REMINISCENCE

A socially sustainable dementia home

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Abstract

Studies estimate that between 64-80 % of all the elderly living in care centres in Denmark have some type of dementia diagnosis, but far from most of the care centers are designed for people with this diagnosis. Therefore, this thesis aims to rethink how nursing homes are built today by making up with the frames of institutions. The goal is to create a design that contributes to the life quality of the individuals and considers each user's unique needs, preferences, and experiences rather than simply addressing their disease's requirements.

By taking the point of departure in a user-centred design and socially sustainable approach to architecture, the 'state-of-the-art' concept of a "Dementia Village" will be deployed to ensure autonomy in a homely and safe environment for the users. In addition, we aim to reinterpret the principles of a town by implementing design strategies such as creating landmarks, visual connections and legible architecture to facilitate easy wayfinding and different levels of community and privacy.

A study was conducted on the current and future development of the population and coverage of existing nursing homes with a focus on dementia. It was found that Aabenraa municipality showed one of the biggest increases in elderly residents and had one of the least coverage of nursing homes. For this reason, a site in Aabenraa City was chosen. To include the primary user group in the local community, choosing a central and easily accessible plot was important as a part of a socially sustainable approach to the thesis.

Reading guide

This thesis report consists of eight chapters. All illustrations were created by the group members unless otherwise noted. In general, all drawings are oriented with north pointed upwards, unless otherwise specified. If a scale for any drawings is not explicitly stated, please consult the accompanying drawings folder for clarification. This folder complements the report and may provide additional information regarding the scale or other details of the illustrations. The Harvard reference method is used throughout the report, and all references are compiled at the end of the Epilogue chapter.

Contents

Motivation

Every year in Denmark, 8.000 people get diagnosed with dementia, which is predicted to grow according to demographic patterns. By 2040, there is an expected 150.000 cases (Ældre Sagen, 2022; Nationalt Videncenter for Demens, 2022). It is estimated that 64-80 % of the elderly living in care centres in Denmark have some type of dementia diagnosis, but far from most care centres are designed specialized for patients with this diagnosis (Ældre Sagen, 2023; Pabst, 2021).

By investigating the role of architecture when shaping spaces for people with dementia, this thesis seeks to design a building that contributes to the life quality of individuals with this condition and creates inclusion and equality in the local community of Aabenraa. Therefore, this thesis aims to rethink how dementia care institutions are built today by making up with the frames of traditional institutions. By carrying a phenomenological approach, the concept of home will be developed to design spaces that promote well-being and safety. Furthermore, the design should consider each user's unique needs, preferences, and experiences rather than simply addressing their disease's requirements.

Approach

Combining the precision of engineering and the artistic expression of architecture, this approach seamlessly integrates functionality and aesthetics. However, when it comes to designing for dementia care, the research scope goes beyond the usual boundaries of architecture due to its complexity.

A comprehensive understanding of the individual experiences of dementia requires a holistic view, integrating insights from psychology, sociology, and neurology. That expanded knowledge base contributes towards creating an architectural design that genuinely acknowledges and caters to the diverse needs of dementia patients.

Key architectural aspects such as the quality of light, precise detailing, and thoughtful material choices are prioritized during the design process. These elements significantly enrich the spatial experience and enhance the aesthetic beauty of the architecture. The overarching goal is to create a functionally efficient environment that stirs positive emotions and fosters social interaction and a sense of belonging.

This approach takes inspiration from Danish and Nordic building traditions, known for their fusion of simplicity, functionality, and deep connection with nature. These age-old traditions are reinter-

preted to resonate with a contemporary context. Classic atmospheres, traditional construction techniques, and natural materials are thoughtfully incorporated into the design, adapting them to meet the evolving needs of the modern user.

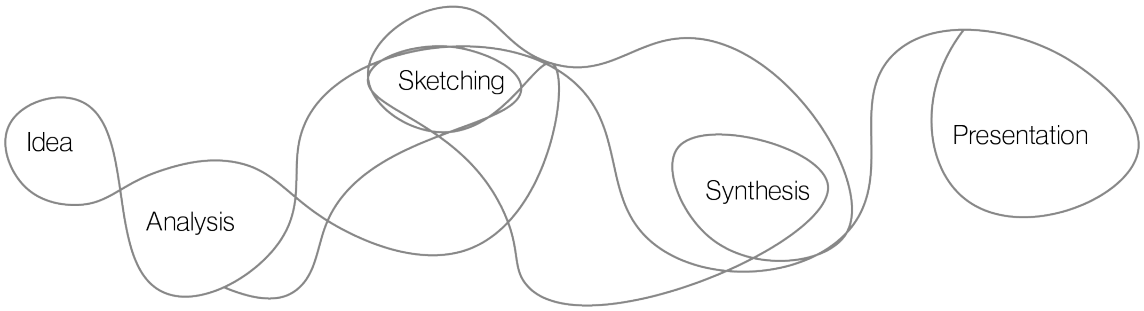
By merging social and environmental considerations into these architectural traditions, the design seeks to create spaces that encourage community interactions, promote individual autonomy, and maintaining a harmonious relationship with the surrounding environment. The balance between tradition and innovation, function and aesthetics, results in a unique architectural vision that places the human inhabitants at the heart of its design.

Methodology and methods

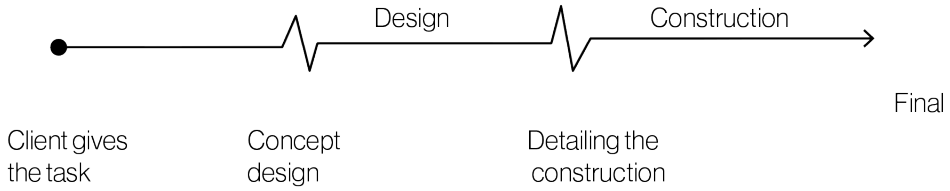
INTEGRATED DESING PROCESS

The Integrated Design Process (IDP) is widely adopted in the Architecture and Design program at Aalborg University due to its comprehensive approach to architecture and design. Through its five phases (see ill.01), the IDP presents an iterative process where the phases overlap. It allows the integration of new and previous information from relevant fields and the possibility of making frequent adjustments to the design or focus of the project as it evolves (Ikudayisi et al., 2022; Larsson, 2009; Knudstrup, 2004). In that sense, IDP serves as the basis for the design process in this master thesis on designing a village for people with dementia.

To understand why the IDP is chosen as the primary method, it seems necessary to dig down into how the conventional design process (CDP) works. In contrast with the IDP, a CDP has a linear structure where the process starts with a project definition or, in a practice context, a client's needs (see Ill. 02). Afterwards, a pre-design phase and a concept design phase emerge, giving way to a design development phase. When the design is, agreed technical aspects and requirements must fit; thus, the construction drawings can be done. The most significant disadvantage of this method is that it does not allow rethinking and optimizing the design during the process. In contrast to the IPD, the CDP does not integrate engineering aspects in the early phases of the design, which can be very difficult and sometimes impossible to implement in the last stages of the design. The CDP may seem simple because of the fact of not design a multidisciplinary perspective where many aspects play a significant role. However, the final design often needs more energy performance, inadequate construction, and an indoor climate that does not meet the standards (Ikudayisi et al. 2022, Larsson 2009).



Ill.1. Diagram that represents the design process when using IDP



Ill.2. Diagram that represents the design process when using CDP

The IDP in architecture has several advantages but also presents challenges in implementation that must be recognized. To ensure a successful outcome, it is essential to have a clear problem statement and proficient use of design and calculation tools to handle the technical aspects of the process, which is inherently interdisciplinary.

The challenge of designing for people with dementia demands a holistic solution that considers and integrates inputs from different fields. Therefore, the IDP will be utilized alongside other methods and techniques, such as phenomenology, evidence-based design, and user workshops, to supplement and enrich the overall approach. In order to incorporate essential aspects like sustainability, human well-being and thermal comfort in the design. Furthermore, there is a desire to create diverse atmospheres that enhance the users' daily day and integrate these with an indoor environment that adapts to users' needs.

USER INVOLVEMENT

This thesis will focus on creating a building that enhances the lives of people with dementia. Therefore, user involvement and a solid user profile will be crucial for the design outcome. As it has been established in many studies, user participation is essential for creating architecture of high quality and usability (Kim et al., 2015; Caixeta et al., 2019, Christiansson et al., 2011). First, however, there is a need to establish to which degree the users will be involved to choose the appropriate methods for user involvement (Kim et al., 2015). This thesis aims to implement an "informative" level of user involvement, which stems from Damodaran's proposition (Damodaran, 1996). This level of participation suggests that users will merely be a part of the initial analysis as informants provide information about their requirements, needs and preferences (Caixeta et al., 2019). However, due to the project's user group of elderly people with a cognitive disadvantage, there might not be possible to involve the primary user personally. Therefore, the information gathered on the user must be based on research, EBD, personal experience from working with the user group and interviews with the caretakers. In addition, the caretakers have limited time to participate actively in the design, and it will therefore be limitations to how many times the users can be consulted during the design process.

To represent and present the users in the report, methods like; Persona and storytelling will be used to ensure that the focus lies on the users' needs and wishes throughout the thesis and thereby certify a higher level of usability of the design (Long, 2009; Pruitt & Grudin, 2003, Tvedebrink & Jelic, 2018). In addition, creating a persona and storytelling is not only an excellent way to enhance the focus on the user perspective and generate awareness and sympathy of the users for the design development but also a good way to communicate this clearly to the recipient of the report (Tvedebrink & Jelic, 2018; Pruitt & Grudin, 2003).

EVIDENCE BASED DESIGN

Due to the multidisciplinary nature of the motivation and the IDP, the evidence-based design (EBD) will be utilised as a complementary methodology in the design process to ensure well-argued and informed design decisions. Designing for individuals with dementia, their families, and caregivers can be challenging, requiring up-to-date research to inform the design process and arrive at optimal solutions. Therefore, EBD will be employed in the analysis and sketching phase to gather the current relevant evidence to understand better the users and what is best in practice regarding dementia and architecture. To employ this EBD, it seems necessary to understand the definition of the method and how it is relevant when designing for people with dementia.

"Evidence-based design is a process for the conscientious, explicit, and judicious use of current best evidence from research and practice in making critical decisions, together with an informed client, about the design of each individual and unique project." (Stichler & Hamilton, 2008)

In architectural healthcare design, EBD applies research findings to design practice and presents the most reliable evidence to aid architects and designers in making informed design decisions that benefit building users (Marquardt et al., 2014). The primary objective of the method is to ensure that design decisions are based on reliable and up-to-date evidence, which can ultimately lead to improved outcomes for the users. EBD has been employed in healthcare architecture to enhance the well-being of patients and staff, reduce stress, and improve the healing process and safety due to the possibility of using research that takes account of the user's needs and preferences. (Stichler & Hamilton, 2008; Phiri & Chen, 2014).

During the analysis phase, best-in-practice research through academic papers, articles, user interviews and workshops will be utilised to collect empirical evidence valuable for the design development. Afterwards, the acquired knowledge and information must be translated and applied into sketches and form studies. To ensure that specific design criteria will be developed based on the research, giving guidelines for the sketching phase of the thesis. However, as the design process develops, the collected literature and knowledge will be reviewed to ensure the design meets the established criteria. Further surveys on new relevant topics may also be needed according to how the process evolves.

SITE ANALYSIS

There is a common belief for the group that a project should relate to the place and appear as a natural part of the site or city in which it is situated. To achieve this, it is necessary to understand and experience the project's location and context and gain knowledge about the heritage and culture of the place (Norberg-Schulz, 1980; Zumthor et al., 2006) to understand the 'genius loci'. The 'genius loci' is a concept that implies that all places have a unique identity that is shaped by a combination of physical, cultural, and historical factors and considering these factors can create more harmonious, responsive, and meaningful places for the people who inhabit them (Norberg-Schulz, 1980). For this reason, both field and desktop analyses of the chosen area will be conducted to ensure a collection of both qualitative and quantitative data for the design process.

A field trip to Aabenraa will be conducted to conduct registrations and empirical analysis on the site and in the city. A version of the situationist method of drifting will be the primary method for analysing the spatial experience and form of the town. Drifting, or dérive, aims to explore urban environments by walking around without any predetermined destination or agenda and allowing unexpected experiences or chance encounters to guide the path. The method will give a subjective view of the area, but Guy Debord believed that it would create a more authentic and meaningful experience of the city. (Debord, 1958) The drifting exercise will, however, not end up in a cognitive map as the method suggests but will merely be used for gathering information, getting a better understanding of the environmental conditions and of the 'genius loci' of the context and site in which the dementia nursing home will be situated in.

To get a less subjective understanding of the site, desktop studies will be conducted to understand local regulations from the municipality and the city's planned development. The desktop analysis will also contain mapping out relevant functions and qualities of the site, which can benefit the nursing home residents and create more inclusion for the residents into the city. Lastly, the urban morphology of the local context will be analysed further to better understand the built environment with the aim of creating a building which relates to its location.

"(..)BUT IF YOU HAVE A DEMENTIA DIAGNOSIS OFTEN IT MAY SEEM THAT EVERYTHING STOPS AROUND YOU. THAT MAY BE SOCIETY'S BIGGEST ETHICAL CHALLENGE, NOT TO SEE PEOPLE LIVING WITH DEMENTIA AS PATIENTS BUT JUST AS SOMEONE WHO HAS A SET OF NEEDS AND REQUIRES SUPPORT TO LIVE WITH THOSE NEEDS."

(Roberts, 2023, p.6)

THE USERS

The following section delves into user groups, a crucial aspect of informed design decision-making. This exploration involves an analysis of various surveys conducted to understand the users, their situations, and the challenges they face.

The knowledge presented here draws heavily on first-hand experience from a team member who worked in a nursing home. This practical perspective is complemented by extensive academic research, analysis of relevant documentaries, and interviews, which strengthen the understanding of user groups and their architectural needs. The synthesis of these insights aims to guide the ensuing architectural design process, developing a design that caters to its users.

What is dementia?

To design for persons with dementia, getting a deep understanding of the disease seems necessary due to its impact on the project.

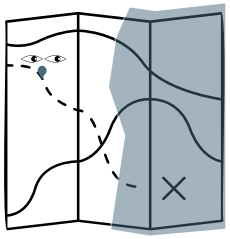
Dementia is a life-altering condition that impacts individuals diagnosed with it and their relatives. In Denmark, it is estimated that roughly 8,000 people are diagnosed with dementia annually (Social-, Bolig- og Ældreministeriet, 2023). It is a collective term to describe a group of diseases that manifest in distinct stages, each with different symptoms and care needs. The conditions that cause dementia; have common symptoms such as difficulty remembering or thinking, communication and confusion about time and place, and problems with visual perception and wayfinding. The loss and damage of nerve cells caused by diseases resulting in dementia lead to a progressive and degenerative condition. The challenges of wayfinding in dementia are directly caused by the neurodegenerative factor, as this process is linked to cognitive problem-solving that relies on multiple brain functions.

Consequently, spatial orientation and wayfinding challenges can strongly impact behaviour, emotions, and social interactions (Kuliga et al., 2021). Unfortunately, there is no cure for these conditions, and the associated diseases often are terminal. While dementia primarily affects older individuals, it is crucial to emphasize that the disorder is not a natural consequence of ageing. (Alzheimer's Society, 2022; Landmark et al., 2022; Social-, Bolig- og Ældreministeriet, 2023)

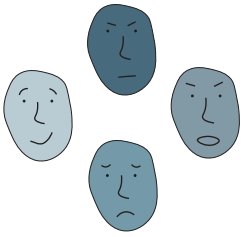
In this project, dementia will refer to the common symptoms of the diseases that cause it, avoiding other symptoms that may follow these. That makes dealing with such a big topic more tangible during the process. Despite the lack of a cure for dementia, this thesis is driven by the belief that improving the quality of the spaces used by patients, caregivers, and their relatives through architecture aims to create a more supportive and beneficial environment for them.

Memory loss

Communication problems

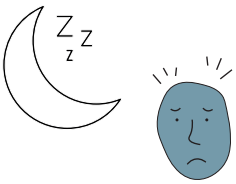


Visuospatial issues



Emotional and behavioural changes

Executive function



Sleep difficulties

III.3. Challanges caused by dementia

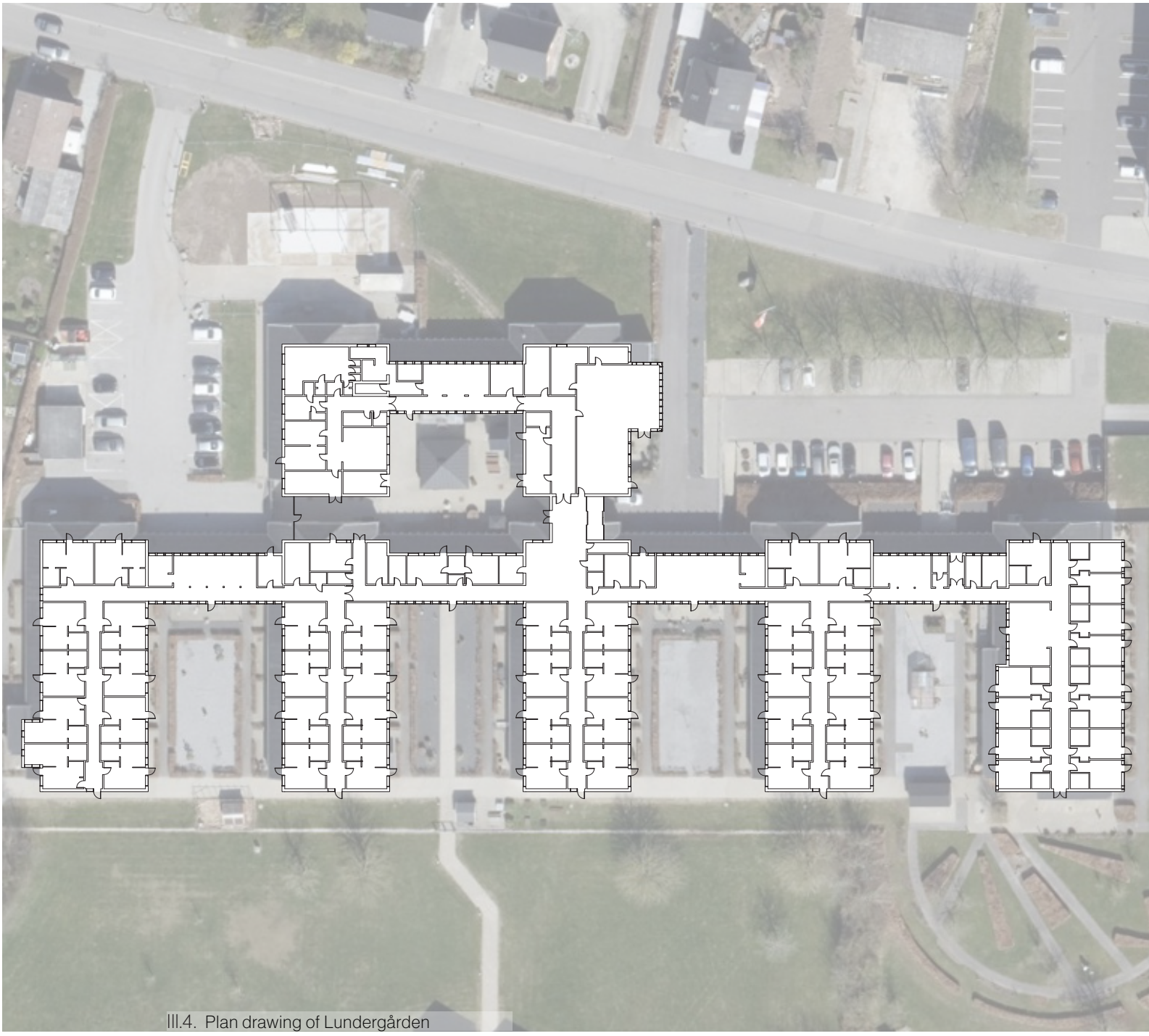
Case study: Lundgården in Vrå

As part of the research, it was desired to visit a nursing home that specializes in dementia care. The goal was to conduct informal interviews and experience the environment firsthand. Lundegård stood out as an interesting choice, as their facility is adapted to their residents and based on the concept of a "Dementia Village." This concept is further explored in the report's theoretical analysis, making Lundegård an ideal place to evaluate and experience the theory in practice.

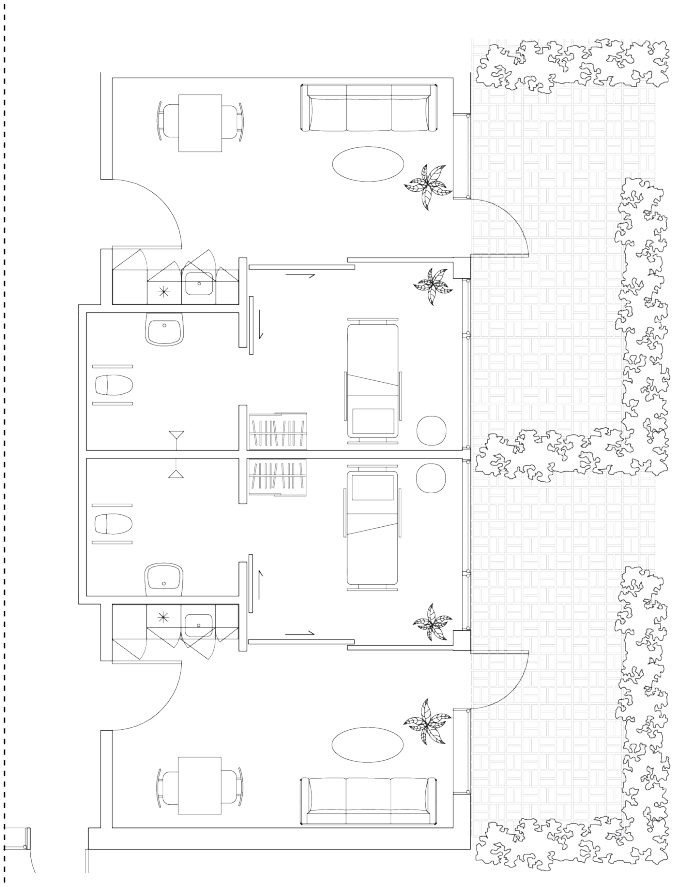
Lundgården is a nursing home for people with dementia located in the residential area of the small city of Vrå. The facilities were built in 1974 and started as an independent institution. Today Lundgården is a publicly owned nursing home with 48 apartments in its 4403 m^2, of which 30 of them are assigned to people with dementia (BBR, n.d.; Hørring Kommune, n.d.). The residence is built on a 28153 m^2 plot and therefore has a big garden and no less than five courtyards.

In 2017, the nursing home implemented the concept of a dementia village into the existing building (Hørring Kommune, n.d. *Lundgården*). The vision was to focus on the person instead of the disease and give the residents a better everyday life with more autonomy and activity in a safe environment (Hørring Kommune, n.d. *demensbyen*). For this purpose, they renovated one of the sections in the building to accommodate new facilities like; a one-seat hairdresser salon where one of the towns hairdressers comes and offers their services occasionally or a thrift shop where the residents can buy everything from used clothes to books or decorations. They also have a wellness room, a cinema, a small grocery store, a bar and a sensory room. (See appendix 01)

Even if the intention of all the facilities is well intended, some of the activities are more successful than others. Some of the less successful activities are the cinema and the sensory room. The cinema does not get used that often, but the staff believe this may be a bigger success if they arranged "movie nights" for the residents to attend rather than just leaving it up to the individual to use the equipment when they want to. One might also reflect on the room the cinema was situated in because it was a multipurpose room with a wellness chair and a seat for the hairdresser. The only thing dividing the different activities was a room



Ill.4. Plan drawing of Lundergården



Ill.5. Plan drawing of the apartments

divider. Therefore, the room did not resemble a real cinema, nor the cosiness of a living room, and it did not invite you to sit down and watch a movie with others.

On the other hand, one of the most successful activities is the thrift shop. It is driven by a volunteer, and the residents can either buy or borrow the things in her shop if they want. The volunteer describes it as an adventure shop because it's just as much about giving them the sensory experience of touching and feeling things and talking about what they see. In her experience, it's not only a fun thing for the residents but also a fantastic opportunity for their families to do something together with their relatives. The thing in the shop is great for creating meaningful interaction and conversations when the alternative is to sit in the apartment for a few hours. (See appendix 01)

As the nursing home started out as a private institution, they have very generous spaces in both the common rooms, especially in the apartments, which are roughly 45 m^2 each. Every apartment contains a small kitchenette, a living room, a big bedroom, and a handicapped-friendly bathroom. The residents rent the apartments, so they are almost free to decorate and furnish the room as they see fit. In addition, they are encouraged to bring furniture from their former home and bring it to their new apartment to create a greater sense of home in this new place.

The apartment's layout shows respect for its highly personal and intimate pace. The wide door from the hallway opens towards a living room

Ill.6. Outdoors facilities at Lundegård

filled with daylight from its big window and fully glazed door that opens to the private terrace. The terrace is surrounded by a beech hedge to give a soft border to the rest of the garden, marking the individual outdoor space and providing some privacy for the apartment.

Before entering the living room, you walk by the kitchenette, which is small but practically designed with an open-plan solution to the living room. A light wall with a wide sliding door separates the living room from the generously big and bright bedroom due to the large windows facing the private terrace. When the door is open, the rooms melt together, creating lots of space, but when closed, it also provides the necessary privacy of the bedroom. The spatial sequence of less to most private rooms ends with the bathroom, which is only accessible from the bedroom. The bathroom is big, white, and practical, with room for a wheelchair and the caregiver to provide help and the fact that this is an institution is prominent in this room. The apartment is large but has limited options for customizing the layout of the rooms. The lack of corners due to the large window area makes it hard to place furniture in different configurations and makes it harder for the resident to personalize the space.

The building generally feels very open due to the many windows allowing for views of the gardens or city. All the main hallways have big windows to the outside, which brings the sun inside and makes the corridors feel wider and more open, which makes them appear shorter. However, the repeated and uniform hallways leading to the

apartments are dark and impersonal, with no aid for the resident to find the right door to their room, merely a small number plate by the door. Even the personnel explained they had trouble finding a way in the large building due to the repeated design. The hallways have small islands of furniture where only two people can sit and talk, away from the common rooms' noises. They create relief places for stressful situations and give a great conversation spot for the residents and the caretakers.

The staff appreciates that the nursing homes are all on one floor because it makes every room and facility more accessible for the residents and gives great opportunities for them to go outside. All the accessible outdoor areas are fenced so the staff can safely let the residents go into the gardens independently. The gardens have a caravan and an allotment house. They are great for the more sensitive residents who tend to get overwhelmed by too many people. And sometimes, the resident thinks it's nice not to be watched constantly. So, these spaces give release from that, and the staff can leave them alone for shorter amounts of time while knowing they are in a safe place. Also, an effective way to decompress if one of the residents gets upset, and the staff wants to shield the other residents from this. (See appendix 01)

The visit to Lundgård dementia centre was very enlightening in many ways. The centre was not built to be a nursing home for people with dementia. Still, after hearing the staff and observing the residents on this short visit, it appears to be a place where both the residents like to live, and the staff enjoy working. This case study gave insight into the concept of the dementia village in practice and that it is more important to focus on a few meaningful activities and give them great quality than just having many of them.

Furthermore, the apartment's layout will be a great source of inspiration. Its spacious design, private terraces, and daylight-filled rooms created a homelike environment and provided a profound sense of privacy with a room sequence from public to private inside the apartments. However, it could offer more opportunities for placing personal furniture and rearranging the layout to fit the individual.

However, the visit was also enlightening on what to avoid in a future design. The repeated layout with long, dark, uniform hallways leading up to a glass wall is to be avoided as it creates confusion even for neurodivergent users. In addition, the apartment door was difficult to recognize due to the lack of difference between them.

User's profile

The thesis is fundamentally centred around three key user groups: the residents living with dementia, the staff, and the relatives of the residents. Each group has unique needs and considerations, which the architectural framework is carefully planned to address.

Primarily, the residents with dementia, who can be at any stage from early to late in their illness, are at the core of our design process. Therefore, our primary goal is to ensure that their needs, desires, and emotional well-being are given paramount importance. Consequently, the design emphasizes creating a familiar environment that fosters feelings of safety and comfort while promoting easy navigation.

The secondary users are the staff members who spend time within the facility. Recognizing the importance of their roles in providing patient care, the design aims to cater to their operational needs. This focus results in an efficient and comfortable working environment, contributing to the overall enhancement of the care provided to residents.

Lastly, relatives comprise the third user group. Given their frequent visitations, the design intentionally incorporates spaces facilitating meaningful interactions with their loved ones. In this way, the architectural design aims to meet and accommodate all its users' diverse needs while focusing on the primary user group - the residents living with dementia.

Personas

SVEND-AAGE JENSEN. 75 YEARS

A LIFE WITH PARKINSON'S DEMENTIA

Svend-Aage Jensen is a 72-year-old man who has spent his entire life in Southern Jutland, specifically in Tinglev. He has been charismatic, talkative, and very social, known for throwing the best summer parties in Tinglev with his wife, Rosa. Sadly, Rosa, whom he had been married with for 50 years, died of cancer three years ago. Since Rosa's death, Svend-Aage moved to an apartment in a nursing home as he could no longer care for the house or himself.

Five years ago, he was diagnosed with Parkinson's Syndrome, which led to a subsequent diagnosis of dementia. At first, he experienced only a few symptoms, such as balance loss, involuntary movements with one hand, and sleep disturbances. However, as time went on, his symptoms became more pronounced. He experienced constant and severe pain in one arm and began using a walker to walk. Unfortunately, he did not like using the walker as it constantly reminded him of his illness and his loss of independence. His dementia diagnosis got worsened significantly after moving to the nursing home.

Growing up in the countryside, Svend-Aage started working when he was 14, helping his father on the family farm. As the eldest of six siblings, he has always been used to having much responsibility, running farming businesses, and having his farm. As a result, Svend-Aage has a natural leadership instinct and values feeling important and valuable, an essential part of his identity.

Svend-Aage's move to a nursing home was a significant upheaval for him, resulting in the rapid development of his dementia. As a result, he sometimes cannot understand what is happening and can no longer remember where he is. ***"I wanna go home now, there are so many things I need to take care of",*** - he often says to the caretakers, and when they try to explain his situation, he becomes anxious and frustrated. Sometimes, Svend-Aage becomes abusive and angry with staff and other residents in the common areas or in situations with too many sensory stimuli, like during collective dining. This results in him often ending up alone in his apartment due to the benefit of the other residents and the staff. That makes him sad and even more frustrated since her dislikes being alone.

Svend-Aage's family plays an essential role in his life. He has a very close relationship with his little sister, Karen, who calls him daily to keep him involved. He also has two daughters, Rikke and Annie, and five grandchildren who visit him often and sometimes take him for walks when the weather is nice. Svend-Aage appreciates their visits, as it helps him to feel involved and connected.

RKKE JENSEN, 45 YEARS RELATIVE

Rikke, Svend-Aage's 45-year-old daughter, battles with the changes she sees in her father since he moved into the nursing home. The man who once stands tall as her role model and pillar of strength has become a shadow of his former self. It is heartbreaking to witness the drastic change in her father, who was once a vibrant, friendly, and loving presence in her life.

The staff at the nursing home informs Rikke of her father's growing aggression and disorientation, which only adds to her distress. She often wonders if the loving father she knows still exists beneath the surface of his newfound aggression and confusion. During her visits to the nursing home, Rikke often faces the possibility that her Svend-Aage might not recognize her.

In an effort to bridge the growing gap between them, Rikke begins bringing a photo album along to her visits. Together, she and her father sit and reminisce about the good times when her mother, Rosa, is still alive. Their stories serve as a lifeline for Svend-Aage, grounding him in the love and warmth of their family's past.

As Rikke flips through the photo album pages, she can see glimpses of her father's former self-shining through. His eyes light up when he sees familiar faces, and their shared memories allow them to escape the crushing reality of his illness momentarily.

Rikke and her sister often feel a profound sense of loneliness as they navigate the challenges of their father's Parkinsom. Sometimes, they long for someone who understands their pain has walked a similar path and can offer comfort and solace.

"It's incredibly challenging and heartbreaking to see someone who has been such an inspiration to me deteriorating like this. The most devastating is to know that there's no cure for his condition." - Rikke says to her sister.

Despite their challenges, Rikke remains dedicated to her father, enlisting the support of her two children, who frequently accompany her on visits to the nursing home. Together, they form a circle of love around Svend-Aage, determined to make the most of their precious moments.

JONNA PEDERSEN. 90 YEARS

ALZHEIMER'S DURING THE COVID-19 PANDEMIC

Jonna is a 90-year-old woman from Aabenraa. After her husband passed away over 20 years ago, she continues to enjoy her passion for nature and the outdoors. However, Jonna now lives in a nursing home due to her Alzheimer's, which makes her forget that she no longer lives in her own house. She often wants to return to her mother's home, where she feels safe and loved.

In her younger days, Jonna loved to travel and explore the world with her best friend. They often went on trips that involved long walks in nature or swimming at the beach. One of their favourite destinations was Jonna's summer house in Blokhus, where they spent their days swimming in the refreshing waters of the North Sea. These special memories of her life, filled with laughter and a sense of freedom, are an essential part of who Jonna was before she got diagnosed with Alzheimer's. However, Jonna's love for long walks and sunbathing has remained strong with the passing of the years.

Unfortunately, her condition worsened significantly last year when she was struck by the coronavirus and isolated herself for five days. This experience leaves her feeling trapped, and her Alzheimer's progresses rapidly.

Since then, Jonna's life has been challenging. She struggles with anxiety and wanders around the nursing home, unable to sleep. She tries to escape the care home several times, often calling out for her mother during her anxiety attacks, saying, ***"Mom, mom help me, I have to go home to my mom."*** These call echoes through the corridors and is a haunting reminder of her internal struggle.

Jonna has two sons who live far away from the nursing home. They love their mother dearly, but distance makes it difficult for them to visit her often. Their absence weighs heavily on Jonna's heart, leaving her feeling lonely and abandoned.

Despite her difficulties, the nursing home staff do their best to accommodate her love for nature. They take her for walks in the garden and place flowers in her room. Although these actions cannot wholly alleviate her anxiety and confusion, they provide some comfort and happiness.

MAJBRITT HANSEN, 40 YEARS CARETAKER

Majbritt is a 40-year-old healthcare worker who has dedicated her life to helping others. With 20 years of experience in the sector, she has found her place at a nursing home where she has worked for almost seven years. She loves her job and the people she cares for, but her challenges are enormous.

As she walks through the nursing home, the stress in the atmosphere is palpable. The building's long corridors and sterile walls seem to echo the tension, and the dim lighting only adds to the weight that Majbritt carries. The nursing home is always understaffed, and there's never enough time in the day. That leads to an overwhelming workload, especially when her colleagues are frequently on sick leave.

Majbritt enters the first room, where a sweet elderly lady named Mrs Pedersen resides. She's waiting for her with a warm smile. Despite the stress, Majbritt tries to return the smile, but deep down, she's already counting the minutes until her shift ends.

As she helps Mrs Pedersen with her daily tasks, Majbritt can't benefit but think of how much more they could do for their residents if time were enough. The nursing home's rooms are designed to be comfortable and functional, but they lack the warmth and personal touch that could make the residents feel more at ease. It breaks her heart that there's no time to sit down and spend quality time with them, and she often worries that they feel lonely.

Over the years, Majbritt has started to experience what she calls "care-tired." It's the feeling of being physically and emotionally drained from constantly giving care without receiving much in return. It's a silent, creeping feeling that has slowly taken over her daily life, making her question her ability to keep going.

The day progresses, and Majbritt finds herself going through the motions, focusing on the tasks at hand but feeling disconnected from her purpose. She knows she's making a difference in the lives of these residents, but the care-tired feeling is taking its toll on her.

As her shift ends, she takes a deep breath and tries to let go of the stress and fatigue that build up throughout the day. Majbritt reminds herself of why she chose this profession and the difference she's making. She holds on to the hope that things will improve and there will be more staff and time to care for the residents. But, for now, she'll keep pushing through, giving her all to those who depend on her.

“AS AN ARCHITECT, YOUR EVERYDAY DECISIONS, LARGE AND SMALL, CAN AFFECT THE MENTAL AND PHYSICAL HEALTH OF EVERYONE THAT COME INTO CONTACT

WITH YOUR WORK”

(PETERS 2016, P.377)

THEO-RETICAL FRAME-WORK

The forthcoming section outlines the theoretical framework that anchors this study, integrating relevant theories and models pertinent to architectural design and user-centric spaces. This theoretical base, enriched by insights into the specialized needs of dementia residents, forms the foundation for data analysis and guides the project's design process. This framework allows a structured examination of results, fostering a deeper comprehension of the architectural considerations involved.

Sustainability

To ensure a sustainable approach to this project, it is essential to understand sustainability as a concept. However, due to its complexity and multidisciplinary nature, sustainability is challenging to understand and integrate (Sassi 2006; Peters 2016; Lami and Mecca 2020). Therefore, in this thesis, the primary focus will be on the social aspect of sustainability to simplify the term and make it more tangible for implementation during the process.

Compared with the economic and environmental aspects, the social has been put aside for many years in the sustainability debate. This discrepancy might be due to the relative difficulty in quantifying social aspects, attributed to the lack of a concrete framework or methodology for measuring success in human well-being, safety, social equity, inclusion, and social interaction (Peters 2016; Shirazi and Keivani 2017; Caistor-Arendar et al. 2011). However, even though these aspects may be subjective and challenging to incorporate directly into the design, architects are responsible for creating purposeful sustainable spaces that address human needs and positively impact the users who interact with these spaces (Lami and Mecca, 2020).

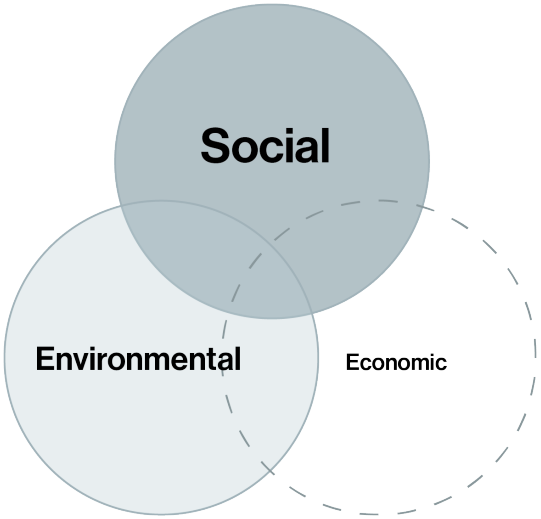
Buildings and spaces that engage our senses that provide clear orientation and a sense of security and identity benefit society as a whole. This approach is not just about improving the ethics and aesthetics of our built environment; it also brings economic benefits: what is good for the carers and relatives of people with dementia is also good for people with dementia – and vice versa! (Feddersen and Lüdtke 2014)

When designing with a user-centred approach that includes the users' needs, the focus becomes creating solutions for individuals and their overall well-being rather than solely addressing the condition's demands. Therefore, developing spaces that account for the needs of people with dementia becomes an essential part of the design process. However, to achieve that in an integrated way, it is necessary to consider social sustainability from the first drawn line in the process.

While the project's primary focus is concentrated on the social parameter of sustainability, environmental sustainability remains a significant secondary focus. It is imperative to note that although secondary, this aspect will not be relegated to the periphery. Instead, it will be cohesively incorporated into the design process, supporting and informing design decisions.

To reinforce the focus on environmental sustainability, this project will utilize the LCAbyg tool. This

tool facilitates a comparison of building materials based on their Global Warming Potential (GWP), thus ensuring the materials selected exert minimal environmental impact while aligning with the architectural design decisions. In addition, the project will comply with Danish building requirements, which dictate that new structures exceeding 1000 m^2 should not surpass an emission limit of 12kg CO_2 eq/m^2/year (Bolig og planstyrelsen, 2022). Thus, while the environmental sustainability aspect may be secondary in focus, it remains firmly interwoven in the project's design approach, contributing to a comprehensive, thoughtful, and sustainable architectural solution.



Ill.7. Sustainability's approach in the thesis

"Sustainability is an inherent urban and architectural problem: It is simultaneously characterized by many different dimensions (economic, environmental and social), pursuing heterogeneous and often conflicting objectives."

(p.1 Lami and Mecca 2020)

Indoor climate

People with dementia, especially those with advanced development of the disease, spend most of their time indoors due to the great need for assistance from a caregiver. (Sigbrand, 2019 a SBi 259) Therefore, the indoor environment of the design will be essential to consider already from the start of the project.

ACOUSTICS

The acoustical quality of a room plays an essential role in enhancing the overall well-being of people with dementia. Evidence-based research has shown that high noise levels can increase wandering and aggression towards others in people with dementia. Too high noise levels have also been shown to decrease social interaction between residents and create more difficulties in orientation and wayfinding. (Marquardt et. al., 2014). Overstimulation is often associated with loud noises like loud talking, singing and clapping, such as crowding and disruptive behaviour from other residents (Day, 2000). Therefore, the project must focus on reverberation time in each room to prevent overstimulation and ensure individuality in the apartments. In addition, the acoustical principles must be incorporated into the architecture to avoid clutter which can be distracting and contribute to overstimulation in high-activity rooms (Day, 2000)

LIGHT

People with dementia often experience visual deficits, including difficulties with colour discrimination, depth perception, and contrast sensitivity (Day, 2000). To facilitate easy orientation and wayfinding, ensuring good light conditions is crucial (Møller & Knudstrup, 2008). Design guides for dementia environments recommend strategies to reduce glare and avoid contrasts between light and dark areas inside the building, as this can help prevent confusion among residents. Therefore, it is essential to consider how the residents and staff can control the amount of daylight in the room and shade from direct sunlight when needed (Møller & Knudstrup, 2008; Sigbrand, 2019, a SBi 259).

Because of these visual deficits, design guides suggest increasing overall light levels and exposing residents to bright light (Day, 2000). Studies have shown that people with dementia are often exposed to inadequate bright light levels compared to other elderly people. Bright light treatment has been found to consistently regulate circadian rhythms and improve sleep patterns in

individuals with dementia (Day, 2000; Sigbrand, 2019 Sbi 263). Therefore, it can be beneficial to position windows in living areas to the east, west, and south, allowing residents to experience the shifting light throughout the day and helping them maintain a sense of time both bodily and mentally. It is therefore recommended to avoid relying solely on north-facing windows for ambient light in rooms where residents spend their time (Sigbrand, 2019 a SBi 259).

Therefore, the future design needs to provide different settings of natural light, trying to avoid high contrasting shadows by implementing light from multiple sides in the rooms and using matte materials to avoid creating glare. However, at the same time provide lots of natural light in living areas to improve sleep patterns and aid the sense of time. To ease wayfinding, there should also be a focus on creating good daylight conditions in the hallways.

VENTILATION

To ensure sufficient airflow and maintain air quality, a mechanically ventilated system is recommended for indoor spaces in highly polluted areas (Sigbrand, 2019 a SBi 259). However, to create a homelike environment, it should also allow manually operable windows to utilise natural ventilation during peak loads (Sigbrand, 2019 a SBi 259). It is important to consider the sensitivity of residents with low activity levels to drafts, as they may have difficulty expressing or understanding discomfort (Sigbrand, 2019 a SBi 259). Additionally, research suggests that maintaining a comfortable room temperature positively impacts general well-being and reduces agitation or disruptive behaviour in elderly individuals (Marquardt et al., 2014). Considering their preference for warmer temperatures due to sedentary behaviour, ventilation strategies should minimise or avoid drafts (Sigbrand, 2019 a SBi 259). The design should incorporate natural ventilation techniques in apartments to enhance autonomy and control over the indoor environment. Some windows will need to be automatically controlled to ensure proper air circulation, while buoyancy-driven natural ventilation will prevent drafts. A combined ventilation strategy should be implemented in highly polluted areas to guarantee adequate air exchange and facilitate natural ventilation during non-heating months.

Healthcare architecture

While there remains no cure for dementia, this thesis takes its point of departure on improving the quality of life of people living with dementia. To understand such improvement, looking at existing environments and care centres to realise what works and what does not is imperative.

When looking for architecture and design in the healthcare sector, it is difficult to ignore the concept of "healing architecture", which defends the idea of architecture that possibly affects the healing process from an illness. This concept embraces some design aspects that promote suitable environments for patients, relatives and staff (Lawson, 2010; Frandsen et al.,2009). Over the last couple of decades, growing attention and development of how built environments impact humans, especially in healthcare, has increased in the architectural sector, creating awareness of how design decisions can affect the long-term value of architecture (Galle & Herthogs, 2019; Lawson, 2010). However, healthcare facilities and institutions, particularly those influenced by modernist architecture, have been criticised for lacking engagement with humanistic concerns (Jiang, 2022).

Healing architecture is a design approach that expresses the idea that architecture affects human well-being and can help strengthen or promote a healing process for a person. The fundamental idea is not that architecture alone can heal. However, design aspects such as the quality of daylight, the atmosphere of the spaces, colours, sounds and the possibility of privacy and security can support the healing that takes place both physically and psychologically (Frandsen et al.,2009). In addition, research shows that sensory-pleasing, supportive and patient-centred environments can significantly benefit patients' quality of life, experience and treatment time (Lawson, 2010; Nadin & Naz, 2019)

In 2006, Bryan R. Lawson and M.Phiri developed

a tool to evaluate and implement in healthcare design: ASPECT (A Staff and Patient Environments Calibration Tool). This tool was developed based on evidence-based research that shows that these criteria can help improve the patient's life quality, experience and well-being and the staff's efficacy. (Lawson, 2006; Lawson, 2010)

Some of the essential aspects of the tool are:

DESIGN FOR PRIVACY:

It is essential to give the patients the possibility of controlling the levels of privacy so they can decide when to be alone or in company. In the thesis, this will be implemented by creating small niches in the common spaces to give the possibility to passively interact in social activities.

DESIGN FOR CONTACT WITH NATURE AND OUTSIDE VIEWS:

This applies to patients, relatives, and staff. Daylight is essential and can positively affect hospitalised patients (Frandsen et al.,2009; Lawson, 2010; Frandsen et al.,2009) and people's work performance (Jiang, 2022; Lawson, 2010; Frandsen et al.,2009). For long-term care patients (e.g. people with dementia), having stimulating natural views can have a positive effect. Nature's contact can also have a reductional stress effect on the users; in case of not having direct physical contact with it, plants and even pictures or art with natural themes can also have a therapeutic effect. (Lawson, 2010; Frandsen et al.,2009) The thesis will incorporate windows facing garden areas and forest views to achieve this. In that way, the design will bring nature inside, creating a connection between architecture and nature.

DESIGN FOR COMFORT:

Give patients, relatives and staff visual, thermal and acoustic comfort. Nevertheless, more critical of designing for comfort is to give the user groups the possibility of having control of this comfort.

The design will provide control of regulating the light, heating, shading and ventilation by windows opening in the apartments. (Lawson, 2010; Frandsen et al.,2009) However, the indoor climate will be regulated differently in the common spaces. Heating, shading and ventilation will be controlled automatically, with the option of opening windows if there is a need for natural ventilation in the peak loads. Lighting will also be semi-automatically but with the possibility of adjustments by the staff.

DESIGN FOR SPATIAL LEGIBILITY:

Design places people can understand and find around. To achieve this is necessary to create a hierarchy of spaces where private and public zones, as well as entrances and ways, are clearly defined. (Lawson, 2010; Frandsen et al.,2009) The design will focus on spatial sequencing from private to public spaces and incorporate buffer zones that mark the shift between functions. However, this concept will need further investigations of how to create legibility for people with dementia and will therefore be elaborated in the chapter' Dementia and architecture'.

DESIGN FOR A HOMELY ENVIRONMENT:

Create places where people want to spend time. A homely, light, airy environment with various colours or textures can reduce stress and pain and encourage a positive attitude. (Nadin & Naz, 2019; Lawson, 2010; Frandsen et al.,2009). There will therefore be a focus on differencing the materials to mark the different zones and substantiate the wanted atmosphere in the room. The concept of home will be further investigated in the chapter 'The concept of home' to elaborate on what a homely environment means for people with dementia.

DESIGN FOR THE STAFF AND NOT ONLY FOR THE PATIENTS AND RELATIVES:

Important to be careful when placing facilities for the team; these tend to be forgotten in the process. Staff facilities also require architectural qualities. Place the staff and practical facilities near each other or within short walking distance. (Lawson, 2010; Frandsen et al.,2009) Therefore, the design must ensure that frequently used facilities are connected to the related functions. The staff offices should also have windows for great daylight conditions and airy spaces with views towards gardens or calm green areas.

In conclusion, the criteria outlined here can positively impact a dementia-friendly setting. However, it is essential to use appropriate terminology, such as “palliative/relieving” instead of “healing”, to acknowledge the reality of the situation. By carefully designing environments from a user-centred perspective, we can provide relief to those suffering from this disease.

a contemporary Danish nursing home

In an effort to comprehend the contemporary architectural context of Danish nursing homes, particularly as it relates to dementia, a case study was performed on Ella Mariehjemmet. The nursing home was chosen due to its easy accessibility for visiting and observing, as well as its representation of current architecture in relation to the increasing social issue of dementia.

Ella Mariehjemmet, built in 2018, is an independent care home designed by Arkitekt Firmaet Nord and constructed by A. Enggaard A/S. The 4100 m^2 facility is centrally situated in Nørresundby, providing residents easy access to supermarkets, pharmacies, and coffee shops (A.Engaard A/S, n.d.). The age range of residents spans from 70 to 95 years, with over half diagnosed with dementia. Despite its resident demographics, the initial design of the building didn't specifically cater to dementia needs, necessitating further modifications to ensure the safety and comfort of these residents.

The three-story building features 17 apartments per floor, each with a private kitchenette and bathroom, shared kitchens and dining areas, common indoor spaces, and south-facing balconies. However, the layout is characterized by long, identical-looking corridors connecting shared facilities, causing navigation difficulties for dementia residents and unfamiliar visitors alike. The absence of distinct visual cues, such as varied colours or unique artwork, exacerbates this issue.

Furthermore, shared spaces lack clearly defined areas for specific activities, leading to underuse by residents and creating an overstimulating environment for dementia residents. This often results in difficulty focusing on tasks or engaging in meaningful social interactions. Harsh, artificial hallway lighting coupled with insufficient natural light further contributes to resident disorientation. The interiors would benefit from a more visually engaging environment with diverse colours, textures, and artwork that can assist in orientation and cognitive stimulation.

The facility's large south-facing windows flood the spaces with natural daylight and offer beautiful fjord views, which are appreciated by both residents and staff. However, these windows also cause overheating in the summer and don't provide sufficient natural ventilation. Mechanically assisted ventilation is not used due to energy consumption concerns.

Ella Mariehjemmet's central city location, while advantageous in terms of accessibility to amenities, presents unique challenges concerning resident safety. There is a significant risk of dementia residents wandering off due to unmonitored exits and easy access to busy city streets. Furthermore, there are concerns about the building's

proximity to an apartment complex and shared parking space. While the location offers benefits, it necessitates a review of security measures.

The nursing home lacks secure green outdoor spaces. Outdoor exercise equipment installed to encourage physical activity among residents is not often used due to safety fears, particularly for residents with dementia who require supervision that is often unavailable due to staff's busy schedules. Hence, Ella Mariehjemmet, while addressing certain needs of its dementia-affected residents, requires design improvements and enhanced safety measures to truly support its residents' day-to-day lives.

Based on the knowledge gained from analyzing the facilities at Ella Mariehjemmet, attention should be given to navigation aids, clear demarcation of activity spaces, improved lighting, and visually stimulating environments. Additionally, addressing temperature control and ventilation issues, particularly in areas with large windows, is crucial. Enhanced security measures need to be implemented due to its urban location, and the design of secure, accessible outdoor spaces for residents should be prioritized. Integrating these factors from the outset of the design will significantly improve the living conditions for residents affected by dementia.

Ill.8. Hallway at Ella Mariehjemmet

Ill.9. The end of the hallway

Dementia and architecture

As architects, we must create inclusive spaces that promote well-being, especially when designing for people with dementia. We must consider how their sensory and spatial experiences affect them and develop dementia-friendly areas accordingly. Understanding what this means and how to create spaces that meet the individual's unique needs is essential. When designing for dementia patients, the degree of how much the room will contribute to individual well-being will depend on the state of the disease. However, some common design principles have a positive impact on users with dementia but also on those without dementia (Feddersen & Lüdtke, 2014).

WAYFINDING

Dementia-friendly environments need to be simple and easy to understand. Visual stimuli and wayfinding are the most common problems for people with dementia. However, the most significant challenges of these rely on wayfinding since it involves different senses and cognitive solving-problem processes. To meet these difficulties, forms, landmarks, scales, and functions must be simplified so that it is easy for the user to understand the configuration of the space. Consequently, when designing for users with dementia, spatial legibility and safe environments are crucial factors. (Kuliga et al., 2021; Van Buuren & Mohammadi, 2022). The design will implement clear sight lines between accessible functions for users with dementia. Simple and geometrical room shapes but with significant spatial and material contrasts mark different sections and functions of the building.

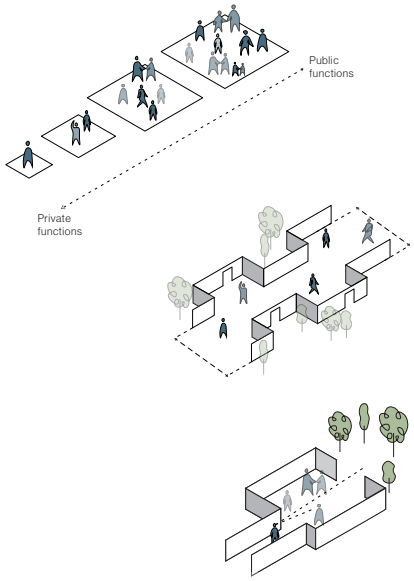
ZONING

Creating zones with smooth graduation that are effortless to understand, from public to private spaces, facilitates de adaption and understanding of rooms for the user groups. Additionally, it is essential to create homelike atmospheres to support an easier orientation and identification of spaces. Finally, avoiding intersections and the number of doors and corners will contribute to more straightforward decision-making situations, which can be challenging and stressful. (Kirch & Marquardt, 2021; Van Buuren & Mohammadi, 2022; Feddersen & Lüdtke, 2014).

The design will use articulated architecture to make it easier to understand spaces and make the decision-making situations clearer and more manageable. Furthermore, breaking down the scale and resembling a traditional Danish home arrangement will facilitate familiarity with the common spaces.

CORRIDORS AND COMMON SPACES

Corridors must be wide enough for two people to pass simultaneously because it gives a better



Ill.10. Design strategies for dementia frinedly design

overview of what is happening. In addition, natural daylight must be implemented; to enhance the whole corridor experience; this will provide visual accessibility and offer better orientation of the users in time and space. It can be beneficial to place common spaces at the ends of the corridor, avoiding private functions or enclosed areas that can cause anxiety for the users (Van Buuren & Mohammadi, 2022).

Common spaces must be visually accessible and placed in a significant part of the building. In addition, these spaces must allow social contact and be open for different uses; this can offer a sense of security and self-determination so that the users do not feel restricted (Van Buuren & Mohammadi, 2022; Feddersen & Lüdtke, 2014).

The design will avoid long corridors and minimize the number of doors in these. Corridors should be straight to enable sight lines towards an accessible function. Natural daylight must be implemented when designing corridors to provide better visibility and understanding of the environment. Common rooms should give place to immersion and social interaction.

COLOURS AND MATERIALS

Using local or traditional materials can be associated with a place or a regional context, bringing memories back. Colours can be perceived differently depending on their textures, which can be positively used to facilitate a sense of familiarity, warmth and security. However, using too many materials and textures can be overstimulating and have the opposite effect. Therefore, less is usually more. (Feddersen & Lüdtke, 2014).

The design will employ different material combinations and textures to create contrast between functions. However, keeping it to a small number of simple combinations on a spatial basis is crucial, letting the architectural expression be the key factor of these contrast.

OUTDOOR:

Studies show that people with dementia benefit from outdoor spaces as they enjoy staying active and connected with the community in these environments. However, these spaces must avoid large scales, noisy places and intersections that can contribute to spatial disorientation, overwhelming feeling and anxiety (Kuliga et al., 2021).

Design should include accessible private and common outdoor spaces while avoiding large scales, noisy places, and intersections to prevent spatial disorientation.

Dementia village

The concept of a dementia village is to enable a meaningful everyday life for people with dementia by providing activities for the residents and focusing on the capabilities the residents still have instead of emphasizing the ones that they have lost. Providing an environment that compensates for the disability but gives opportunities for the residents to live as normally as possible in familiar and homelike settings, which still facilitates needed meditation and care 24h a day. (Peoples et al., 2020; Chrysikou et al., 2018; Roberts, 2023)

The dementia village concept aims to move away from the institutional care facility with patients and, instead, create a familiar and safe home with specialized care for its residents. This is done by making a small community for the residents with dementia, which facilitates different functions for everyday activities like; a café, clothing shop, hairdresser, library, bar and similar functions. Combined with large outdoor areas that provide residents with opportunities for walks or gardening. This allows for autonomy and to continue with regular daily activities in familiar surroundings, which can reduce the residents' anxiety and fear and provides motivation for physical activity. Additionally, doing everyday activities, like shopping or going to a café with family, is life-affirming for the residents, and the relatives feel that it gives the residents more life quality and keeps them socially connected. (Chrysikou et al., 2018; Peoples et al., 2020; Roberts, 2023) The local community is encouraged to engage in activities but also has the space to facilitate different activities empowered by relatives or volunteers. This social approach to caring for the residents invites them to activate and address their still-existing abilities rather than just clinical care for their physical needs. (Roberts, 2023)

They enable the residents to move freely on the compound without restrictions of locked doors and gates. Instead, rooms that residents are not allowed in are visually obscured, and accessible areas are spatially highlighted and inviting with many principles for easy wayfinding, such as visual permeability between spaces and actively using art for perception clues to ease self-orientation. Furthermore, by creating opportunities for the residents to participate in different activities, they are given a choice and control over their daily activities, giving them a stronger sense of independence and dignity despite their need for constant care. (Peoples et. al., 2020; Chrysikou et. al., 2018)

One of the main critiques of the dementia village concept is that it provides the illusion that the residents are still taking part in the local society by constructing these facilities exclusively for

the residents and whether this is a dignified treatment. (Hansen et. al., 2020) But is it really an illusion when real services are provided? When the hairdresser is at the salon, they provide the residents with their usual services and everyday social interaction. It just takes place in a safe and familiar environment where the residents know and can get professional assistance if needed. (Brøgger, 2018)

This state-of-the-art concept for a nursing home for people with dementia will be applied to this thesis due to the many beneficial effects it provides for the residents and due to the more person-centred approach to architecture and the functions it facilitates. Therefore, facilities will be implemented into the design that can benefit the residents and be a part of their everyday activities, and invite relatives and the local community to participate and create meaningful interactions with the residents. When designing these facilities, it will be necessary to consider accessibility for the residents but also for visitors since the biggest critiques from the research on two of the existing dementia villages were the distance between the apartments and the activity areas as well as the failure of getting visitors to use the existing facilities due to the layout of the villages. (Chrysikou et. al., 2018; Peoples et. al., 2020) Even if the activities are under the same roof, they can be too far away (Appendix 01). Therefore, activities should be provided in relation to the residents' private units, both inside and outside, creating easy access and inclusion for less mobile residents. The facilities should also be inviting and accessible for visitors, so it encourages use and interaction.

The concept of home

Remember the feeling of getting lost as a child. The feeling of being lost in space is unsettling for everyone but can happen daily for people with dementia. For people with dementia, getting lost can happen even in familiar places, and when you're lost, you try to find a home. Home is strongly connected to the feeling of security, and that might be the reason why people with dementia are known to feel restless and to want "to go home". (Feddersen and Lüdtke 2014)

Our home is strongly related to who we are and acts as an anchor in our life. The notion of home is not necessarily a specific place; it is a feeling; to feel at home. A place where we can be ourselves. Home is, therefore, a private and intimate space. A reflection of our personality and a place that we own and control. A mark of territory. It is a space that we shape by organizing furniture and placing personal belongings. To be able to move things around and create a personalized space becomes even more important with dementia. (Feddersen and Lüdtke 2014; Benjamin et. al., 1995; Vacher, 2011)

The phenomenology of a home is more about actions than physical appearance or space. To develop habits and rituals is to inhabit a place; it is an expression of security and gives a feeling of having a solid platform to return to. Therefore, we have a basic need for autonomy, and continuing in familiar patterns can strengthen the sense of home, with or without dementia. (Benjamin et. al., 1995; Feddersen and Lüdtke 2014; Vacher, 2011)

"We need to create spaces in which people can live how they have learned to live, in which memories can find a home and in which feelings find and echo. This is how we can do justice to people - whether or not they are affected by dementia."
- Eckhard Feddersen (p.20 Feddersen and Lüdtke 2014)

When exploring the concept of home, researchers often try to explain the phenomenon through childhood memories. The image of the home seems to refer to the place where one grew up and is, of course, highly individual. (Benjamin et. al., 1995; Feddersen and Lüdtke 2014) The notion of home is nostalgic and often related to places where we have lived, routines that have been transferred from relatives and the memory of experiences we once had. Therefore, it's also inevitably influenced by the ideological way of life and the culture of the place we are situated. (Vacher, 2011) To create a home, the architect must design with cultural heritage in mind. A home can not only satisfy our physical needs but must also embrace the mind of its dweller and therefore consider the oneiric image of a house which is culturally conditioned.

(Benjamin et. al., 1995)

When one's own home can no longer be recognized as such, then it can be hard to recreate the feeling of home in a totally new building. This factor makes it both impossible and extremely important to try and create a home for people with dementia. When creating a home for people with dementia, it is essential to give them the freedom to individualize their own private space, so they have a place where they feel in control and can find comfort surrounded by objects of their choosing that has affectionate value. The apartments must therefore give opportunities for arranging furniture in different ways and room for personal objects.

The architecture of the nursing home will play on the cultural building heritage in the local area in both shapes and materials to try and give a sense of familiarity in the architecture without becoming too nostalgic or outdated. In addition, the architecture should present different atmospheres with different levels of privacy and sensory stimulation so individuals can choose preferable moods and spaces to be in and find comfort.

It's vital to create accessibility for the residents to move freely and by implementing the concept from the dementia village to sustain autonomy. This will bring possibilities for creating new habits that can help to develop a feeling of home.

“WHILE COST EFFECTIVE, ON LANDS ONCE USED FOR FARMS OR WILDLIFE, THIS IS BEYOND URBAN SPRAWL. FAMILIES LOSE THE ABILITY TO RECONNECT; ESPECIALLY UNFORTUNATE WHEN ONE FAMILY MEMBER HAS FEW MEMORIES LEFT WHICH NEED REINFORCING. WHILE THE PHILOSOPHY OF “AGE-IN-PLACE” IS ACHIEVED, SOCIAL SUSTAINABILITY IS AT RISK. “ -

SUSAN BLACK

(FEDDERSEN AND LÜDTKE 2014, P. 10

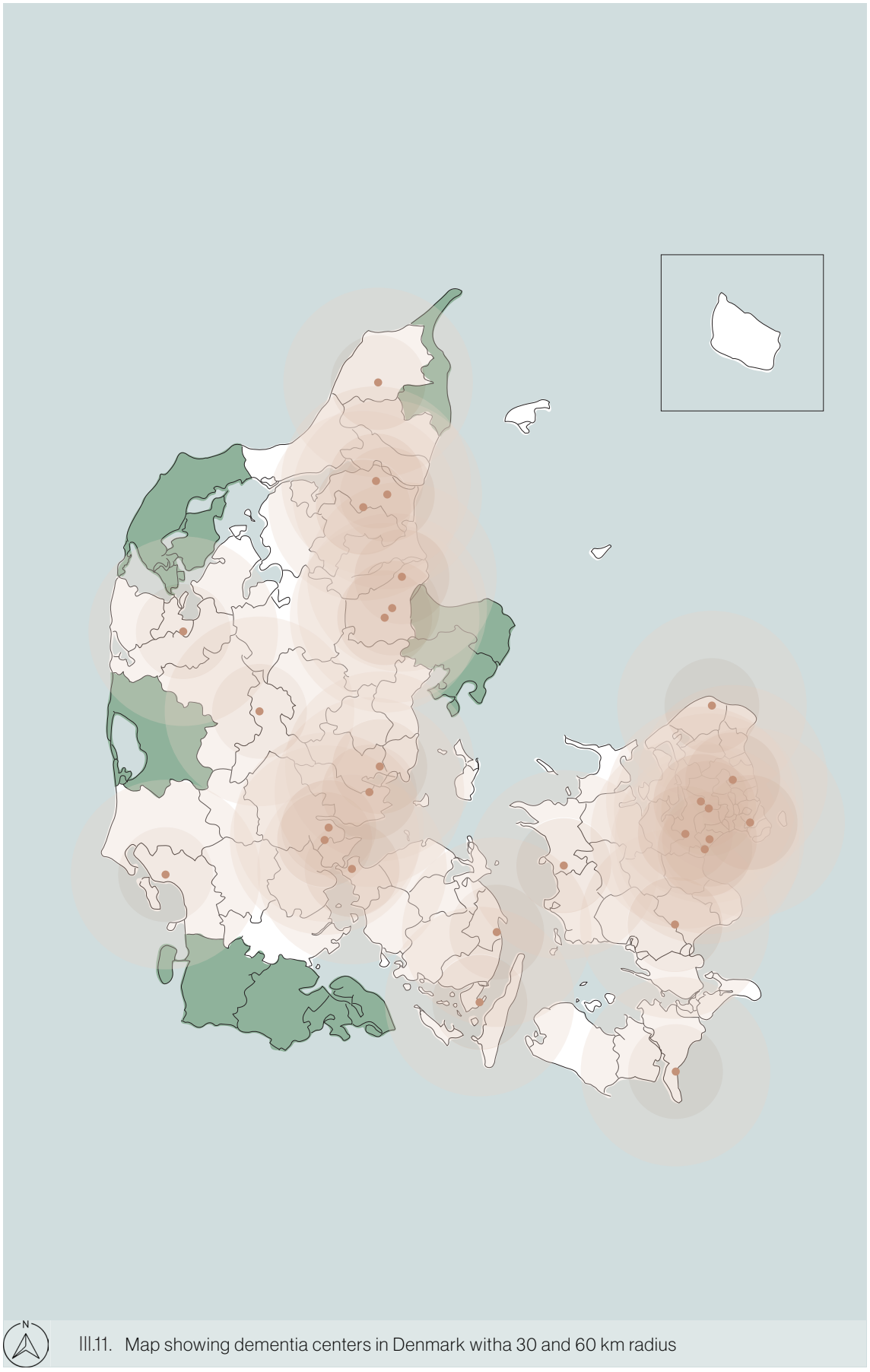
SITE ANALYSIS

This chapter shows the results of a thorough site analysis carried out on the site. The investigation began with desktop research to choose a site and then collect crucial details about the location and the surrounding city. Afterwards, we visited the site and the city firsthand, which helped us gain a deeper understanding. This chapter presents the outcomes of the preliminary research and the on-site visit, offering a comprehensive view of the site's features and broader context.

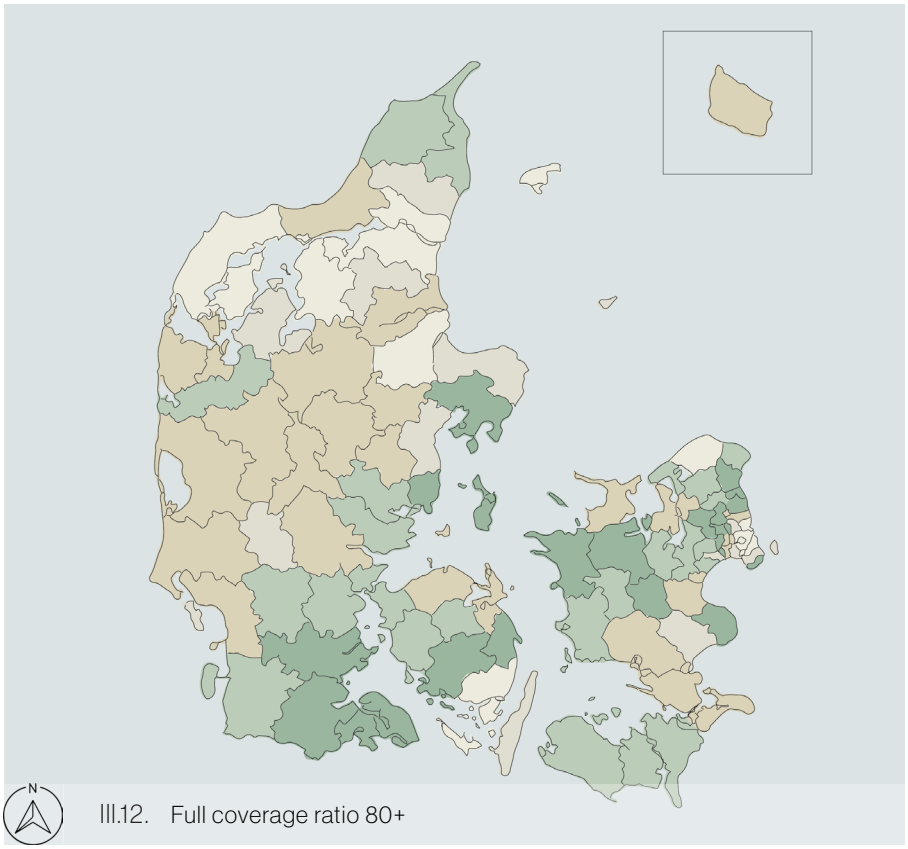
Finding the site

It was decided from the beginning that the project would be situated in Denmark, so it would be easier to involve the targeted user group and do more extensive user involvement. At the same time, the decision would facilitate site visits for site analysis to understand the context it would be situated in.

The initial investigations aimed to narrow down the scope to the municipality in which the project would be situated. Therefore, the first analysis examined the existing nursing homes in Denmark, focusing on people with dementia, to see the coverage. The current places were then given a radius of 30 and 60 km due to an estimation that it takes approximately 30 minutes to drive 30 km and one hour to drive 60km. These distances were decided from the assumption that many Danes think driving for a longer time is too much for frequent travel, based on how long they are willing to travel for work (Sinkjær-Rasmussen, 2021). The assumption is, therefore, that people would be unwilling to move further away from their family than an hour in travelling time due to the potential risk of not being able to see their family that often. From this analysis, five areas were discovered which had more than an hour to the nursing home with a special focus on people with dementia.



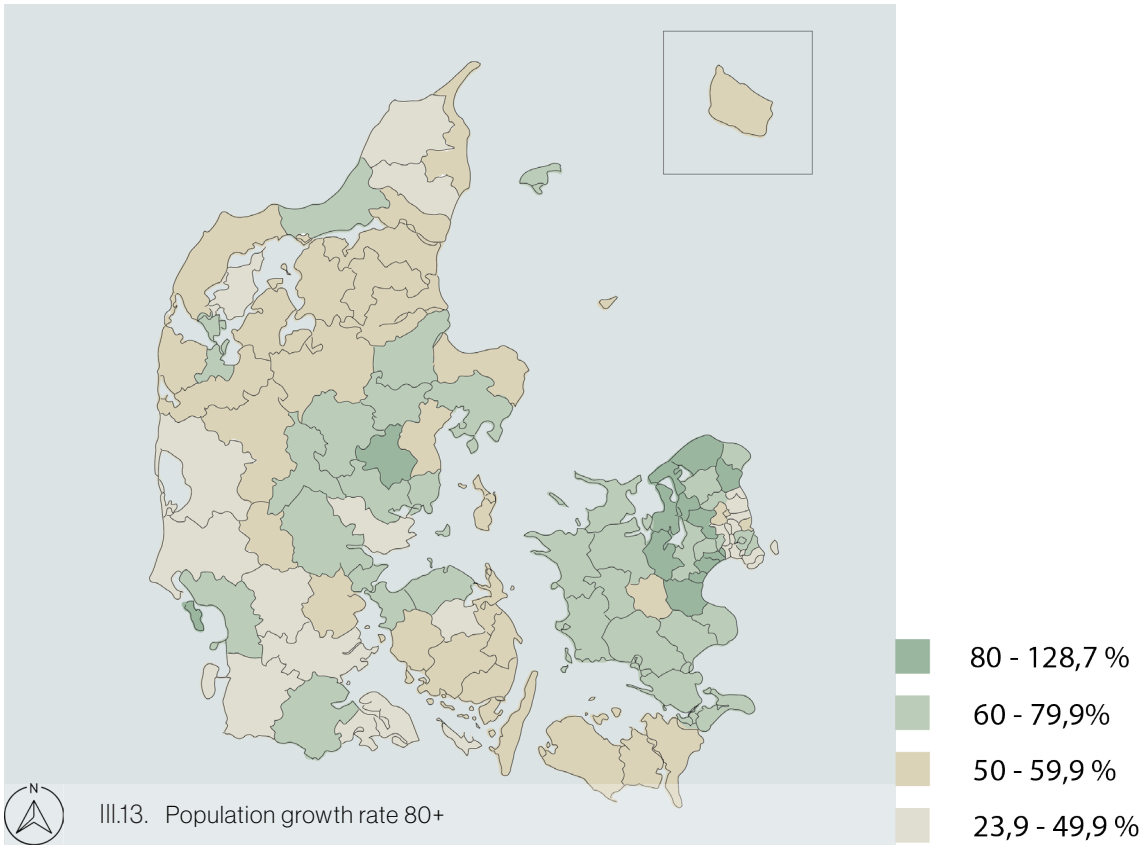
Ill.11. Map showing dementia centers in Denmark witha 30 and 60 km radius



Ill.12. Full coverage ratio 80+

Further analysis on the coverage of nursing home apartments for the population above 80 years old where then made to decide which municipality the project should be situated in to create more opportunities for people to choose a more dementia-friendly home. This analysis showed a bigger coverage in the areas of Thisted, Morsø and Ringkøbing-Skjern municipalities; therefore, these areas were excluded. However, this did not conclude a result, so an analysis of the expected development of the population above 80 years old was made to understand the future need for a nursing home. The fact is that the average age of people moving into a nursing home is 84 years old, and 10% of everyone older than 80 years old already lives in a nursing home. In addition, 2/3 of all the people living in a nursing home have some type of dementia diagnosis (Ældre Sagen, n.d.; Ældre Sagen, 2020), justifying the age scope of the analysis. This showed more significant population growth above 80 in Syddjurs and Aabenraa municipalities. However, it was decided to proceed with Aabenraa municipality due to the larger distance to existing nursery homes for people with dementia.

When researching about theory and practice of existing dementia villages, it was found that many of the relatives of people with dementia found it important for the residents in the dementia village to participate in the 'real life' outside of the nursing home. Hence, they still feel part of the society. The relatives also experienced that visiting familiar places to connect to their life before moving to the dementia village was important and enjoyable for the residents (Peoples et al., 2020). However,



Ill.13. Population growth rate 80+

some dementia villages have also received criticism for their remote placement, which presents social segregation and might promote loneliness due to the distance to the central transport network. This both affects and complicates the situation for the staff that must commute to the site and relatives that want to visit. The long-distance might discourage relatives from visiting, especially spouses of the residents, whom themselves might have mobility or orientation problems without dementia. This separation from family can increase loneliness, anxiety, and anger among the residents and their relatives (Chrysikou et al., 2018).

"While costeffective, on lands once used for farms or wildlife, this is beyond urban sprawl. Families lose the ability to reconnect; especially unfortunate when one family member has few memories left which need reinforcing. While the philosophy of "age-in-place" is achieved, social sustainability is at risk. " - Susan Black (Feddersen and Lüdtke 2014, p. 103)

For these reasons, it was important to find a site in the city which easily accessible and a part of the city but still be in connection to nature. With these criteria in mind, listings of cadastres for sale were examined and led to the choice of the final site, which had the desired location, size and attributes that would give lots of possibilities for future design.

For the nursing home to feel like a home, it must be situated close to the old residency and in a familiar setting. - Møller, K., & Knudstrup, M. (2008)

Land use and building utilization

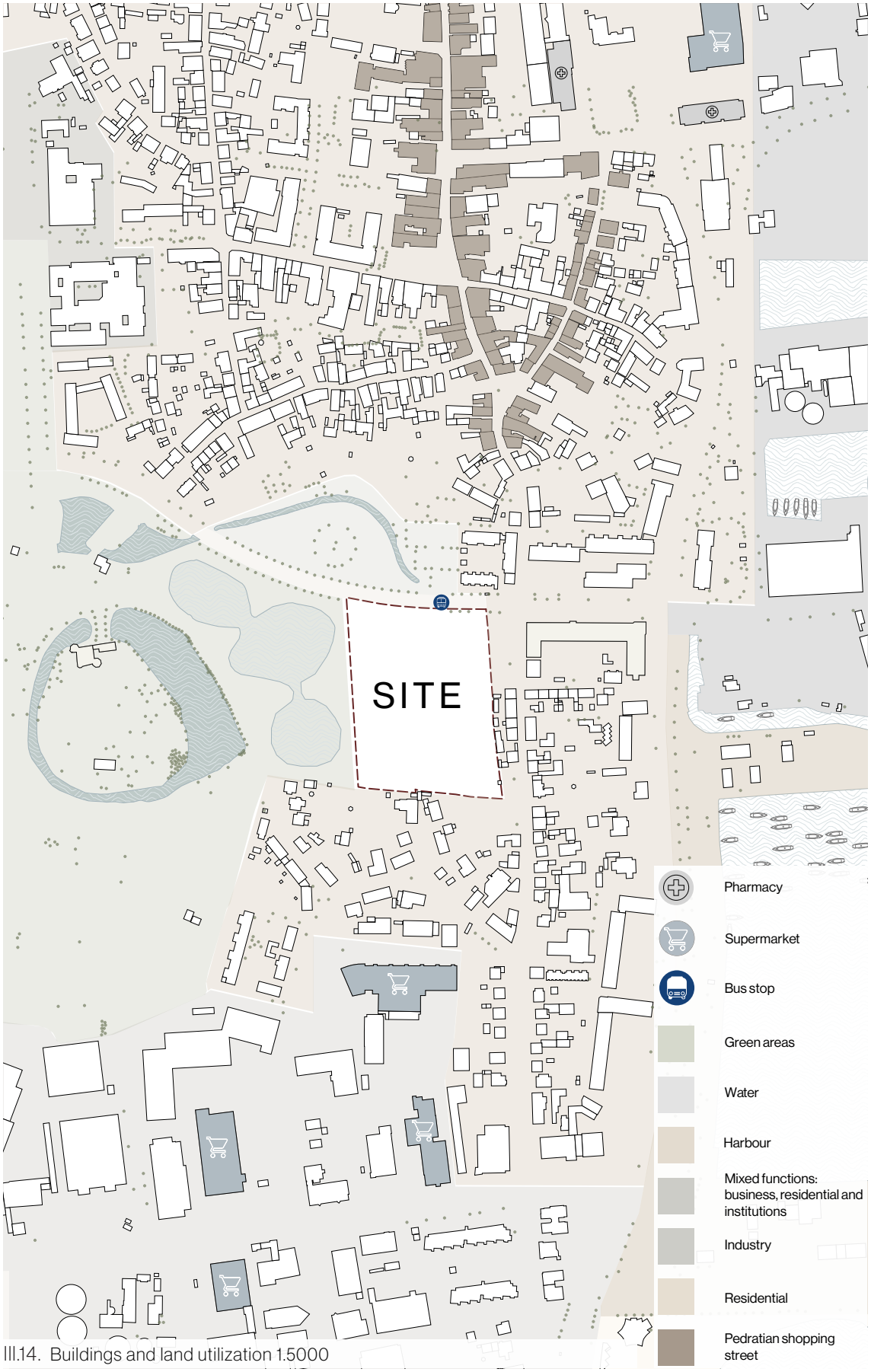
When designing spaces for ageing populations and individuals with dementia, it seems crucial to prioritize a deep understanding of the urban context to ensure aspects such as safety, integrating essential facilities, and creating a sense of community for the users. To achieve this, a thorough analysis of the site's urban context and its surroundings is conducted, identifying key features, facilities, and land use patterns that can be utilized and integrated into the project.

As depicted on the map, the site's western boundary is marked by a pristine natural expanse, while a green park borders its northern edge. To the south, a mix of residential and commercial structures define the area. A bus stop in the northern section connects the site to the city and the greater Southern Jutland region, offering convenience to relatives and staff who reside outside the city.

Within a 700-meter radius of the site, various recreational and cultural attractions, such as an art museum, pedestrian shopping boulevard, marina, church, and Arena Aabenraa, can be found. These venues allow for brief outings with family or staff without requiring extensive travel. Essential amenities, including pharmacies, doctors' offices, and a dentist, are 600 meters away. However, the nearest hospital lies 5.6 kilometres from the site.

Proximity to grocery stores provides added ease for visiting relatives. At the same time, a couple of nearby second-hand shops can be utilized for donating or acquiring furniture and other items, potentially supporting a thrift shop within the design.

This site's central location addresses recreational and essential needs within the urban context. It benefits the residents who can easily engage with the local community and enjoy the city's diverse offerings in the company of caretakers or relatives. Moreover, the site presents an opportunity to establish a new urban hub where elderly individuals, both with and without dementia, can actively participate in the city's broader community.



Ill.14. Buildings and land utilization 1.5000

The spirit of the place

It is a cold February day, and the atmosphere is infused with freshness and purity due to the winter weather combined with the rainfall of the last few days. The cloudy sky above has a muted grey tone that brings a sense of intimacy and chilliness to the surroundings. Entering the site, the serene solitude envelops the area, highlighting the tranquil beauty of the surroundings. Despite the stillness, there are a few signs of life and vitality on the site, such as the small weeds growing in some areas of the abandoned parking lots, which decorate the landscape with shades of brown and green. A group of leaves dancing, blown by the wind, and a flock of birds flying are the only ones adding movement and energy to the calm landscape.

To the west of the site, an overgrown forest area conceals the surrounding nature and a park, lending an air of seclusion to the location within the city. The fields, bushes, and tall trees stretching into the distance emphasize the outskirts feeling of the experience. Sometimes the peacefulness is disrupted by the noise from the cars passing on the road to the north of the site. Even in the middle of the day, with no mill traffic, the road's sound is clear amidst the silence. Shortly, the sound of flowing water into the old watermill nearby and birds singing tunes out the traffic noise.

Taking a few steps into the site, the noise of the passing cars gradually fades away, immersing in the quiet of the surroundings. The sensation of each footstep becomes heightened as the small stones and hard surfaces beneath the feet provide a tactile experience that adds to the sensory richness of the location. The old parking lots are a strong reminder of the site's abandoned past, with the deteriorated pavement and empty spaces serving as a canvas for potential revitalization. The need for a new life here is palpable, with the forgotten history catalyzing the potential of what could be. Exploring the site further, the sense of possibility and potential is almost tangible, waiting to be realized by the vision and drive to bring it to life.

The cold weather and the grey landscape accentuate the lonely and abandoned character. In the background, the sound of church bells ringing in the distance marks the presence of the town, adding authenticity to the scene. The ringing bells indicate noon, and the midday sun is still hidden behind the clouds. The sound of the chimes over-

whelms all other surrounding sounds, momentarily transporting the place closer to the city than it is. The site is experienced as a junction where rural and urban elements meet and compete for their place in the city of Aabenraa.

The unique characteristics of the place will be utilized to create outdoor private and shared spaces that promote the user's well-being by providing a safe and controlled immersion in nature. The goal is to create a small private oasis in the city centre that allows users to find relief and be in a secure environment. Additionally, the design will incorporate the peacefulness of the surrounding environment by framing natural views through west-facing windows and avoiding all kinds of noises or visual stimuli that can provoke stressful situations for the users. This approach will enhance the tranquillity and create a homely atmosphere, making the space feel more welcoming and comfortable. Overall, the design will prioritize the user's well-being by creating a space that fosters a sense of calm and relaxation. Furthermore, by drawing upon the characteristics of the location, the design will provide an escape from the city while remaining in the heart of it.

Ill.15. Nature area close to the site

Aabenraa in details

The site on the border between Aabenraa's old town centre and a housing neighbourhood perfectly represents the city's rich architectural diversity and contrasts. The old town centre features a mix of historical buildings from different styles and periods, reflecting the city's cultural and architectural evolution over time. The low and dense constructions, made mainly of brick, demonstrate respect and appreciation for the human scale.

The facades of the buildings are a visual record of the city's past, revealing the passage of time and the evolution of construction techniques and materials. Additionally, the buildings' variation in styles, ornamentation, and patina accumulated over time make the streets a tactile journey into the city's cultural norms and traditions that have shaped its history. In particular, the city is characterized by well-maintained gable- and half-timbered houses from the 18th century, which feature vivid colours that decorate the street profiles. These historic buildings primarily have distinctive bay windows and colourfully ornate doors that testify to the skilled craftsmanship of the past and the city's architectural heritage.

Aabenraa's architecture represents the city's past, resilience, and adaptability. A rich architectural history that spans several centuries, from medieval to modern times, is a testament to its commitment to preserving its architectural heritage for future generations. The more modern structures reflect its growing prosperity in the 19th and 20th centuries, demonstrating its ability to evolve and adapt.

The city presents itself as a cohesive entity consisting of various structures and surprising urban areas, creating a sense of harmony and unity. To enhance this experience, exploring new possibilities within the existing architecture and urban spaces is necessary. That can be achieved by incorporating architectural details into the facades and presenting a design that respects the context and building traditions, thus creating more engag-

ing spaces within the city. Furthermore, it calls to connect the old town centre experience with the site's rural characteristics to evoke memories of the past times through architecture.

The design will incorporate some of the architectural details observed in the city as the ornamental decoration in the doors, and façade materials such as bricks and wood and gables facing the road, giving rhythm and dynamism to street profiles. Furthermore, the design will incorporate reused materials, doors, and windows where it makes sense to enhance the narrative of the design and create a contextual link.

Ill.16. Brick detial in a facade nearby the site

Ill.17. Buildings in the city centre

Ill.19. Doors

Ill.20. Roofs

Ill.18. Ports and passages

Ill.21. Bay windows

Ill.22. Windows

Ill.23. Details

Ill.24. Materiality

SCOPE

In this chapter, the thesis approach is synthesized through theory and analysis. The problem to be solved is clearly defined, and the solution's aspirational elements are identified to establish a sense of scope,

Problem statement

How can we design a home for people living with dementia where senses and good spatial experiences become an integrated part of the architecture, contribute to a better quality of life, and promote safety and well-being of the user groups?

SUBQUESTIONS

How can we rethink the Danish care institutions through a user-centered and dementia-friendly architecture that considers the individual's specific needs?

How can we create the frames for a home for someone who no longer perceives their previous home as familiar?

How can the design promote a sense of community and achieve a socially sustainable approach by creating functions that encourage social interaction and benefit both the users and the local community?

CREATING A HOME

The design should prioritize the specific needs of its users by providing ample opportunities for privacy and personalization of the apartments through a flexible layout and coherent spatial sequence.

ENVIRONMENTAL RESPONSIBILITY

The design must meet Danish LCA requirements by employing reused and local materials where possible to minimize the environmental impact.

CONNECTION TO NATURE

The design should provide physical and visual interaction with nature, creating safe and calm outdoors spaces, shielded from the noise of nearby roads and other visual stimuli.

SUPPORTIVE SOCIAL SPACES

The design should create supportive social spaces that promote the well-being of the relatives by providing opportunities for social connection and support with other relatives and staff.

CARING FOR THE CARETAKERS

The design should also prioritize the comfort and well-being of the staff members by creating spaces that promote a good end effective workflow through well thought placement of the function and giving place to social interaction between coworkers

COMMUNITY ENGAGEMENT

The design should promote a sense of community inclusion by creating public functions that benefit both users and the larger community.

DESIGNING FOR COMFORT

The design should prioritize visual and thermal comfort for the users. Special attention should be paid to visual comfort to ensure a relaxing atmosphere for the user groups.

DEMENTIA-FRIENDLY ARCHITECTURE

The design should incorporate the dementia village concept by offering a few meaningful functions and ensuring accessibility with a short distance between apartments and social facilities. The design should create accessibility for the residents to move freely to sustain autonomy and bring possibilities for creating new habits that can help to develop a feeling of home.

WAYFINDING

The design should create legible spaces by implementing landmarks and spatial sequency in the design to ensure a clear and intuitive understanding of the of the space with different degrees of social interaction in the common spaces.

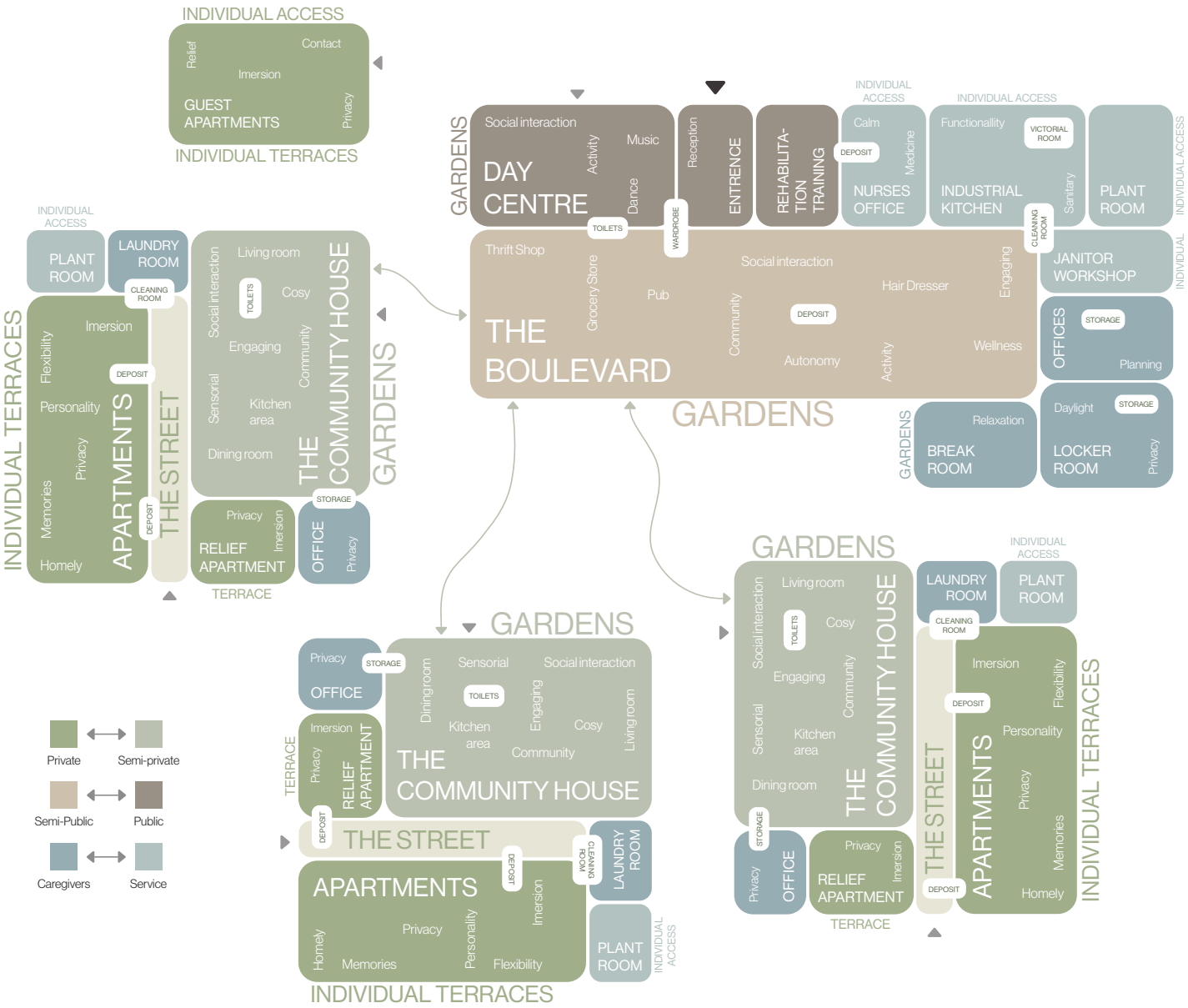
AESTHETICS AND CONTEXT

The design should draw inspiration from local craft traditions and aesthetics while using local materials to establish a contextual link.

Room program

Room name	Quantity [-]	Area [m2]	Ceiling height [m]	Number of people [-]	Activity level [met]
Offices	5	18	3	2	1.2
Office, Visiting staff	1	18	3	1	1,2
Rehabilitation training r	1	30	2,5	5	2,8
Breakroom	1	25	3	3	1,2
Entrance	1	20	3	2	1,2
Locker room	1	50	4	9	1,2
Town square					
Hairdresser salon	1	18	2,5	4	1,2
Grocery store	1	20	2,5	6	1,2
Thrift shop	1	35	2,5	6	1,2
Wellness	1	25	2,5	4	1,2
Pub	1	20	3	6	1,2
Day center	1	80	4	30	1,2
Industrial kitchen	1	60	3	5	2
Janitor workshop	1	30	3	2	2
Guest toilets	5	5	2.5	1	1,2
Guest apartments	3	51	3	2	1,2
Depository	6	10	2.5	-	-
Viktualierum	1	10	2,5	-	-
Wardrobe	1	20	2.5	-	-
Plant room	5	20	2.5	-	-
Cleaning room	3	9	2,5	-	-
Storage	4	13	2,5	-	-
Hallway	1	200	2,5	-	1,2
SUM AREA		1168			
Departments					
Long Apartments	12	47	3	1	1,2
Short apartments	12	51	3	1	1,2
Respite care apartmen	3	57	3	2	1.2
Kitchen, plating	3	20	3,5	4	2
Open digning area	3	50	3,5	9	1,2
Living room	3	30	3,5	5	1,2
Hallway	3	281		-	
SUM AREA		**3658**			

Function diagram



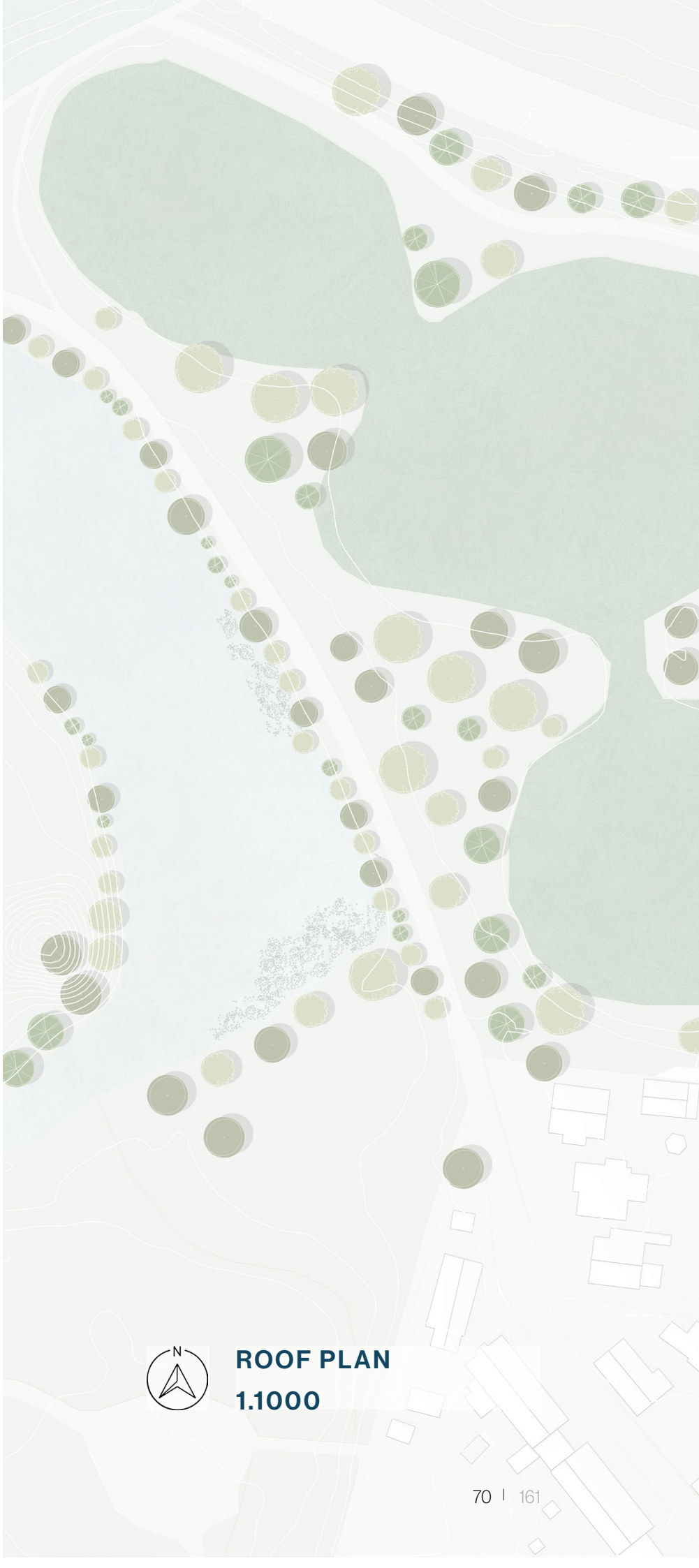
FOR MOST OF US, *REMINISCENCE* IS A NATURAL PART OF LIFE, NOT LEAST OUR SOCIAL LIFE, AND IT CONTRIBUTES TO THE CREATION AND DEVELOPMENT OF OUR FEELINGS AROUND IDENTITY AND BELONGING(...)

(REMINISCENS | NATIONALT VIDEN-

SCENTER FOR DEMENS, 2022)

DESIGN PRESENTA-TION

This chapter presents the design solution that results from synthesizing theory, analysis, and the defined scope. It introduces the concept of a new dementia village in the city centre of Aabenraa, explaining its functions and the relationships between them, as well as how they promote the well-being of the residents, their relatives, and the staff.



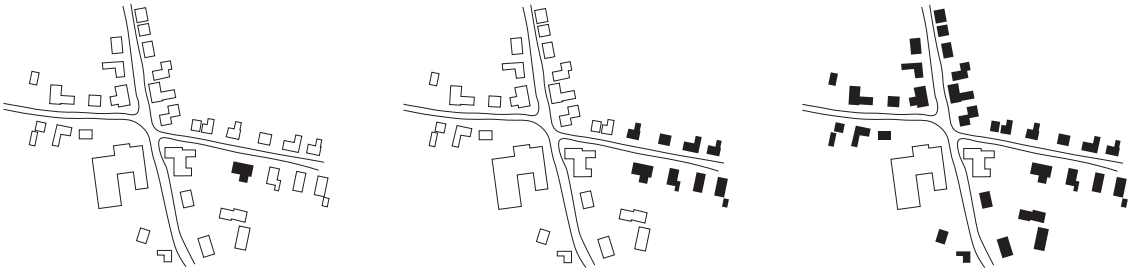
ROOF PLAN

1.1000

Concept

Reminiscence challenges traditional care facilities by prioritizing the individual needs of its residents, staff, and relatives, thus redefining the concept of a care institution. In this architectural paradigm, we harness the power of design to promote a sense of belonging and community, establishing a *'town within a city'*. The village is designed in a circular layout, assisting wayfinding and fostering a familiar urban atmosphere within a safe environment.

In the heart of the village is the Town Square, which recalls a traditional cityscape featuring traditional city functions. The configuration of these functions around the central square enhances social interaction and establishes a sense of everyday life, maintaining an essential connection to life outside the care facility. Each function in the town, indoors or outdoors, is thoughtfully designed to offer distinctive atmospheres and activities, allowing residents to engage with their environment and others around them. The outdoors offers a variety of open spaces with different characters, providing opportunities for physical activity, social interactions, and closer contact with nature. These spaces are integral in promoting residents' well-being and keeping them physically and socially active. Recognizing the significance of relatives' involvement in dementia care, the design proposal provides specific areas where family members can spend quality time engaging with their loved ones. These spaces facilitate essential familial interactions, thus fostering emotional support and nurturing relationships. *Reminiscence* positions architecture as an essential tool for fostering well-being and a sense of community in dementia care. It presents a paradigm shift in elderly care by prioritizing the needs of its users and integrating them into the very essence of its design.



The House
Individuallity and Privacy

The Neighbourhood
Familiarity and Belonging

The Community
Fellowship and Inclusivity

The Town
Facilities and Autonomy

'A Town within The City'

III.25. Concept diagram

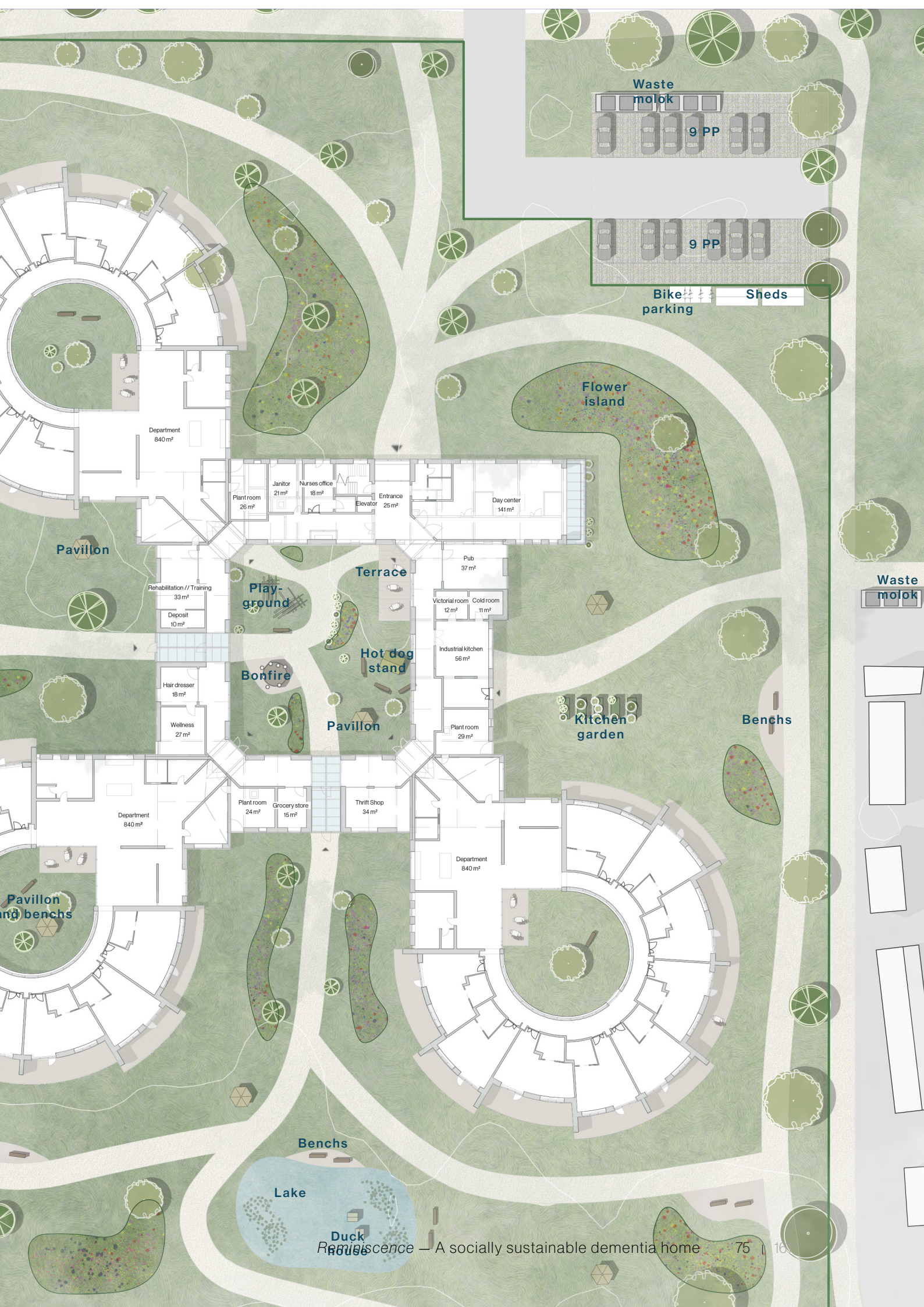
III.26. Isometric diagram of the design

Functions and wayfinding

In *Reminiscence*, functions are divided into three levels - public, semi-public, and private - to improve user experience and encourage social interaction.

At the public level, the Town Square serves as the central hub of the village, facing north towards the city. It offers a variety of public amenities that residents can access independently or with their families, creating a lively social space that mirrors the city environment. Semi-public functions are located in the Common Houses, positioned at the corners of the Town Square to serve as prominent landmarks. These Common Houses act as transitional spaces between the private apartments and the public square, fostering community interaction while respecting individual privacy. Each Common House is designed with distinctive exterior and interior materials to assist residents with navigation, making them easily recognizable and facilitating movement within the village. Private functions, such as the apartments and their terraces, are intentionally situated towards natural surroundings, providing residents with a peaceful and serene environment.

Functions are placed to ensure that corridors lead to shared spaces within Cluster or the Town Square, promoting social connectivity. These corridors have large glass sections, allowing ample daylight and visual contact with nature. Additionally, seating areas are included, offering residents cosy spots to pause and relax. Thus, integrating architecture with dementia care promotes a harmonious living environment.

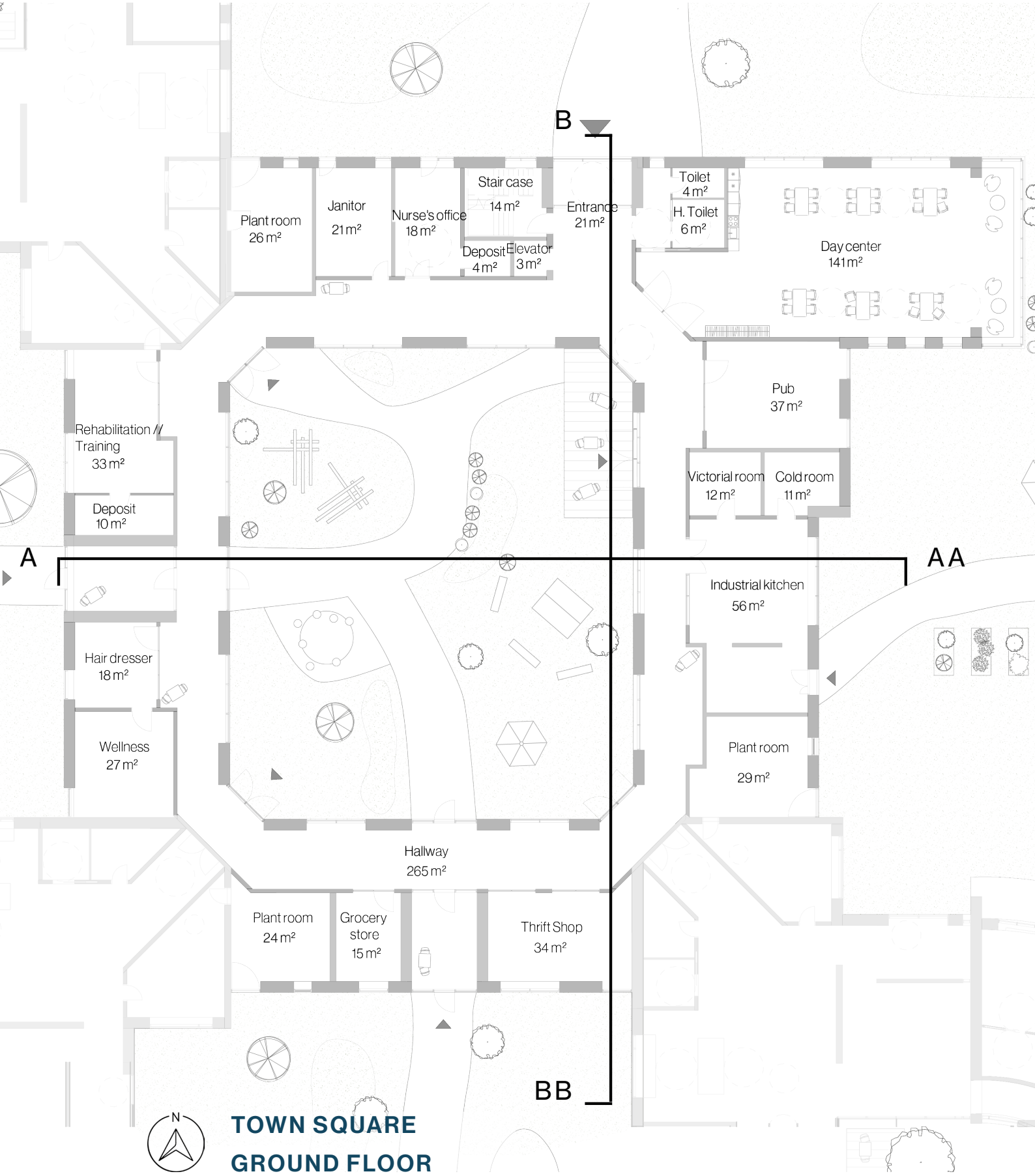

Waste molok
9 PP
9 PP
Bike parking
Sheds
Flower island
Department 840 m²
Janitor 21 m²
Nurses office 18 m²
Plant room 26 m²
Elevator
Entrance 25 m²
Day center 141 m²
Pavillon
Pub 37 m²
Terrace
Play-ground
Rehabilitation / / Training 33 m²
Deposit 10 m²
Victorial room 12 m²
Cold room 11 m²
Waste molok
Industrial kitchen 56 m²
Hot dog stand
Bonfire
Hair dresser 18 m²
Wellness 27 m²
Pavillon
Plant room 29 m²
Kitchen garden
Benchs
Plant room 24 m²
Grocery store 15 m²
Thrift Shop 34 m²
Department 840 m²
Department 840 m²
Pavillon
nd benchs
Benchs
Lake
Duck house

The Town Square

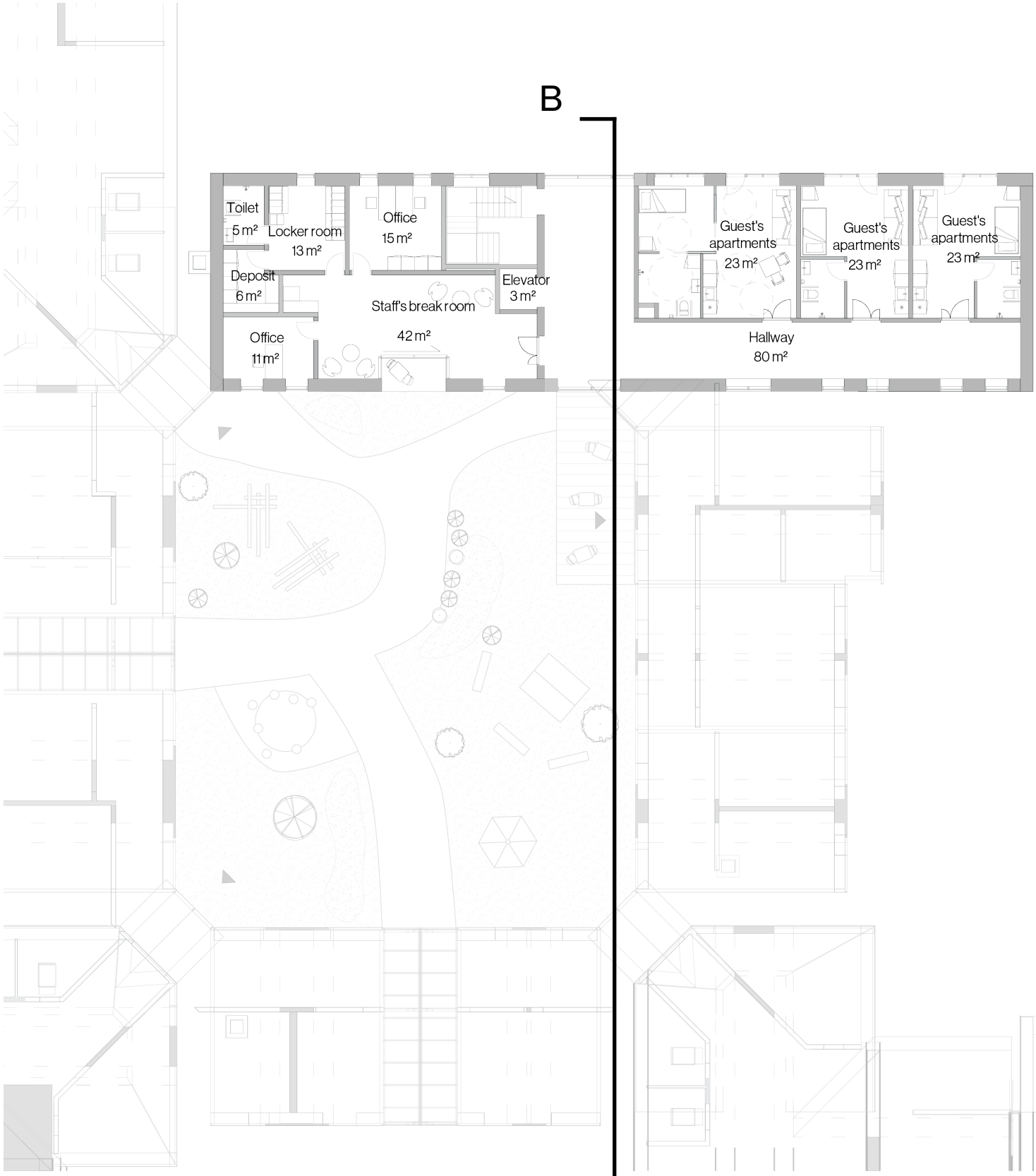
The Town Square is the heart of the village, designed to foster community and social interaction. It integrates various indoor functions surrounding an open outdoor courtyard. These indoor functions promote daily activities and foster the residents' sense of everyday life and normality. They include a small grocery store, a personal shopping shop, a hairdressing salon, a wellness centre, and a pub with an open-air terrace as a socializing space. An industrial kitchen is another key feature, encouraging residents to partake in communal bakery workshops and fostering skill-sharing and community bonding. Furthermore, the design includes three guest apartments for relatives visiting for extended periods.

Each amenity around the square has distinctive facades to help residents recognize and remember these spaces. The day centre, located in the northeast corner of the square, serves as a communal space hosting social activities for residents and citizens of the town, seamlessly integrating the village into the broader local community. During off-hours, it becomes an informative resource and meeting centre for relatives. The second main area's outdoor courtyard offers spaces for sitting, moving around and engaging in activities. It features a playground for residents and their younger relatives, a sausage boat, and a fireplace, creating a diverse and lively outdoor experience.

Ill.27. Visualization from the Town Square



TOWN SQUARE
GROUND FLOOR



TOWN SQUARE
1. ST FLOOR

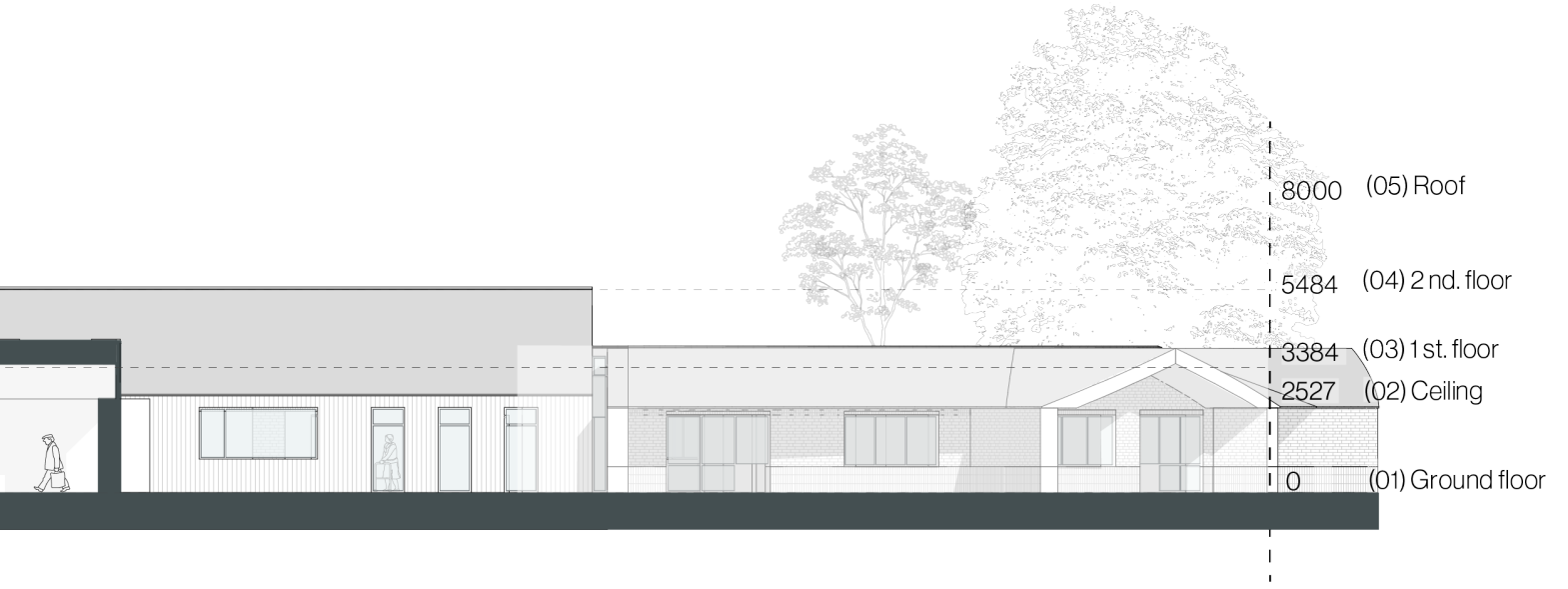
1 Section A-AA

1:200

2 Section B-BB

1:200


8000 (05) Roof
5484 (04) 2 nd. floor
3384 (03) 1 st. floor
2527 (02) Ceiling
0 (01) Ground floor

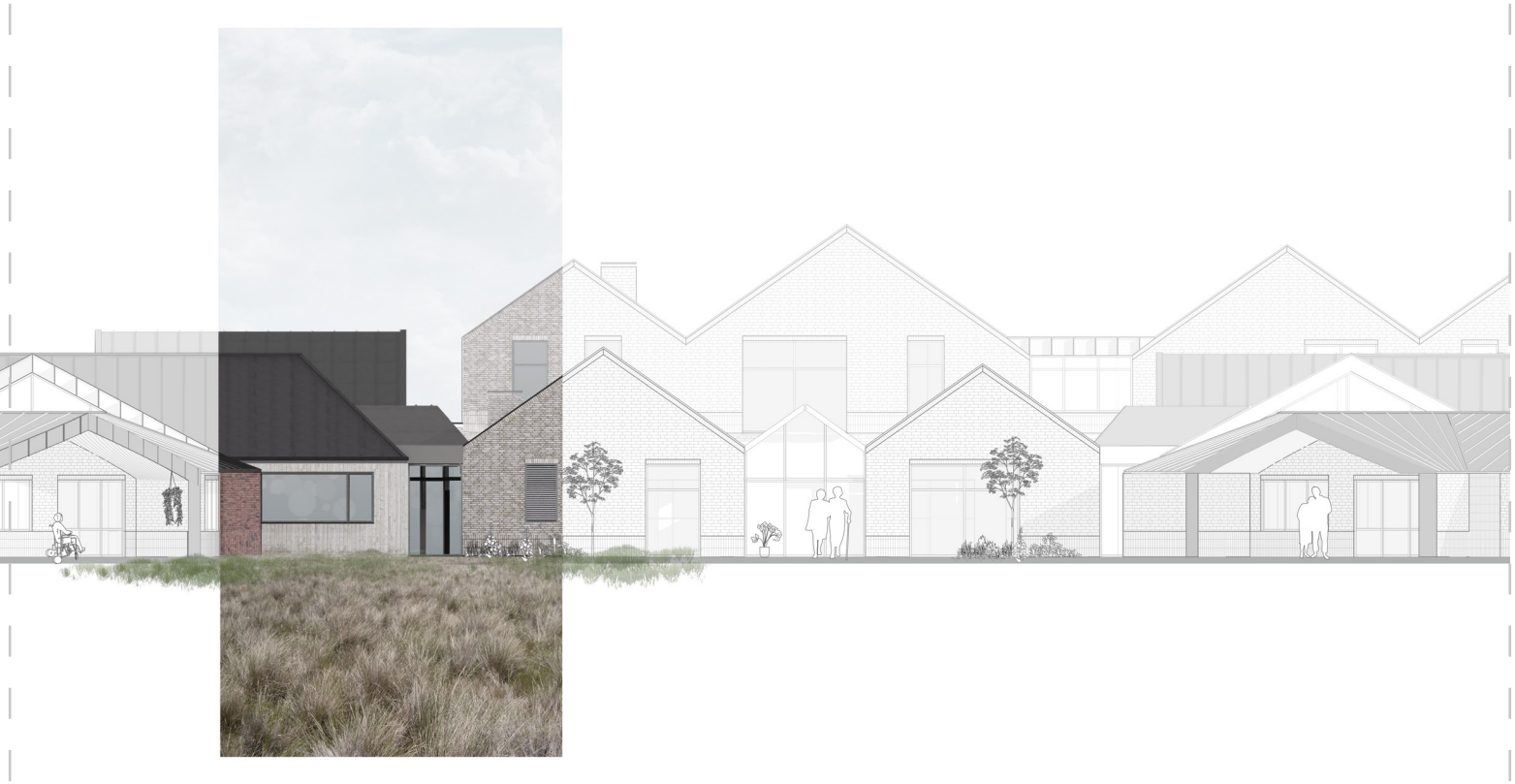

8000 (05) Roof
5484 (04) 2 nd. floor
3384 (03) 1 st. floor
2527 (02) Ceiling
0 (01) Ground floor

The gardens

Surrounding the village like an invisible membrane, the gardens visually integrate the village with its natural setting, creating an enclosed, safe environment for residents to explore freely. A looping path system, beginning and ending in the Town Square, facilitates ease of navigation through the gardens, further enhancing the sense of freedom and autonomy. The pathways are designed to offer opportunities for residents to sit and immerse themselves in nature, providing a serene contrast to the bustling activity of the Town Square. These spaces are deliberately designed for relaxation and engagement at a slower pace, promoting calm and tranquillity. Spread throughout the garden area are several pavilions for accommodation and an allotment house available for residents' use. Towards the south, a serene lake enhances the beauty and tranquillity of the site. In keeping with the theme of interaction and engagement, kitchen gardens are integrated into the garden spaces. Here, residents can partake in planting vegetables, guided by staff members, fostering a sense of purpose and connection with nature. Supporting local biodiversity, wild-on-purpose islands and insect hotels are scattered around the site. These features not only enhance the visual appeal of the gardens but also contribute to a thriving ecosystem, further enriching the sensory experience of the residents. The gardens, thus, embody a harmonious blend of safety, engagement, and immersion within nature.

Ill.28. Visualization from The Gardens

FACADE
NORTH



FACADE
NORTH

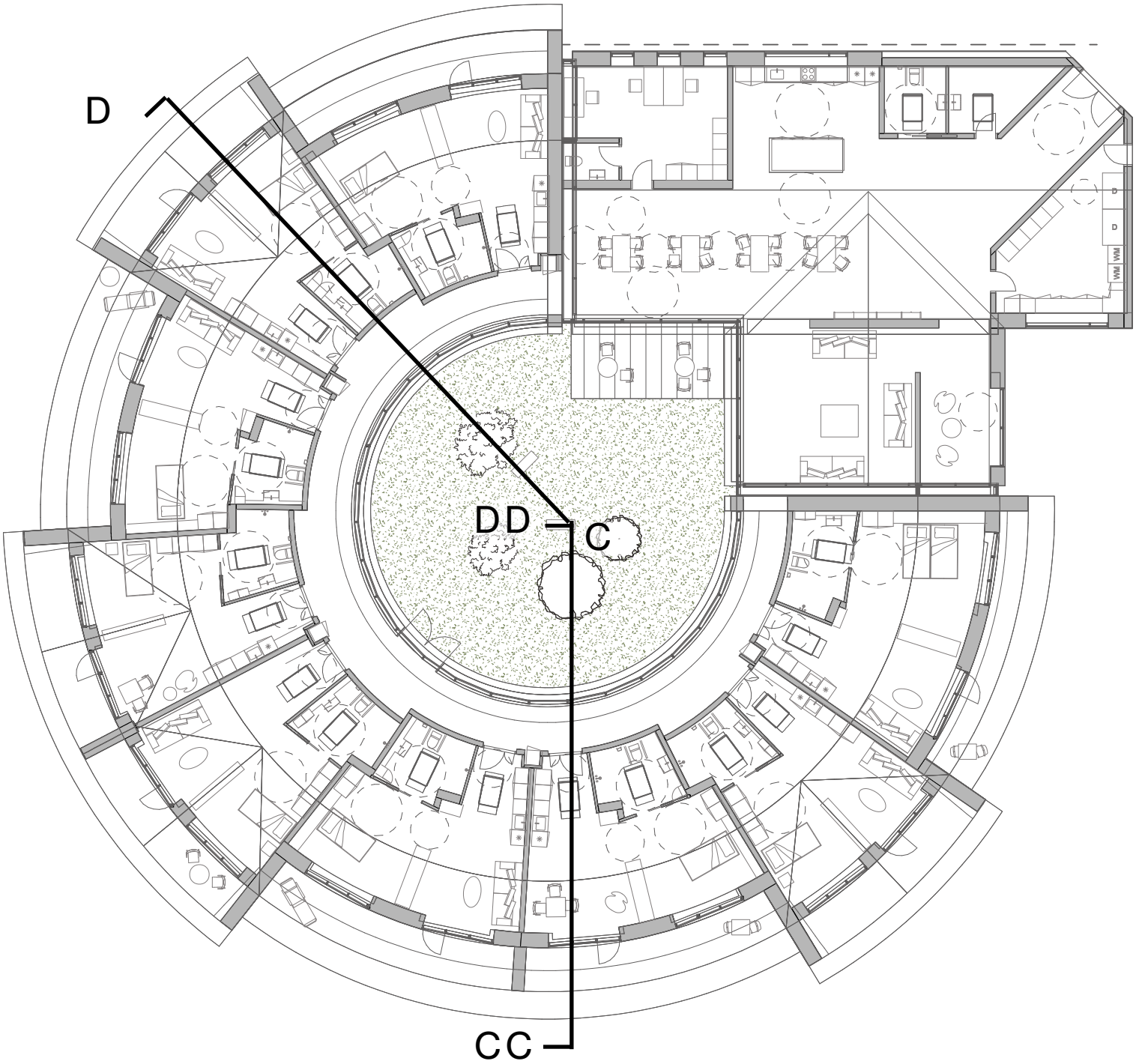
Common houses

The Common Houses in every department act as transitional spaces, bridging the gap between public and private areas. They resemble a neighbourhood within the city, offering spaces where residents can engage in everyday activities such as enjoying coffee with neighbours or cooking alongside staff. That fosters a sense of community, making the Common House a symbol of unity and togetherness.

The design includes small, intimate niches, allowing residents to retreat, immerse, yet remain connected to the social setting. The heart of each Common House features a tranquil courtyard, serving as a personal oasis where residents can feel safe and in close contact with nature.
Additionally, the courtyard hosts a small terrace, which can be utilized as a dining extension during warmer months, providing a refreshing change of scenery for mealtimes.

Architecturally, the inner facade of the Common House, which overlooks the private courtyard, is predominantly made of glass. This design decision promotes transparency and openness within the space, offering clear sightlines through the house. The glass facade enhances the residents' visual connection with their environment but also aids staff in maintaining visibility for the safety and well-being of the residents. Thus, each element in the design of the Common Houses contributes to a harmonious balance of privacy and community engagement.

Ill.29. Visualization from the Common House



AREA DISTRIBUTION FOR A CLUSTER:

Long apartemts' area: 4x 51 m^2

Square apartments' area: 4 x 47 m^2

Relief // Couple apartment's area: 1 x 57 m^2

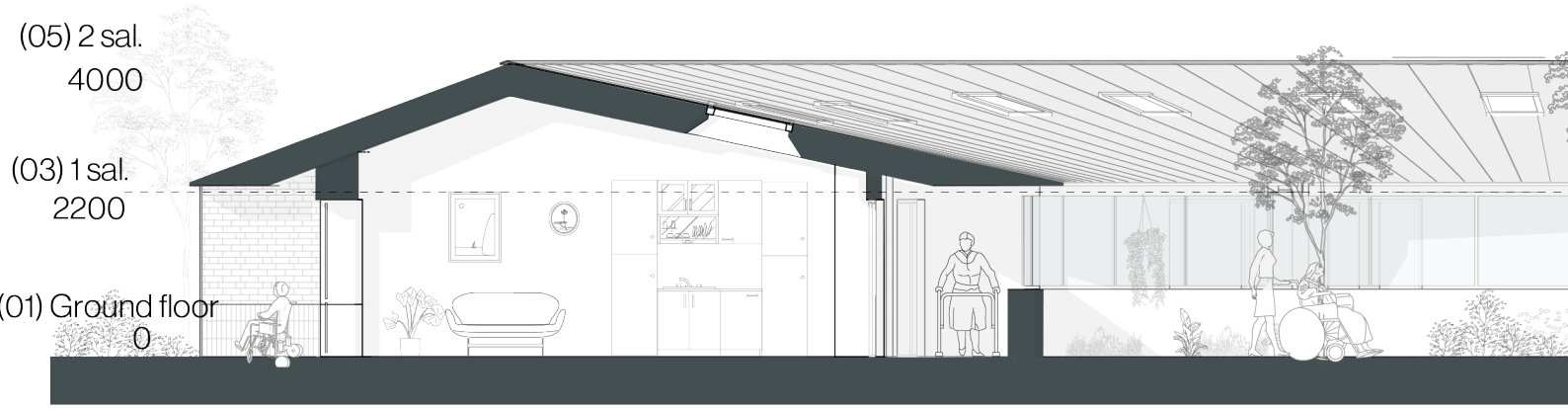
Common House's area: 686 m^2

Total area: 1135 m^2

N

CLUSTER PLAN DRAWING

Ill.30. Visualization from the Common House

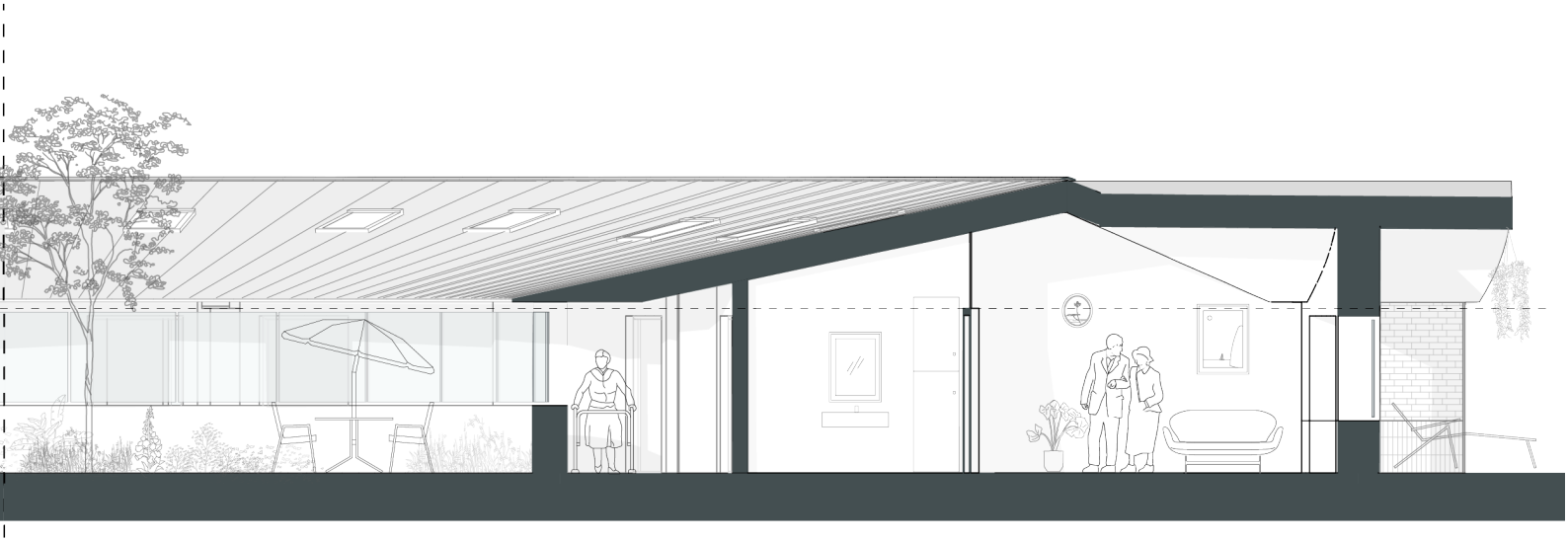


1 Section C-CC

1:100

APARTMENTS

SECTIONS 1.100



Section D-DD

1:100

2

Apartments

The architectural design of *Reminiscence* includes two types of apartments - long and square. While they are comparable in size, the long variant benefits from a shared roof structure. In addition, both models boast a private, covered terrace accessible from the living room, offering residents their outdoor retreat overlooking the lush gardens.

Thoughtful placement of windows ensures that all residents, including those bedridden or disabled, can enjoy direct views of the vibrant outdoors, creating a strong connection to nature and the surroundings.

Significant in the design is the incorporation of large windows. These provide panoramic views of the surrounding area and allow ample daylight to flood the interiors, contributing to a bright, uplifting living environment. Through these design elements, the apartments at *Reminiscence* aim to offer residents a comfortable, personalized, and harmoniously connected living space.

Ill.31. Visualization from the long apartment

Each apartment also offers room for personalization, allowing residents to make their spaces unique and enhancing the homely feel. In addition, the choice of warm and cosy interior materials further amplifies these spaces' comfort and familiarity.

Ill.32. Visualization from the square apartment

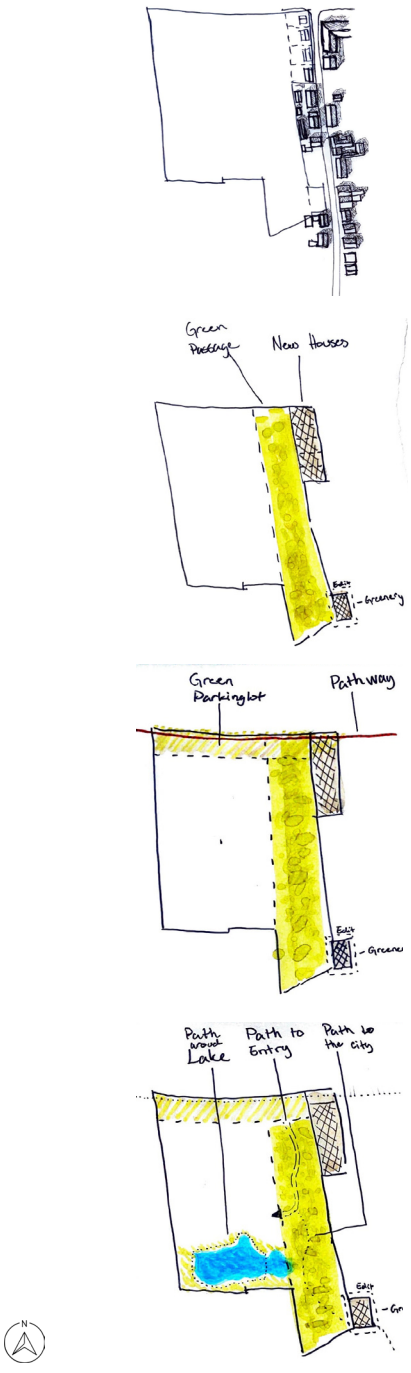
DESIGN PROCESS

This chapter provides a simplified overview of the design process for the thesis. The design is achieved through an iterative approach, which means it involves a non-linear process where architecture and engineering intersect and overlap. As a result, this chapter summarizes crucial explanations related to the project's development. The final design proposal is a result of digital representations and simulations are used in addition to traditional methods such as hand-sketching and physical models. The final design proposal uses digital representations and simulations in addition to conventional methods such as hand-sketching and physical models.

Meeting the context and concept development

To start the process, a study trip was organized to Aabenraa for hands-on exploration of the site and to experience the city. The traditional and well-preserved colourful buildings in the city centre were an inspiration from the start to develop a nearly interconnected design with its surroundings.

In the begging, the idea was to continue to build near the existing buildings east of the site (see ill. 33). The main intention was to recreate the city structure in the design. That was quickly discarded due to our user group and the idea of giving places where they could move freely and safely. It was crucial to include the users in the local community. As a result, it is essential to consider how much the local community was involved in the design and how to give some qualities back to the city. This connection developed the idea of creating a green belt around the building that could work as a park and use the lowest part of the topography to make a lake. This *"green belt"* was to keep distance and screen noise from the busy road to the north while providing a place for a walk for the users and the city's citizens (See ill. 33). Furthermore, there was an idea of creating an orangery in the southeast of the plot, where the users could participate in community activities. However, this involved the design being placed at a corner of the site and very distant from the city, which went against the initial idea of making



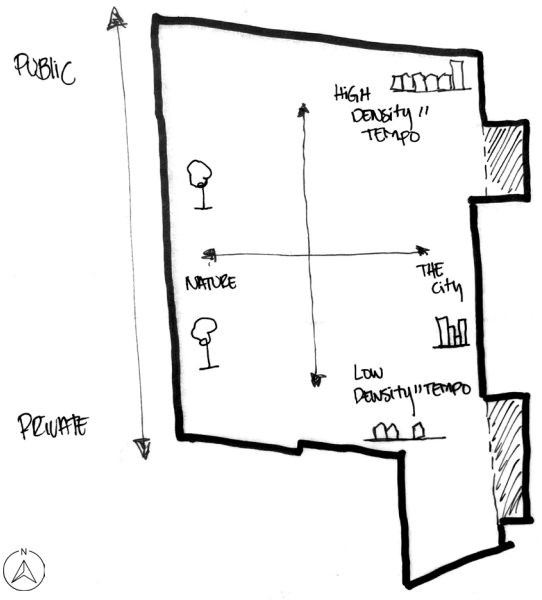
III.33. Initial sketches, relation to the context

the building an integrated part of the context.

During this iteration, essential criteria were established for the project. These included maintaining a distance from nearby context by not building in the plots near the existing buildings, incorporating nature into the site design, and creating a green path around the area to connect the community with nature and the city (see ill. 34).

Ill.34. Green path connecting nature and the city

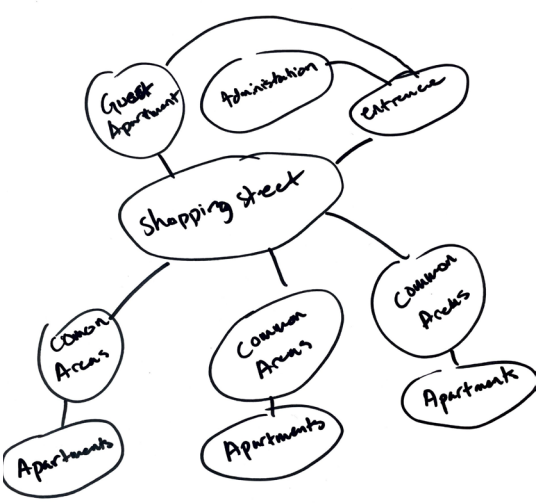
From there moved the process to try different placements of the various functions on the site, still on a conceptual level. The site was split into two axes according to the context (Se. Illu 35) to place the functions according to the site characteristics. Here was essential to place the apartments facing nature and calm areas to the west f the site to avoid audiovisual stimuli. On the contrary, the activities and habitations that required more social interaction were positioned north and east of the site bordering the city. This way, the entrance from the main road on the north could be facilitated. The staff offices and guest apartments were also placed for the relatives in this area. When planning the placement was essential to imagine who the flow would be in the building so that the semi-public and private zones were well-defined for the residents and their relatives.



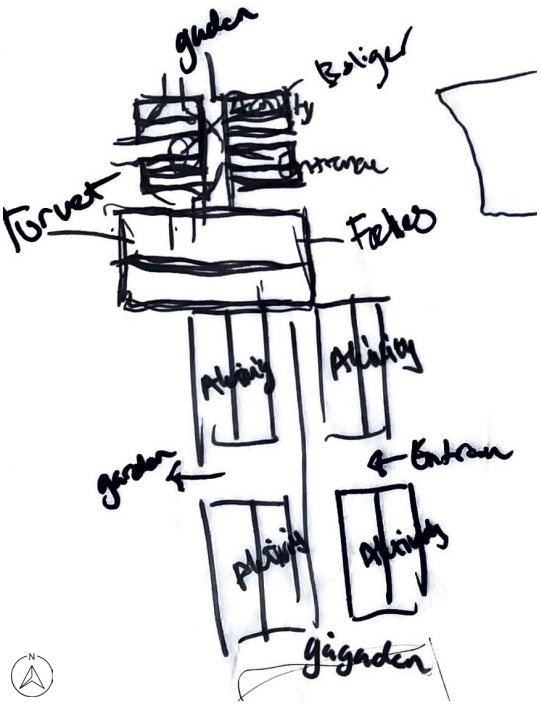
Ill.35. Sitet divided into axes and zones

In the initial sketching phase, it was essential to break down the scale of the building by dividing it into small segments to avoid an institutional building expression. Therefore, some principles were outlined to determine the possible arrangement; the main idea was to create in-between spaces as common outdoor areas with nature as the main connector. However, there was the challenge of departments and functions needing to be nearly connected and shelter from rain and wind. For instance, a glass roof connecting the buildings was considered. However, this was slanted quickly as it would require a lot of material and energy to cold down or heat it.

As our design iterations evolved, creating a *"town within the city"* became a crucial goal. The need for a secure environment that encouraged individual autonomy was evident. The design aimed to simulate a traditional townhome,

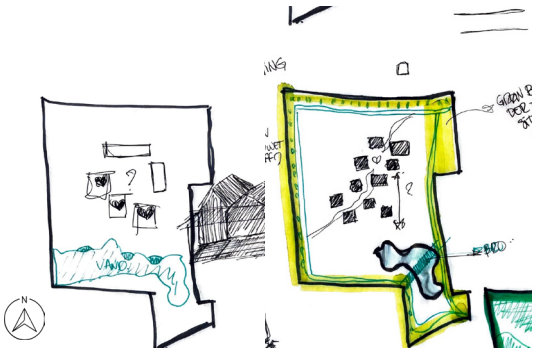


Ill.36. Initial function diagram

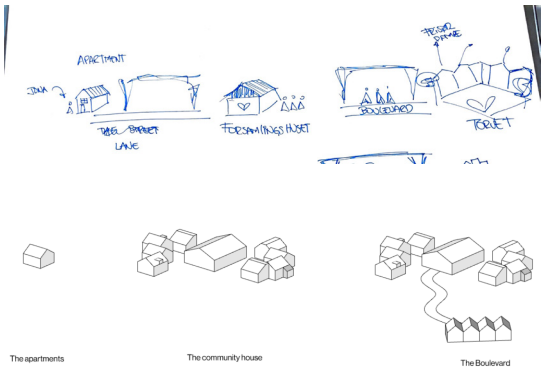


Ill.37. Initial function diagram

offering privacy and independence while enabling routine activities like grocery shopping and community participation. (see ill. 36-38) Replicating the essence of communities typically found in a city became integral to our design. In cities, smaller communities foster a sense of belonging, interacting with larger city-wide communities through shared experiences such as shopping in the same stores or visiting the same parks. The design aimed to mirror the diverse regions in a city, from residential zones to mixed-use areas, each varying in pace and density and offering visual cues for navigation (see ill. 39). Inspired by the diverse architecture found in cities, we sought to deviate from monolithic institutional structures to create a human-scaled, relatable environment. The ultimate goal was to design a compact, controlled town that could provide immediate assistance when needed while protecting it.



Ill.38. Initial sketches, placement in the site



Ill.39. Initial sketches, concept development

Shape and wayfinding

To understand what a non-institutional building looked like, we needed to explore what characteristics we believed an institutional building possessed. Creating a common ground for what we wanted to achieve architecturally and, more importantly, what to avoid. With foam pieces representing the total square meters from the room program, we started exploring what we imagined an institution to look like. The conclusion became a large, uniform, multi-story building with a tendency to close off from the city with long anonymous facades making it hard to identify with the building.

Ill.40. Model study of an institutional building

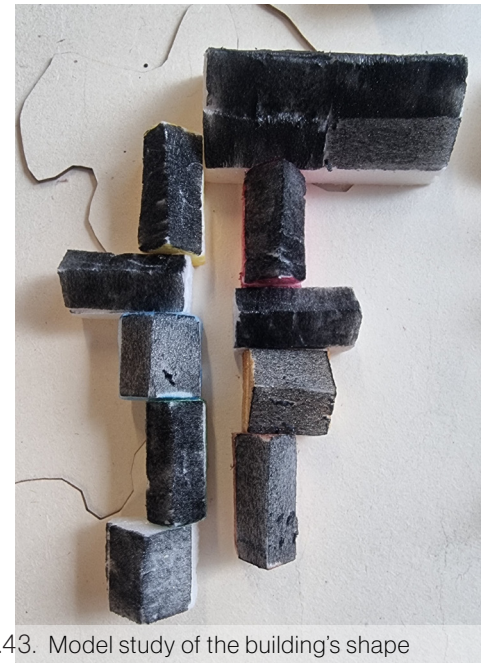
The goal, therefore, became to do the opposite by creating diversity in shape and size and breaking down the scale of the building, and designing homes that display individuality and personality, as tried to show in illustration 41. All of these characteristics dominated in the immediate context and in the city, which had a large variety of buildings with different colours and shapes stacked right next to each other. However, as established in chapter 02_2 A case study on Lundegaarden, it might create an obstacle for the users to go outside to reach the common facilities, making them harder to use. This factor created a conundrum, how do we create one connected building that is experienced as multiple buildings?

Ill.41. Model study of an non institutional buildings

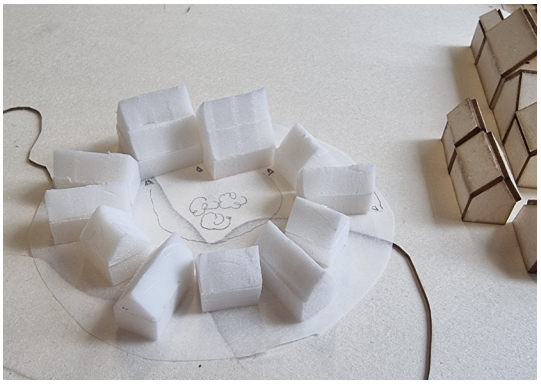
The initial thought was inspired by the city streets we visited in Aabenraa. The idea was to create streets inside the building with a glass roof, giving residents the feeling of stepping outside their apartments without needing shoes or jackets. By designing only two types of apartments that could be turned 90 degrees, the facades facing the "street" (hallway) and exterior appear dynamic and express the residents' individuality. Different shapes and colours would aid wayfinding and make it easier for users to identify with the house rather than just seeing it as a numbered door resembling others. Creating small niches by slightly pushing back some facades would allow space for café chairs or a bench, enhancing the facade and walkway dynamics.


Ill.42. Street nearby the site

However, this proposal would result in a long hallway ending blindly or leading to the gardens. Research has shown that blind endings or locked doors at the end of hallways can cause anxiety and frustration for people with dementia, making them feel confined and diminishing their autonomy (Faith, 2015; Marquardt & Schmieg, 2009). Allowing residents to leave the house without the caregivers' knowledge is also not expedient, as it can be stressful for caregivers who are uncertain whether the resident is in the gardens or outside the compound. Caregivers may also need to ensure that residents are appropriately dressed for


Ill.43. Model study of the building's shape

Ill.44. Model study of the building's shape



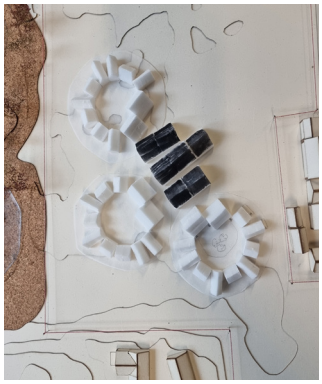
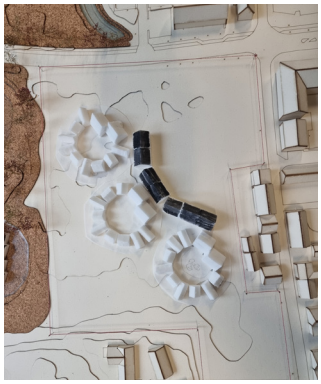
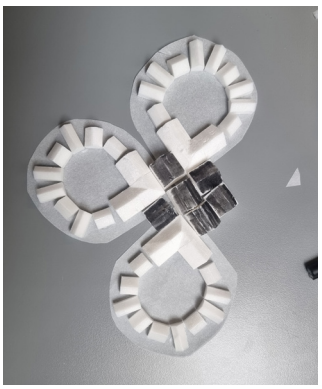
Ill.45. Model study ofthe circular shape

the weather before leaving, making unsupervised exits less preferable. The long hallways would also present residents with many doors on both sides, leading to decision-making challenges and making it harder to choose the right door to their apartment (see Chapter 02 or Marquardt & Schmieg, 2009).

The private terraces facing each other can be problematic in terms of privacy since the residents might be able to see straight into the neighbour's apartment. The outside area between the homes also resembles the space in the case of Lundegården, which had shown to be hard to activate and utilize. With all the apartments facing the same area, it is easy to feel watched in such a place, making it uncomfortable to stay in, so what could it be used for? The only courtyard frequently used at Lundegården was the one in the middle (see Chapter 02_2), which was intimate, sheltered from the wind, and invited to stay with various low-tempo activities. Therefore, it was decided to have two types of outdoor areas, an intimate courtyard with a low tempo and a garden with a higher tempo and more community activities like a chicken coop and a pond to walk around but also include escape places like an allotment hut and a caravan to allow the residents to withdraw from the community like in Lundegården (see Chapter 02_2).

The answer to the problems with the hallway in Ill.44 and the issue of privacy for the apartments and terraces in Ill. 45 became a circular placement of the apartment. Still with two types of layouts and shapes to create diversity and display individuality, but with more private terraces facing different directions while at the same time, the small community of the department closes around itself, marking the fellowship within the small community of the cluster and creates a sheltered and intimate courtyard.

With this proposal, the hallway would be inside the circle, with only doors on one side and visual

Ill.46. Relation and placement of the buildings

access to all the doors through the courtyard, making it easier to find the one you are looking for. In addition, by creating this looped hallway, the residents will always be led back to the Common House and its activities and where the caregivers are and therefore can provide care but also have good supervision over the residents. The loop can also be beneficial for residents who are more anxious and walks around a lot and resident who does not like or want to move but for health reasons needs to. For the residents who walk a lot, the Common House distracts them from wandering. Instead, it encourages them to participate in joint activities. On the other hand, the loop can be more encouraging for the residents who do not want to move because you do not just walk back and forth in a hallway. Still, you can walk toward a destination, even if that place is the same as where you started.

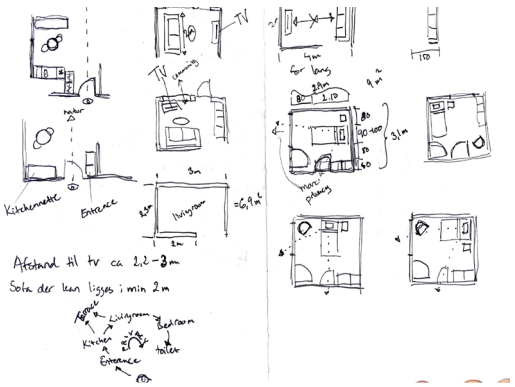
Nevertheless, this circular shape would prove challenging to bind together into one building in a manner that made sense with the outdoor areas. To create something for the bedridden residents to look at other than the tv or the quiet nature, we wanted the apartments to face the gardens. Then the residents could, therefore, also watch the activities and people or animals in the park. We imagined the gardens and the shopping street we called the boulevard to be the parts binding the whole community into one. But the circular shape created negative spaces which were hard to utilize or activate, and many of the apartments would face away from the community.

In the same way, many of the apartments would solemnly get diffuse skylight from the north, and the terraces would also face north, making those apartments less attractive. This condition would also affect the indoor climate negatively, creating lots of heat losses with little heat gains from the sun, potentially causing a problem for the Be18 calculations. In addition, we had learned from the indoor climate chapter that seeing the sun's path

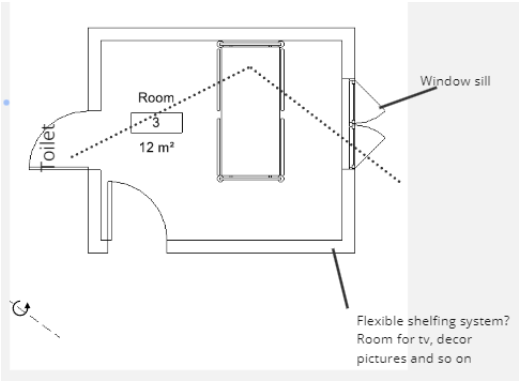
over the sky could help the residents regulate their day rhythm and sense of time (SBi 259) and therefore wished to avoid having apartments facing strict north. However, these wishes could not be fulfilled with the circular design due to the shape and area of the site. Therefore, the principle of avoiding having apartments facing north was dropped due to the need for evidence that it does help with time orientation and that the residents would also spend a lot of time in the Common House, which would provide a different light setting.

Since we did not find a suitable principal for the orientation and placement of the clusters, we tried to look at the project on a different scale and define more precisely what these volumes should contain and look like. Then, we started detailing the apartments, focusing on creating possibilities for the residents to make it into their homes.

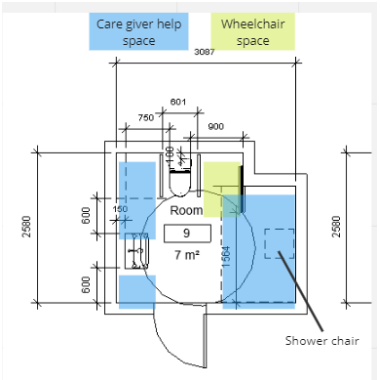
First, the focus lay on creating flexibility in placing furniture and creating opportunities for the residents to personalize the room layout. It was essential for us to create privacy for the residents; therefore, it was important that the flow sequencing of the rooms graduated from the most public to the most private, creating restricted visual access from the entrance to the bedroom and only having access to the bathroom from the bedroom. This principle also complied with the recommendations for designing apartments for



Ill.47. Initial sketches of the room layout



Ill.49. Visibility from the bed sketch

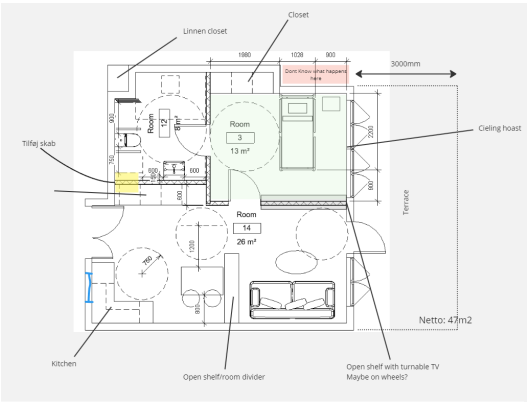


Ill.48. Initial plandrawing of the bathroom

people with dementia. It promotes having the bathroom door visible from the bed to make it easy for the self-reliant user to find the bathroom at night (Sigbrand, 2019). However, the apartment layout does require accessibility for a wheelchair. Still, it most importantly requires space for the caregivers to do their job in an ergonomic posture. The latter put lots of restraint on the flexibility of the bathroom and bedroom layout.

Nevertheless, the apartments should foremost be a home for the residents. Therefore, it became necessary to include storage and more possibilities for creating personalization in the existing layout by having open shelves and windowsills to place personal items. In the bathroom, we also insisted on making a shower enclosure since the shower situation might be one of the most private moments for a person. The shower enclosure has a foldable shower seat. Still, it has the required space for the caregivers to help. However, by doing this, the self-reliant resident could still enjoy a shower in privacy.

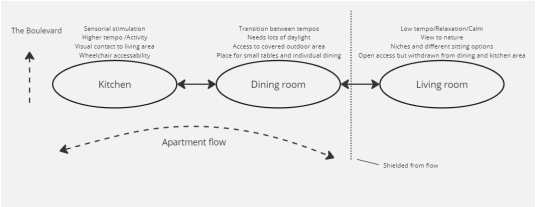
Simultaneously, we started working on design principles for the Common House, determining the functions, specific atmospheres, and affordances we wanted them to have. It was decided to keep the flow from the apartments towards the more active areas to encourage interaction and keep the living room calmer and at a lower tempo. In addition, the access to the boulevard



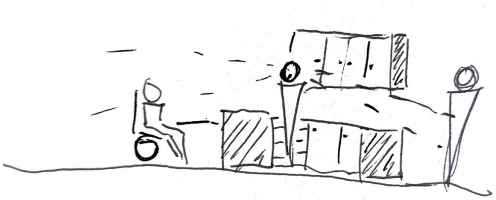
III.50. Priniciples for the apartment's plan layout

would pass by the kitchen since this is the highest stimuli area but also as a reference to a typical residency where the kitchen usually lays next to the entrance area.

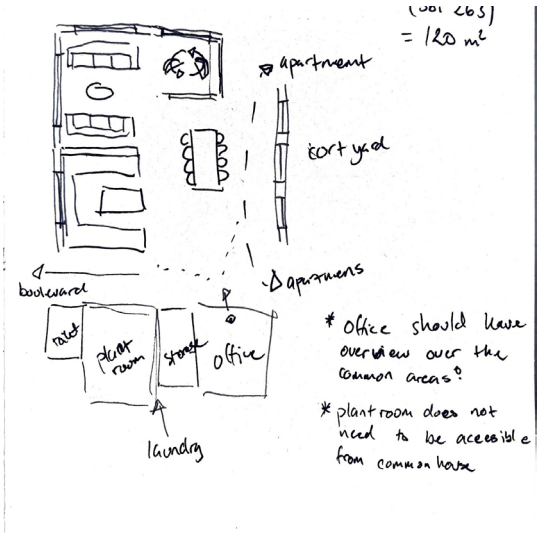
We wanted to create an open plan where the kitchen and dining room were available towards the flow. The living room would be in open connection to it but withdrawn from the activities with niches that are not visual from the flow, making them more private and calmer. The dining room would be close to the courtyard, with a terrace so the residents could dine outside when the weather allowed it. In the III. 52, there is only one big dining table; however, this was not in the residents' best interest since the dining situation can be difficult for some residents. Depending on the type of dementia, all the sensorial stimuli, from the smell of food to the group gathering and loud talking, can be challenging to cope with and result in agitation or anxiety. Therefore, it is more favourable to have multiple small tables which



III.51. Flow principles for the Common Houses



III.53. Kitchen-digning room sketch



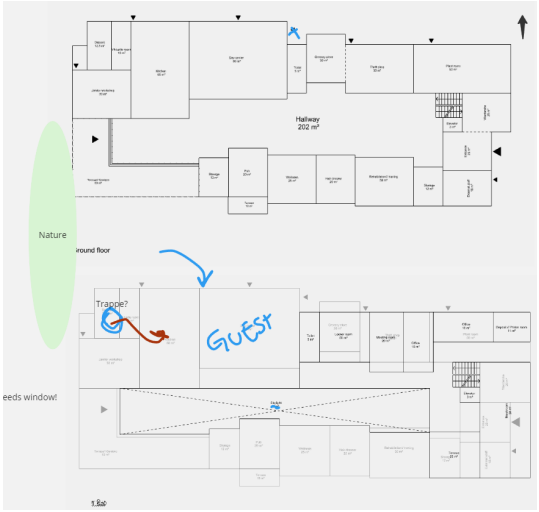
III.52. Function positioning in the Common House

can be arranged in different consultations to fit the individual resident eating situation (Sigbrand, 2019). The kitchen is usually a social gathering spot in the home. It should therefore be kept open and residential and allow everyone to participate in the kitchen activities. Thus, the kitchen design must be inclusive and enable wheelchair users to manoeuvre around and participate. In addition, to ease the caregiver's work, the office should have easy access to the common areas and provide a good overview of the room so they can do the necessary desk work but still be near the residents. In the same way, the laundry room should be in connection with the flow from the apartments to ease the workflow during the day. However, these design principles still need to get a membrane of a building to be in because the previous problem with connecting the clusters to the shopping street still remains.

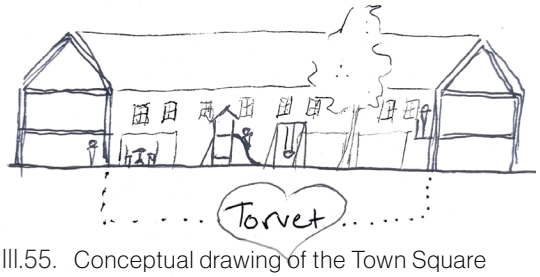
For this reason, the focus was turned towards the shopping street to try and grasp the problem from another angle. The aim was to create an internal shopping street we called the boulevard. Creating the covered "outdoor" area with a glass roof, as mentioned at the start of the apartments, again plays on the principle of the city and the concept of the functions having storefronts and creating a feeling of being outside, however physically still inside.

To avoid presenting too many locked doors for the residents, some of the functions which would not be accessible to the residents were put on a second floor. This creates both privacy for the functions and a natural barrier for the residents with the stairs and an elevator.

We also wanted to be mindful of the relatives by moving the guest apartments and offices to the second floor. This would give easy access to needed personnel but also provide the relatives staying in the guest apartments with privacy and be able to withdraw from the nursing home. The transition to a nursing home can be tough on the resident but can also be challenging for their



III.54. Initial plan layout of the shopping street



III.55. Conceptual drawing of the Town Square

III.56. The park sorrounding the building

relatives and giving them space to be close to the resident was important for us to incorporate.

This phase also brought to our attention that having two gathering spots of the Common House and the gardens were not combinable with the round shape of the clusters, so it was time to reevaluate one of the principles. The conclusion was to rethink the principal of the garden and the shopping street and, instead of separating them, combine them and use the garden with a higher tempo as the third element to gather the buildings around. This would also create a clearer sequencing of the functions from public to private in the building.

So instead of a shopping street, there would be a Town Square. Formed as another closed courtyard, but in contrast, this one would have a higher tempo, with more social activity like an ice cream house, an outdoor cafe-inspired terrace in connection to the pub and day centre and maybe a small playground for visiting the young family members.

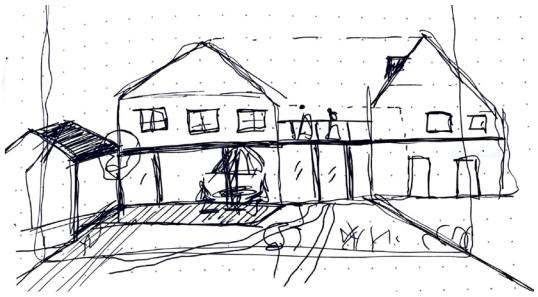
The park would now surround the nursing home and have a lower tempo and be more nature-oriented, creating opportunities to take a walk outside, have a chicken coop and a pound to bring life in terms of animals and something to visit on the walk together with small places for immersion and be alone for the residents like the caravan and the allotment hut. This would still give the bedridden residents some activity to observe from their beds but at a lower tempo.

To enhance the predictability of the Town Square, we established an axis that ran through the courtyard, effectively dividing the various functions based on their respective characteristics. To the northwest, we have social spaces for external interaction and public functions, including the day centre and pub, which would be connected to the day centre for events, rehabilitation facilities, and offices for external staff. Guest apartments and directors' offices are also located here.

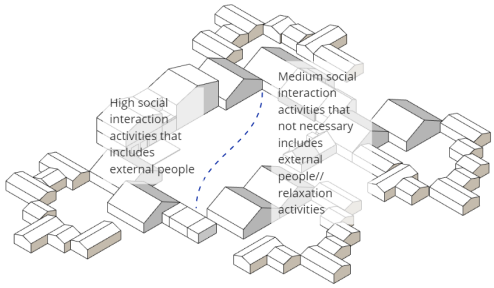
Moving eastward, central facilities like the large kitchen, caretaker's workshop, lockers, and staff breakrooms ensure easy access to different departments. Lastly, tranquil activities take place in the southern section, such as wellness and a hairdressing salon. These spaces seamlessly connect to surrounding gardens, providing a serene environment.

Until now, the connection between apartments, the Common House, and the circular hallway has still been conceptual. Still, with a concept and principle for the whole building, it was time to detail the clusters. Different design options for creating the circular hallway and connecting the apartments to a more coherent form. We tried to challenge the round exterior to better reference the city of Aabenraa. However, these proposals did only create quirky corners either in the hallways or in the apartments, compromising the principle of easy wayfinding by creating corners in the hallway (see III.58-57) or creating inaccessible corners when designing the layout of the apartment due to the need for accessibility for wheelchair users.

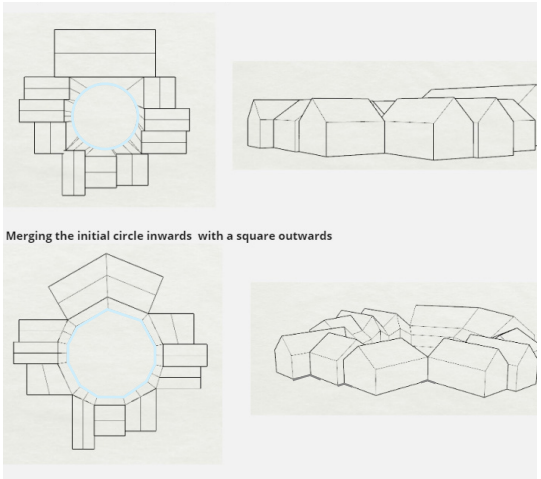
For these reasons, we went back to the original form of the circle and instead made all the apartments trapeze shaped. This would enable only having 2 different layouts for the apartments but also create a more unanimous expression and visualize the small community of the neighbour-



III.58. Conceptual drawing of the Town Square



III.57. Princip for the placement of the Town Square's functions

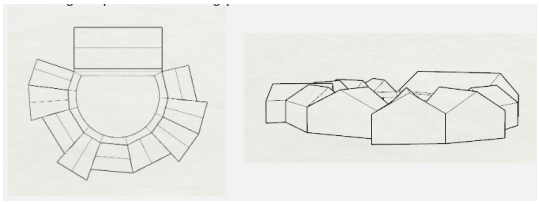


III.59. Experiments with a combination of square and circular shapes

hood and create more privacy in the apartments since all the terrasse and facades will point in different directions. Showing a more apparent distinction between private and community. In addition, this proposal was more compact, creating a less square meter façade than the other two options, which would be more beneficial for the LCA calculations.

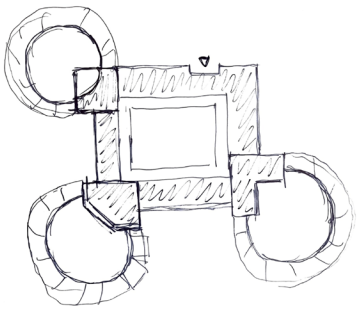
Lastly, the meeting between the apartments and the Common House needed a principal to avoid the quirky corners shown in Ill. 61-63. By designing an L-shaped building and having the Common House gables meet the apartments' gable, it would complete the circle and eliminate the problem of the quirky corners. The roof structure would later be developed further and is described in the chapter Roof and Building Connections. It would also create an opportunity to bring lots of daylight into the Common House and potentially make the wanted division between the living room, dining area, and kitchen.

With the principles for the clusters in place and some additional research on wayfinding, a slightly new idea for the Town Square arose. Instead of including the Common House façades in the building mass around the courtyard, they would be more drawn back to ensure the privacy of the small neighbourhood. Therefore, they would be placed in the corners, creating straight sightlines towards the common areas and landmarks for the users to orientate from because research

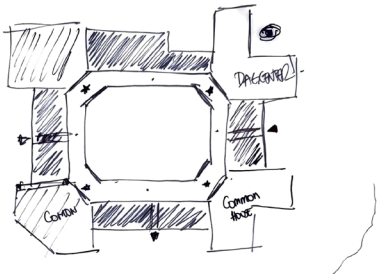


Ill.60. Extention of the apartment's shapes to fill the gaps in the corners of the shape

Ill.61. Meeting between the Common House and the apartments

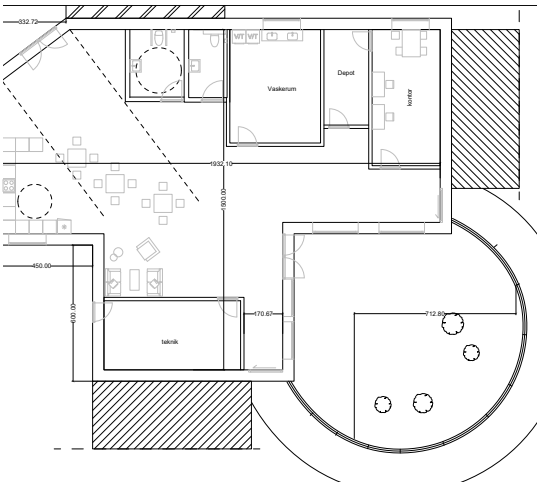


Ill.62. Meeting between the Common House and the Town Square



Ill.63. Meeting between the Common House and the Town Square

shows that the place where the residents eat is more accessible for them to remember the way to (Marquardt & Schmieg 2009). The Common Houses would then need to be distinguished from each other by having vastly different expressions to ease the wayfinding and not create confusion (Marquardt & Schmieg, 2009; Faith, 2015). By doing this, the functions around the Towns Square could be placed freely between the departments.

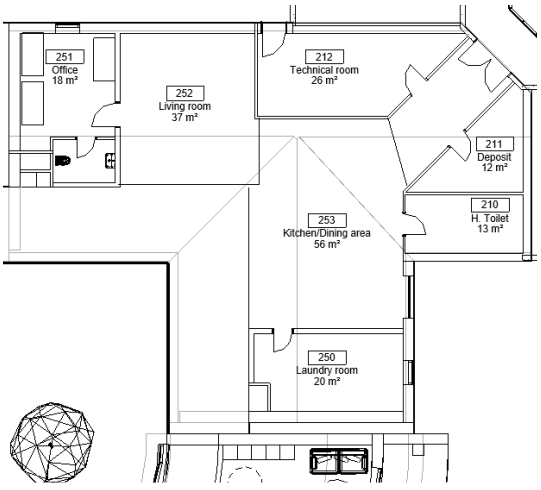


III.64. Common Houses' layout development

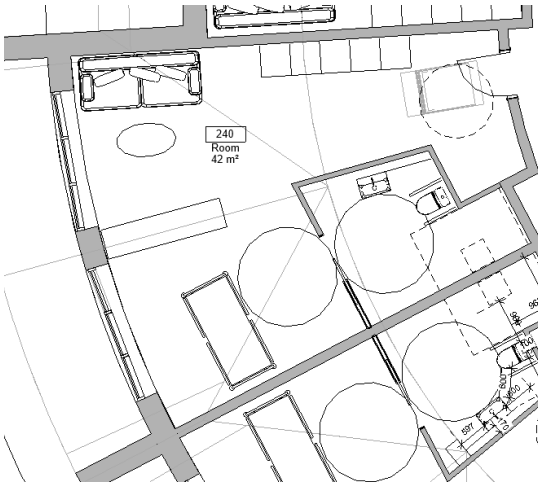
A few iterations were done on the layout of the Common House to put the design principles into a physical form. The illustration 65 was the most favourable option. However, the principle of the living room's niches was lost.

When the glass connection between the Common House and the apartments was further developed (see Chapter 06_3 Roof and building connections). This layout changed into the final proposal to utilize the quality of the skylight in the connection between the buildings more efficiently, which also provided an opportunity for creating more private niches in the living room.

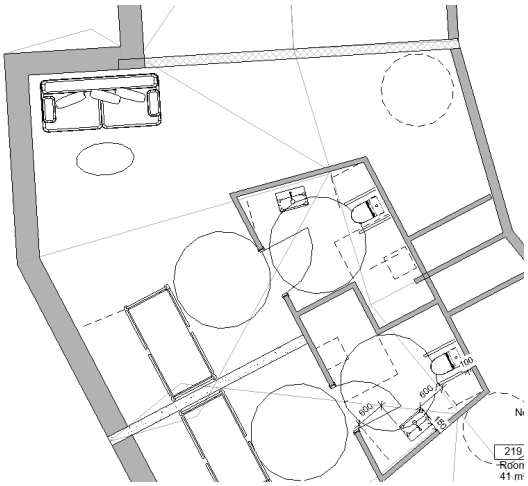
The principles from the ideal apartment were easy to implement into the square apartment (see III. 67). However, the long apartment (see illustrations 66 and 68) did not go as smoothly. The main problem with these layouts was that the highest point of the roof structure became the bathroom, which was not desired. But, by sticking true to the original idea, the layout finally succeeded in the final design.



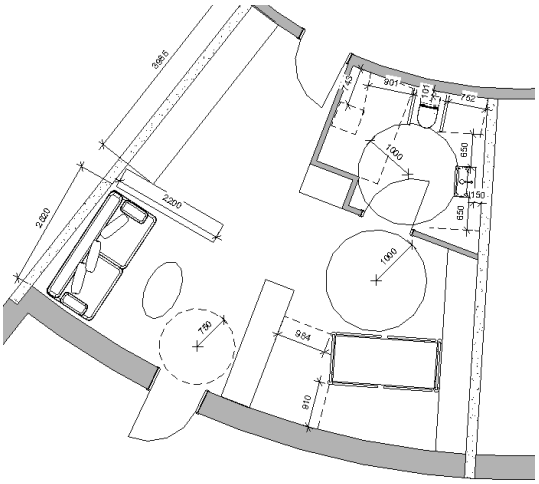
III.65. Common Houses' layout development



Ill.66. Apartments' layout development



Ill.68. Apartments' layout development



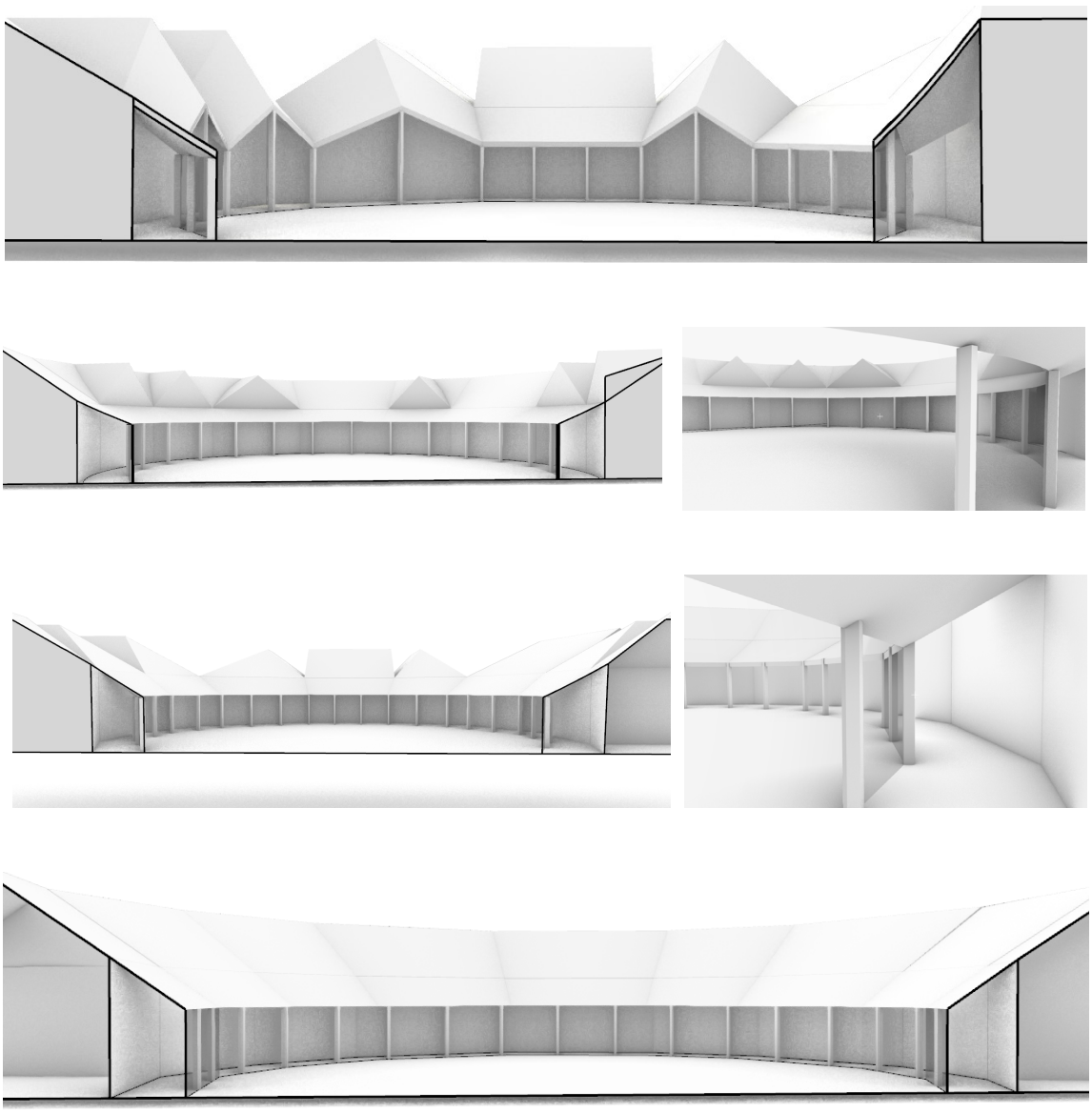
Ill.67. Apartments' layout development

Roof and building connections

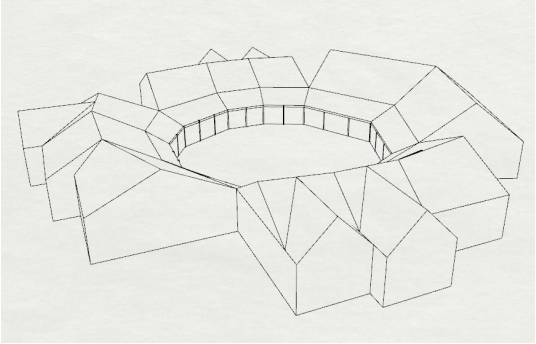
Upon first visiting the site at the start of the process, we experienced the town's diversity and immediately knew we wanted to reflect that same diversity in our project. Even though diversity is a sign of development in different stages, the distinctions between the buildings also represent individuality and personality, which is vital to create, especially when living in the community. The saddle roof makes it very easy to create diversity due to the vastly different shapes of the gable and the long side, so by turning the ridge 90 degrees, the house is experienced differently. In addition, the saddle roof building is probably what we associate most with a home – how we draw a home as children and what we use as an icon for our home address. This also represented the opposite of an institutional building, as discussed earlier.

Therefore, the initial thought was to create a street where the saddle roof played the central role in creating a distinction between the apartments and trying to make it easier to find one's own home. However, the street became a circular courtyard due to wayfinding principles. Therefore, we started to develop how to bind the houses together and how the hallway could become an integrated part of the roof, not an extension of the building, as illustration 70 displays.

Ill.69. Roofs in the near context



Ill.70. Hallaway's roof invesigations



Ill.71. Variation in the gable

It was also essential for us to explore how the shape of the building was experienced from eye level and that the roof design contributed to a calm atmosphere in the courtyard. However, we still wanted to display individuality from the centre and the outside. Different ideas were tried to accommodate both principles but, in the end, the gables on the inside of the courtyard were dropped because the hallway would either become very complex and became too distracting or confusing in shape and experience (see Ill. 70) or the gables would not be seen from the hallway and therefore make no difference in the experience of walking by it (see Ill. 70). Furthermore, the one-sided slope would tie the houses together and eliminate problems of leading away water and collection of snow or leaves in between the slopes (as the proposal in Ill. 71 would). It also created the desired calm experience from the courtyard.

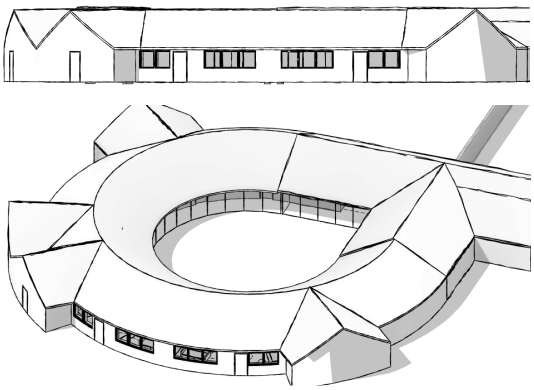
To keep the individual houses' principle, the circle's outside would have a variety of gables and sides, and only the inside would have the same slope. This would also enhance the individuality of the apartments and the person from the outside but display the community on the inside.

APARTMENT'S ROOF

It was important for us to display and utilise the shape of the roof in the apartments as well, bringing height and volume and making them feel bigger and like a tiny house. The problem with this was avoiding a too-high ceiling because this could cause an opposite effect on the room, especially in the toilet. Furthermore, we wanted the roof to contribute to the atmosphere in the rooms without creating a visually complex space due to the users' needs and the size of the apartment. The concern with the proposal in Ill. 71 was that the gabled flats would have a very complex shape for their size and that the now somewhat uniform roof shape made it look more like an institution. The problem with the equal-sided saddle roof was that the roof ridge was situated inside the toilet. We wished to avoid having a lowered ceiling to still give the toilet quality and wanted to utilise a skylight for natural ventilation. However, the apartment's layout was more fixed due to the specific space requirements; therefore, the roof would need to adapt to the layout. The roof shape went through some iterations to try and solve these problems.

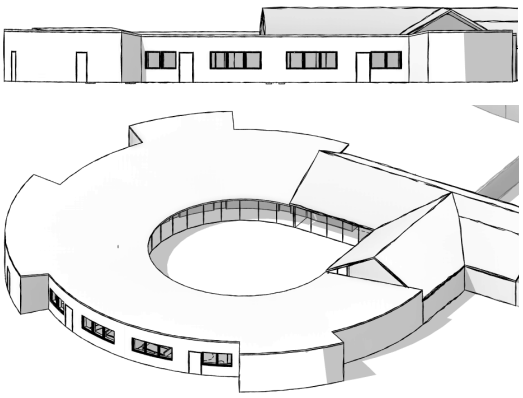
Firstly, we tried to accommodate the height of the toilet's ceiling and amplify the atmosphere in the apartments by having a one-side roof slope.

This would give the bathroom and entrance of the apartment the lowest ceiling height. Then it would open up in the living- and bedroom creating a tall façade towards the gardens, allowing big windows to bring lots of daylight into the apartment. It also reduced the amount of square meter roof, making it the most beneficial choice in terms of LCA. However, the whole apartment is very private, so big windows would not be appropriate here. In addition, the expression of individuality from the outside and the connection to the context were lost.



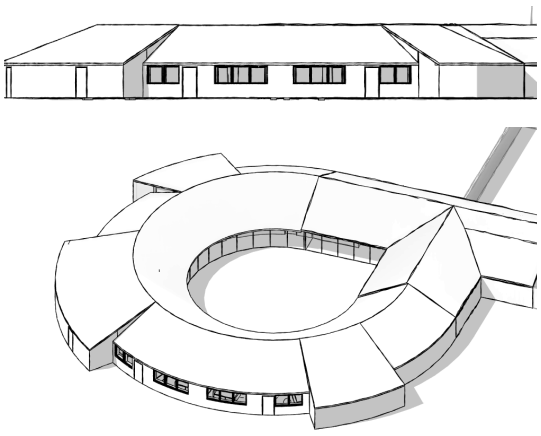
Ill.72. Roof experiments

To simplify the interior expression of the roof in the apartments and avoid unnecessary use of materials, a continuous saddle roof was tested. The ridge would move so the highest point would no longer be in the toilet, but the reference to the context would still be there. However, this proposal became even more institutional in its expression, and we were not willing to discard the principle of emphasising the individuality of the apartments from the outside.



Ill.73. Roof experiments

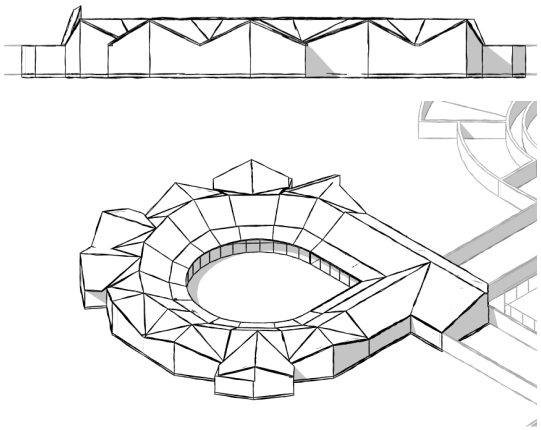
Lastly, we tried having only gables outwards to



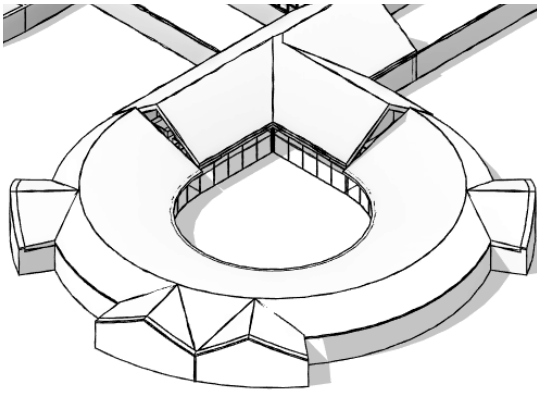
Ill.74. Roof experiments

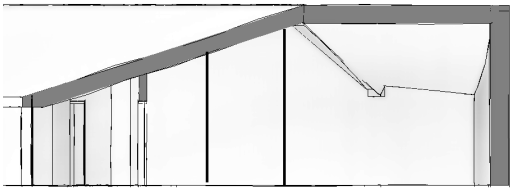
create a more dynamic facade through the shape and, in that way, mark the individual apartment. However, the proposal had the opposite effect. Even if the gable marked the apartment, they all looked the same inside and outside. It also enlarged the building, making it more monumental.

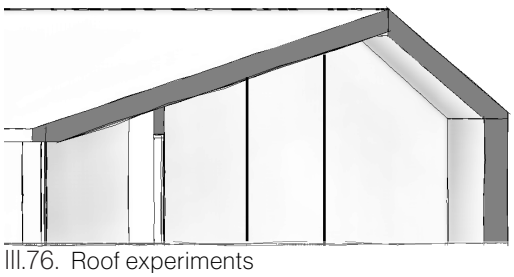
With this, it was concluded that the original idea (Ill. 75) best represented what we wanted to create both from inside and outside. The issue of the roof becoming too complex was put to rest by creating a section through the apartments visualising the shape from the inside, and to solve the problem with the bathroom, the ridge was moved towards the outside of the circle, creating a lowered roof in the bathroom and entrance but still a high ceiling in the living - and bedroom. However, this solved the bathroom situation in the square apartment (see Ill. 76) and not the long apartment (see Ill. 76). In this case, it was best to change the layout rather than the roof since we saw few possibilities for finding other solutions.



Ill.75. Roof experiments







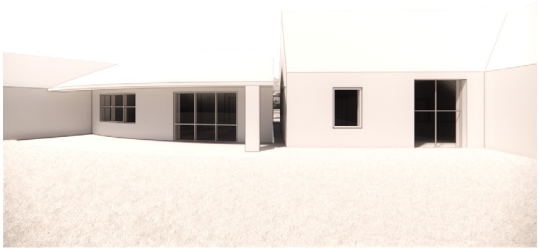
Ill.76. Roof experiments

APARTMENTS MEET THE COMMON HOUSE

Already from the conceptual thoughts, the idea was to mark the community house with a different type of roof, giving it more height, highlighting the community of the cluster from the outside but also creating a more spacious inside. The Community House would act as a landmark with the placement of the kitchen and dining area, and we wanted to reflect this in the form as well. Creating a clear distinction between the social and the private areas.

Since the apartments and Common House had now developed into two different forms and slopes, there was a need to connect the two buildings both architecturally and physically to mark the transition between the zones. This could be done by a material change or by physical separation, but because the shapes were vastly different, we needed a third element to bind the buildings together.

The first idea was to create a glass connection of about 40 cm between the outer walls of the buildings. The link created a separation which broke up the scale of the continuous building volume. However, this glass area would need to be more significant to create a vastly different experience when walking through the building. It also seemed like a shame that this connection would be purely architectural and not bring quality to the rooms.



Ill.77. 40 cm glass gap between the Common House and the apartments

Ill.78. Bigger glass gap etween the Common House and the apartments

Ill.79. The glass gap experienced from the inside of the Common House

Therefore, different iterations were tried to use the inlet of daylight in the Common House. This also brought the final change in the layout of the Common House.

We tried making the glass part bigger to significantly impact the experience when walking by it, making it appear as being outside before entering the next building. A few different proposals were made, but they either did not work from the outside (see Ill. 80-82) or it made the gable wall appear very heavy from the inside. In addition, the daylight quality did not affect the room (see Ill. 80 and 82). Finally, we tried implementing a visual scissor-beam structure to match the slope of the apartments and disguise the heavy gable. However, even with a cc of 1.2m, the beams cluttered the room and removed the room's quality and marking with the considerable ceiling height.

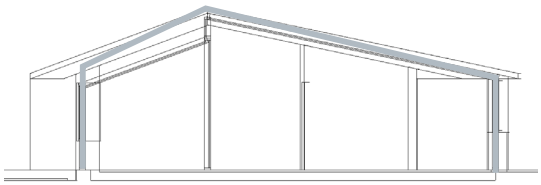
Ultimately, we found a solution by making a glass gable and a smaller glass separation between the buildings. This brought lots of daylight into the room and highlighted the Common House's shape and transition. The gap between the building is not experienced as exiting one building to go to the next. Still, it brings lots of daylight in, and the glass gable marks the different sizes of the apartment building and therefore creates a clear marking of the shift (See. Ill. 83)

Ill.80. The roof connection expeienced from the oindised

Ill.81. The glass gap experienced from the inside of the Common House

Ill.82. The roof connection expeienced from the oindised

Ill.83. Visible scissors beams



Ill.84. Section of the final iteration

Ill.85. Final iteration from the inside

Ill.86. Final iteration from the exteriors

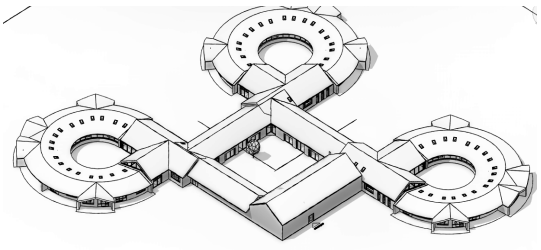
Ill.87. Final iteration from the exteriors

COMMON HOUSES MEET THE TOWN SQUARE

The Town Square were the binding element between the different clusters, creating the fellowship of the whole village. Here, the shape of this building did not have to adapt to a strict floor plan, except for the principle of creating a big courtyard in the middle.

The wayfinding principles in the Town Square resembled the tenets of the clusters. Therefore, we tried to use the same roof construction as well. This created the same calm expression from the inside as in the courtyard of the clusters. However, the Town Square would have a different function. It was supposed to be the centre of activity, so having the same atmosphere was not desired to avoid confusion. Moreover, the uniform saddle roof elongated the building volume and made the building look more institutional.

By creating only gables towards the courtyard, the expression became vastly different and more playful and visualised the various functions of the buildings. This principle symbolised both the diversity inside and the distinct function of the whole town square compared to the Common House and the apartments. It also broke up the scale of the two-story buildings to the north, avoiding the institutional look. However, we still wanted to accentuate the Common House clearly since it acts as a clear landmark for the residents. Furthermore, the Town Square had become quite large to fit both the functions in the courtyard and



Ill.88. Same roof construction as the Common Houses

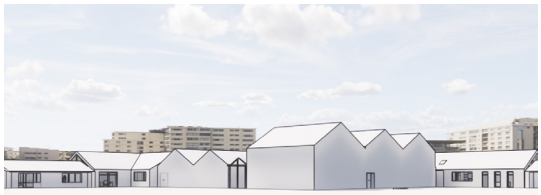
Ill.89. Transition between the Town Square and the Common House seen from the courtyard

Ill.90. Town Square's roof seen from the street

Ill.91. Town Square's roof seen from tthe gardens

Ill.94. Transition between the Town Square and the Common House seen from the courtyard

Ill.92. Town Square's roof seen from the gardens



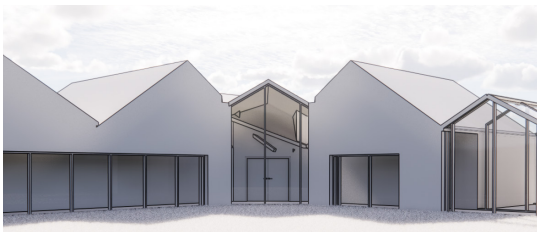
Ill.93. Town Square's roof seen from the street

Ill.95. Transition between the Town Square and the Common House seen from the courtyard

the building. Therefore, we decided to emphasise the entrances to the Common Houses so that they would stand out from a distance.

It was a challenging process due to the complex intersection of the three roof corners and being able to establish a realistic roof construction, but three possible solutions were developed. It was chosen to go with the glass gable to keep true to the form concept of the courtyard. In this way, all the entrances and exits to the building would be marked with a glass gable and frame the door to the Common Houses. This principle so separated the buildings, making it look like many individual buildings clustered together, creating the little town as the conceptual idea suggested.

Ill.97. Transition between the Town Square and the Common House seen from the courtyard

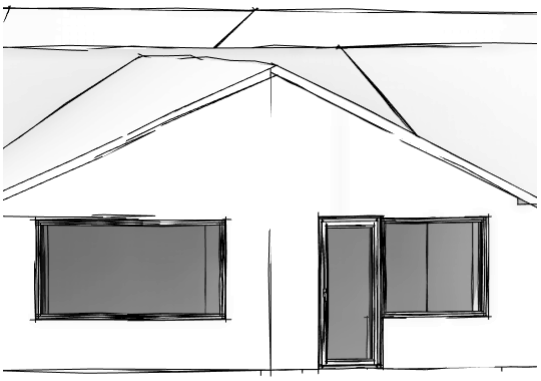


Ill.96. Transition between the Town Square and the Common House seen from the courtyard

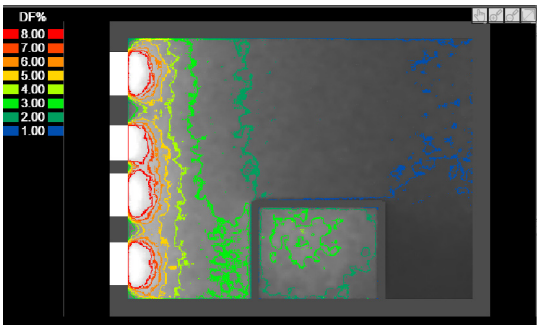
Facades and indoor climate

The indoor climate and energy performance aspects have been in our minds since we started designing. At the beginning of the sketching phase, there was a desire to place the apartments and buildings mainly facing south to utilise passive solar heating during the heating period and easily shade from the sun during the summer months. However, since the user group needed help with wayfinding, designing for easy orientation became the most important thing for their well-being and autonomy. Therefore, other design aspects, like the indoor climate and energy performance which could be adapted through careful consideration of the façade design, were put on hold until an initial layout and principles for wayfinding were determined.

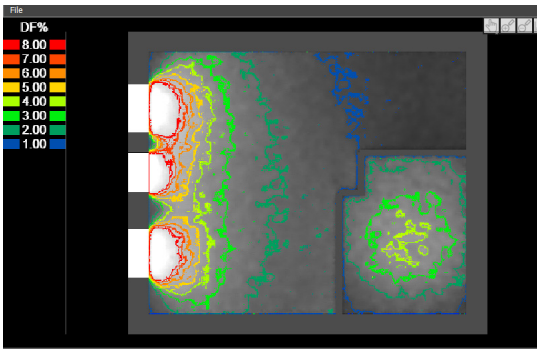
The first iteration of the design proposal was very ordinary, with a window area of 30% of the façade area because, from our experience, that usually works fine for upholding the Be18 calculations with a standard windowpane. However, we were most concerned with the daylight factor in the long apartment because of the depth of it and since we would only be able to have windows on one side of the apartment. It was, therefore, also important that the main living area would be close to the outer façade in the layout.



Ill.98. First facade iteration, 30 % windows area

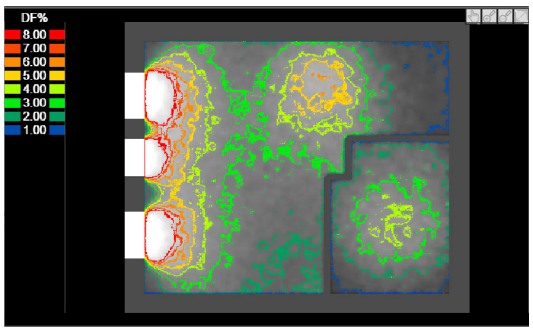


Ill.99. Initial daylight analysis

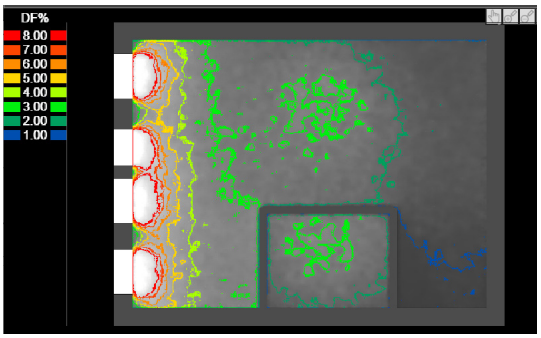


Ill.100. Initial daylight analysis

The initial daylight analysis was quick and in a square, not representing the apartments' actual form. However, these conditions were expected to be worse than the exact apartment shape and therefore accepted as initial iterations. The target was a daylight factor of 2,1%, as described in the DS/EN 17037:2018+A1:2021 (Danish standard organisation, 2022). They confirmed that windows were also needed on the opposite side in both apartments, the long apartment being the most critical. From the start, we decided to have a skylight in the bathroom to bring in light and ventilate naturally. Initially, there was a desire to avoid using another skylight as it was considered an easy solution and did not bring additional quality to the room. Although, the only possibility was to put a window in the hallway wall. This was not desired because we wanted to keep the apartments as private as possible, and the hallway was the main flow of the building. Therefore, the only solution was to have another skylight in the hallway/kitchenette area of the apartment, and it resolved the issue.



Ill.101. Second iteration with two skylights



Ill.102. Second iteration with two skylights

Simultaneously, we ran a Bsim analysis to test for thermal comfort and ventilation for CO^2. We decided to ventilate the apartment naturally but with automatic control for some facade windows and both skylights to utilise the cross and stacked ventilation. Cross ventilation for securing a high

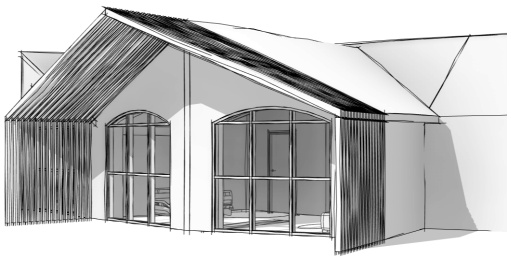
Temperature above	number of hours	Max. Number of hours
> 27	82	100
> 28	30	25

Ill.103. Analysis of thermal comfort in the apartments

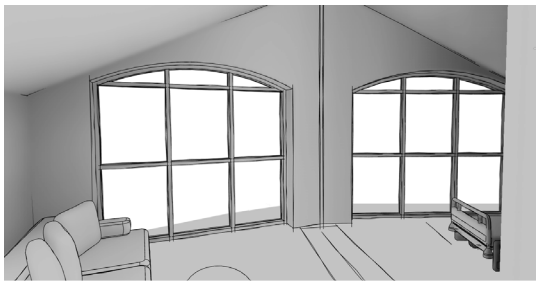
airflow and avoiding overheating in the summer and stacked ventilation to prevent drafts in the heating periods but still be able to ventilate for CO^2. Since the apartments would be facing in all directions due to the round shape, we decided to test the two different types of layouts individually in all four directions, starting with the south-facing as a point of departure for the design. The setpoint for the indoor temperature was set at 22 degrees Celsius because the users would mostly have a very low activity level, which would be their comfort temperature. Furthermore, the CO^2 level was set to 1000 ppm since this is the recommended maximum value (BFA, 2023).

The CO^2 levels were checked daily during December and June to ensure that the natural ventilation would be enough and with the two skylights, so a combined ventilation method was possible; it was always kept under the max value. However, the thermal comfort was slightly too high, and with a wish to have a more open façade, other measures would need to be implemented.

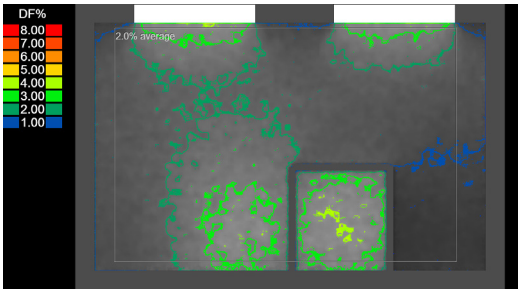
In this design (see Ill. 104 and 105), the arched window form was investigated, drawing inspiration from local crafts traditions and aesthetics of the city's architecture and modernised by extending it to the floor. This larger glass area aims to connect the apartments with the surrounding gardens, blur



Ill.104. Investigation og the arched winows on the facade



Ill.105. Investigation og the arched winows on the facade



Ill.106. Daylight factor investigation

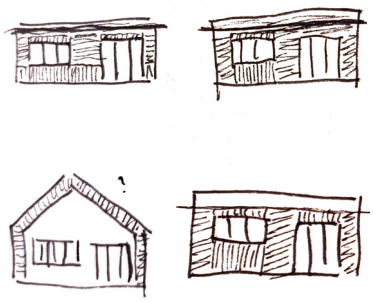
Temperature above	number of hours	Max. Number of hours
> 27	67	100
> 28	21	25

Ill.107. Analysis of thermal comfort in the apartments

the boundary between indoors and outdoors, and maximise natural light, which research shows can improve residents' orientation and well-being (see Chapter 02_ The Users). These large windows needed shading to not create overheating, and since the design required to work in all directions, there would need to be both overhangs and shading from the sides. The design required overhangs for more reasons than just to avoid overheating. We wanted overhangs to enable the resident to use the terrasse for a more extended period during the year. The overhang would provide shade in its summers to avoid harsh glare inside but also enable the resident to sit outside during poorer weather and provide shelter from the wind. Therefore, the apartments were tested in Bsim and for daylight with an overhang and sides of 2,7 m. Partly due to the large window areas but also because that would create coverage over the whole terrasse and frame a more enclosed space.

Fortunately, the design upheld the set values for thermal comfort and the daylight factor if we considered that the analysis did not represent the actual form. However, the extensive glass areas presented some challenges for the user group, particularly in the bedroom. From personal experience with individuals with dementia, large windows can trigger anxiety and stress, as they may feel observed by someone outside. Additionally, caregivers must adjust curtains frequently when assisting residents with changing clothes or for hygiene care multiple times daily.

In response to these concerns, facade design principles were established. Windows should correspond to the function of each room, with larger, more open windows in living areas and smaller, private windows in bedrooms. Still, providing the user with a good view over the gardens to have something to look at if needed to be bedridden. Additionally, windows should offer opportunities for personalisation, in terms of windowsills and be accessible at a height suitable for wheelchair users to enjoy. In addition, the arched window was dropped because it created a very large contrast between the gables and the roof design, and the aches could not be seen with the square apartment's overhang principle. This led to implementing brick details instead of still marking the windows and drawing upon the local crafts, traditions, and aesthetics.



Ill.108. Facade principles

This design did not work with a 2,7 m overhang in terms of daylight (See Ill. 110), and the expression of the building became very heavy. Therefore, the overhangs were reduced to 1,7m, still providing lots of covered space. In addition, different principles for the gabled apartments were also tried to find a discrete principle that would create a coherent look with the square apartment.

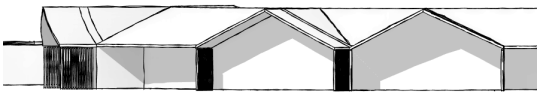
The most favourable option became Illustration 111, which most resembled the square apartments shading principal and created more privacy for the residents and framed and enhanced the gable's shape. This proposal also worked in terms of daylight but created more significant problems for thermal comfort, where the south apartments were the worst.

However, the principles for the façade made sense for the user and the layout. Therefore, we decided to use a glass pane with a lower g-value to reduce the heat gain through solar radiation. This vastly reduced the overtemperature into accepted values.

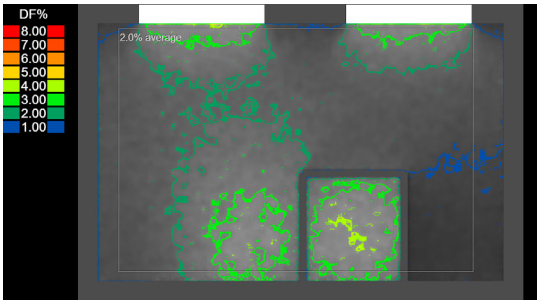
Temperature above	number of hours	Max. Number of hours
> 27	161	100
> 28	75	25

Temperature above	number of hours	Max. Number of hours
> 27	81	100
> 28	22	25

Ill.113. Thermal conditions calculation, with high g-value and with lower g-value.

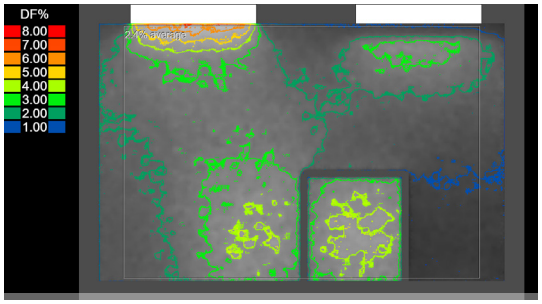


Ill.109. Facade with the 2,7 m overhang



Ill.110. Daylight analysis of the facade with the 2,7m overhang

Ill.111. Testing different expressions of the overhangs

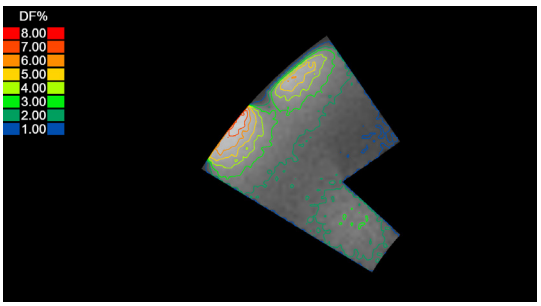


Ill.112. Daylight factor analysis of the facade above

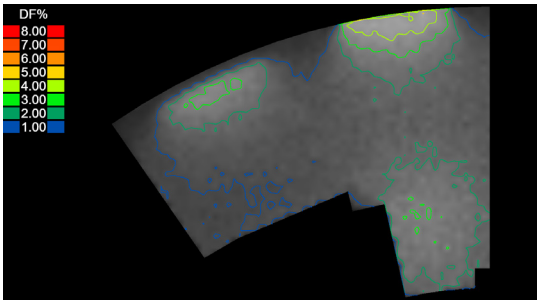
Although, this change would, of course, also affect the daylight simulation of the apartments. This time a more precise simulation was done to find the more exact value. Fortunately, the less accurate shape of the apartment proved to be worse than the actual design, as predicted, and the daylight conditions were upheld in all the apartments and common areas. (See Appendix 02 for the full report.)

Lastly, we wanted a heated hallway so the residents did not need to wear a jacket or shoes to go to the Common House. Therefore, we ran a simplified simulation of the hallway in Bsim. The first idea was to have a whole glass façade towards the courtyard; however, we knew it would be unrealistic if the space was heated. For this reason, we decided to start the window at 90cm above the ground, which would be the same height as the hand railing needed to assist the residents. Making the railing into an integrated part of the windowsill and still providing visual contact to all the apartments from the hallway.

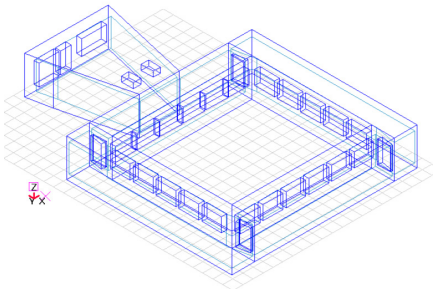
This proposal also worked very well in Bsim, upholding the demands for thermal comfort and creating a slight resignation in the temperature of the apartments as well.



Ill.114. Final daylights simulations for the long apartment



Ill.115. Final daylights simulations for the square apartment



Temperature above	number of hours	Max. Number of hours
> 27	38	100
> 28	12	25

Ill.116. Inddoor thermal conditions for the hallways at the Common House

Materials and atmospheres

The decision-making process for selecting materials for the design was based on their global warming potential (GWP), lifetime, recycling potential, and aesthetic properties. Initially, different materials were analyzed and compared based on their appearance and how they would fit within the design. Afterwards, the materials and their corresponding quantities were tested using the LCAbyg tool to investigate the total environmental impact of the design.

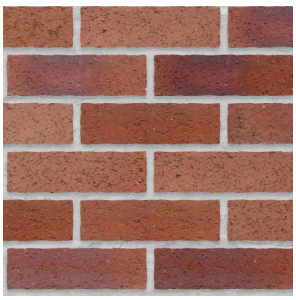
There was a desire to link the design with its surroundings. As the design took shape and became an unfamiliar form in its context, it became evident that materials would serve as a linking element. During this investigation, concerns arose that the design might blend too much with the neighbouring context. To avoid this, it was decided that the facade and roof materials should create a contrast with each other. That brings us to studying the exterior materials where facades were explored. For the facades, it was necessary to showcase diversity and individuality in the apartments, so different types of materials were explored to achieve this.

EXTERIORS

During the site visit, we were fascinated by the city centre's rich brickwork details and colourful facades. That inspired us to develop a facade design that honours traditional Danish building techniques through its use of details, shape, and colour. Initially, bricks and plaster were considered due to the possibility of painting them with diverse colours and variations to recreate the city in the design. However, they were discarded because they would become similar to the context, and the LCAbyg shows a high GWP(Ill. 120). Instead, the idea of using reused brick in the facade arose. Reused bricks had a long lifespan and a very low GWP. Therefore, they offered an opportunity to reinterpret the most common building material in the city's facades and give a narrative to the design through the history of the bricks' earlier life. Additionally, using reused bricks allowed the recreation of details in the facade and the creation of different patinas for the apartments. This variation showed individuality from the exterior and added character to the building.

In the case of the Town Square, the purpose was to create a unified expression and use the same material in the facade to foster a sense of belonging and togetherness in the design. There were also decided to employ red bricks for the facade, but in contrast to the apartments, the bricks should be the same colour. Several studies were conducted to determine the ideal colour for the building facade to achieve the desired appearance (see ill.20). The use of red bricks was deemed unsuit-

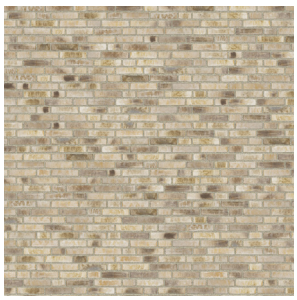
Ill.117. Facade materials



Bricks
80-years lifespan
582,5 kg CO_2eq/ m^2

Plaster
50-years lifespan
119,39 kg CO_2eq/ m^2

Wood
50-years lifespan
1.89 kg CO_2eq/ m^2



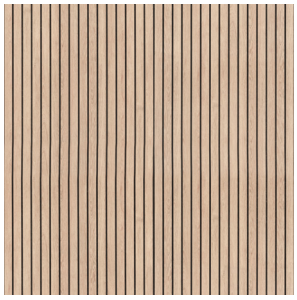
Reused bricks
80-years lifespan
5,47 kg CO_2eq/ m^2

Ill.118. Interior materials

Plaster
50-years lifespan
119,39 kg CO_2eq/ m^2

Wood
50-years lifespan
1,89 kg CO_2eq/ m^2

Clay plaster
60-years lifespan
82,0 kg CO_2eq/ m^2

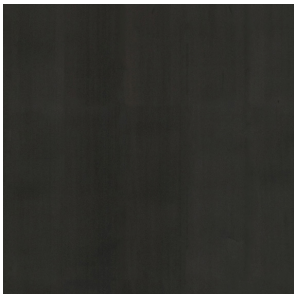


Acoustics panels
50-years lifespan
1,32 kg CO_2eq/ m^2

Ill.119. Roof materials

Tiles
60-years lifespan
15,8 kg CO_2eq/ m^2

Slate
50-years lifespan
15,03 kg CO_2eq/ m^2



Zinc
50-years lifespan
2,09 kg CO_2eq/ m^2

Ill.120. Comparation of the materials for the design

able due to its combination with the building's shape, resulting in a heavy and unwieldy facade. A difference from the grey bricks that looked very modern but created a big contrast with the facade of the apartments with brick facades in different colours. Therefore the beige brick facade was chosen since it was considered to fit better with the whole expression of the building (See Ill. 121) A strong contrast was desired to make the Common Houses stand out from the rest of the building's design. That also makes them a recognizable landmark from the building's exterior. Super wood was chosen as the material due to its low GWP to achieve this effect. Additionally, different patinas of super wood were used for each Common House to give them a distinct colour and make them easier to identify from the outside.

ROOF

In considering the roof, we investigated tiles, slate, and zinc to determine which would best complement the design. Tiles are the most commonly used roofing material in Aabenraa Centre and traditional Danish roof materials. Therefore, they were investigated as part of the initial material investigations. However, as the roof design took shape, the tiles were quickly scrapped due to their complexity. At the same time, this material would give a nostalgic look to the design. Natural slates were also investigated for their

Ill.121. Materials studies of the Town Square's facade

long lifespan and reclining potential. However, we decided not to use them because we believed they would not contrast the brick facade enough. During the investigations, we considered using zinc as a possible material for the roof due to its ability to provide a modern aesthetic and create a visual contrast with the facade. In addition, despite having a shorter lifespan than other materials we explored, zinc has a significantly lower GWP and can be recycled mainly after use.

Ill.122. Common house without acoustics pannles

INTERIORS

After our interview and visit to Lundegård, it became clear to us the importance of material selection, where there was a strong emphasis on having calm natural colours in the interior that could contribute to a tranquil atmosphere. That was considered when deciding the interior materials in the apartments and the Common Houses. When designing the apartments, we wanted to ensure that residents could easily make the space themselves and feel at home in their new surroundings. To achieve this, we needed interior materials that could be easily customized to meet their needs. While gypsum plaster seemed the obvious choice, its high GWP made it an unsustainable option. So instead, we turned to clay plaster, which has a similar aesthetic, comes in natural colours, and has a lower climate impact.

Ill.123. Common house with acoustics pannles

Plaster clay was also used in the Common Houses. The intention was to give each Common House a different colour, creating distinct atmospheres to aid users in navigating the building. Furthermore, acoustic panelling was implemented on the ceiling to improve the room's acoustics, one of the most problematic areas.

Outdoor areas

Our approach to designing the outdoor spaces was centred around the residents' needs, focusing on providing diverse experiences and opportunities. Our design decisions were informed by insights gathered from previous research on dementia villages and our visit to Lundegaarden, with consideration given to the successful activities identified.

Understanding the residents' need for social interaction, we integrated various facilities such as hot dog stands, outdoor terraces, and barbecue areas into our plans. The objective was to create a dynamic environment to draw residents outdoors and foster communal engagement among them and their visiting relatives. The spatial organization of these social amenities was oriented towards the courtyard square, acting as an outdoor continuum of the indoor activities from the main building. Such an arrangement was a conscious decision driven by our considerations for optimizing building flow and connectivity.

We ensured these social hubs were centrally positioned and conveniently accessible from the entrance (further details are provided in the flow and layout chapter). That was a crucial aspect of our design strategy, aimed at maximizing convenience and promoting frequent utilization of these communal spaces.

Ill.124. Outdoord functions different characters

Contrasting these lively communal areas, we designed secluded retreats throughout the site, catering to the residents' desire for tranquillity and nature immersion. The design of path systems, complemented by peaceful seating areas, responded to this need.

In order to ensure accessibility in the design of the outdoor areas, the choice of paving material was deliberated carefully. Our goal was to create a barrier-free environment allowing all residents, including those reliant on walkers or wheelchairs, to move freely and comfortably throughout the site. That important design choice underlines our commitment to creating a user-friendly and accessible outdoor environment for all residents.

EPILOGUE

Conclusion

The investigation into the role of architecture in shaping spaces for people with dementia has resulted in the design of a building that significantly enhances the life quality of individuals with this condition and promotes the inclusion of the users within the local community of Aabenraa. By challenging the conventional norms of dementia care institutions, the design breaks free from traditional frameworks and prioritises the well-being and quality of life of individuals with dementia.

The design process follows a multidisciplinary and iterative approach, utilising the Integrated Design Process, which allowed for a holistic investigation where first-hand experience and evidence-based design research have enabled the nuanced handling of the complex needs and preferences of dementia patients. Emphasising a user-centred and socially sustainable approach, the primary focus has been tailored primarily to cater to residents with dementia, emphasising meeting their specific needs and desires. As a result, the design fosters an environment that promotes well-being, familiarity, and ease of navigation. Simultaneously, the design considers the operational needs of the staff, creating an efficient and comfortable working environment that ultimately contributes to improved patient care. Furthermore, the design recognised the importance of the tertiary user group, the relatives, by providing spaces encouraging frequent visits and meaningful interactions with their loved ones.

The design prioritised the experiences and emotions of each individual, tailoring the environment to their unique needs and preferences rather than solely focusing on their disease-related requirements. By implementing the innovative concept of a “Dementia Village”, adapted to fit the local context and unique identity, the design creates a small private oasis in the city centre. Offering the residents relief and a sense of autonomy within a secure and homely environment and establishing the concept of a “town within a city.” This model encourages free movement, drawing upon city principles, like creating landmarks, visual connections, and articulation of architectural expressions to facilitate easy wayfinding. Thereby fostering the continuation of old habits and the potential development of new habits that contribute to a sense of home.

To further aid wayfinding, the design utilises spatial sequencing to create a clear and intuitive understanding of the space while providing a spectrum of social interaction and privacy levels. The functions of the building were divided into three levels - public, semi-public, and private - to encourage social interaction and legible zoning. At the public level, the Town Square is a central

hub designed to foster community, activity and social meetings. Semi-public functionalities are integrated within the Common Houses, strategically positioned at the corners of the Town Square to serve as prominent landmarks. These Common Houses act as transitional spaces between the private apartments and the public square, encouraging community interaction while respecting individual privacy and providing the resident with the choice of participation.

Recognising the importance of privacy, the apartments express the most private pace, turning in different directions to allow for a retreat from the community. In addition, the layout of the apartments gives residents the freedom to individualise their private spaces, allowing them to arrange furniture and personal objects to create a sense of familiarity and comfort.

The design also acknowledges and integrates the physical and cultural essence of the chosen site, thereby creating an environment that harmonises with the unique identity of Aabenraa—embracing the traditions of Danish and Nordic construction, employing time-honoured techniques and materials to meet contemporary needs. Furthermore, it assimilates characteristic architectural details prevalent within the city, such as traditional façade materials and ornamental brickwork, and the variety of building types, thereby infusing a sense of rhythm and dynamism into the cityscape.

In conclusion, this thesis proposes a comprehensive, compassionate, and innovative solution for a care home for people living with dementia. The design prioritises the residents' well-being and quality of life by focusing on their specific needs, creating a heightened sense of autonomy and fostering a profound feeling of belonging and community while creating inclusion for the residents in the local community of Aabenraa.

Reflection

Creating a space for individuals living with dementia has been a valuable learning experience but also quite challenging. With a user-orientated approach, it was crucial to get a deep understanding of dementia's effects on individuals and their spatial perception, which is a complex and not well-researched subject.

When we started looking into the best ways to design a nursing home, we found more information about caring for people with dementia than how to create spaces for them. Designing especially for dementia is also relatively new; therefore, there are not many reviews of the existing nursing home designed for the purpose yet. This highlighted the limitations of existing architecture in addressing the challenges of dementia. This can result from the difficulty of conducting research with this group due to ethical concerns. This meant we found it hard to find an existing best practice design to evaluate, and for the same reason, it was hard to find evidence-based research on the subject. Many of the researched principles could also be quite contradictory, and many of the principles on wayfinding are based on the same sources due to the shortage of evidence-based research on the subject.

We had hoped, therefore, to be able to have a more user-orientated design process, but we were limited in our ability to speak with the residents, and the caregivers were too busy to talk much with us. Thankfully, one of our team members had personal experience working with people with dementia. Complimenting her experiences with research and evidence-based design helped guide us as we made design choices. We are pleased with the outcome of the design; when comparing it to the research we've done, we believe that this design could make a difference for the residents.

The design process for this project has been a significant challenge, marked by intense stress and pressure. Our collective aspiration to excel and apply the full breadth of knowledge accrued during our education compelled us to undertake a complex project. As a result, we chose to focus on a complicated user group, conduct thorough indoor climate and Life Cycle Assessment (LCA) analyses on our design, and maintain an ambitious vision throughout the process. Looking back, our high ambition led us to bite off more than we could chew regarding the level of detail we aimed to achieve, given our time constraints.

We initially planned to accomplish the same amount of work as we had on previous projects, where we were part of a larger six-person team. This was a miscalculation that could have been mitigated with more thoughtful project planning.

Despite working together on numerous occasions and being fully aware of our collective struggle with time management, we did not adequately address this challenge. For this reason, we should have made more effort to manage our time more effectively to avoid last-minute stress and overwork. However, our deep-seated desire to excel consistently led us to prioritize the pursuit of optimal design over meeting project deadlines. The motivation to deliver our very best for this final project has always remained at the forefront. The time shortage has mostly affected the outcome of the report rather than the actual design or the analysis. Despite the stress and challenges, this intense process was a valuable learning experience, and we remain committed to our ambitious vision and believe in our design. However, as was the intent from the start, we would want to go more in-depth with material choices and reverberation time calculation, but we simply needed more time to do so. This will, therefore, be brought to the exam.

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APPEN-
DIX

01_Notes from the visit at Lundegården in Vrå

THE ACTIVITIES

- They have a big gathering room, which Is used every day for activities, both for the residents but also for others who still lives at home. It is also a good way for the transition from home to the nursing home.
- They have activities such as singing or dancing to music, and they can get a glass of bailey. Brings fantastic energy! It's a good way to be active because music usually works positively even in very developed cases of dementia.
- They even have a local orchestra/band that comes and plays on some Fridays.
- They use simple everyday things as activities, don't need to be special or extraordinary, just ordinary things they can relate to.
- Before the corona pandemic all the activities were exercised more, but it's starting to get up and going again.
- They usually take trips out of the nursing home once a week. Then they do activities like visiting the beach, a museum, a theatre, or a sports hall to do some exercise. It's voluntary to participate.
- The residents are allowed to help with daily chores if they want to. One of the residents, for example, is a former cook/worked in a kitchen, so she likes to help with the dishes, and it calms her to do the dishes. They focus a lot on giving them activities that bring the residents joy and make them calm. And for most of them, it does not matter if they do the same activity many times.
- She thinks it's good that the nursing home is in the city because it gives the residents opportunities to still be a part of the community and the staff sometimes takes the residents for walks in the city. They can also take them to the grocery store, where they usually help them remember what they needed and pay for the things they got.
- Being in the city also gives them the opportunity to observe other people in the city, which is also giving. And it's also easier to take them out on activities and for volunteers to take part in the work.
- She would recommend we focus on activities of great quality instead of quantity in our project.

THE FACILITIES

- They have more space than usual due to the fact that they started out as an independent institution, there are some size demands today that limit the sizes of the apartments and spaces.

They have cats, living at the nursing home. They are allowed both inside and outside and bring great joy to many of the residents. Cuddling, feeding or just watching them.

- In the closed courtyard, they have an aviary with lots of birds, which a volunteer takes care of. Together

with an ice cream parlor, a roof covered patio with a grill and a porch swing for wheelchair users which are frequently used in summer. This place has some plants which are taken care of by a volunteer but is otherwise mostly pavement and gravel, creating a bit of a cold and industrial environment.

- The bar also needs to be run by volunteers to really be open, but the residents still can buy alcohol or softer drinks like coffee or chocolate milk, if they want to. When it's open it's quite a social place for the residents to talk to each other and share gossip.

- They also have a small cinema, with a popcorn machine and a big screen, but it's not used frequently. It might work if it's organized properly but the residents can't have control themselves, because they usually find something inappropriate to look at...

- They also have a little supermarket where the residents can buy groceries that are normally included in their diet and practical things like toothpaste and soap.

- The activity room has an open space for dance floor, 5-6 dining tables and a lounge area with individual chairs, a little more drawn back from the high activity dance floor. There is a well-lit room with lots of natural light from the many windows in the façade. There is also a kitchen, big and practical, but also it has a homey vibe to it.

- They have a shop with all kinds of stuff that the residents can buy or borrow if they want. It's driven by a volunteer who has a deal with the organization 'røde kors', so she gets clothes and things from them to sell at the nursing home, where half of the profit goes to the nursing home and the other half to 'røde kors'. She also sells new underwear in different sizes so the residents or their family can buy and try it out if they are not sure of the size. She calls it an adventure shop because, even if they can and do buy the things, it's just as much about giving them the sensory experience of touching and feeling things and talking about the things they see. In her experience it's not only a fun thing for the residents to do, it's also a great opportunity for their families to do something together with their relatives. The thing in the shop is great for creating meaningful interaction and conversations, when the alternative is to sit in the apartment for a few hours. The residents can visit more than once with the same things because they usually can't remember it from the last time, they visited the shop. So, every time it is a new experience, and it gives them a great sense of autonomy.

- Some of the activities are more or less a success. Wellness is a great success and so is the hairdresser. The ladies like to feel pretty and neat, with nice hair and painted nails. Wellness should be exercised more because it really gives the residents (Mai Ejby? Spabad på plejehjem i grensted)

- Another activity that no longer was in use was the sensory room. While this room can be beneficial for some of the residents, the activity is highly dependent on a staff member to perform the activity and they often don't have time to engage with only one person for a longer period of time. The staff's available time is a general concern when it comes to these activities that the dementia village concept brings. Therefore, more time-consuming tasks keeping the stores or the bar open require help from volunteers in the city.

- They have a bus stop inside of the house where usually the guests gather when it's time to go home. It works very effectively and is a natural way for them to live.

- They had guest toilets for every department.
- The residents of each department eat together in a common dining room.
- They have a sunspace which they want to furnish and decorate for a summerhouse ambience.
- They also have a caravan and an allotment house in the gardens. They are great for the more sensitive residents who tend to get overwhelmed by too many people. And sometimes the resident thinks it's nice to not be watched all the time by the staff. So, these spaces give release from that, and the staff can leave them alone for shorter amounts of time while knowing they are in a safe space. Also, a good way to decompress if one of the residents gets upset, and the staff wants to shield the other residents from this.
- They also have a reception which seemingly also acts like a kiosk where the residents can buy candy and chocolate. There was no receptionist present.
- Even here, where all the activities and facilities are under the same roof, there is too great of a distance to them, so some of the residents don't use them and the staff don't have time to take them there. If they were more accessible it may be more successful.
- The staff think it is a great advantage that the nursing home is all on the ground floor. It gives easy access to the outdoors for the residents but also easy access to the whole building. There are no stairways to restrict their movement.
- Remember ramps and accessibility for disabled people. Many of the residents are poorly walking, so they need aid like a walker or even sitting in a wheelchair.
- She also recommended having a closet for towels and bedlinens very close to the apartments, to save time and ease the work for the staff.
- Also talked about having a cart with water, cloths, diapers and other things they use to care for the residents.
- And they need a room for walkers and weelshairs.

THE APARTMENTS

- They also have respite care apartments, where people can come and live for a few days at the time. It usually gets used as a transition for the people who eventually move into the nursing home.
- The residents rent their apartments so that's their own space and they are free to decorate it as they wish. They also have their own personal terrace to walk out to from their apartment. The apartment contains a livingroom with a small kitchenette, bedroom and a big handicap friendly bathroom.
- Across the yard they also have some apartments for relatives who wish to live close to their loved ones in the nursing home.
- Some of the residents are more reactive and sensitive to stimulation than others. They have their own section in the building, more secluded from the rest of the nursing home but not restricted from moving around.

THE INTERIOR

- They think a lot about the interior and try not to use too vibrant colors, but it must not be clinical! So, they

use a natural palette of colors.

- Uses things and furniture that the residents can relate to, furniture that they grew up with. But also has life size statutes of a cow and a pig that is placed in the garden in summer, because the residents have usually grown up on farms and its animals they can relate to.

- Nice to use landmarks and incorporate pictures or references to familiar places. Because they usually can remember things like that for a longer time.

- Do not use black or too dark colors! The residents might have bad sight and therefore can't see if the black spot is a hole or something else than what it is.

- Bokoncept has furniture that is designed for nursing homes and can take the cleaning detergent

- They don't hang paintings on the wall anymore because some of the residents found them too distracting and took them down. But they do have lots of cabinets with old things, like porcelain figures or artefacts on display, which is fun to inspect but also a conversation starter.

- The corridors are not very long but dark and always end with a window, and all of them look the same. There are names and numbers on the apartments in the hallways but that is mostly for the visiting family, so they can find the right room, because most of the time the residents can't find their rooms. They have tried different techniques, like pictures or stickers of animals on the resident's door, but they usually don't remember the sticker, or they can't remember where the door is.

- They have used furniture from the time the residents were young, but we should consider that a new generation will move into nursing homes soon. They may have grown up with Ikea furniture, so be aware of the new generations' culture.

- It is important to not make it feel clinical, but less is more. And to keep it natural and soft. Incorporate pillows and blankets.

THE INDOOR CLIMATE

- There are a lot of sounds in the nursing home, from other people but also from carts that the care takers use to transport everything on. Also, materials that reflect sounds, so it's a long reverberation time.

- People with dementia have an easier tendency for depression so they need a lot of daylight.

- Smoking is not allowed inside. This can vary from nursing home to nursing home.

- Their indoor air is very dry and not pleasurable for the residents or the staff. They also have a smell, that is partly hospital like, smell of detergents, and a little diaper. Could use a better ventilation system.

- The residents can open windows and control the heat, but they usually don't do that themselves. But it can be important for some residents to be able to regulate the temperature in their own apartments, to their liking.

THE ROUTINES

- Many of the residents have one care giver that takes care of them, so there is some consistency and familiar faces.

- Many of them don't usually interact so much with each other, mostly with the care givers. So, there are a

lot of places for just two people to sit and have a chat.

. It's the caregiver's responsibility to do what is best for the resident, so some of the residents who can get very over stimulated by their surroundings do not participate in some of the activities.

- All the residents should be out of bed by 10 am, and after that they get breakfast and pills.
- At 12 pm lunch is served
- Between lunch and dinner, cake and coffee are served
- Dinner is at 6 pm.
- And all residents are put to bed or at least ready for bed, at 10 pm. Some residents stay up much later watching television in their apartments.
- All trips outside of the nursing home are usually done after lunch and are planned and announced a month ahead. (Could family members attend these trips? Or do they just confirm that their relative is "allowed" to go?)
- Try to keep a normal daily rhythm for the residents so they don't turn day and night.
- The ones with very progressed dementia usually stay in their rooms, they get easily overstimulated and can't do many of the activities.

THE STAFF

- They only have one big meeting room for the staff. It also has a kitchen. They usually don't use it. They rarely have time to sit down and eat food they have brought with them, so they eat something quick while standing in the open kitchens or eat a small meal together with the residents.
- The facilities for the staff need to be nice as well. It's easier to be happy and do a good job if the surroundings are pleasant and not only where the residents are. They might need to take a shower or change clothes more than once a day if an accident happens.
- Using a picture on a closed door, demystifies the concept of a closed door, they accept what they see on the picture and don't wonder what's behind the door. They use paintings over the doors to the staff facilities to avoid drawing attention to them as well as giving the hallways something pleasant to look at. They also have coded locks on all the staff doors or the use of two handles to avoid having residents walking in.
- They have different types of cleaning facilities, small ones for every department in the house where towels, cloths or bedlinens can be washed. But sometimes pillows or blankets need to be washed as well, so they also have one big washing room with an industrial washing machine and dryer to take care of this. These rooms really need space for storage as well.
- They have 4 offices, one of which is reserved for the affiliated nurse, physiotherapist or similar health care professionals. The other 3 are for the staff, one for the planner, one for the manager and one for the care givers which contains 2 workstations with computers and in an adherent room, a printer.
- When they had a staff meeting, for example a team shift during the day, they held the meeting in the foyer.
- The fridges and freezers stand in the kitchen areas and cause a lot of noise. It's both disturbing for the residents but also really irritating for the staff when they cook and prepare the food for the residents. It would be preferable if they were in a separate room. Otherwise, the kitchen is industrial looking for

presumably easy cleaning, with a kitchen island and an L-shaped kitchen around it, practical and lots of table space. It has one industrial dishwasher.

OTHER INFORMATION

- Mostly women live here, and they live there alone
- People move into the somatic department but when they move, they can get dementia symptoms because they are so used to live and do the same things and have been doing that for such a long time
- Many of them you can have a long and meaningful conversation with, but they never remember where they live or how to get somewhere in the building.
- Some of them just can't find their way around, but that is why we need to do something about the corridors. It should be intuitive to find the way...
- Do something about the corridors. There should be a natural architectural path sequence with variation but not too distracting or drastic. Maybe using furniture as a landmark.
- We should try to limit too much wandering, because it only wears down the body and is a sign of stress. They try to shift the focus of their "wanderers" so they can do something else.
- The somatic residents can get quite annoyed with the dementia residents. They don't always have the patience to listen to the same story or for their actions.
- To think too much of designing for corona, or viruses, is not always in the interests of the residents. It gets very closed and restrictive.
- Visitors have access to all the 'public' facilities in the nursing home and can use them with their relatives. They are not restrained to one area.

02_ Full rapport of day-light factor

Daylight Visualizer

Calculation on zones

Project name: Master Thesis 1
Simulation type: Daylight Factor
Daylight Visualizer version: 3.0.89

Select Country

Denmark

Select Report Options

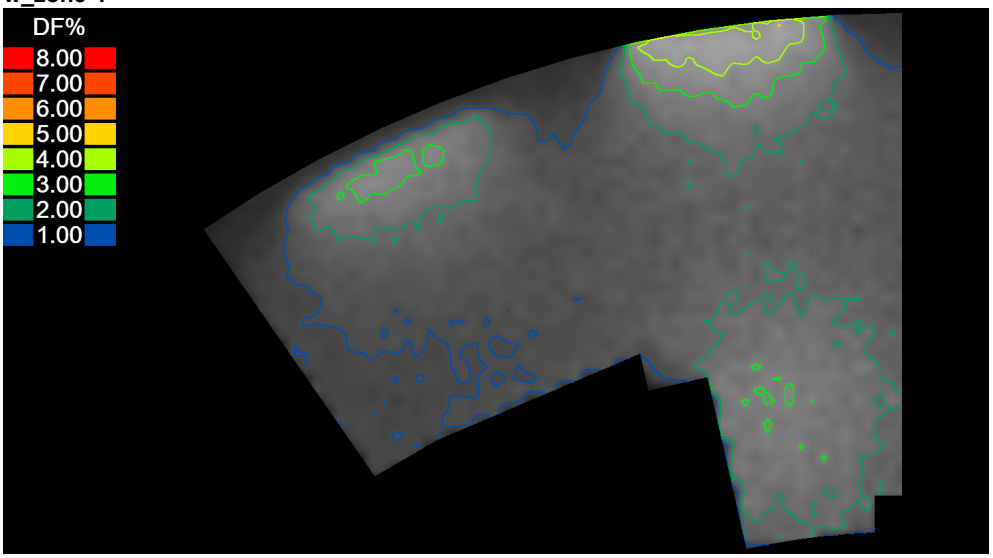
- [x] EN17037
- [x] Active House

EN 17037 For Denmark the target daylight factor (D_T) is 2.1% and the minimum daylight factor target (D_{TM}) is 0.7%. The standard is available for purchase from the National Standardization Body in your country.

Active House For Denmark the target daylight factor is 2.1%. The Active House specifications 3.0 are available here.

** The illuminance (lux) values stated in brackets are derived from the median external diffuse illuminance recorded in weather data files for the selected location.*

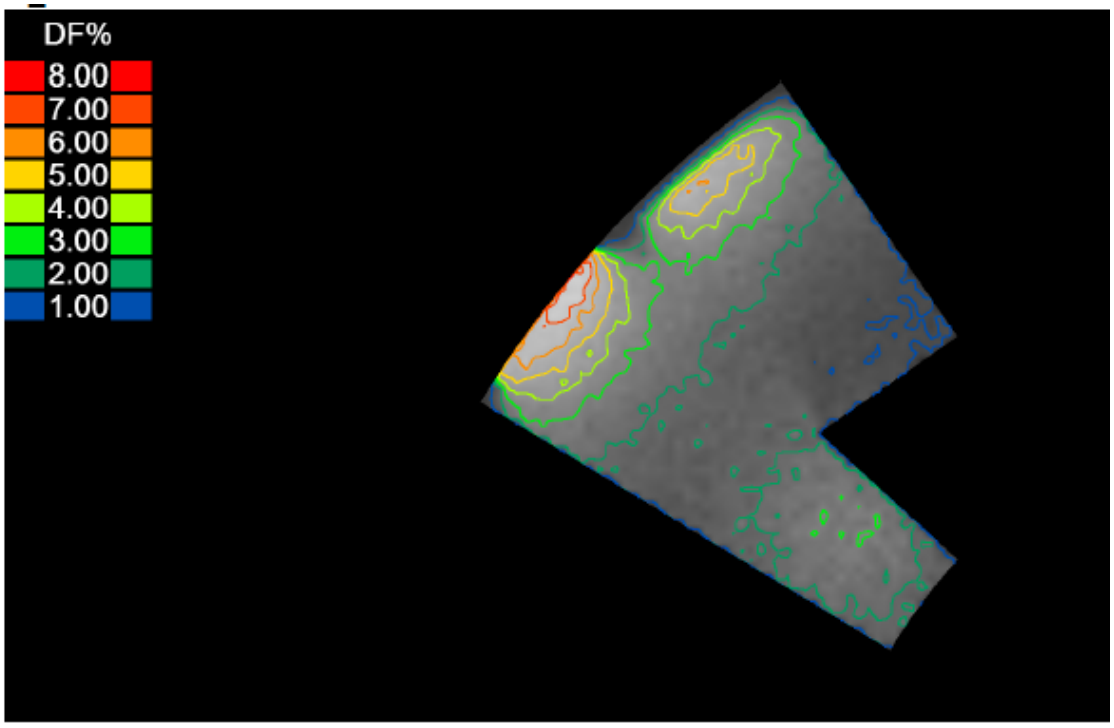
w_zone-1



EN17037

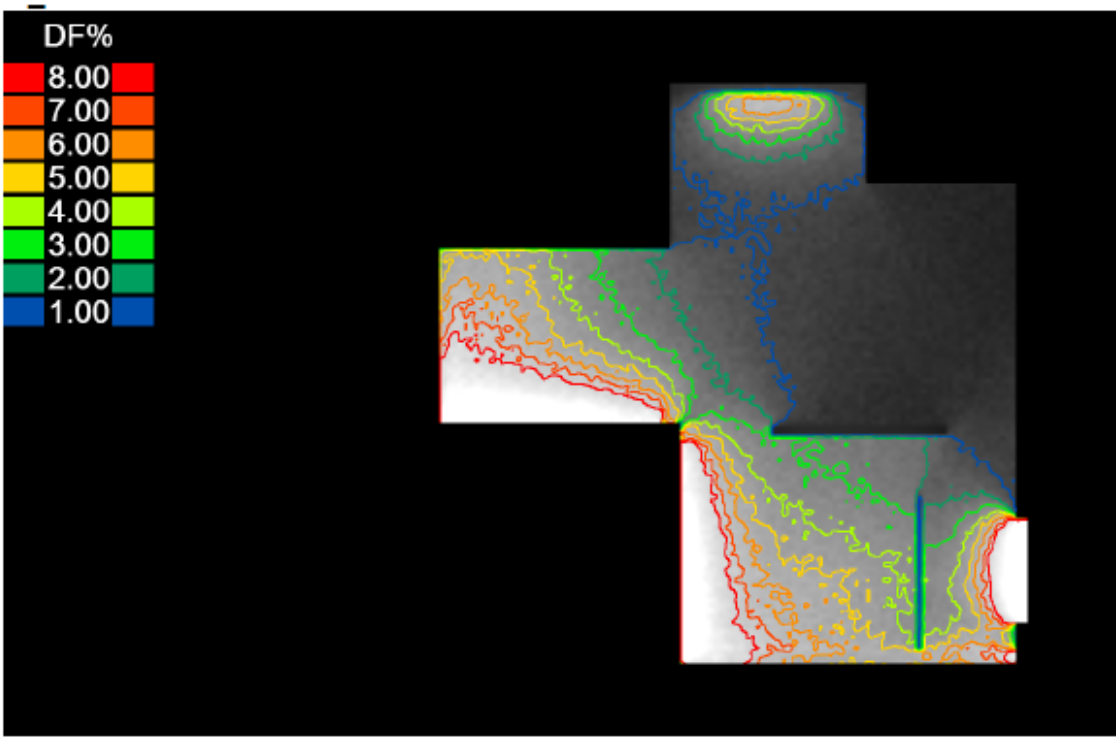
$F_{plane,\%} \geq 50\%$ (median)	D_T	2.88 DF[%]	Pass (409 lux)
$F_{plane,\%} \geq 95\%$	D_{TM}	1.83 DF[%]	Pass (260 lux)

Active House



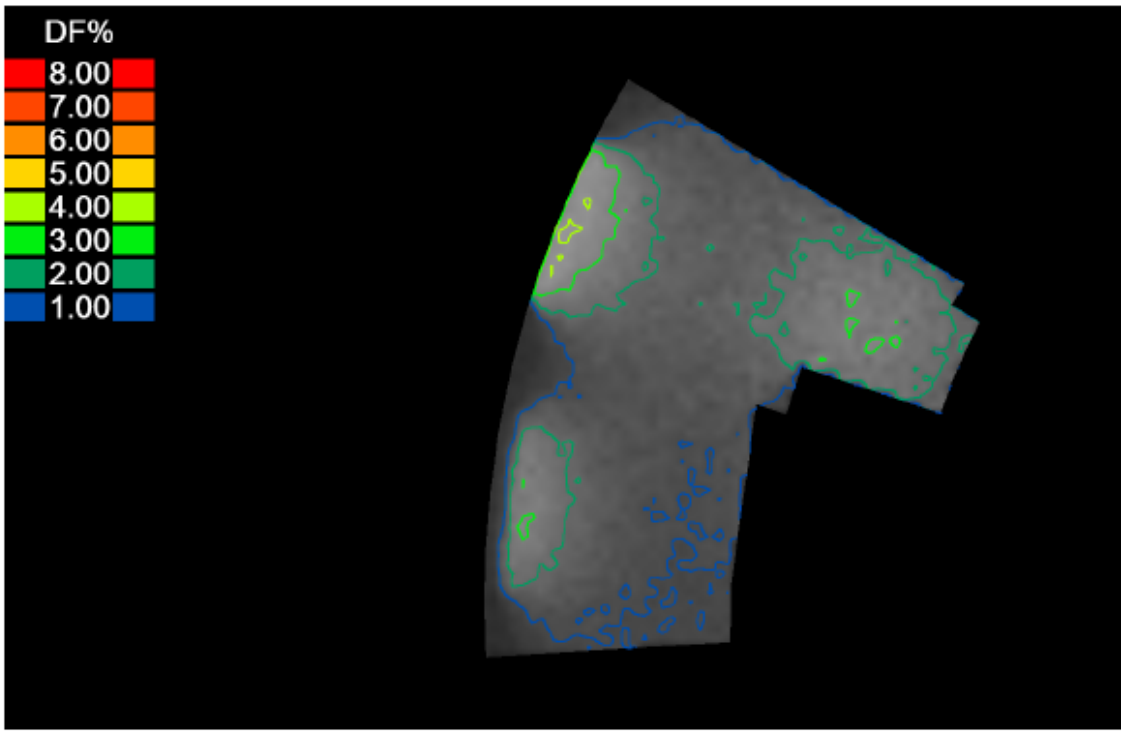
EN17037

$F_{plane,\%} \geq 50\%$ (median)	D_T	3.37 DF[%]	Pass (478 lux)
$F_{plane,\%} \geq 95\%$	D_{TM}	2.30 DF[%]	Pass (327 lux)



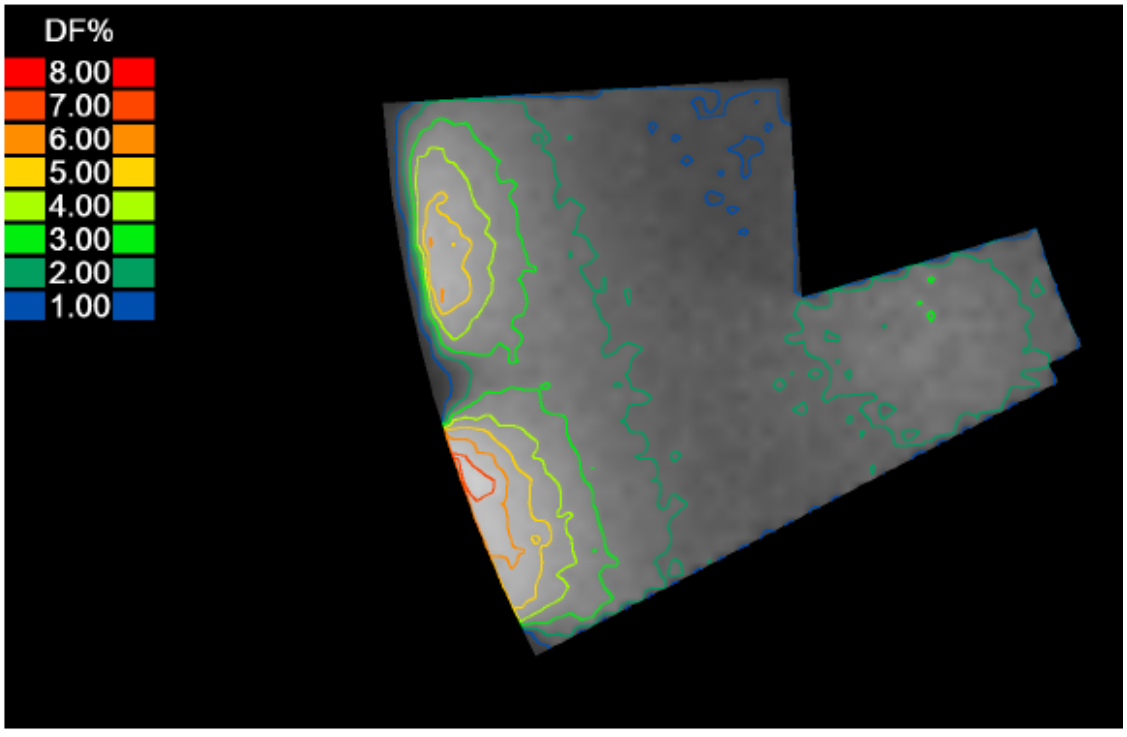
EN17037

$F_{plane,\%} \geq 50\%$ (median)	D_T	4.87 DF[%]	Pass (692 lux)
$F_{plane,\%} \geq 95\%$	D_{TM}	1.14 DF[%]	Pass (162 lux)



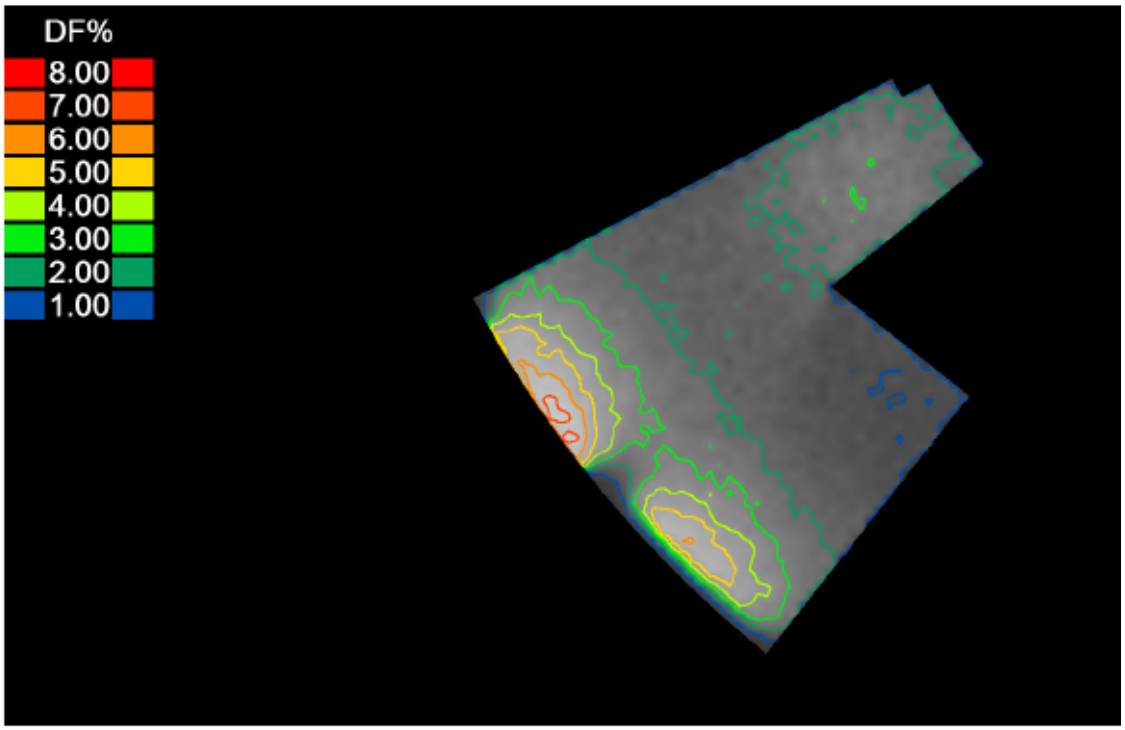
EN17037

$F_{plane,\%} \geq 50\%$ (median)	D_T	2.82 DF[%]	Pass (401 lux)
$F_{plane,\%} \geq 95\%$	D_{TM}	1.85 DF[%]	Pass (263 lux)



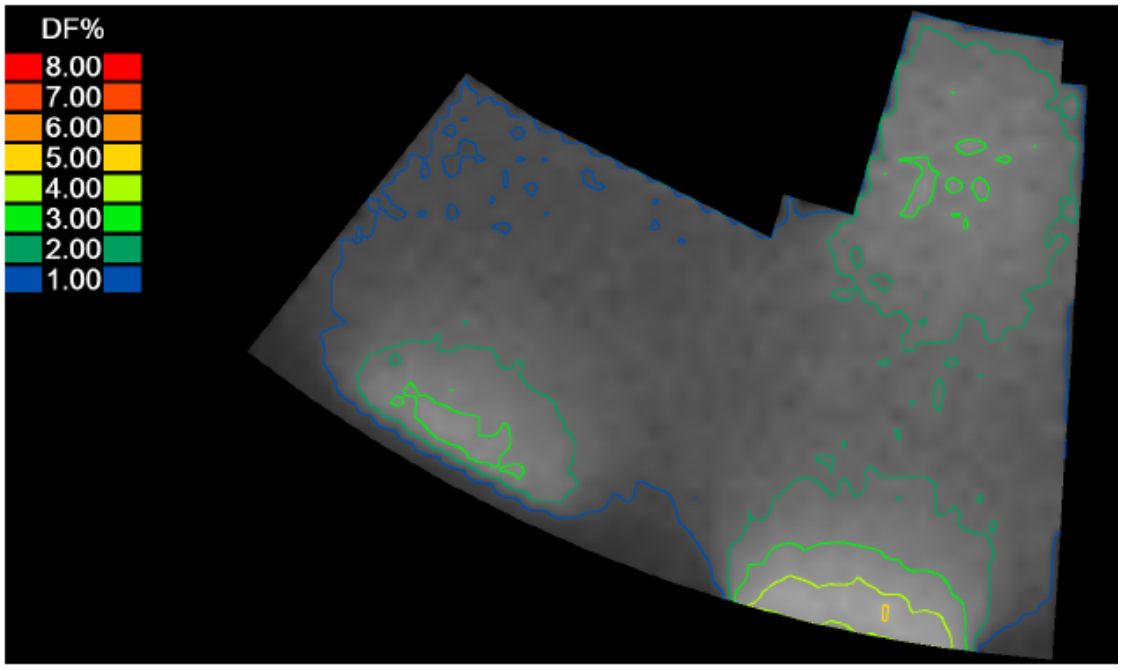
EN17037

$F_{plane,\%} \geq 50\%$ (median)	D_T	3.19 DF[%]	Pass (453 lux)
$F_{plane,\%} \geq 95\%$	D_{TM}	2.17 DF[%]	Pass (309 lux)



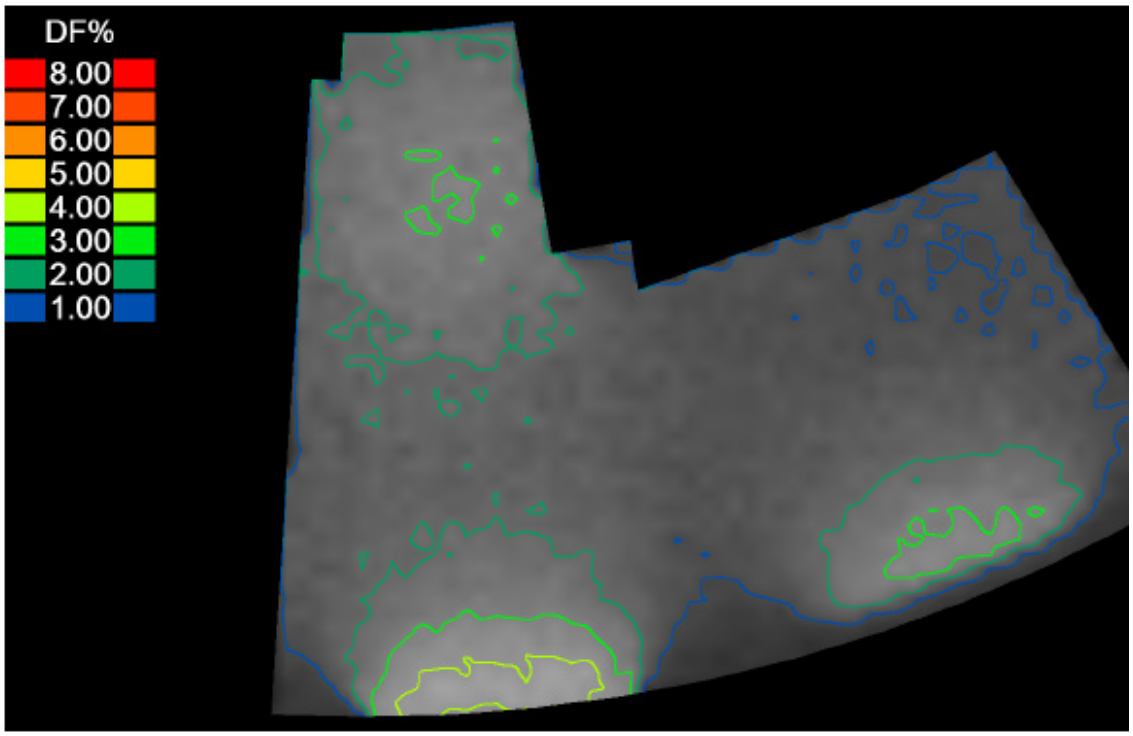
EN17037

$F_{plane,\%} \geq 50\%$ (median)	D_T	3.21 DF[%]	Pass (456 lux)
$F_{plane,\%} \geq 95\%$	D_{TM}	2.20 DF[%]	Pass (312 lux)



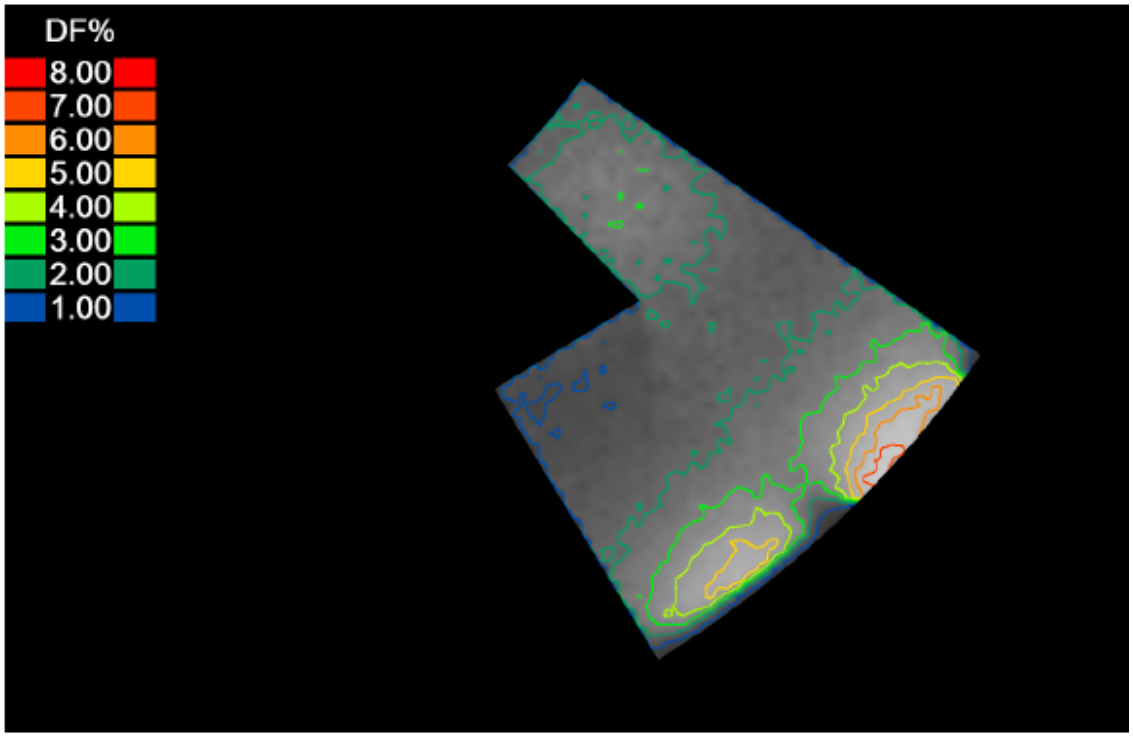
EN17037

$F_{plane,\%} \geq 50\%$ (median)	D_T	3.00 DF[%]	Pass (426 lux)
$F_{plane,\%} \geq 95\%$	D_{TM}	2.00 DF[%]	Pass (283 lux)



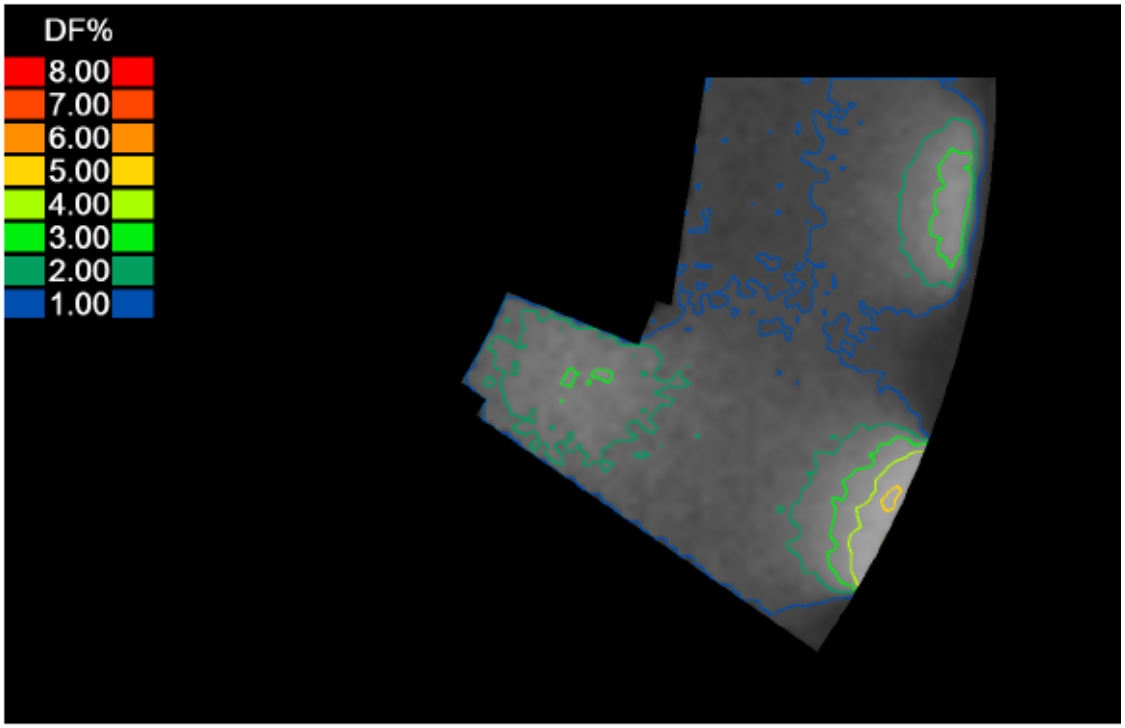
EN17037

$F_{plane,\%} \geq 50\%$ (median)	D_T	3.00 DF[%]	Pass (426 lux)
$F_{plane,\%} \geq 95\%$	D_{TM}	2.02 DF[%]	Pass (286 lux)



EN17037

$F_{plane,\%} \geq 50\%$ (median)	D_T	3.29 DF[%]	Pass (468 lux)
$F_{plane,\%} \geq 95\%$	D_{TM}	2.23 DF[%]	Pass (317 lux)



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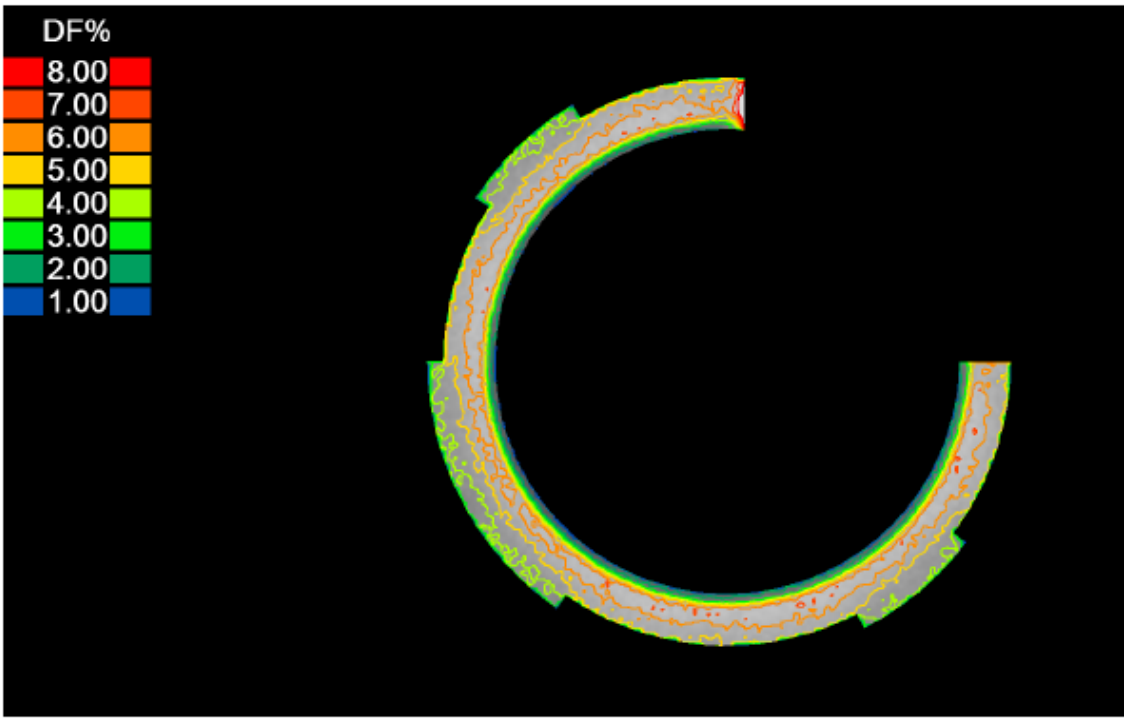
$F_{plane,\%} \geq 50\%$ (median)	D_T	2.49 DF[%]	Pass (353 lux)
$F_{plane,\%} \geq 95\%$	D_{TM}	1.68 DF[%]	Pass (238 lux)



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$F_{plane,\%} \geq 50\%$ (median)	D_T	8.94 DF[%]	Pass (1269 lux)
$F_{plane,\%} \geq 95\%$	D_{TM}	5.56 DF[%]	Pass (789 lux)