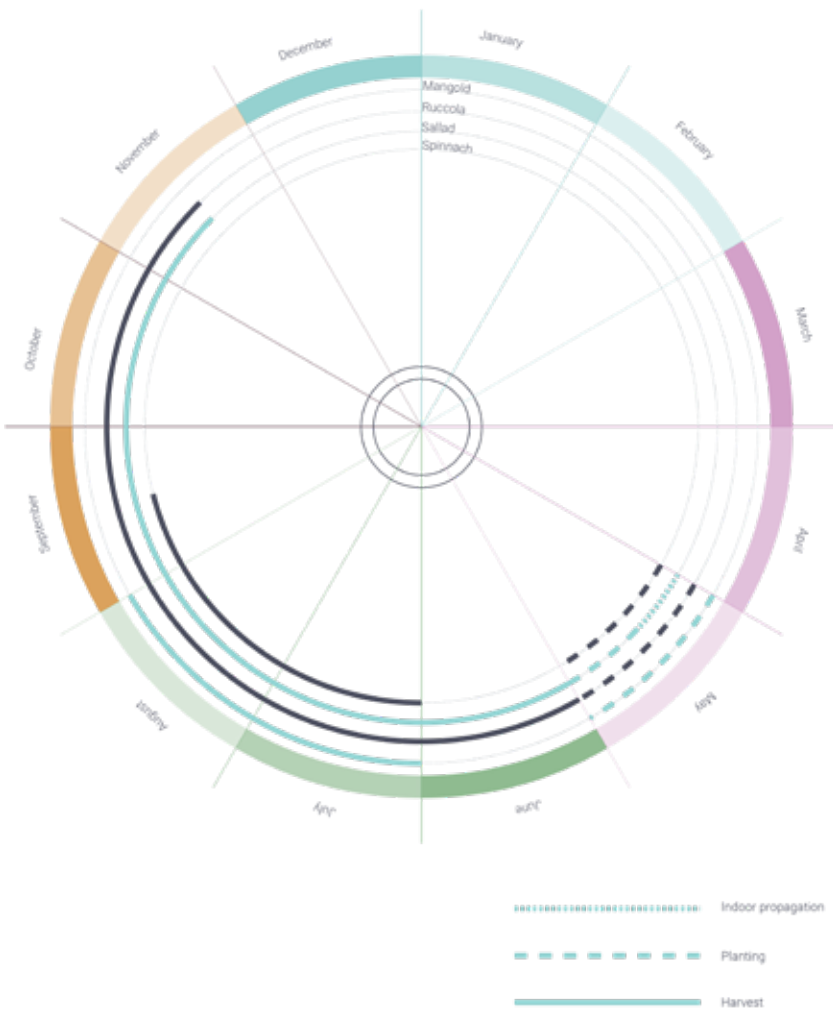


Fig. 110. Plant scheme with sallads

Root vegetables and potato

Biomial name	Common name	Position: Sun	Position: Half shade	Position: Shade	Soil: Drained	Soil: Porous	Soil: Solid	Soil: Nutritious	Soil: Warm	Soil: Moisty
Brassica napus ssp. rapifera	rutabaga	●					○	●		
Beta vulgaris var. condifera	red beet	●	◐					●	●	
Daucus carota ssp sativus	carrots	●				○		●		
Helianthus tubersus	jerusalem artichoke	●	◐			○				
Solanum tuberosum ´Desiree´	potato ´Desiree´	●	◐		●	○		●		
Solanum tuberosum ´Duke of York´	potato ´Duke of York´	●	◐		●	○		●		
Solanum tuberosum ´King Edward´	potato ´King Edward´	●	◐		●	○		●		
Solanum tuberosum ´Maris Peer´	potato ´Maris Peer´	●	◐		●	○		●		
Solanum tuberosum ´Sharps Express´	potato ´Sharps Express´	●	◐		●	○		●		

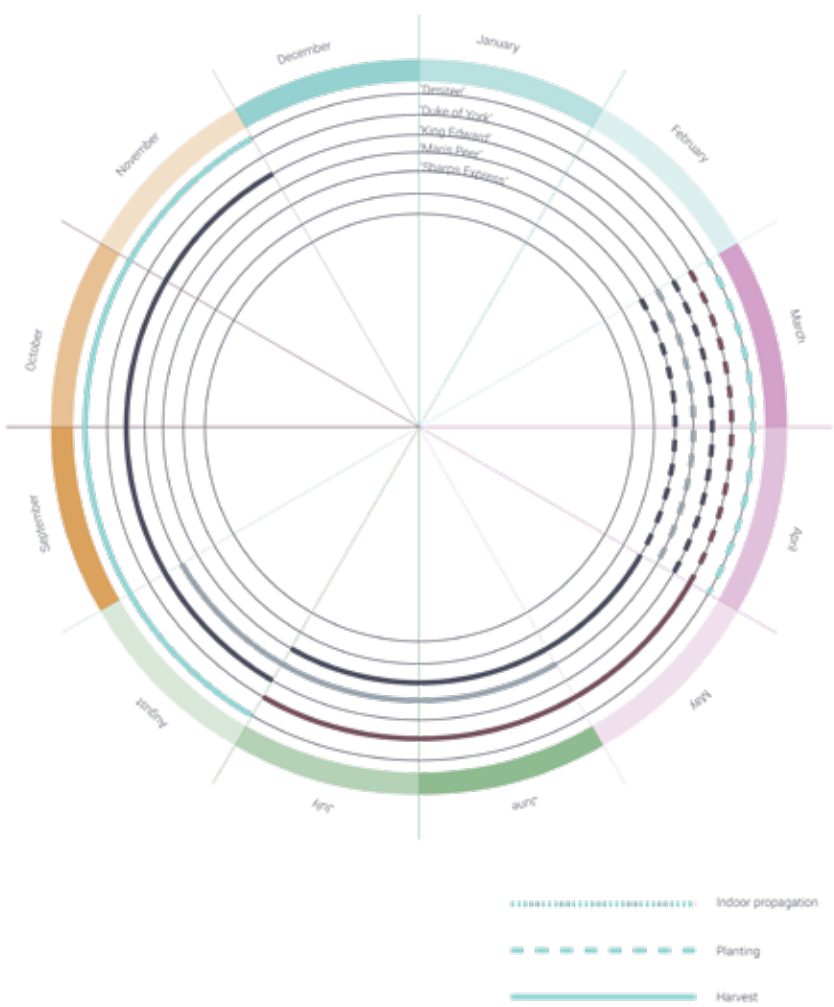


Fig. 111. Plant scheme with potatoes

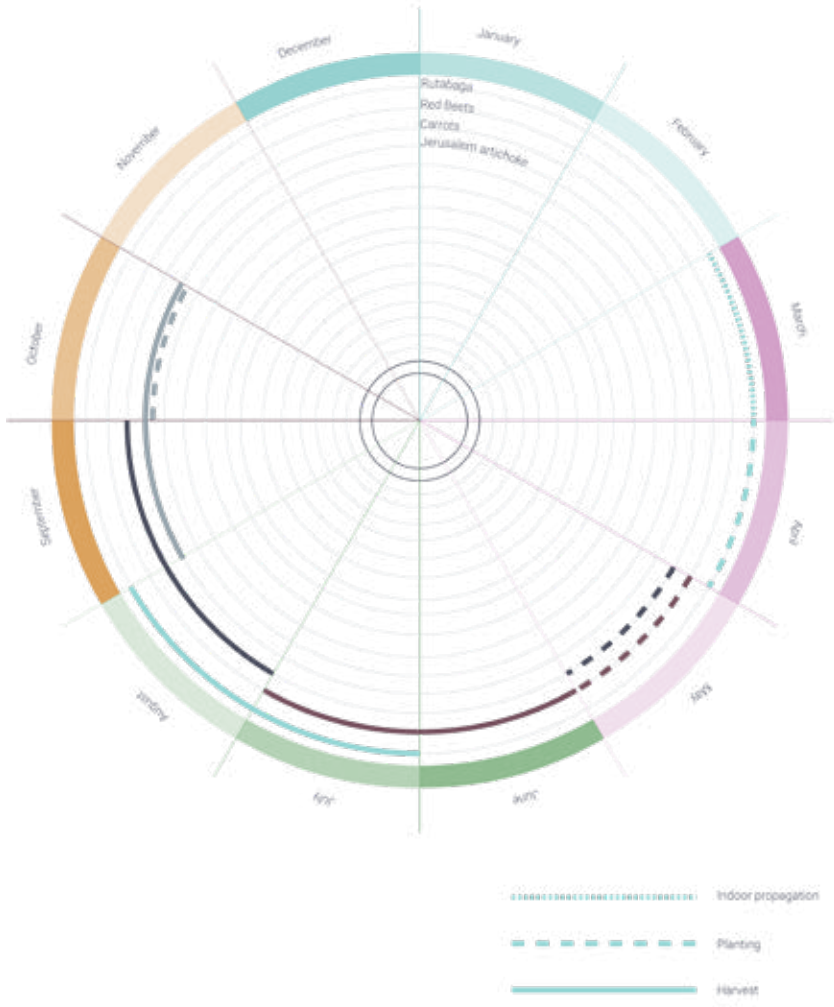


Fig. 112. Plant scheme with root vegetables

Herbs and spices

Biomial name	Common name	Position: Sun	Position: Half shade	Position: Shade	Soil: Drained	Soil: Porous	Soil: Solid	Soil: Nutritious	Soil: Warm	Soil: Moisty
Annual and Biennial										
Agastache foeniculum	anise hyssop	●	◐		●			●		
Matricicaria chamomilla	chamomile	●			●					
Coriandrum sativum	coriander	●			●			●		
Anethum graveolens	dill	●	◐	●	●			●		●
Ocimum basilicum	basil	●			●			●		
Thymus vulgaris	thyme	●			●			●		
Petroselinum crispum	parsley	●	◐					●		
Perennial										
Allium schoenoprasum	chives	●	◐		●					
Artemisia dracunculus	french tarragon	●	◐			○		●		
Hyssopus officinalis	hyssop	●			●			●		
Lavandula angustifolia	lavender	●			●					
Mentha.	mint	●	◐	●	All soils					
Origanum vulgare	oregano	●			●					
Rosmarinus officinalis	rosemary	●			●			●		

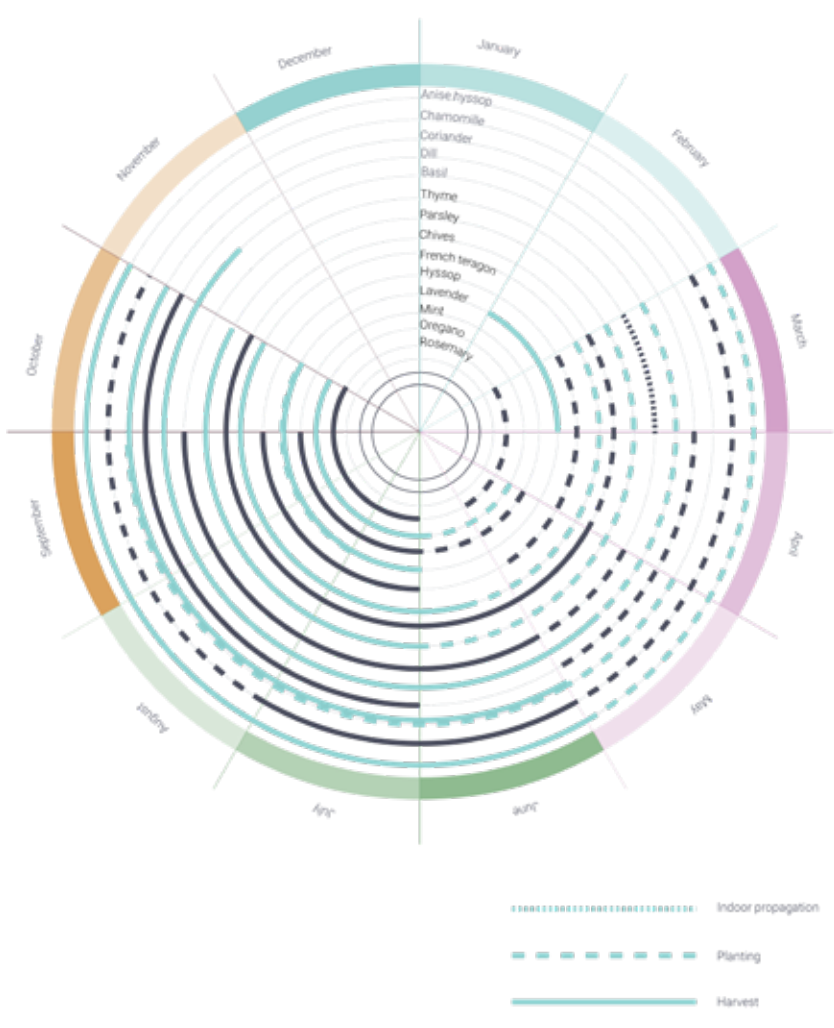


Fig. 113. Plant scheme with herbs and spices

6.1.7.
Trees

All new trees in the park are different types of fruit trees. The apple trees are carefully selected based on their size, decorative values regarding flowering, ripening time and pollination. All apples are able to get pollinated by each other to make sure that they can produce fruit.
Sources: Svenska äpplen (Näslund & af Sandeberg, 2010), Eliteplanter.no (2021),

Biomial name	Common name
Malus domestica 'Alice'	apple 'Alice'
Malus domestica 'Aroma'	apple 'Aroma'
Malus domestica 'Ingrid Marie'	apple 'Ingrid Marie'
Malus domestica 'James Grieve'	apple 'James Grieve'
Prunus avium KLOSTER® E	cherry KLOSTER® E
Pyrus communis 'Anna' E	pear 'Anna' E
Pyrus communis 'Ingeborg' E	pear 'Ingeborg' E

Fig. 114. Plant scheme with trees

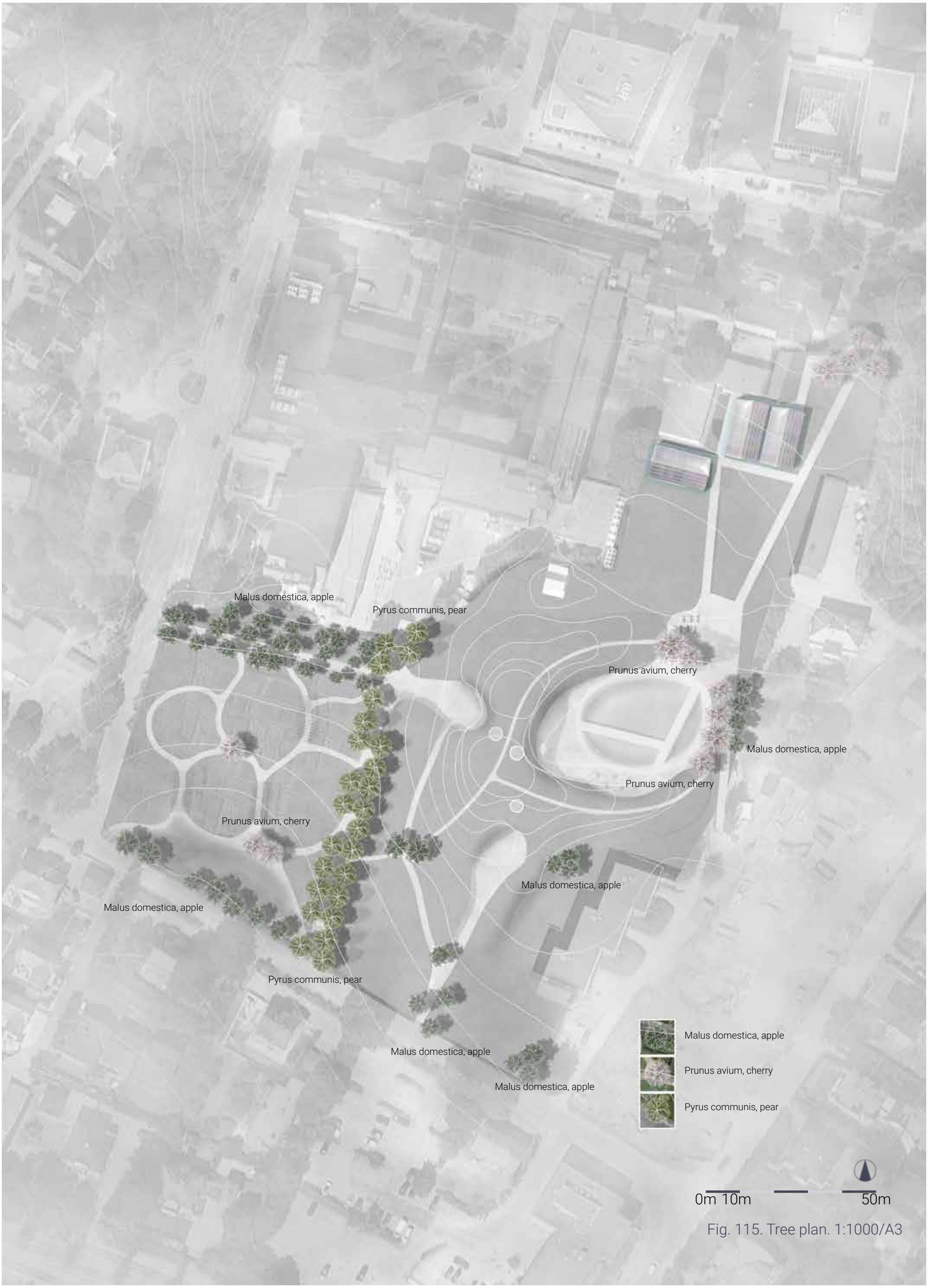


Fig. 115. Tree plan. 1:1000/A3

6.2 Design proposal

Part II - Crisis

6.2.1.

Expanded cropfields

The community garden expands

As an action to secure the food resources in the area the crop fields expand over the park. This means that the possible harvest is more than duplicated compared to normal. In most parts of the park the meadows are plowed and potatos, beets and rutabaga is planted.

The Community Hub

Because of the crisis its more activity in the Community Hub than usual. People from all over Oslo come here to learn how they can start community gardens in their neighbourhoods and backyards.

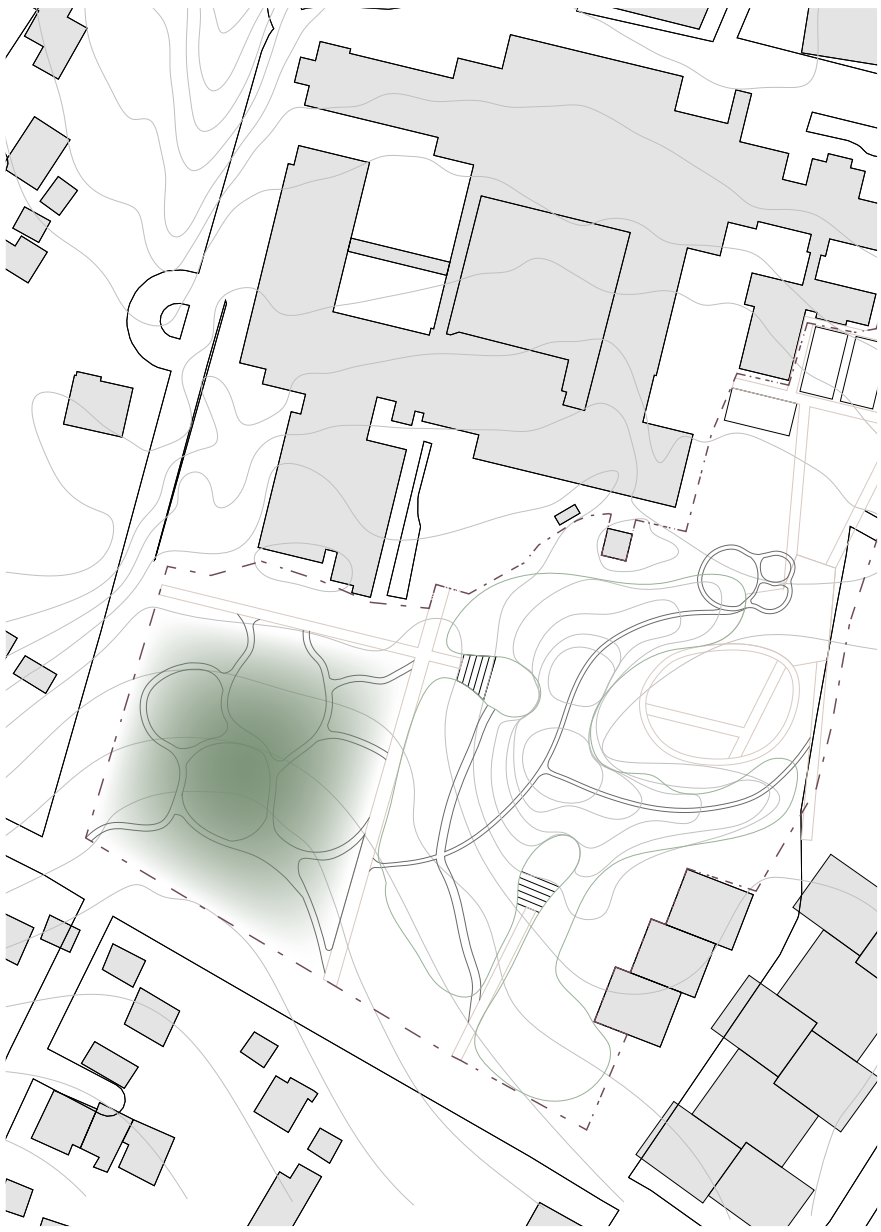


Fig 116. Cropfields before crisis

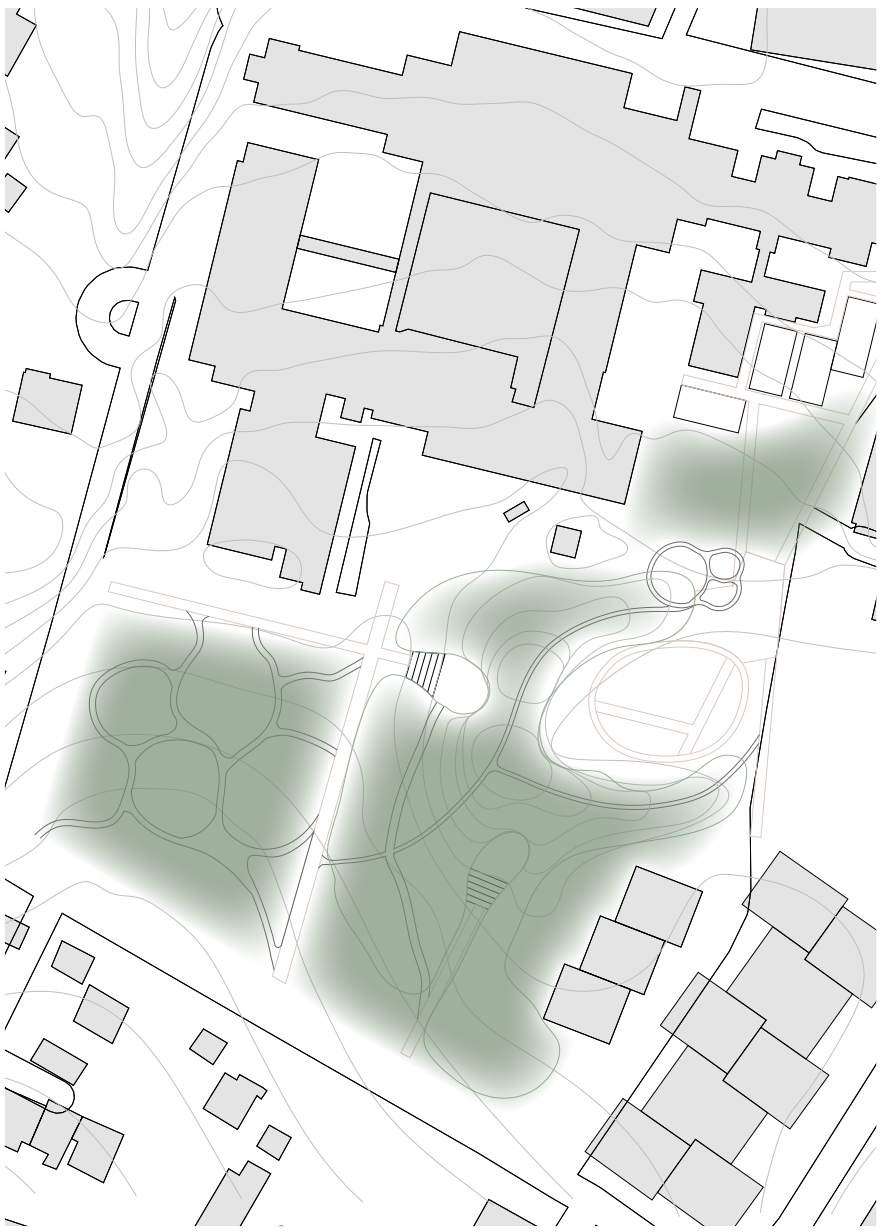


Fig 117. Cropfields during crisis/ the event

Fig 118. Park design during crisis. The Park is now covered by crops of potato, rutabaga and kale.
Plan 1:1000/A3

May 17th, 2027

It's been a year since the war started. Even though Norway is not directly involved and so far, has been able to stay out of direct conflict it is a tension in the air. The Government proclaimed a state of emergency exactly one year ago, on a day on which you and your friends used to enjoy with the rest of the Norwegian public. Since then, many things have happened, the borders closed and since Norway has relied heavily on import of many goods, the park has developed into a community centre where people from all over Oslo come to get seeds and borrow tools to start their own gardens.

What was before meadows and grass are now covered with crop fields, even the roof of the Community Hub is covered of potatoes and rutabaga as they are the easiest to grow and provide food that can be stored all winter. You are taking a short break to drink some water and spectate your fellow gardeners. Since the war started the amount of people participating has absolutely boomed. Since you are one of the senior members of the garden group you have been named manager of a group of 10 that help take care of the plantation. There are six more groups just like yours and you take turn on when to take care of the plantations. It's heavy work, but you have been able to provide food not only for you and your families, but the amount of potato is enough to cover the supply for the hospital as well. Now you are setting a second round of potatoes after the first harvest.

Fig. 119. The southern entrance. Early potato plants to the right and setting of later potatoes to the left

May 17th, 2027

Lunch break at the hub. Since the war started the canteen at the community hub has been busy. Before the crisis, this used to be a café where you and your friends used to go for coffee to enjoy yourself in the sun and maybe play a game of cards. Now it has developed into a community kitchen for volunteers and hungering people. All food served is based on the harvest from the garden. In general, it's good. Well-cooked and it somehow tastes better with the knowledge that you were part of the whole thing. From planting to harvest. But you can't deny that you're starting to get tired of soup with potatoes and rutabaga. Since that's what's easily stored over winter, that's what has been served for a couple of months, with the very welcomed addition of apple pie on Saturdays. But you can't complain. It's better than nothing, and you know that some people have it worse. But now you're looking forward to some fresh vegetables from the upcoming harvest.

Fig. 120. Inside the Community Hub.

Epilogue

October 6th, 2032.

The War came and went, and you feel lucky that you never had to encounter direct conflict yourself. However, times are still different from when you first moved to Oslo as a student about ten years ago. You and your partner has taken your daughter to the park where you were very active in a few years back. You remember that day in the park back in 2023 when you brought your mother to show her what you had been working on all summer. That summer was the hottest so far, but since then the summers have been warmer and warmer and the rains are coming more randomly, but when they do the sky is absolutely exploding. The park is still used as a resource of food for the hospital and your daughter are taking a closer look on the kale that is planted on the side of the water reservoir. You see people in line to order inside the Community Hub, the café is once again a café instead of a temporary community kitchen as it was used as during the years of war.

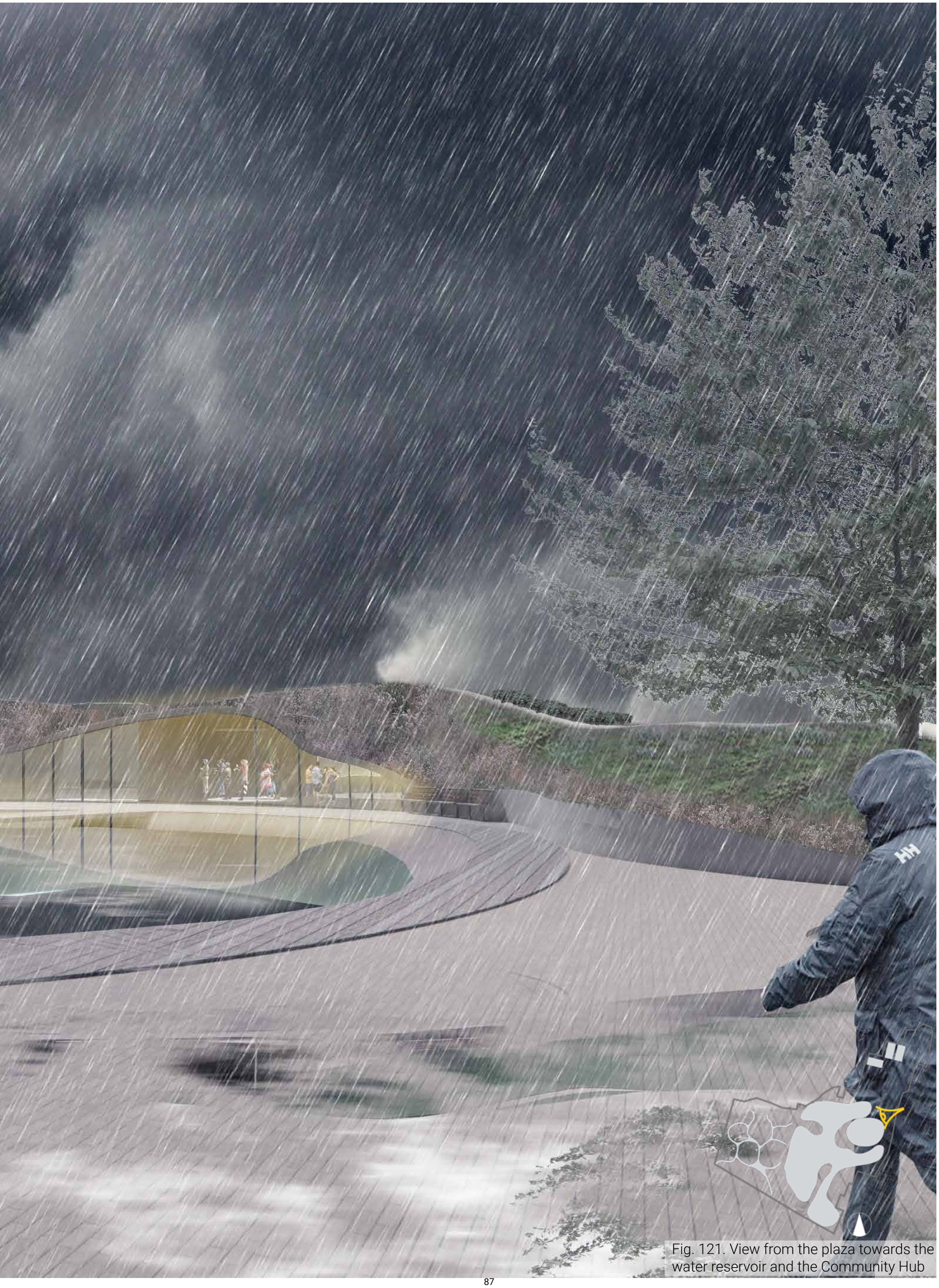


Fig. 121. View from the plaza towards the water reservoir and the Community Hub

7. Discussion

Results

General discussion - how the project came to be

In the beginning of the project, I had grand visions on all the things I would do and investigate, however as so many had told me before, the result has developed into something else than what I had first expected. That said, I am not dissatisfied with how things changed along the way. The project started off in September 2021, however the idea of doing a project somewhat connected to food and/ or foodscapes in an urban context, had been with me for almost two years, since my exchange in the Netherlands. As mentioned before, what inspired this project was also the brochure 'If Crisis or War Comes' from MSB (2018). Based on those sources of inspiration I am very satisfied with how the project has developed since I find myself more educated in the field of urban food systems and resilience.

Does the design answer the question at issue?

The design is in many ways inspired by and in some areas a direct reflection to the research done in this project. I have read texts regarding different fields of urban farming and resilience, and conducted a profound site analysis in which I have touched upon various variables that could affect the park today and could have an influence on how the park could look like during times of crisis. Based on that I claim that the design presented in this project answers, if not on all, but many of the challenges that a possible food crisis could cause. Nonetheless, given the timeframe, I recognize that even more research and even more sketching could have resulted in an even better result.
However, I do claim that the overall park design answers to the question at issue; 'How can Diakonhjemmet campus park be designed in an aesthetically appealing way to resilience and easily be transitioned into producing food during and after crisis?' as well as the sub-question; How does the use and appearance of the park change in such a transition?

To answer the main and sub-question I decided to divide the design proposal into two parts. Part I handles the general park design and how the framework for resilience is integrated into the park. Part II handles the park design in a crisis scenario.

Part I

I have created a park with a framework of physical ability to transition into producing food, teach people about gardening as well as creating a social hub where people can come together to share experiences and knowledge. The park provides a framework for resilience in a practical sense, by providing space for food production on a big scale, given the boundaries of the park. The community garden also comes with other characters of social, educational and health benefits, further making the park design resilient towards a crisis.

The Community Hub was designed with the ambition to blend in with the surrounding hilly landscape and to create the destination point that I think that the park so desperately needs. I do believe that a building, whether it is a café, educational centre, or both, was necessary in the argument of creating a natural meeting point which is independent of external factors such as weather. However, it is not the building itself that is to be this destination, but rather the combination of landscape and building. The landscape is in fact the predominant factor, in the architecture of the Community Hub. With the seamless meeting between the buildings grassy roofs and the surrounding landscape I succeeded with my goal of blending the building within the park, while preserving big areas of the land that could transform into cropfields, in times of crisis.
Although some images and diagrams show an insight of the interior of the Hub, this is not something that I spent neither time nor effort in trying to design properly. Since I am not a trained "building architect" I recognize that the interior design and planning are having some or even many flaws. Furthermore, the interior design of the Community Hub is not very relevant in a conceptual landscape design like the one presented in this project.

Another thing I recognize is that a remodeling of the landscape in this scale is a very big intervention in the park, however I think it has been necessary both for practical and aesthetical purposes. Furthermore, this is my last project as a student, therefore I wanted to design something drastically different from what I have done before, and what I expect to design in many years forward.

Regarding the design and purpose of the Community Garden. I am concerned that a top-down approach towards community making could be a problematic way to start a community garden. As mentioned by Rees & Melix (2019), community gardens initiated by citizens, with a bottom-up approach, seems to be more successful than those initiated with a top-down approach. However, making space for a community garden should increase the likeliness of it emerging significantly. Furthermore, the community garden is an effective tool in the toolbox, that creates the framework for a resilient park in terms of food crises. Afterall, community gardens and urban farming in general have been used before, as a tool for resilience, in times of crisis.
Another important parameter in the design is the two ponds or water reservoirs. In an ideal world I would have liked to put more energy into the functionality of the reservoirs, but since that was never really the purpose of this project, I content myself with placing them in the areas where there is/was the greatest risk of flooding, according to the analysis. The shape of the two water reservoirs were heavily influenced by the organic design idiom.

At an early stage of the design, I intended to give more space and focus to the green houses, as I wanted the park to have a progressive approach towards the challenges that a crisis would cause. When I read about the vertical farms used in Singapore (30 by 30, 2021) I got very inspired. However, after some time and reflection I could not look past the fact that these kinds of solutions are extremely energy consuming. A system like the vertical gardens would be dependent on a steady source of energy. The reliability of high levels of energy makes them vulnerable, as it is not sure whether there is any electricity at all during a crisis. In the end I still decided to add modern green houses, inspired by the ones mentioned in the Wageningen (WUR, 2021) example, but I did not want to claim that these were part of the park

resiliency as the technology are uncertain during crisis.

Part II

The design presented in this part does not stand in big contrast from Part I at first glance of the plan view. However, the user scenarios and the park, viewed in eye-level, are a substantial different experience than that in Part I. It is in Part II one can see how the framework presented in Part I could work. The crop fields are expanded and the role of the park as an even bigger community maker is clear. However, I do realize that crises would or will look different from each other. All I can do is to make qualified guesses on different crisis scenarios based on the literature and analysis. Hence, Part II is purely speculative and more of a strategy, to show how the framework, presented in Part I, could work for resilience in times of crisis.

Methods

The discussion, concerning the method and the design process, deals with the general approach to the problem and the different parts which the design process has involved, such as sketching and visualisations of the analysis, design concept and the final design result. It problematizes the assumptions, the question at issue/ problem and conclusions, that the project started from. This has been done to broaden the perspective and to evaluate the methods for future projects.

Research for Design

Designing as a method of conducting a project, is something we as landscape architects and designers always do. Design as opposed to art, must have a purpose. Design is created to solve a problem, while art can be created to enlighten a problem. Hence, a designer must know what the problem is to solve. The designer must think of the user and how he/ she will use the design and what kind of problem the design will solve for them. In Janssons (et al. 2019) report about Landscape design based on research, Jansson (ibid.) discusses five different models of design based on research. *the artistic model*, *the intuitive model*, *the adaptive model*, *the analytical model* and *the systematic model*. Summarizing the models, they differ in what degree research is used for the design process, with the first one least connected with research and the latter more connected.

The method incorporating the least amount of research, at least in the early stages of a design process, the "Artistic model" seeks to set research aside from the design with the purpose of releasing creativity as "too much research leads to a loss of creativity" (Milburn & Brown, 2003 see Jansson et al. 2019 p. 22). In a beginning stage of the project, I would have claimed that this was the model that best described my process as I tried to think freely, by drawing big and without any specific form or shape in mind. However, at this stage where I am now, I would claim that a project like this one, where the student or designer is required to have chosen a subject of interest for the thesis and a site of design, "the artistic model" as presented by Jansson (et al. 2019) would be almost impossible to claim as a method of design.

Regarding the remaining four it is only the latter mentioned, "The systematic model" (ibid.) that I can reject, as it describes a design process done by a robot. However, I do see links to the "Analytical model" (ibid.) in my design process. In my sketches I can see this as a direct result from the articles and pictures I have studied. The design proposed in these sketches are much more programmed and with less regard to the aesthetics of the design. A good example of this is how the community garden developed from a cropfield, very much inspired by traditional rural agriculture and the historic landscape references of Diakonhjemmet. Out of the four models mentioned, I recognized some sort of middle ground between the *intuitve model* and the *adaptive model* as the methods best describing the result presented in this project. While the *intuitive model* corresponds with some parts of the design, the *adaptive model* does with other.

A delayed site visit

When this is written we are still in midst of the Covid-19 pandemic that changed the everyday life for most of the global population. Norway, as well as many other countries, have tightened its borders, thus making it harder for me to travel from my current home in Copenhagen to Oslo in September as originally planned. However, the site visit was finally conducted in November 2021. By that point I had worked with the project for almost two and a half months already. Although I had worked with Diakonhjemmet during my internship for several months and with this project for little more than a half semester, I was surprised by how different the area was from what I had interpreted it to be from maps, images and my 3D-models Thus, proving the importance of site visits at an early stage in a design process, simply because it is hard to visualize space purely based on digital or printed material. I went to Oslo for in the beginning of November and had time to visit the park twice during my stay. Once In the afternoon of Thursday the 10th, and in the morning after. Initially my plan was to go there once, but as I came there in the afternoon, the sun was already on its way down and the light not ideal for images, due to the position of the sun in the sky, thus a very bright backlight in the images taken towards the south of the park.

The site visits also gave me valuable information about the "dyrknings kasser" or pallet collars that are placed in the center of the park today. Althogh the pallet collars did not contain a lot of plants and/ or vegetables, they gave me a hint of what kind of plants that can be planted in the park. In November the temperature not seldom goes below zero degrees Celsius in Oslo, therefore it was valuable to see what plants that still lived and flourished in the pallet collars. This was also confirmed during my second visit to the park, in the morning of the 11th of November. As I visited the park the frost was still visible in the shade and on some of the vegetables.
Luckily my design at that point fit quite well into the landscape and the main ideas could be further developed with input from the site visit.

The Narrative Design Approach

By using a narrative design approach, I hoped to be able to tell a story through my design. The original idea was to implement the narrative throughout the whole process of the design, however as the project changed and as new knowledge was acquired through the literature study and site analysis, it became difficult to tell a consistent story throughout the entire project. The narrative changed along the way and so did my attitude towards the narrative design approach, as a method of design, for this project. In the end I decided to tell stories through images instead. In the design proposal you, the reader is the main character through a timeline, consisting of different events that are linked to the purpose and question of this project. The narrative proved to work well as a method to explain the design and how it changes through different events or scenarios in a more playful and speculative way.

SWOT-analysis

The SWOT-analysis was an effective method to collect and summarize the information I received from the other types of analysis I used in this project. The SWOT-analysis was also effective in the translation of the site analysis into a program of the site since the SWOT compresses the site analysis into a manageable list of pros and cons. The SWOT-analysis is therefore only valuable if the variables it is based on have been properly examined.

Conclusion

During the past months I have studied and investigated urban food and urban farming in the event of crisis. I have designed a campus park with the ability to transform into a destination regarding food in times of crisis. Based on this I have come to the conclusions that;

- It is possible to create urban green space with an aesthetical appealing design that in the event of crisis can be transformed into producing food.

- Since this is a conceptual design proposal, it is hard to tell if the park design and its functions will work when it comes to create social resilience. Community Gardens are an effective tool for this purpose. However, it is very important that the initiatives are well grounded in the public community.

Further research

- What role does landscape architects, architects and planners have in the civil contingency for food security and food resilience?

- How can the public get activated on the issues regarding food security in times of crisis?

- What would be the best plant selection for such a transition in terms of how much food the park can produce and what is the most nutritious choices for a bigger crowd?

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