

FAR FROM HOME

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ABSTRACT & READING GUIDE

ABSTRACT

This project addresses the issue of social and environmental sustainability in the housing of asylum seekers arriving in Denmark, through the design of an asylum centre located at Godsbanearealerne in Aarhus. The proposal is shaped through the Integrated Design Process by Mary-Ann Knudstrup, and further supported through the implementation of Evidence Based Design into the existing design process. The urban location of the site attempts to improve the conditions for the acculturation process between the asylum seekers and the users of the city. In addition to this the project seeks to improve the conditions for mental healing through the implementation of horticultural therapy along with the possibility of participation in meaningful activities to positively distract the asylum seekers from their current situation. The result of the process is an integrated proposal for a new and sustainable asylum centre that is aesthetically connected to its context.

READING GUIDE

The report is split into five chapters; the introduction, analysis, design process, presentation and a conclusion of the project. The introduction clarifies the scope and focus of the project, followed by the analysis where key issues are investigated and concluded upon, creating the design criteria and vision for the project. It is then followed by the design process, where the proposal is sketched and developed before the presentation where the final proposal is communicated through plans, elevations, sections and visualizations. The report is then finalized by a conclusion and reflection of the project and process itself.

The literature used throughout the report is referenced through the Harvard method and the sources can be found at the end of the report along with the illustrations list. The annex is found separately. The report should be read as spreads rather than single pages, in order to ensure the best communication and understanding of the project.

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INTRODUCTION METHOD

ANA



DESIGN PROCESS PRESENTATION

PREREQUISITES

THE IDENTIFICATION OF THE PROBLEM

Individuals all over the globe are driven to migration and displacement from their homes and countries as a direct consequence of war, human rights violations, lack of jobs and now also due to environmental challenges and climate changes. Often overlooked as a driver for migration, the climate changes are becoming more relevant than ever as a topic of discussion and action concerning the forceful migration and persecution of millions of individuals across the world.

The United Nation Refugee Agency states that, as of 2018, **70.8 million** individuals worldwide are forcibly displaced, which includes **41.3 million** internally displaced people, **25.9 million** refugees and **3.5 million** asylum seekers (Unhcr, 2019). A prognosis predicts that the issue will keep growing, reaching **250 million** permanently displaced people in 2050, and shows that climate change plays a significant part in this development (Richards,

J 2016).

The millions of people fleeing their homes and countries are taking on a high-risk journey in the search of improved living conditions, resulting in post-migration stress and mental health disorders. Whether people are fleeing war and conflict or climate change, the journey and the experiences in their home countries results in various psychological conditions and a general poor state of mind once they reach their destinations. Research have shown that three types of mental disorders are especially prevalent in the wellbeing of asylum seekers; depression (67,9%), post-traumatic stress disorder (60,7%) and anxiety (59,3%) (Solberg, Ø 2020).

DECLARATION OF HUMAN RIGHTS

The time following the second-world war was marked by a milestone in human rights legislation on an international level. The Universal Declaration of Human Rights was signed in 1948, which de-



ILL. 1 - MALE REFUGEE

clared the rights and universal protection for people in need.

Article 14 of this declaration is of particular importance in relation to refugees and therefore, this project (United Nations, 1948):

Everyone has the right to seek and to enjoy, in other countries, asylum from persecution. article 14 (United Nations, 1948).

The above-mentioned article became the cornerstone of the United Nation Convention relating to the Status of Refugees, commonly referred to as the Geneva Convention. It was created in 1951 and is still the centrepiece of today's international refugee protection and sets the framework for the rights of these individuals, how they are defined and the responsibility of the nations in relation to the refugees (Uncher, 1951).

The state of the world has changed dramatically, over the last 7 decades, since the signing of the Geneva Convention, and has led to antiguated interpretations, classifications and definitions. The people fleeing as a result of climate change are not legally classified as refugees, since the Refugee Convention defines refugees as people who are being persecuted. The Geneva Convention and its definition of a refugee is outdated and is resulting in people getting denied asylum even though their living conditions in their home country are impossible. However, a recent court decision by the UN Human Rights Committee has opened the possibility of a broader classification of refugees as it has acknowledged that climatic changes can pose a potential hazard of life (Human Rights Committee, 2020).

In other words, this acknowledgement means that climate refugees, who previously has been rejected asylum, in the future can be accepted by international law. Such a change will increase the need for asylum centres as climate changes affect the planet on a global scale.

ASYLUM IN DENMARK

The Danish government has in 2014 received **14.732** and in 2015 **21.316** asylum seekers, which is almost twice the number from the previous years, due to the large number of people fleeing from conflict in Syria. These large numbers of asylum seekers challenge the Danish society, due to the asylum seekers often arriving with both physical and mental issues, which results in isolation from the surrounding society. In relation to this, the Government wishes to counteract formation of parallel societies, which challenges the Danish norms and values (Regeringen.dk, 2020).

In 2015, this resulted in a stricter immigration policy with several initiatives to make Denmark unattractive as a destination for the future asylum seekers (Regeringen.dk ,2016). In addition to that the government cut assistance benefits by half, furthermore in January 2016 they introduced a **"jewellery bill"** which allowed the authorities to confiscate valuables from the asylum seekers. In 2017 the government re-imposed border controls to control the illegal immigration and smuggling. By introducing these stricter immigration laws, the number of asylum seekers dropped to around 6.235 people in 2016(Pace 2017).

CONDITIONS AT THE ASYLYM CENTRES

The nature of the Danish asylum centres and the asylum process itself, have been heavily critiqued for not providing the proper help and the proper surroundings for dealing with individuals that suffer from these types of mental illnesses (Lakmann, 2020).

The asylum centres are usually placed in geographically isolated places, where participation in Danish society is difficult and interaction with Danes is limited. This results in social exclusion of the asylum seekers, lack of social relations and lack of support from the local community. A phenomenological study described an asylum seekers perspective on social inclusion in a Danish asylum centre. The study showed that prolonged periods of occupational deprivation had a negative effect on both the social interactions between the residents themselves but also between the residents and the staff. In addition to the internal conflicts, it also has a negative effect on the long-term integration and mental conditions for the asylum seekers living in these asylum centres(Morville et. al, 2019).

PROBLEM STATEMENT

How do we design an acculturation and interaction promoting asylum centre that supports the psychological recovery of displaced individuals, while providing a sense of home in a temporary and uncertain situation?



ILL. 2 - REFUGEES ON THE DANISH MOTORWAY



INTRODUCTION

METHOD ANALY



INTEGRATED DESIGN PROCESS

The Integrated Design Process by Mary-Ann Knudstrup is an iterative and hermeneutic methodology, that aims to ensure design relation between the field of architecture and engineering. The objective of the process is to achieve holistic design with a clear connection between aesthetics, functions and techniques.

The methodology is divided into 5 phases, that covers the design process from initial problem to the final presentation.

The first phase **PROBLEM** is the formulation of a problem, in this case the design of an environmentally and socially sustainable asylum centre that supports mental healing.

The second phase **ANALYSIS** gathers all the knowledge needed before the sketching can start. This includes knowledge about site, users, local plans, vegetation, functions, materials, microclimate, scale and atmospheres of the site.

The third phase **SKETCHING** of the project combines the knowledge gained

through the earlier analyses. The knowledge is used to create sketches, physical models and 3D models that considers both architectural and engineering aspects of the building, at an early stage.

The fourth phase **SYNTHESIS** combines individual ideas and considerations from the sketching phase and details them to achieve the final form of the building. The building design at this stage contains detailed considerations of the functions, aesthetics, energy performance and structural principles. The performance of the building is assessed through calculations and simulations to help optimize the design of the building.

The fifth phase **PRESENTATION** the qualities of the project is communicated through plans, sections, facades, visualizations along with a description of the final design (Knudstrup, 2005).



ILL. 3 - THE INTEGRATED DESIGN PROCESS

INTEGRATED DESIGN

Integrated Design, in architectural thinking, relates to a design that includes, considers and processes both aesthetical, technical and functional parameters. This way of thinking about architecture can be traced to the roman architect and architectural theorist Marcus Vitruvius Pollio, who stated that built environments of great quality should contain the elements of utilitas, firmitas and venustas. These elements, known as The Vitruvian Triad, can be translated to functional, technical and aesthetical considerations and the interplay between these are what results in meaningful and rich architecture (Vitruvius. 1914).

UTILITAS

Utilitas is the element which concerns the usability and relates to the sociologic and functional conditions of the design proposal.

FIRMITAS

Firmitas is the technical element of integrated design and involves measurable aspects such as constructive thinking, energy and indoor environment.

VENUSTAS

The remaining element to complete The Vitruvian Triad is the aesthetical branch which describes the proposal and its relation to delight and firmness. This can, among other, include relation to the surrounding context, choice and finishing of material and how the architectural means and its composition relates to individuals and the users.

This project has combined each of the three elements mentioned earlier, as each project is unique and requires a critical approach to the prioritizing of each element in relation to context, users and society. This project has combined the three elements with utilitas being the highest priority since the user group is particularly sensitive in this project. Interviews with the users combined with investigations of existing asylum centres have ensured a high degree of usability and functionality in the building, which, combined with solar studies and context analyses, have shaped the overall volume of the building.



ILL. 4 - INTEGRATED DESIGN

EVIDENCE BASED DESIGN

Evidence-Based design is a term that is described as the use of the best and most current evidence based on research and practice for making informed design decisions. EBD should be viewed as a process, and not as a product, where standards and ready-made solutions to complex problems can be found. New knowledge is found every day, and the best solutions therefore change with it.

Although the word Evidence-based design is a relatively new term, the method at the core is not a new concept. Architects and designers have always relied on knowledge and experience from others, whether that be statics, energy, economics or something else entirely that is based on knowledge and experience. The difference between EBD and design with knowledge is that EBD leans heavily on academic research, experiments and observations done with a rigor that allows for usable data to be extracted and implemented in a design process as design driving concepts (Hamilton, 2009). Evidence-Based Design should not be viewed as a stand-alone process or method of designing, but rather an addition to a pre-existing design process, in this case the *Integrated Design Process*. In this project, the evidence-based method will be used primarily in the analysis and sketching phases, as this is where the evidence can provide the most critical information for the project. However, the knowledge gained in these phases can also influence the project at later stages.

PROCESS AND METHOD FOR EVI-DENCE-BASED DESIGN

As stated earlier, EBD cannot be viewed as a product, but as a method and process that can steer a project towards a deeper understanding of a certain problem or topic, in this project the design for mental health of refugees. The main focus of any **EBD model** is the way a designer or architect acquires and interacts with research, evidence and information.



ILL. 5 - IMAGE FROM THE VISIT AT JELLING ASYLUM CENTRE

There are three types of research in an evidence-based project:

- Research performed by others and collected by a design team and interpreted it into design concepts.

- New research or studies done in relation to the project to answer a specific/ important question

- Evidence gathered after a project is completed documenting the performance and effects on the project in a real-world situation

This project will utilise the WHR nine-step model for EBD, developed by Kirk Hamilton for WHR Architects (Hamilton, 2009). The use of this particular model allows for a natural implementation into the *Integrated Design Process* used already in this project. As the name suggests, it is a nine-step model that covers a wide range of research, analysis, interpretation, implementation and finally evaluation of the proposed solutions, see illustration 6.

The WHR nine-step model takes a practice-oriented approach to EBD, which means that modifications should be made for an academic use of the model. As this is an academic project, the collection of evidence following construction of the project, cannot take place. This project will focus on gathering research performed by others and research or studies done in relation to this specific project for any unanswered questions. Therefore, will this project of an academic approach tailor the WHR nine-step model to become a model of seven steps (Hamilton, 2009).

7-STEP EBD MODEL

Step 1: Identify the user's goals, wishes and needs.

- Casestudies, Interview and Persona.

Step 2: Identify the groups goals. - Sustainability and site analyses.

Step 3: Identify the Top 1-3 Key Design Issues.

- Design for mental health, Acculturation and site specificity.

Step 4: Convert Design Issues into Research Questions.

- Mental healt in architecture, impact of spaces, nature and mental health and Current asylum conditions.

Step 5: Gather Information (Benchmark examples, Literature sources, Internal studies).

- Academics research and fields studies.

Step 6: Critical Interpretation of the Evidence.

- No direct answers; requires openminded creativity, balance and critical thinking.

Step 7: Create Evidence-Based Design Concepts.

- Based on creative interpretation of the implication of research findings.

This model is illustrated on the right.



ILL. 6 - EBD APPLIED TO IDP

INTERVIEW METHOD

Interviews are used to gather and collect information from one specific individual or several representatives on a specific topic. Through this qualitative method the interviewer obtains a deeper understanding of the respondent's point of view. The knowledge from one or several respondents cannot be generalized across a larger group of individuals and must be critically interpreted to ensure a balanced response. Through conversation between interviewer and respondent(s) the interviewer collects opinions, values, experiences etc. The questions can vary from dichotomous questions, that are generally used for basic validation, to more open questions that gives the respondent the opportunity of using his or her own words. This results in a nuanced picture of the respondent's opinions and perceptions of the topic in question.

In this project informal interviews have been applied during the visit at **Asylum Centre Jelling**.

The structure of the interviews was a combination of dichotomous and open

questions and therefore the questions were continuously reconstructed upon the previous feedback and response. This type of interview is often used in longer field work, where the interviewer can ask a large series of questions. Furthermore, it is important to be aware, when interviewing a minor number of respondents, that the interviews does not represent the whole section of the population, in this case all the asylum seekers in Jelling. However, through this method one can create a more varied foundation of the conditions in the asylum centre, which can be compared to previous research(metodeguiden.au.dk).



ILL. 7 - MEETING WITH THE USER

SUB CONCLUSION

The project will be shaped through and based upon the *Integrated Design Process* by Mary Ann-Knudstrup. This iterative process aims to create holistic design and will ensure that the design of the asylum centre will undergo numerous cycles and iterations. *The Integrated Design Process* will act as the catalyst that drives the project towards an integrated piece of design, that merges functions, techniques and aesthetics.

The Integrated Design Process is supplemented by the use of Evidence-Based Design, that will provide a foundation to build the understanding of the user profiles in the project. This will be achieved through interviews conducted in relation to this project, along with the findings in academic research on projects of similar themes.



ILL. 8 - RED CROSS IMAGE



INTRODUCTION

METHOD

ANALY



SIS DESIGN PROCESS PRESENTATION

SUSTAINABILITY

The climate changes have major consequences for people around the world and is now causing people to flee their homes in search of better living conditions. The ambition of the project is therefore to create a sustainable building that can provide a home that can help the healing process and one that does not further escalate the global climate crisis. Sustainability is branched into three categories:

social, environmental and economic sustainability and will be prioritized in that order.

A sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Brundtland commission, 1987).

In 1987 the world commission on environment and development wrote the famous report **'Our Common Future'**, commonly known as the Brundtland report.

The above-mentioned definition catalysed a sustainable way of thinking and with

three decades has gone by, this thinking is still being applied in todays practice. In the field or architecture and engineering, words like sustainability, sustainable architecture and CO₂ neutrality have become critical topics in discussions and advances within these fields (Brundtland commission, 1987).

SOCIAL SUSTAINABILITY

Social sustainability is a part of the general sustainability concept, that focuses on the people using the architecture and how the built environment influences their lives, rather than focusing on the building itself. In the design of socially sustainable spaces it is critical to design the spaces in a way that ensures equal use of the building or space. In addition to this, the architecture must allow for great diversity and facilitate the creation of communities, both within the building itself, but also between the building and context.

As mentioned earlier, the majority of asylum seekers arrive in Denmark with several mental health issues, and are placed in temporary spaces, that were not designed to consider the specialized needs of these individuals. It is therefore crucial to consider the social sustainability of this project, as the users are in need of improved living conditions, while they await judgment in their case. As a consequence, hereof, this project seeks to address the issues of social inclusion, design for mental health and acculturation (Brundtland commission, 1987).

ENVIRONMENTAL SUSTAINABIL-ITY

Environmental sustainability concerns the environmental footprint and energy use of a building. In order to create an environmentally sustainable building, it must not leave the planet in a worse condition following the end of life of the building. This can be achieved through various design considerations, including the use of long lasting and renewable materials and a design thinking that considers the long-term perspective of the building and urban spaces surrounding it. In addition to this, the building should be designed as a zero-energy building, which will ensure a balanced energy use and production.

Environmental sustainability can also be achieved through the design of a building that can adapt over time. The design of a flexible building, that allows changes in functions, as the needs change, will be a greener alternative to the construction of a new building. A building that takes advantage of the microclimatic conditions can be a powerful tool in achieving integrated and well performing architecture, that reduces a buildings environmental footprint and increases the quality for the users (Brundtland, commission 1987).

ECONOMICAL SUSTAINABILITY

The latter aspect of sustainability concerns the economical approach in a project. A common denominator for the three general aspects of which constitute sustainability is their dependence on each other. Therefore, the aspect of economical thinking cannot be highlighted as an independent idea, but in connection to environmental and social sustainable thinking. The project will aim to create a centre that promotes acculturation, social inclusion and supports the mental and recovery of asylum seekers in a way that reduces the rehabilitation time, and thereby facilitates a faster establishment in Denmark, and allows them to contribute to the Danish society (Brundtland commission, 1987).











USER PROFILE

Red Cross is an organisation with more than **11 million** volunteers distributed over 191 countries. Throughout 150 years Red Cross have developed their organisation on the foundation of helping people in need, no matter their nationality, ethnicity or religion (Rødekors.dk).

THE ORGANISATION WORLWIDE

Red Cross is the largest humanitarian aid organisation and aims to always contribute and help in cases of global emergency to take care of people in need. Across the globe, during catastrophes, the organisation of Red Cross contributes with temporary shelter, food, clean water along with access to medical supplies. In many cases the victims are exposed to famine and hunger due to climate changes and conflicts, which makes it impossible for the locals to farm the land (Rødekors.dk).

DANISH RED CROSS

In Denmark, Red Cross contributes to local communities with 204 local Red Cross departments focusing on social distress, making a difference and helping the weakest in the society. In Denmark there are over **32.000 volunteers** and almost **200.000 Danes** who support the organisations work (Rødekors.dk).

AREAS OF EXPERTISE

RECYCLING

Across the country there are **1700 cloth**ing containers, where individuals can donate their clothes, furniture, shoes along with other textiles. The donated items will be used for further selling or as textile fibres for production of new clothes.

SOCIAL WORK

Red Cross focus on supporting socially impaired people who are lonely, vulnerable families, women and children who are exposed to abuse and violence, prisons inmates and lastly refugees.

HEALTH CLINICS

In 2011 a collaboration between Red Cross, Danish Refugee Council and the medical Association facilitated the establishment of 3 healthcare clinics for people without residence permission. Since then the clinics have been treating over 6.588 patients.

FIRST AID

This part of the organisation contributes with over 800 volunteers that offers a wide range of abilities from fundamental first aid education, emergency treaters to educated doctors and nurses.

ASYLUM

The Danish Red Cross has, since 1984, organized accommodation for asylum seekers along with operation of centres situated on Zealand, Central- and East Jutland. In the period when the asylum seekers wait for the authorities to process their application, Red Cross aims to create a purposeful environment, where one can participate in school, kindergarten, adult education among other. In addition to this, the Red Cross aims to help the asylum seekers improve their mental and physical health.

The asylum centres are divided into differ-

ent areas of expertise, depending on who are in question and how far in the process they are. Red Cross have four different types of centres:

ARRIVAL CENTRE

- Where the asylum seekers stay for the first weeks.

RESIDENTIAL CENTRE

- Where they live while the authorities treats their application.

CHILDREN CENTRE

- Children under 18 years old, who came to Denmark alone.

CARE CENTRE

- A centre for residents with special needs. (Rødekors.dk).

The centre type of this project will be the residential centre as this is the centre that houses the most residents for the longest period during their case development.

ASYLUM PROCESS

The process of seeking asylum in Denmark is divided into three overall phases: Phase 1 – Arrival and Registration,

Phase 2 – Casework and Asylum Grant, Phase 3 - Final rejection and returning home see illustration 9.

In PHASE 1, the asylum seeker arrives in Denmark and will typically encounter the police at either the border, the airport, an asylum centre or a police station. Following the initial contact, the asylum seeker is registered by name, date of birth and country of origin. The asylum seeker is then issued a personal ID-card and placed at an arrival centre, where they await further development in their case. The asylum seeker will attend an interview with the Immigration Office and a caseworker, where the applicant must provide information on identity, nationality, family, reasons for fleeing and the travel route to Denmark for the Immigration Office.

In PHASE 2, following the first interview, the case is reviewed by the Immigration Office. Based on the first interview, the Immigration Office can determine that the asylum seeker does not have substantial reasons for obtaining asylum. That can happen if the Immigration Office determines that the experiences of the asylum seeker are not relevant for achieving asylum or if the applicant is from a country that usually does not obtain permission for asylum in Denmark. Such decisions cannot be directly appealed but will be handed over to the Danish Refugee Council, which will then assess the case and determine if it should be appealed to the Refugee Appeals Board.

If the Immigration Office approves the conditions for seeking asylum in Denmark, a second and more detailed interview will take place between the asylum

seeker and the Immigration Office. Following the second interview the asylum seeker will receive a determination on the case, approval or denial. If asylum is granted, the applicant will be assigned to a municipality, that will take over the responsibility for refugee. If the request for asylum is denied the case will automatically be appealed to the Refugee Appeals Board, and the asylum seeker can remain in Denmark while their case is assessed. If the Refugee Appeals Board overturns the denial of asylum, the asylum seeker will be assigned to a municipality who will take over the responsibility of all further case development. In the case of denial for asvlum, the case is closed and handed over to the police, and the asylum seeker will have to leave the country within a pre-set timeframe.

In **PHASE 3,** following a final denial of asylum, the asylum seeker must leave the country either by their own free will or with the help of the police. The police are responsible for arranging the journey home for asylum seekers that have been rejected, if they cannot afford it themselves. The journey home will be planned between the police and the asylum seeker and must sign a form stating that they will leave the country voluntarily (DRC, 2020).


ILL. 9 - THE PROCESS OF SEEKING ASYLUM

CASE STUDY

WHAT An analysis and observation of a day at an existing asylum centre in Jelling, Denmark.

WHY To gain an understanding of the current conditions, their advantages and disadvantages.

HOW Through a phenomenological registration of the centre, and critical interpretation of statements made by residents and staff.

The Danish Red Cross manages Jelling Asylum Centre, established in the early 1990s to house the mass flow of war-refugees freeing Bosnia. Currently it functions as a residential centre for a wide variety of nationalities, cultures and religious backgrounds.

The centre is constructed from a combination of hard materials consisting of brick, concrete and tiles, which creates a colder and rougher aesthetic that matches the sensitivity of the residents poorly. The outdoor area of the centre is functionally limited and does not invite the users to socialize in them or participate in any outdoor activities.

The centre contains several types of housing units spread over a large area in the centre of Jelling. The main type of housing units is a rowhouse-like typology that contains a shared kitchen and bathroom connected to single rooms of varying sizes to house 1, 2 or more residents, often resulting in overcrowded spaces and lacking privacy. The second housing type is located in an old nursing home and consists of 8m² rooms that houses up to three individuals with shared kitchens, baths and toilets.

The third housing type is located in identical buildings to the first housing type; however, it is reserved for especially vulnerable individuals that must live separated from the rest of the centre's users.

The housing units are worn down and appear unwelcoming, while only providing the bare essentials to sustain an existence as the spaces offer no additional spatial or functional qualities to improve the living conditions for the users. The rooms are overcrowded and bare, as the residents haven't furnished or decorated the rooms, which increases the institutional and prisonlike atmosphere of the units.

Unlike most other centres, the residents are responsible for cooking their own food and doing their own laundry in the common kitchens and laundry rooms scattered throughout the asylum centre. As mentioned above, the centre houses a wide variety of nationalities and religions, which could lead to potential separation and conflict, however this was not true at Jelling Asylum Centre. Instead, different nationalities, cultures and religions lived side by side, connected by the situation they currently have to endure.

In addition to the housing units, the asylum centre also contains a school where children and adults attend Danish lessons, lectures on Danish society and laws combined with different activities and workshops where they can socialize and occupy their minds and bodies.



ILL. 10 - SCHOOL OF JELLING CENTRE

Entrance to the small school of asylum centre Jelling, in brick and concrete. This area is where residents across the centre become social.



ILL. 11 - EDITORS MEETING

A look at the weekly **editors meeting** that plans, organise and advertise social events of the future. A chore that motivates and counteracts occupational deprivation.



ILL. 12 - ONE OF THE LIVING UNITS

Worn playground with **cold barracks** of living in the background. The old nursing homes lack individuality, life and character



ILL. 13 - THE BREAK ROOM

The smaller entrance and **social space** of the school. The space functioning as a space of recess between lectures and consists of both social spaces and smaller private niches.



ILL. 14 - ONE OF THE ROOMS

A typical **home** of existing conditions. A small space only filled with basic necessities of bed and minimal storage.



ILL. 15 - ANOTHER ROOM FOR FOUR

Unfurnished of typical apartment layout. Residents are to furnish and decorate the rooms themselves resulting in empty and **unwelcoming homes**.



ILL. 16 - THE COMMON BULLETIN BOARD

The multicultural information board consisting of **social events** and informative aspects of the week at the centre.



ILL. 17 - ONE OF THE SHARED KITCHEN A shared kitchen of a worn character. Poor acoustics and **institution-like** appearance emphasise the room.

INTERVIEW AT CENTRE JELLING

WHAT An interview with the users of Jelling Asylum Centre - Hashem, Ninette, Amalie, Gitte, Mahmoud and Shahryar.

WHY To get an understanding of the everyday life at an asylum centre and to explore the centres current conditions.

HOW Through informal, semi-structured interviews with residents of Centre Jelling and Centre Sandvad along with staff of both centres.

THE INTERVIEW

The interview gave an indication of the great diversity of provided activities that both covers leisure and school related aspects. These did, among other, include how to navigate in the Danish society and important tools related to this (ed. NemID, Laws etc.), Danish lectures, afterschool activities and creative courses. The interview likewise revealed the difference in appreciation for the activities and how often the residents were participating in them. Some of the users would spend time with their family in their private spaces, where-

as others would use the majority of their time in common spaces, try socializing or doing activities. The interview showed a need of private kitchens for cooking their own food, along with a private bathroom and common laundry facilities. These aspects help the users control their own situation.

Furthermore, the interview showed that the centre did not separate new arrivals by religion or race, but they are placed after which type of space they needed. The lack of this division was not at the expense of disagreement nor conflicts. The product and information gathered during the interviews along with previous accumulated research will in the following be used for the development of personas.

The seclusion of the centre in the rural communities poses challenges in the independence of the residents as public transportation is limited, especially in the evening, which limits their options for participation in social events (Appendix 1 & 2).



ILL. 18 - EDITORS MEETING

PERSONAS

User-oriented design requires great attention and awareness of the processing of information and data. A process where the architect in question must transfer user perspectives into tangible design solutions. This transferring of knowledge to architectural design can contain compromises and misinterpretation among other. which can, in some cases be linked to the lack of interaction with the user. standardized concepts of the human body, legislation and economical aspects occurring during the phase of design (Tvedebrink et al. 2018). In addition to this there is a risk of creating hypothetical users that rely greatly upon the architects themselves, their body and perspectives.

A countermeasure to this has been the investigation of narratives to help understand the daily life of the future building users, the **following 10 pages** will illustrate the personas. A design method which, according to initial studies, increase designer's awareness of the users' needs thereby becoming sensible and emphatic when designing while overshadowing their own perception of the best solutions (Tvedebrink et al. 2018).

The development of a persona cannot be done through a predefined template; however, published academic articles provides an outline of a general approach, that can be condensed to three steps (Nielsen et al. 2015).

STEP (1) is the collection of empirical data which, in this project has been accumulated through observations, interviews and informal interaction with the users.

STEP (2) concerns the clustering of data and logical organization into groups.

STEP (3) aims to develop detailed persona profiles through a narrative composition, giving each persona a relatable identity. In this project, the identities have been achieved through the description of name, age, reason for fleeing, a typical day, needs and ambitions.



ILL. 19 - IMAGE FROM JELLING ASYLUM CENTRE



ILL. 20 - LONE

	LOINE
AGE	58
NATIONALITY	DANISH
RELIGION	CHRISTIAN
EDUCATION	SOCIAL ASSISTANT

FAMILY RELATIONSHIPS

Lone lives with her husband through 27 years, Per and their four children Casper 13 years, Signe and Louise on 15 and Christian aged 18. A traditional Danish family that contrasts the families Lone meets in her work at the asylum centre.

VALUES

Lone seeks to improve the everyday life of the vulnerable asylum-seekers at Centre Jelling through her role at the centre. The job as social and healthcare assistant has resulted in a great diversity of assignments; however, she believes that all cases should be handled equally and taken care of.

CONCERNS

Lone worries about the future and the health of the inhabitants of the centre as well as the potential worsened future if the asylum-seeking individuals' cases get rejected. In relation to that, she worries and must pay great attention to the term of compassion fatigue. Her concern is strongly emphasised due to her family background and whether she can separate personal life and feelings from the situations of the centre's residents.

NEEDS

Lone's needs are focused more on the asylum seekers than on herself and wants to meet the asylum seekers at eye level and build relationships based on trust between staff and residents. The daily routines of hers varies from desk work with case handling to tasks covering the entirety of the asylum centre. Lone spends the majority of her time in transition zones, halls, in larger spaces as well as the homes. She stresses a need for smaller intimate spaces in public zones where private matters can be taken care of.

AMBITIONS

Lone's ambitions for the future have arisen as a result of her past observations, and she wants an asylum centre that recognizes individuality in communities, their need for private spaces and a healthy and open environment to develop themselves in.

AN ORDINARY DAY



FUNCTIONS DIAGRAM



47



ILL. 21 - ZAMIR

NAME		ZAMIR
AGE		41
NATIONALITY		IRAQI
RELIGION		ISLAM
EDUCATION	SOFTWA	RE ENGINEER
REASON FOR FI	LEEING	CONFLICT

FAMILY RELATIONSHIPS

Zamir had a large family, with both his parents as well as three siblings, however he lost them in the internal conflicts that has plagued Iraq for several years. With no family left, he decided to leave the country for his own safety and try to start a new life for himself in a peaceful country.

VALUES

Zamir is a curious individual who always seeks to learn new things and pass on knowledge to others when possible. He also aims to become as independent as possible to prepare him for life after his time at the asylum centre.

CONCERNS

Zamir worries due to his current situation that there will be lack of stimulation in his everyday life. In relation to that he is concerned about his future in Denmark, is it possible for him to use his education or does he need to go back to school?

NEEDS

Zamir has been through a long and rough journey and has a need for privacy, so he can separate himself from others if he needs peace and quiet. On the other hand, it is important for Zamir to have the possibility to socialize with others, to pass the time and to distract his thoughts from his traumatic experiences and focus on creating good and meaningful relationships with others. The possibility to involve himself in meaningful recreational activities or tasks is also important to keep the mind and body busy and counteract the feeling of empty and purposeless days.

AMBITIONS

Zamir seeks to make the most of his time at the asylum centre, where he wants to socialize as much as possible, and invest himself in the activities and tasks at the centre. Once his asylum application is granted, he wants to find work in the IT sector in Denmark.





FUNCTIONS DIAGRAM





ILL. 22 - SAYA

NAME	SAYA
AGE	23
NATIONALITY	SYRIAN
RELIGION	ISLAM
EDUCATION	UNEDUCATED
REASON FOR FLEEING	ABUSE

FAMILY RELATIONSHIPS

Saya fled with her daughter from their hometown of Homs, from her violent and abusive husband. Her parents didn't know about her plan to flee and wouldn't approve it, so she left everything and everyone she knew in order to search for a better life and security for her daughter.

VALUES

The most important element in Sayas life is the safety of her daughter and to secure her a future. As a result of the abusive relationship, Saya values equality and womens rights highly. In addition to this she appreciates close bonds with loved ones and tries to teach her daughter the same values.

CONCERNS

Due to her harsh teenage years and her abusive marriage Sayas main concern is to create a new identity and ensure that she cannot be identified and connected to her previous life in Syria. In relation to that she is concerned that going through all this trouble, seeking asylum in Denmark, that there is a risk of denial of asylum which will force her to continue her journey.

NEEDS

In Sayas situation her essential needs are to secure a normal everyday life for her and her daughter. Her journey to Denmark as a refugee had led to the mental problems of PTSD and anxiety which she needs to treat in order to carry out her role as a mother. In relation to that she needs treatment along with a steady daily routine and mental stability.

AMBITIONS

Saya wishes to get a stable mind which creates the possibility for her to get an education and a job in Denmark in the future. These ambitions should create a stable and secure future for herself and her daughter. Saya wants to give her daughter the childhood she did not have herself. She wants to give her daughter the opportunity to be a child and to get an education and develop her own ambitions for the future.



AN ORDINARY DAY







ILL. 23 - ASALE

NAME		ASALE
AGE		45
NATIONALITY		MALAWIAN
RELIGION		CHRISTIAN
EDUCATION	UNEDUCAT	ED FARMER
REASON FOR F	LEEING	CLIMATE

FAMILY RELATIONSHIPS

Asale lived and worked as a farmer in Malawi with her young son and husband. They all fled from their home together, however Asale and her son got separated from her husband on the way to Denmark, and they don't know where he is or if he is alive.

VALUES

Asale aims to be a role model for her son, especially now after losing her husband, it is important that her son has someone to look up to and follow their example.

NEEDS

She needs privacy so she and her son can have peace and space to be a family, and Asale can help her son adjust to the new situation. On the other hand, Asale is alone in a foreign country, so she also needs to meet and socialize with new people to pass time and distract her from some of the negative thoughts.

CONCERNS

Asale's main concern is being denied asylum and being forced to return to Malawi where it is impossible to farm the land, but she also worries about her husband, if he is alive and where he might be. The future is weighing on her mind and she worries about how she is going to find work in Denmark, that is a very different country compared to Malawi.

AMBITIONS

Her ambition for the future is to be granted asylum for her and her son and to find work in Denmark so she can provide a safe, steady and carefree life for her son. She wants to make sure that her son never doubts where the next meal will come from.



AN ORDINARY DAY

FUNCTIONS DIAGRAM





ILL. 24 - BOMANI

NAME	BOMANI
AGE	8
NATIONALITY	MALAWIAN
RELIGION	CHRISTIAN
EDUCATION	UNEDUCATED
REASON FOR FLEEING	CLIMATE

FAMILY RELATIONSHIPS

Bomani lived in a small hut with his parents, who worked as farmers in Malawi. The family fled the country and travelled north, but Bomani and his mother were separated from his father on the journey to Denmark. Bomani does not know where his father is, or if he is even alive and he is now depending on his mother to guide him.

NEEDS

Bomani feels a responsibility to help his mother as much as he can, especially since losing his father. In addition to this, he also wants to learn Danish, play with other kids and have a place where he can feel safe away from all the people and activity.

CONCERNS

Bomani is concerned about his mother because she must handle everything by herself. He also thinks a lot about where his father is, and if he is alive or not. Bomani also worries if the other children want to play with him, and if he can learn Danish.

AMBITIONS

Bomani wants to learn Danish and go to a

Danish school so he can get an education and a job to provide for his mother when he gets older. He also wants to make new friends at the asylum centre, so he has someone to play and have fun with.



AN ORDINARY DAY





KEY DESIGN ISSUES

INTRODUCTION

The evidence-based approach in this project consists of a combination of academic research along with accumulated field studies, interviews and other investigations. Using this evidence-based approach has narrowed the field of study from more general knowledge about people and spaces to more specified knowledge on refugees, mental health and architecture.

This acquired knowledge is divided into three main topics; the impact of surroundings on the **human body**, secondly the relation between different **spaces and human interaction** in those spaces and thirdly the social and psychological impact of various types of **activities**. This knowledge has been processed and critically interpreted into a design driving guide, that focuses on each on these three categories and how to address them in a design.

BODY

Studies support the general consensus

that **natural light** is of great importance to the human body and mind. In general, the research shows that the body responds well to daylight, and it can play a significant role in improving the mental health of patients that suffer from depression, is considered the most effective. In addition to this, sufficient daylight and sunlight helps to improve sleeping pattern as residents experience a larger contrast between night and day, and it helps them to keep track of time as they experience the change in their environment, as the light changes throughout the day. Light can also help to reduce the perception of pain and be helpful in relieving stress following a traumatic or stressful experience (Frandsen et al. 2009).

Research have also pointed out the importance of **stimulating the mind** and the body of patients or residents, whether that be to positively distract them or to progress their healing. **Art** has been proven successful in the positive distraction of patients and residents as it provides a train of thought that is not directly connected to their current situation and allows for a sort of brief mental escape. The visual distraction or stimulation can be supported by installations that can stimulate other senses through sound, feel or even taste (Frandsen et al. 2009).

The **acoustics** of the built environment can have major impact on the feeling of privacy, sleeping patterns, stress levels and feeling of control when it comes to a resident or patients' physical environment. Studies show that sound, if perceived as noise, for example traffic or velling, can disrupt sleep and increase stress levels, especially if the resident or patient cannot control the sound level themselves, whether that is by closing a window or a door, or something else entirely. This can be handled through lowering the reverberation time of a resident's room, lowering the noise from technical installations and reducing the sound travelling through the structure of the building. On the other hand, the design of sound can be effective to calm or positively distract individuals, much like the visual art mentioned earlier (Frandsen et al. 2009), as illustrated on illustration 25, on the following page.

RELATIONS

Research have highlighted three overall types of spaces in the design of care facilities: **personal space**, **social space and outdoor space**. Studies show that achieving a feeling of privacy in the personal spaces is critical to ensuring the residents' feeling of safety, and thereby the lowering of stress levels and anxiety. The studies also show that it is important for the residents to have control over their own space, for them to feel in control of their situation (Frandsen et al. 2009).

The research on the design of **social spaces** point out the importance of designing different spatiality's for different

social situations, as the space will inform the situation that occurs in the space. There should be a difference in the space that you have private conversations with family or friends to the space where you are interacting with a wider range of people in different scenarios, for example playing board games, reading or playing pool. The facilitation of social interaction between the residents is critical as this can help reduce anxiety and stress. This relation between the residents and even the staff can be achieved through the design of different situations that allows for different kinds of socializing. The research also states that the social spaces should feel safe, be easy to navigate and maintain an overview over. In addition to this, a "homey" designed space can increase the level of social activity as this space will resemble a situation where they would normally be social (Frandsen et al. 2009).

Outdoor spaces can contribute significantly to the guality of a building, and research have shown that if the spaces are designed and located correctly, they can have significant impact on several aspects of both physical and mental health. The view and access to green spaces have been proven several times to be of significant benefit to the general health. stress levels and in some cases even the ability to concentrate. The outdoor spaces should contain different functions, like the social spaces mentioned earlier. Some areas might be for quiet contemplation and dealing with personal issues or questions about their situation, while other areas should be for socializing and could contain activities that can provide positive distraction, purpose and be a catalyst for social interaction. This way, the outdoor spaces can meet demands or desires for a wide variety of users, while addressing the user's individual needs (Frandsen et al. 2009).

Research point to the importance of horticultural therapy, gardening and green care in the recovery of users struggling with both mental and physical health issues (Wagenfeld et al. 2013). The green settings have the potential to reduce the levels of anxiety, depression and PTSD, while it can increase the degree of social inclusion through meaningful activities that revolve around the green spaces (Harris, 2017). This is supported by studies that show satisfaction in asylum seekers that have participated in horticultural therapy and gardening, as it became a hobby and a meaningful activity that provided some purpose in their day (Bishop et al. 2013). as illustrated on illustration 26.

ACTIVITIES

Individuals at asylum centres are in a mental and physical limbo, which often results in boredom and occupational injustice. This can be counteracted by the participation in meaningful activities to provide anchor points and purpose in the asylum seekers lives (Wardenburg et al. 2019). Observations made at Jelling asylum centre, clarified that providing a daily purpose was critical to help the residents cope with a difficult, unknown and empty situation. This observation is supported by research that shows recreational activities and sports can provide positive distraction and relief from thoughts of traumatic events they have gone through and from concerns for what the future will bring (Wardenburg et al. 2019).

The activities can provide **purpose** and facilitate communication within the centre, but also between the residents of the centre and the people in the surrounding context, thereby promoting early integration of the asylum seekers into the host country. The observations of asylum centre Jelling showed a great diversity in the type of activities held throughout the centre, which highlights the wish to meet the diversity in the people living at the centre. The activities varied from **daily chores** to more recreational activities like badminton, chess, boxing, painting etc. Through these activities, it becomes possible for the asylum seekers to be active both physically, mentally and socially, both inside and outside of the asylum centre, as seen on illustration 27.





INTRODUCTION

METHOD

ANALY



SIS DESIGN PROCESS PRESENTATION

SITE INVESTIGATION

THE USERS IDEAL SITE

A site, its context and the local regulations all have significant influence on what type of architecture can be created. In practice. analyses will be made as to what type or types of buildings will fit the area the best. and the firm in charge of the project will have to work within the constraints of that site. In academia, the process can be reversed, where the needs of the users can be a determining factor for the choice of site. The needs of the user, identified through scientific articles and research along with an analysis of the asylum strategy of the Danish Red Cross, have played a significant role in the choice of site for this specific project.

Asylum centres in Denmark, typically located in old schools, nursing homes or old military barracks, promotes social exclusion between the Danish communities and the residents of the centres (Morville et al. 2018). This exclusion often happens as a result of poor public transportation. In the rural areas, the public transportation rarely run in the evening, and as asylum seekers have no other means of transportation, they are isolated in their homes in the afternoon and evening. In addition to this, there is usually a limited amount of recreational activities and cultural events in the rural communities.

The urban location for a new asylum centre could promote the social inclusion and acculturation of future citizens of the Danish society, along with meaningful social interactions. Articles have shown scepticism from the rural communities about the consequences of a new asylum centre in their area (Whyte et al. 2018), while other studies have shown a greater tendency of acceptance and embracing approach of asylum seekers in urban environments than rural communities (Crawley, 2019). Articles support the fact that access and view to nature along with quality daylight and quiet also play a significant role in the improvement of both physical and mental conditions for the asylum seekers, however, these are parameters that can be implemented in a design of an urban asylum centre(Ulrich 1984, Harris 2017, Curtis 2007). See illustration on the right.

	MULTIPLY FACTOR	RURAL	URBAN
MULTICULTURALISM Wide range of ethnicities to identify with.	•••		•
VIBRANT LIFE Possibility of participation in activities and communities	• • •		
NATURE Connection to surrounding nature	••••	•	
STRESS Importance of stress-free environments	•••	•	
NETWORKING Networking with people and other refugees to help with work in the future			•
CULTURE Cultural surroundings to enhance the acculturation of the asylum-seeking individuals			•
INFRASTRUCTURE The ability to move and transport yourself free- ly and independently of asylum centre staff			•
NOISE The absence of noisy surroundings to help minimizing mental health stressors		•	
LIGHT Lights influence on mental well-being		•	
MUTUAL DEPENDENCE the society is dependent on the asylum-seek- ers – vice versa		•	
TOLERANCE To what degree the host society accepts the fleeing individuals			•
TOTAL		11	13

CHOOSING A SITE

CITIES OF ITEREST

The previous analyses determined that the asylum centre should be placed in an urban context in order to improve the acculturation of the asylum seekers and to create the possibility for them to interact with the Danish society.

The three largest cities in Denmark; Copenhagen, Aarhus and Odense were chosen as potential candidates for their diversity in people, culture, recreation and other activities. Aarhus was chosen as the case for this project, mainly due to its focus on culture and the diversity of the inhabitants of the city, however the project could have been located in either of the three cities.

DISTRICTS OF INTEREST

In order to select the optimal site for the location of the asylum centre, different areas of the city were investigated, to discover what elements each district contained, that had relevance for choosing a site. The elements that were investigated were recreation, access to greenery, traffic load and mixed functions in the surrounding context. The three districts of interest were Latinerkvarteret, Trøjborg and lastly Godsbanen all located in Aarhus.

The **Latinerkvarter** is an area with great social interaction and a vibrant atmosphere, however the area lacks green spaces that can meet the user's needs and was therefore not chosen, see illustration 28.

Trøjborg is an area with good opportunities for the use of nature, however the area suffers from heavy traffic and lacks the variety in functions, see illustration 29.

Godsbanen, see illustration 30, was selected due to the large diversity of mixed functions and people in the surrounding context, which creates the opportunity for the asylum seekers to interact with the Danish culture and inhabitants. In addition to this, it is an area that can handle a larger scale of building, while still providing the opportunity for creating green outdoor spaces.



PRESENTATION OF SITE

SITE - GODBANEN IN AARHUS

The area is situated in the centre of Aarhus and is made up from approximately 13 hectares spread between Skovgaardgade and Ringgadebroen. Currently, most of the area is empty, except for several shipping containers and self-built structures, that have been transformed into a hub for creativity, culture and social interaction. Located close by this hub, are two century old buildings worthy of preservation, that operated until the change of millennium. The buildings are of an industrial character, built in red bricks and painted wood, emphasise the history of the area (Aarhus Kommune, 2017). In 2012, it was announced that the now abandoned area should be transformed into a revitalised and sustainable town district with Godsbanen and culture in focus, called Aarhus Κ

The location of **Aarhus K** enables the area to possess a great diversity of functions including cultural activities, natural access to the future green wedge along with the quick access to Aarhus Å. To the north one can find the botanical gardens and the new district of Ceres Byen where educatio and youth housing adds life. The area of Godsbanen contributes to Aarhus' cultural image and becomes a continuation of cultural and recreational vein that among other consist of the nearby museum of Aros, Musikhuset, Folkestedet, congress centre and shopping street (Aarhus Kommune, 2017) see illustration 31.

VISION OF GODSBANEN

The **Godsbanearealerne** is a district recognized for its rich cultural history and an area in constant development. The previous years as well as the years to come are of great importance to the municipality and citizens of Aarhus. The vision for this partially abandoned and unplanned space in the city centre is the development of **Aarhus K** – a district of culture, creativity, cultural history that will become a node in the city (Kultur, Kreativitet, Kulturhistorie, Knudepunkt). The plans and ideas are to protect and develop its iconic and authentic atmosphere and subcultures.



ILL. 31 - THE SITES CONTEXT

The area should emphasise the diversity of people, shops, offices, cultural institutions, creative educational departments that will be placed in both new buildings as well as in the industrial and existing preservation-worthy buildings (Miljø og teknisk Aarhus Kommune, 2017). The ambition of **Aarhus K** is to link urban context with landscape, culture with nature while letting the raw and urbane atmosphere of the old industrial act as common ground (Miljø og teknisk Aarhus Kommune, 2020).

DISTRICT PLAN

The following text extract is a merged description of the district plans of 1044. 1077 and 1107. These smaller district plans each contain individual characteristics, but the general conditions and descriptions are homogenous and highly influenced by each other. A common denominator is their approach and through awareness of the area's history, its materiality, scale as well as the potential for them to become the missing link to the surrounding context and culture. The surrounding context is highly emphasised by traditional city blocks of masonry and the future volumes must relate to these by becoming contemporary blocks with defined corners and active and transparent ground floors. The district plans state that one must ensure displaced layout of roads and volumes enhancing the wishes of smaller, intimate corners and spaces. These volumes, of primarily flat roofs, is intended to descale towards south from 4-6 stories towards the city edge to a lower and scale orientated height enlightening courtyards, meet the green wedge and with respect for the historic Pressenning Huset and Toldvarer huset. The displaced and height varying volumes should likewise oblige with the city's pronounced landmarks visible from the area. This does among other include the Aros museum, the town hall as well as Ringgadebroen.

The plans contemplate that the majority of future buildings appearance should be emphasised by harder, industrial materials like concrete, masonry, metal, glass and the likes. However, smaller areas in the façade can supplement these by a lighter appearance such as a wooden façade. (Miljø og teknisk Aarhus Kommune, 2017, 2018, 2020)

SELECTION OF SITE

The building site was selected based on previous accumulated research and observations along with analysis of the context and the district of Godsbanen. The chosen site is a part of district plan 1107. will in the future be embraced by surrounding volumes of diverse character will provide shelter from the traffic of Carl Blochs Gade. The district plan 1107 contains a plan for a building complex with housing, offices and a supermarket, along with another office building towards the north. At the area of the chosen site it was initially planned to construct a 6-storey car park, which would scale down to the south-east to the recreational space and the Institute for (X). This car park should house 363 parked cars, for the district plan and had a footprint of 2400 m².

The location of the site provides the possibility for social interaction and activities in the surrounding context, in particular the creative environment of Institute for (X). Due to the open character of the Institute for (X), it is possible for the asylum seekers to observe the activities at a safe distance, before participating themselves. Furthermore, an asylum centre can contribute with activities and users for the future interaction to the context. As the asylum centre is located on a site previously planned for a parking structure, the second option for the location of the parking house will be used, see Appendix 3.



ILL. 32 - THE FUTURE PLANS

THE SCALE OF THE AREA

In the variegated context of the site both newly built structures, green clusters and old industrial buildings can be found. This has resulted in an area of great diversity in relation to height and density of the surrounding volumes.

LONGITUDINAL SECTION A-A

The longitudinal section of the context shows the sites neighbouring volumes towards north-east and south-west. These 20-meter volumes housing the future architectural school along with a larger youth housing sits on each side of the 65-metre-wide site. Located next to the creative architectural school on the right can one find a larger area intended for a future square. This square, that in the future will become a node of the area is an element of which the future centre should relate to.

CROSS SECTION B-B

When highlighting the cross section of the surrounding context it becomes clear that a significant descaling occurs. The higher volumes of 20-35 meters houses residential use, stores and offices and contrast the smaller and more intimate



ILL. 33 - SECTION A-A



ILL. 34 - SECTION B-B

scale towards south-east. These volumes of merely 3-10 meters are fragmented and uncontrolled in their placement. This means that the future asylum centre is to be placed as an infill where both smaller, larger, dense and open volumes sits.



ILL. 35 - SECTION LOCATION





THE AGENCY OF MAPPING

WHAT A cartographic analysis, *Mapping* by designer and architect James Corner.

WHY To improve the understanding of the surrounding context and its elements

HOW By extracting functions, the infrastructure, buildings worthy of preservation, landmarks, recreational spaces and noise.

MAPPING

The Agency of Mapping by American landscape architect and urban designer James Corner is a design and analysis method used to improve the understanding and perception of cities and landscapes. James Corner states that the agency creates a mirror of the reality and its existing proportion. The method, which uses a cartographic plan, illustrates and analyses a larger area which in this project involves **Godsbanearealerne** and its surrounding context. In the process of creating maps of the area for exploration Corner introduces the term 'Tracing'

which clarifies the existing element and spatiality. This includes functions, infrastructure, recreational area and noise. These elements of the area are illustrated and operated by three definitions; creation of fields, the extraction and plotting. The fields operate as a surface that the extraction will use as a layer of foundation. The extracts are the elements that are isolated and meticulously analysed from the context. The last definition, plotting, becomes the element where extraction is reinputted and merged with the fields creating a new meaning and understanding of the area and thereby showing limitations, possibilities and opportunities for the future (Cosarove, 1999).


ILL. 36 - FUNCTIONS

FUNCTIONS

The functions in the surrounding context varies from dwellings, business, culture and institutions, creating a multifunctional context. Various types of functions create the possibility for the user to explore and participate in different activities of the local environment.







ILL. 37 - INFRASTRUCTURE

INFRASTRUCTURE

Illustration 37 shows the different traces of infrastructure, mainly two types of roads, the primary roads which leads the traffic around the area, where the secondary roads lead the traffic through the area. Furthermore, the bicycle and walking paths and bus stops surrounding the site connect the site to the city centre.





ILL. 38 - BUILDINGS WORTHY OF PRESERVATION

BUILDINGS WORTHY OF PRESER-VATION

The context surrounding the site contains several preservation worthy buildings, that tells the story of the industrial heritage of the area. This includes the cultural hub Godsbanen, **Presenningshuset** and **Told Varehuset**, that all hold architectural, historical and cultural value.

BUILDINGS WORTHY OF PRESERVATION



ILL. 39 - LANDMARKS

LANDMARK

The landmarks of the surrounding context are evenly distributed to the north and north-east of the site. These landmarks represent different types of activities, cultural landmarks and recreational spaces to help navigate in the in the heart of the city.

LANDMARKS



ILL. 40 - RECREATIONAL SPACES

RECREATIONAL SPACES

The context contains three different types of recreational areas for the user to enjoy in an urban context. These different types of recreational spaces create the possibility for the user to escape from the hectic city to be surrounded by nature.





ILL. 41 - NOISE

NOISE

As the illustration 41 shows the noise in the surrounding context is mainly connected to the roads. As only secondary roads go through the area there is a low concentration of noise on the site, which creates the opportunity to create quiet places for the future residents.



SERIAL VISION

WHAT A phenomenological analysis of the experiences of the context through the methodology *Serial vision* by Gordon Cullen.

WHY To give a phenomenological and sensory based understanding of the context and its unique character and materials.

HOW By showcasing selected viewpoints on two paths specifically chosen to highlight the diversity of the area's functions, activities, materials and people.

SERIAL VISION

The urban designer Gordon Cullen published in 1961 the book **Townspace**. In the book, the analysis of Serial Vision could be found and was a methodology that helped the user understand the elements of the city in a human scale. A city does not merely contain inhabitants as it has elements and an identity that creates life and activities for the user, which explain why many people prefer to live in communities rather than isolated. Every path through a district creates views for the user to explore and discover new elements of the city. The method takes place in an urban environment, where the user explores spaces, materials, elements along a decided path. These images are illustrated on a cartographic level on the selected path, by pictures or drawings. (Cullen, 1961)

The great diversity found in the context of Godsbanen has resulted in the illustration of two routes. The first path consists of greenery and peace and stretches from an open space where Folkestedet is situated, along the creek towards the site. This contrasts path two which highlights the transition of typologies, materials and scale that goes from the Musikhuset and Aros, through the traditional town blocks which is followed by the cultural hub Godsbanen and the Institute for (X). The paths are illustrated through a collage of pictures and drawings supplemented by a Tomographic analysis in Appendix 4, to give the impression of the future conditions.



ILL. 42 - SERIAL VISION MAP

PATH 1



ILL. 43 - FIRST STOP

The first thing to greet you on your path towards the site is the red brick and glass house called **Folkestedet**, a place for conversation, playing and food.



ILL. 44 - SECOND STOP

The flow of water in the creek, the sound of gravel beneath your feet creates distance between the pulsating life in the city, and this experience of nature.



ILL. 45 - THIRD STOP

A wooden bridge leads you across the creek, and you are now standing on the edge of the youth and educational district **'Ceres Byen'**.



ILL. 46 - FOURTH STOP

The walk along the creek is over and one are now greeted with the road of Carl Bloch's Gade and a glimpse of the future architectural school, office and supermarket in concrete, steel and glass.



ILL. 47 - IMAGE OF INSTITUTE FOR (X)

PATH 2



ILL. 48 - FIRST STOP

The centre of **AROS** and **Musikhuset** marks the start of this route. An open place of larger volumes where individuals gather for events and activities.



ILL. 49 - SECOND STOP

The traditional masonry town blocks sits next to the preservation-worthy cultural hub of **Godsbanen** and the larger masonry zizzag building of the future.



ILL. 50 - THIRD STOP

A view towards **Godsbanen** highlights the architecture and materiality containing mixed textures of old red bricks, corten steel and detailed architectural ornaments and constructions of wood.



ILL. 51 - FOURTH STOP

A view towards the area of the future **Aarhus K** consists of a cobblestoned path and rails where the old building tradition serves as a reminder of the area's industrial past of freight and goods.



ILL. 52 - FIFTH STOP

The green wedge of the future will become a space of learning, diversity, relaxation and life. To the right one gets a glimpse of the creative workshops of the future architectural school.



ILL. 53 - SIXTH STOP

A view towards the inner courtyard space reveals a transition between a transit zone and a recreational area at the end of the tunnel, shaped by the **stacked containers**.



ILL. 54 - SEVENTH STOP

Various creative functions located in smaller huts, containers and **self-built** structures are scattered throughout the villagelike area, giving an intimate and welcoming atmosphere.



ILL. 55 - EIGHTH STOP

The view towards the site reveals larger volumes of a diverse architectural language, with a mix of **vertical and horizontal lines**, textures, people and functions that will shape the area.

A WALK THROUGH THE CONTEXT

WHAT A narrative method for spatial and phenomenological understanding of a site and its atmosphere that is based on the theories *Genius Loci* by Christian Norberg Schulz (Norberg-Schulz, 1979) and TerriStories by Klaske Havik (Havik, 2019).

WHY To describe the experience of the site as a phenomenological experience and to allow the author to, in a pedagogical manner, specify the sensory impressions of the site and the surroundings, all contributing to the overall understanding of the atmosphere of the place.

HOW Through a first-person narrative of the sensory experience of a walk from the centre of Aarhus, through the site and along Aarhus Å, describing what is seen, heard, smelled and experienced on the way.

I had just finished my visit at the **Aros museum** of art in the centre of Aarhus, when I decided to go explore the old **Godsbane area**, just west of the museum. I walked down the stairs between Aros and 'Musikhuset', passing the outdoor auditorium on my way down. I took a left, then a right, and I caught a glimpse of Godsbanen further down the road. As I approached **the old industrial freight station**, I looked to my left and could see parked trains in the distance, right on the southern edge of the old railway area.

I turned my gaze to the old railway building once more. The building appeared old and used, but still robust and with plenty of life left for many years to come. Some of the red brick walls on the exterior had been painted over with graffiti. However, unlike most graffiti, these paintings seemed more like pieces of art, than vandalism, and added character and identity to the area. As I opened one of the many doors into the building, I could hear the buzz of activity before I could ever see it. I walked through a large exhibition hall, where the Aarhus School of Architecture currently displayed their graduation projects and entered the central hub of Godsbanen

Here, I could see people in meetings,

working on their own projects, or enjoying a meal and a drink in the café. I walked directly across the space towards the workshop area where the space changed again. I was now taken back by the **large**, **curved**, **wooden beams** that support the roof structure of the hall. The workshops are located in boxes put up along the central axis of the building. I walked down the hallway and caught glimpses of people woodworking, welding, plotting, sculpting and laser cutting for their own projects.

I exited the building and moved into the central courtvard and made my way onto the roof of the new building. As I reached the top, I discovered a small, cluttered and almost anarchist looking community in the southern part of the area. This community clearly stood out from everything else in the area and I decided to go and explore it. I made my way down from the roof and walked along the path lying between the train tracks to the south and the edge of Godsbanen. Behind scaffolding and fencing the New Aarhus Architecture School was being built. The scale of the building is larger than most of the buildings in the area, however it positions itself up against Godsbanen and steps down in height towards the smaller scale buildings to the south.

I walked past the new school and turned right through an opening underneath a stack of shipping containers, that were transformed into offices. On the other side there was a **small playground** and **green areas for relaxing**. A network of paths weaved in and out of each other allowing access to all the containers, huts and sheds that were scattered throughout the area. The scale of the area seemed **small and intimate**, and people seemingly settled wherever they felt like it, ensuring unique spaces and pathways throughout the area. In spite of poor weather, I saw

people working outside on their containers, and fixing bikes in the local bike shop. As I looked in through the windows of some of the containers and wooden huts. I saw people painting, manufacturing and creating various arts and products. The materials of the area varied from wood to brick, steel to concrete, gravel to grass and created a kind of three-dimensional collage of spaces, surfaces and connections in the area. I ran into a local on my journey through the area, and he explained that the area was a community called Institute for (X) where people have the opportunity to be cultural, creative and innovative, whether it is creating small businesses, learning new things or becoming a part of different initiatives.

I looked north, and trees emerged between buildings on the other side of the road, so I decided to cross the road and explore what lies on the other side. As I crossed the road and trees started to surround me, the sounds of the city, the traffic and the howling wind all faded away. I moved across a bridge, over the stream, and the sounds were now replaced by the sound of gravel beneath my feet, the flow of water in the stream and birds chirping in the trees that formed a barrier between this **green walkway** and the **pulsating** city. I followed the path northeast where I passed art installations hovering above the water. I crossed another bridge and found myself at the 'Folkestedet', where the smell of food and coffee filled the air and I heard eager conversations between the visitors of the café and **community** centre.

SUB CONCLUSION

The site for this project was selected from a user-based perspective, which is possible in academic work, but less so in practice. The decision was based upon academic research, articles and interviews, which pointed towards an urban location for the new asylum centre, while keeping in mind that access and views to nature were significant to the users as well. A 2400 m² site at Godsbanen in Aarhus was chosen, as the city houses a large diversity of people, making it easier for the new asylum seekers to find their place in society. Godsbanen was chosen because the area possesses a rich cultural and creative tradition, with a vision for the future, that supports the identified needs and wishes of the users.

Cartographic analyses of the area showed a large variety in the functions, thereby creating different types of life and activities at different times during the day, week and year. As the traffic in the area is limited, with all the primary roads going around the site, the area is relatively quiet, allowing the residents of the area to take in other sounds of individuals working on their sheds or even birds chirping in the trees. The recreational spaces to the southwest of the site allow users to escape the city and experience nature in the heart of Aarhus.

Phenomenological studies of the site and area supported the findings in the mapping of the area, highlighting the access to both culture and nature close to the site. It also showed the transition in scale and building typology from large to small as you approached the site from the city, and the industrial and traditional character of the materials in the context. The study revealed a vibrant urban environment with activities, art and recreation in different scales and situations.



ILL. 56 - OVERVIEW OF INSTITUTE FOR (X)



INTRODUCTION

METHOD

ANALY



ZERO ENERGY BUILDING

INTRO

Awareness of the building industry's environmental impact has catalysed international and regional attention over the last decades and one of many counteracts to this is the concept of Zero Energy Buildings, commonly referred to as ZEB. The concept of ZEB can in general be defined as buildings designed with a lowered energy demand, through the implementation of passive strategies, that is covered by renewable energy. However, this is supplemented by other definitions creating alternative clarifications of what a Zero Energy building is, and no comparable, clear and agreed definition and calculation methodology have currently been made. The complexity of the calculation and geographical location of the building among other means that parameters included in ZEB calculations are used differently across the globe.

PARAMETERS OF CONSIDERATION

The parameters of consideration are important in how a ZEB status is perceived which, in this project, will be based on Danish building legislations and regulations. The parameters of consideration includes; the metric of the balance, the balancing period, the type of energy use included in the calculation, the type of energy balance, the accepted renewable energy supply options, the connection to the energy infrastructure, the requirements for the energy efficiency and lastly the indoor environment of the built environment (Marszal et. al. 2011). The above-mentioned parameters can then be translated into this specific project and appears as following:

The metric of the balance: kWh/m² year

The balancing period: One year

The type of energy use included in the calculation: energy for heating, ventilation, cooling and DHW.

The type of energy balance: Balance between the energy consumption and the renewable energy generated by active strategies The accepted renewable energy supply options: Includes both on-site (wind, sun etc.) and off-site supply (biomass etc.)

The connection to the energy infrastructure: Connected to the grid

The requirements for the energy efficiency: 20,0 and 25,0 kWh/m² year of respectively dwellings and other buildings than dwelling in which is not covered by \S 474.

The indoor environment of the built environment: Comply with current building regulation.

THE PROJECT AIM OF ZEB

The stated parameters are of great importance when highlighting the projects aims for an asylum centre of a low environmental impact. The centre will comply with abovementioned demands and reflects the perception of a low energy building in this project. However, this project will further seek to comply with ZEB standards and therefore be a building of either no or negative energy demand while still creating an indoor environment of great quality. The latter will be an uncompromisable aspect as the indoor climate, especially for the users of this project, is one of the cornerstones for improved living and mental health. Therefore, should the aspects of acoustic, thermal, visual and atmospheric comfort be thoroughly implied in the phase of sketching while aiming for a ZEB building. Considering and complying with the four aspects of an indoor environment will ensure at built environment of great quality enhancing the life and mental health of the centre's users.

ACOUSTIC COMFORT

The acoustical sense and is important to implement in the design of the future asylum centre, especially in relation to the aforementioned mental health issues of the residents. The acoustical properties of a space are a contributing factor in the perception of the atmosphere of a space. The acoustic aspect will in the project be explored through comparable calculations helping decision making and further emphasised by the choice of sound absorbing materials.

THERMAL COMFORT

The project will implement thermal comfort indexes of PMV-PPD to achieve a satisfactory thermal environment. The centre will be divided into two types of uses, respectively residential use and other types of use than dwellings, and as a consequence hereof the building must comply with two regulations. The first being a maximum of 100 hours above 27 degrees and 25 hours above 28 degrees for dwellings which is supplemented by 100 hours above 26 degrees and 25 hours above 27 degrees for the remaining functions (Bygningsreglementet.dk § 385 - § 392).

VISUAL COMFORT

The project must ensure an effective use of daylight as a natural source resulting in minimized electrical use minimizing heat gain and energy use. The regulations state a minimum of 300 lux in at least half of the floor area in at least half of the daylight hours which will ensure adequate and well-lit environments. This has to be documented however further optimization to improve the visual indoor environment will be investigated to create a light, welcoming appearance that likewise ensures visual connection to the surrounding context or potential greenery. (Bygningsreglementet.dk § 377 - § 384)

ATMOSPHERIC COMFORT

The fourth aspect of indoor environment covers the atmospheric conditions of a space. Danish building regulations states no rules regarding indoor quality, however, refers to Danish Standards (DS-EN 15251). Atmospheric comfort is in this project achieved through class B which states a CO₂ concentration of maximum 500 ppm above outdoor concentration. The atmospheric comfort likewise covers smell pollution which in class b states a maximum of 20% people dissatisfied that equals an experience air quality of 1,4 decipol or less (DS-EN 15215).

LIFE CYCLE ASSESMENT

INTRODUCTION

The tool and use of life cycle assessment (LCA) in preliminary design development give designers an improved understanding of buildings and building components life cycle from cradle to grave. This informs the design phase and gives a broader view on the building components' environmental advantages as well as disadvantages. Understanding the life cycle assessment and its phases from production, building process, use to end of lifetime helps decision making during the phase of design. When highlighting materials, one must consider the element such as production methods, durability, lifetime and re-use. Understanding these elements with help

making a building of an improved life cycle assessment which helps the environmental impact of the building.

INVESTIGATING MATERIALS OF THE CONTEXT

The risen interest in LCA has during the past years catalysed detailed life cycle programs (eg. LCAByg) and books of guid-

ance in which include detailed calculations and geometry considerations.

The accumulated information, used as early guidelines, grounded the further exploration of three external walls of 1m², concrete, masonry and wood.

These walls, of great environmental and aesthetical diversity, were chosen based on contextual relation.

Life Cycle Assessment in general covers 5 main phases (illustration 57) that are highly complex as it concerns extremely detailed calculations of everything from the extraction of the raw materials to the disposal or reuse of the materials at the end of the life cycle.

The LCAbyg software does not cover the entirety of a Life Cycle Assessment, and is limited to three main phases: **Production**, **Use and End of Life**, resulting in a detailed, but simplified picture of the Life Cycle Assessment(Statens Byggeforskningsinstitut, 2019).



ILL. 57 - PHASES OF LIFE CYCLE ASSESSMENT

THE RESULTS

The reality of a buildings true Life Cycle Assessment is more complex which requires critical thinking and interpretation of the results given by the analysis. The analysis does not provide sufficient data regarding transportation and logistics, which can have significant impacts on the GWP of different materials.

The same can be said for the maintenance and repair of a wooden façade compared to a brick façade.

The results of LCAbyg showed that the external wall composition of **concrete** had an environmental impact twice the wall of wood (see illustration 58-60). Initial analysis of that particular outcome was as a matter of course due to the element of natural versus unnatural materials. A wall composition of natural materials has an advantage during the early phases of the life cycle assessment (**Production A1-A3**) as these would absorb CO₂ and therefore create a negative number of GWP. This negative impact, unlike the one of concrete and masonry, will therefore compen-

sate in the phases of **use** and **end of life**. The smaller impact of the wooden façade could likewise be further minimized as one can identify that the natural material during the phase of disposal **(C3)** are generating energy and has an increased GWP print as a result of burning.

The wooden façade will during disposal C3 produce CO₂ however, this could be lowered by choosing alternative ways of disposal that, among other, could be **downcycling** to give worn elements new life.

The wall composition of masonry has a GWP impact of 94,8 kg/C02eq. /m² and the majority of this impact are to be found in the early phases of its lifetime. The high durability and long lifetime of 120 years results in a wall in which contain little maintenance and replacement during the phase of use unlike the façade of wood that during the asylum centres lifetime of at least 120 years should be replaced and of course maintaine. See Appendix 5 & 6 for u-value calculations and LCA calculations



94,8 kg/CO₂eq. /m² ILL. 59 - MASONRY WALL



111. 60 - WOOD WALL

MICROCLIMATE

The microclimatic conditions of the building are vital to the design of both attractive outdoor spaces as well as the implementation of passive and active strategies in the building design. As the site is situated in an urban context elements like shadows from surrounding buildings should be analyses and considered in the design of the centre and its outdoor spaces, as good solar conditions are critical for usable outdoor spaces in a northern climate. Through the analysis of the site's climatic conditions, the design of the building can be informed and improved concerning the energy demand and comfort levels, through the implementation of energy efficient strategies and principles. By analysing the sites wind conditions, effective strategies for natural ventilation and the sheltering of outdoor spaces can be investigated. Through these analyses the microclimate becomes a design driver for creating sustainable design.



ILL. 61 - IMAGE OF INSTITUTE FOR (X)

SOLAR CONDITIONS

WINTER

The large, future volumes of the surrounding area will cast significant shadows at winter solstice. However, unlike the majority of the context, the site of this project will be lit in the first half of the active sun hours of the shortest day of the year. This is due to the large opening towards southeast that consist of the smaller Institute for (X) volumes see illustration 62.

EQUINOX

During the active sun hours of spring and fall equinox the site is well lit. This is partly due to the increased angle of the sun and the increased number of sun hours. This indicates possible areas where the use of well-designed outdoor spaces could be extended see illustration 63.

SUMMER

The sun path of the summer solstice begins in an early north-eastern rise and due to the high angle of the sun (57,5 de-

grees at 12 AM) the site will be fully lit for 11 hours throughout the day. This means that in the hours from 5 AM to 4 PM one can find conditions of which will be optimal for the implementation of active solar strategies see illustration 64.



WIND CONDITIONS

DEC-FEB - WINDROSE

In the colder months of the year, the strongest and largest amounts of wind will primarily come from the span between west and south. This information is critical in the massing of the building and the design of usable outdoor spaces when considering the openness of the site, particularly towards the west, see illustration 65.

MAR-MAY - WINDROSE

During spring, the wind power is reduced when compared to winter, and the wind is spread more evenly across all directions, with a slight dominance towards south and east. The even spread across all directions combined with higher temperatures creates good possibilities of natural ventilation as the changes in wind direction will change the pattern of windward and leeward side, thereby creating opportunity of natural ventilation on all facades, se illustration 66.

JUN-AUG - WINDROSE

During summer the dominant wind direction spans from west to north-west, illustrating similar tendencies as seen in the winter months. The sheltering of outdoor spaces and massing of the building can therefore serve the same purpose in winter as in the summer, creating year-round usable spaces. The wind direction in summer also shows that the best possibility for natural ventilation is on the south- and north-western facades, see illustration 67.

SEP-NOV - WINDROSE

In autumn, the majority of wind is found in the span from northwest to south, showing similar wind conditions as in summer and winter. The colder temperatures in autumn increases the need of sheltered outdoor spaces, as this allows an extension of the outdoor functions and activities otherwise found in summer, as illustration 68 shows.





SUB CONCLUSION

The chapter of environmental sustainability was catalysed with a broader definition of buildings with a low environmental impact and how the future centre should comply with the aims of an improved tomorrow. The project will seek to create a building of ZEB status that relates to the current energy frame definitions of the Danish government. As stated, should the building be designed with this in mind while maintaining and creating an indoor environment of great quality for the residents and staff of the building that complies with current regulations of building environments.

The investigations of solar conditions showed great potential of well-lit outdoor spaces as the volumes of the context are optimally placed and shaped when observing shadow conditions.

Environmental sustainability likewise includes an awareness of materials of choice and the composition of these. An LCA investigation were conducted to improve the understanding of chosen materials of great contextual relation that included masonry, concrete and wood. The latter, of a small environmental impact were chosen due to its natural attributes and CO₂ absorbing properties while creating a warm, reassuring appearance in close relation to the surrounding buildings worthy of preservation.

The analyses of the area's microclimate illustrated favourable solar conditions across all seasons and were supplemented by wind conditions. The direction of the winds across the year is predominantly in a span from south to west to north, which will create both turbulent air, and wind tunnels on the site, and must be handled in the design out outdoor spaces and placement and size of building volumes.



ILL. 69 - IMAGE OF INSTITUTE FOR (X)



INTRODUCTION METHOD

ANALYS



SIS DESIGN PROCESS PRESENTATION

ECONOMIC SUSTAINABILITY

ECONOMIC AND ENVIRONMEN-TAL SUSTAINABILITY

The long term thinking in sustainable architecture does not allow for a separation between the economic and environmental aspects of a building, since the design parameters often overlap, for example construction type, materials and programming. The lifetime of the building depends on its ability to adapt over time and the buildings capacity to withstand wear during the operation of the building. The goal for the new asylum centre is a lifetime of minimum 120 years, which can be met through the design of a building that can meet the specialized needs of the current users, while being able to adapt to potential other users in the future (Statens Serum Institut et.al, 2014). Examples of these new uses could be social housing, student housing, a hotel or offices. By designing an adaptable and flexible building, it allows for an economic and environmentally sustainable solution. This flexible thinking also allows for adaptation of the asylum centre itself, as the need for capacity is a constantly changing factor (Richards, J, 2016).

ECONOMIC AND SOCIAL SUSTAIN-ABILITY

In the socioeconomics of sustainability, the economic and social aspects are tied together, as the social sustainability has consequences for the economics of the general society. On a long-term basis the guick and effective integration of individuals in the society and labour market can reduce the cost of welfare benefits. According to the Danish law of integration new refugees must be in employment within the first year of their asylum grant. Unfortunately, this isn't a reality and according to Finansministeriet 64% of the refugees in Denmark aren't in employment within the first year of settlement (Folketingets Statrevisoere, 2018). This is partly, because of the psychological and physical traumas that refugees sustain in their home country, on their journey to Denmark or the mental stress form an uncertain future.

These issues hinder their motivation and possibility of participating in activities that are supposed to help them prepare for integration into the Danish society. Furthermore, the duration of living at an asylum centre represents fear of departure and not being in control over of their own life. Therefore, the length and quality of the stay in asylum makes the future integration a difficult task in the long run and likewise effect the economic influence on the society due to the lack of future employment (Bakker et.al, 2013).

The aspects mentioned above cannot necessarily be solved through architectural means, however the architecture can improve the physical environment of where the refugees stay and help support treatment and activities that improve their conditions. The architecture can provide a feeling of home, in a temporary place and situation, thereby relieving mental stress, and improve the possibility of faster recovery and integration.



INTRODUCTION METHOD ANA



LYSIS DESIGN PROCESS

PRESENTATION

ROOM PROGRAMME

The accumulated elements of the analysis phase have resulted in an improved understanding of existing asylum centres structure, their organisation and architectural means. The stated mental status of the displaced people has furthermore highlighted the element of adding functions to the asylum centre of this project. These functions include outdoor spaces, meditative spaces and areas for social interaction. In contrast to existing conditions of asylum centres this room programme seeks to improve and emphasize the common facilities of the centre enhancing social interaction both internally and externally.

The room progamme is branched into the subcategories of common facilities, common outdoor spaces, staff area, residential facilities along with residential outdoor spaces.
COMMON FACILITIES

SPACE	AREA (m ²)	CAPAC- ITY (people)	AMOUNT	VEN- TI.	CHARACTER	REMARKS
ENTRANCE AND RECEPTION	25	20	1	HYBRID	Embracing / Informative	Reception of visitors and new residents
COMMON AREA	200	45	1	HYBRID	Vibrant / Em- bracing	-
COMMON KITCHEN	75	25	1	MEC.	Collaborative / Embracing	-
WORKSHOP	100	25	2	MEC.	Creative / Sup- portive	Music, wood, sewing and painting
LEARNING	30	10	5	HYBRID	Supportive / Motivating	-
PRAYER ROOM	75	20	1	HYBRID	Therapeutic	-
MEDICAL FACILITIES	75	5	1	HYBRID	Safe / Support- ive	Waiting area, consultation room
LIBRARY	50	10	1	HYBRID	Relaxing / Sup- portive	-
MINDFUL- NESS	50	20	1	HYBRID	Therapeutic / Relaxing	-
LAUNDRY AREA	30	10	4	MEC.	Independence	-
DAY CARE	100	15	1	HYBRID	Supportive / Fun	-
SECOND HAND SHOP	75	20	1	HYBRID	Independence/ Interacting	-
AREA SUM COMMO	1195 m ²					

COMMON OUTDOOR AREAS

SPACE	AREA	AMOUNT	REMARKS
VEGETABLE GARDEN	50	2	-
SENSORY GARDEN	100	1	-
GREEN SPACES	300	1	-
AREA SUM COMMON	450 m ²		

STAFF AREAS

SPACE	AREA ^(m²)	CAPAC- ITY (people)	AMOUNT	VENTI.	CHARACTER	REMARKS
CELL OFFICE	7	1	3	HYBRID	Focused / Professional	-
OPEN OFFICE	110	15	1	HYBRID	Focused / Professional	-
BREAK- ROOM	75	20	1	HYBRID	Relaxing / Interacting	Staff kitchen included
TOILETS	2	1	3	MEC.	-	-
CLEANING ROOM	3	1	4	MEC.	-	-
MEETING ROOM	10	б	1	HYBRID	Interacting / Informative	-
TECHNI- CAL ROOM	10	1	б	MEC.	-	-
AREA SUM COMMO	294 m ²					

RESIDENTS OUTDOOR

SPACE	AREA	CAPACITY (people)	AMOUNT	REMARKS.
PRIVATE OUTDOOR SPACE	50	10	5	For particularly vulnera- ble residents
AREA SUM COMMON	250 m ²			

RESIDENTS FACILITIES

SPACE	AREA (m ²)	CAPACITY (people)	AMOUNT	VENTI.	CHARACTER	REMARKS
1 P. APART- MENT	20	1	13	HYBRID	HOMELY	Private toilet, bath and kitchen included
2 P. APART- MENT	30	2	11	HYBRID	HOMELY	Private toilet, bath and kitchen included
FAMILY APART- MENT	50	4	15	HYBRID	HOMELY	Private toilet, bath and kitchen included
AREA SUM COMMON	1340 m ²					

FUNCTION





S DIAGRAM

VISION

The ambition for this project is to design an asylum centre that promotes interaction between the residents themselves through internally oriented social spaces that facilitate the meeting between people of different backgrounds and stages in life.

Furthermore, the project must provide opportunity for acculturation and interaction between the asylum seekers and the local community through various activities already present in the creative and culture-based area as well as new additions from the asylum centre. The centre must provide the asylum seekers with a safe haven, that can help mitigate traumas of the past, uncertainties of the present and concerns for the future.



ILL. 70 - REFUGEES

DESIGN CRITERIA

FUNCTIONS

- The private living spaces must provide the users with enough flexibility to make each apartment their temporary home.
- The common spaces should encourage different kinds of social interaction, depending on the severity of the user's mental issues.
- The centres integration into the context must support a socially sustainable relationship between the users of the centre and of the city, while ensuring the necessary privacy for the residents.
- The centre must support recreational activities and a sense of structure, that provides purpose to an otherwise occupational unjust existence.

AESTHETICS

- The green spaces should provide both recreational and stimulating experiences of nature in an urban context.
- The diversity of the area should be reflected in the appearance of the centre, thereby creating a unique identity that reflects its specific function.
- The building should signal a sustainable thinking as a response to the present climatic conditions, while allowing the industrial identity of the area to remain.

TECHNIQUES

- The building must comply with the Danish building class of 2020 and reach a zero-energy status.
- The design of the building must be flexible enough to allow functional changes in the future.

The selection of materials must be made as a result of investi-

 gations of the Life Cycle Assessment and indoor environmental performance of the materials.



INTRODUCTION METHOD ANALYSIS



DESIGN PROCESS

PRESENTATION

DESIGN PROCESS

This part of the report outlines the key areas, ideas, concepts and explorations that has led to the final proposal for the asylum centre. The design process has gone in different directions, in several loops and a varying amount of detail. The process that is presented in this following chapter is a rearranged version of the actual design process to ensure a good understanding of the topics, findings and results that have been investigated throughout this phase.

The process is presented in five subthemes, THE VOLUME, GROUND FLOOR WORKSHOP, THE ROOF GARDEN, APARTMENT WORKSHOP and BLOCK WORKSHOP, see illustration 71.

Their chronological place in the process can be found on the next spread and likewise on the first page of each section.

The issues and challenges of the different subthemes will be illustrated through a diagram on the first page of each subheme. On the last page of each subthemes bullet points will conclude eachs section findings accompanied by an illustration.







THE VOLUME

WHAT A volumetric examination of varying sizes, geometric shapes, concepts and principles.

WHY To understand scale, densities and heights in relation to the context, the centre and its users.

HOW Through the use of physical models, sketch sessions including plans, sections, principles, radiation study along with CAD programs and perspective views highlighting relation and scale.

The phase of sketching was catalysed with physical models to understand the scale and the sites relation to the surrounding context. This chapter likewise implemented other medias such as hand drawings, radiation study, 3D models and virtual perspectives in eye height.

ELEMENTS OF EVALUATION

This chapter including both early thoughts and ideas as well as later sketching phas-

es of a more detailed level and were to be evaluated on four main parameters. These considerations had a strong relation to the aforementioned design criteria and vision to improve the living conditions of the users.

The first element for evaluation was the proposals contextual relation and their ability to become an infill adapting the great diversity of scale spanning from 3-35 meters.

The second element for evaluation were the proposals ability to become part of the surrounding context and its lively environment.

Stated in the phase of analysis were likewise the importance of green outdoor spaces. Therefore, the **third element of evaluation** being the proposals implementation of social sustainable outdoor spaces of great quality that among other includes improved solar conditions, overview, green spaces and a human scale. **The fourth** and final element of evaluation was the ideas ability to ensure privacy and individuality while still promoting the element of community and social interaction.



VOLUME STUDIES

THE SCALE

The scale of the context and the scale of the site was investigated using a physical model that also provided an understanding of the different key functions, areas of the context and how the building might relate to them. Illustration 74 on the right highlights the square towards the north that will become a node of flow in the area, which the building must relate to. In addition to this Institute for (X) is located to the east and south of the building and is an area of small scale and **vibrant activity** that the building should frame.

The scale and volume towards NW and W allow a denser and **taller volumes**, in a way that avoids a backside of the building.

INVESIGATION OF THE VOLUMES

The square meters defined in the room programme were placed on the site to understand the floor area ratio of the building, and thereby give an idea of the height and density needed to meet the requirements defined in the room programme. The shape of the site itself is quite irregular with two long, straight lines to the northwest and southwest and then a jagged line defining the eastern boundary of the site. The irregularity of the site combined with the number of square meters needed called for an efficient use of the available area to keep the building height and density as low as possible. The smaller scale and lower density of the building is necessary from a contextual point of view to ensure that the building will be in a human scale that matches Institute for (X), and the needs of the residents of the building.

Following the initial observations and FAR investigation a variety of ideas were tested to understand how different volumes related to the context, in the early sketching phases:

 $\frac{5000 \text{ m}^2 \text{ FLOOR TO AREA RATIO }}{2400 \text{ m}^2 \text{ SITE AREA} = 208 \%}$



ILL. 74 - THE SURROUNDING ELEMENTS



ILL. 75 - VOLUME STUDY 1



ILL. 76 - VOLUME STUDY 2



ILL. 77 - VOLUME STUDY 3



The volume of this proposal was determined by the scale of the context where the building would drop in height from west towards east and thereby adapt its scale to the surrounding context. As the depth of the building is quite large, daylight conditions in the centre of the building could be challenging



This proposal split up the building volume in container block and stacked them to free up space on the ground level to soften the meeting between building and city on the ground level. The stacked blocks appeared dramatic in scale the quality of spaces on the ground floor lacked quality as a consequence.



In this proposal the building has a public square running through the building with transparent openings in the key locations for the meeting between context and building. As a consequence hereof the building is quite tall and does not relate well to the smaller scale buildings to the south and east of the site.



ILL. 78 - VOLUME STUDY 4



ILL. 79 - VOLUME STUDY 5

RESULTS

The investigation of the floor area ratio of the building resulted in a FAR of 208%. The various proposals highlighted many of the same challenges concerning the volume of the building. On the south and eastern side of the context the scale is small, intimate and delicate, which is the opposite of the scale on the western and northern side of the site, which means that the building must relate to the contextual scale differently on either side. The investigation showed a desired maximum of 5 storeys towards north, while 2-3 storeys towards the south and east is optimal for retaining a human scale



In this proposal the dimensions of a shipping container have been used as a geometric reference to the containers located to the south and east of the site at Institute for (X). The containers are stacked in orientations to optimize solar conditions for the units along with adaptation of scale in relation to the context.



The volumes in this proposal are shaped like large scale row houses with urban spaces in between where people from each row could meet each other. This type of building also relates well to the building typology seen in the area. However, like some of the earlier proposals, the scale of the buildings makes the outdoor spaces unattractive and its scale is too large for the context.

and sensitivity towards Institute for(X). The implementation of outdoor spaces helps to soften the meeting between building and city, improve daylight conditions, while providing the users with spaces for recreation and relaxation. The latter is developed further as the high FAR percentage resulted in large volumes where sunlight would be a limited in some areas. This is supported by other volume studies of fragmented volumes that result in outdoor spaces of insufficient sunlight, as investigated through radiation studies, and a scale too large for the sizes of the outdoor spaces.

RELATION TO SITE

This phase investigated different concepts and principles, linked to the previous analyses along with the aforementioned volume studies. This is done to begin to understand the buildings relation to the context and how the building can meet the user's needs, while keeping the ideas of sustainability in mind.

CLUSTER

The first theme involved a design arranged in clusters, where the centre would be divided into smaller sections, thereby creating smaller communities within the centre itself (see 80 and 81). The typology attempts to descale the building complex; however, the concept struggles to create useful outdoor spaces as the volumes are located close together, which is worsened by the heights and densities needed to fulfil the room programme. In addition to this, the lack of a connected common space that belongs to them all creates separation instead of connection.

THE HEART

Illustration 82 and 83 shows the conceptualization of the heart space of the building, which should function as the living room of the asylum centre. The investigations showed a location for this space, right next to the "Presseningshus", where the activities in the common space could add to the life that already exists in that area. One proposal, illustration 82, investigated the idea of a double high space, combined with a large staircase with a built-in library and niches for reading, while another idea, illustration 83, combined a double high space with a courtyard to add greenery and light to the space.

ROWHOUSES

The third theme of illustration 84 and 85 focused on the development of a rowhouse concept, where people could interact in their "front garden". The typology proved difficult in the incorporation of common facilities and social spaces as each green wedge between the rows created a smaller community, resulting in a separation of the residents. A common



ILL. 80 - CLUSTER 1



ILL. 82 - THE HEART 1



ILL. 84 - ROWHOUSES 1



ILL. 81 - CLUSTER 2



ILL. 83 - THE HEART 2

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ILL. 85 - ROWHOUSES 2

denominator of the two concepts was the fragmented scale, however the concept of illustration 84 investigated the idea of relating to the diverse scale found in the area and therefore consists of both larger volumes to the north and smaller volumes to the south.

INDUSTRY

The fourth theme, of 86-89 focused on the relations to the industrial heritage of the area and how that history could shape the new asylum centre. One idea was using a modular approach where shipping containers were used to define the building volumes, as seen in Institute for (X).

The idea of modularity was further developed and the shows of 87 illustrates a descaling of larger façades by dividing it into smaller segments either by choice of material or a structural system.

Other ideas investigated the use of a structural system that referred to objects, construction types and materials seen in the area. One of them was based on the old freight cranes that were used to move goods from the trains to the warehouses, where a large timber frame would support a floating box, similar to how it would have appeared, when the area was industrially active. The idea of modularity combined with a visible structural system provided a connection to the context that is explored in the further development of the design.

COURTYARDS

The fifth theme explored the implementation of a courtyard, as an element of recreation and visual stimulus. In one proposal the courtyard becomes a green public space the connects that centre to the city and allows users of the city to physically interact with the new asylum centre, as illustration 88-89 shows. Another proposal seen on illustration 90 investigates the idea of the courtyard as a visual connection and wayfinding element within the building that allows users to easily navigate the building as the courtyard provides a landmark. A third seen on illustration 91, proposal shows how the internal spaces of the centre could be connected to a common green space that would provide the possibility of interaction while adding to the visual quality of their surroundings. The idea of a more sheltered, private outdoor space were developed further, in combination with investigations on what type of activities and spatial connections it should contain.

CONCLUSION

The initial sketching provided diverse proposals trying to answer the question of contextual relation and fulfilment of user needs through exploration of industrial reinterpretation, the element of a community and the positives of greenery.

The concepts of rowhouses saw many limitations in relation to optimal outdoor spaces, however the idea of the "front garden" is explored further. The idea of the front garden gave the residents affiliation to their temporary homes and could be used as a zone of transition from private to semi-public. A need that the analysis highlighted as the resident's mental disorder could affect their social life. In relation to that, the analysis likewise gave an indication that recreation and visual stimulus had a positive effect on the vulnerable users, and the ideas of courtvards implemented in the building volume were likewise given further loops of design.

This was further emphasised by the design criteria that stated that the building should support recreational activities and that spaces of greenery could improve conditions for mental healing. The phase of initial sketching likewise indicated that the industrial history of the area should be incorporated in the building design, however to what extent and interpretation that would be were still to be sketched upon. The use of a common space that stretches over two floors allow for a zoning of the space that allows for different activities and situations in the same space, is explored further in the concept development.





ILL. 86 - INDUSTRY 1



ILL. 88 - INDUSTRY 3



ILL. 90 - COURTYARD 1

ILL. 87 - INDUSTRY 2



ILL. 89 - INDUSTRY 4



ILL. 91 - COURTYARD 2

INITIAL CONCEPTS

THE BOXES

Illustration 92 shows a proposal where the full area of the site is used on the ground floor for various social and semi-public functions combined with a courtyard that facilitates outdoor interaction and improves daylight conditions. This ensures social interaction between the residents along with an active ground floor that adds life to the surrounding context, while the use of individual apartment blocks increases the feeling of individuality for the residents. This also helps to descale the building to match the smaller volumes towards south and west. The scale, amount and location of the blocks result in poor solar conditions in the outdoor spaces on the first floor where volumes are closely placed, and the spaces could appear uncomfortable for stay see illustration 93.

THE CONTAINER CONCEPT

Illustration 94 shows a series of upscaled stacked boxes similar to the anarchistic and uncontrolled appearance of the Institute for (X). The volumes are dissolved to

help descale the building and increase the individuality of each block and each floor. The proposal allows for several outdoor spaces as public spaces on the ground floor and roof terraces and balconies on the upper floors. Some outdoor spaces on the ground floor lack spatial quality as the large overhanging building appear intimidating and cast shadow on the spaces, see illustration 95. The displacements of the volumes along with the outdoor spaces on the ground floor results in a tall building in order to fulfil the demands for square meters in relation to the room programme. In addition to this the separation of the blocks might reduce the feeling of community and reduce social interaction between the residents, as they can access their apartments directly from the street.

THE VILLAGE

Illustration 96 shows a series of pitched roof buildings in an upscaled village-like composition where a variety of outdoor spaces that differ in atmosphere and size is achieved. The building typology lacks the ability of reflecting its functions



ILL. 92 - THE BOXES



ILL. 93 - PERSPECTIVE VIEW OF THE BOXES



ILL. 94 - THE CONTAINER CONCEPT



ILL. 95 - PERSPECTIVE VIEW OF THE CONTAINER CONCEPT



ILL. 96 - THE VILLAGE

ILL. 97 - PERSPECTIVE VIEW OF THE VILLAGE

making it difficult to differentiate between social spaces and the apartments. The typology fits poorly into the context and the scale of the buildings means that the pitch of the roof must be very steep, thereby reducing usable square meters. The quality of the outdoor spaces is also greatly reduced by the size of the buildings as they tower over quite small spaces (see illustration 97).

THE COURTYARDS

Illustration 98 shows two seperate buildind volumes that create two courtvards. one private for the residents and staff and one public shared between the asylum centre and the users of the city. The ground floor houses all the semi-public and social functions like common space, classrooms, day care etc., which ensures activity and life on the ground floor and facilitates interaction between residents internally and users of the city externally. The descaling of the building towards southeast creates semi-private roof terraces that allow residents to use outdoor spaces more privately and have overview of the building and area. The building volume seems to intimidate the outdoor spaces, see illustration 99, however the building manages to open towards the Institute for (X), thereby creating a relation between the two functions.

THE STAIRS

Illustration 100 shows a proposal with full use of the ground floor for semi-public and social functions, similar to the earlier proposals. The courtyard provides an outdoor transition zone between the building and the city, where the users can feel safe and where interaction between residents can occur. The courtyard has good solar conditions due to the opening towards south that allow sunlight to enter the courtyard for most of the day. The row of apartments towards the east create a wall like appearance that does not relate well to the smaller buildings and spaces of Institute for (X) (see illustration 101).

THE GRID

Illustration 102 shows a proposal where the building steps down towards the east with semi-public and social functions located on the ground floor and outdoor spaces on the first floor, facing Institute for (X). The descaling improves the solar conditions of the square, however the larger spaces that will become a future node can handle higher volumes and this area of the site could be used to mark the centre in the context. A modular, structural system has been used, to give character to the building and outdoor spaces while allowing for changes to the building, should the demand for its function change in the future. The solar conditions for the outdoor spaces are not ideal as the building itself shades the outdoor spaces for large portions of the day. This proposal as well as the concepts of illustration 99 and 101 create an uncomfortable meeting with the high office volume towards northwest as they appear high, dense and do not create the perception of being welcoming (see illustration 103).

CONCLUSION

The concept studies showed that the full use of the ground floor allows for smaller and more dissolved building volumes from the first floor and up, which will help reduce the overall impression of the scale of the building and improve solar conditions. The location of the outdoor spaces must be chosen based on both spatial qualities along with microclimatic analyses to ensure a high degree of usability. The studies also sparked the idea of a modular structural system that adds character to the spaces and building, while providing a platform of flexibility for any future changes in needs from society, users or building owners. In addition to this, the use of a visible modular system could descale a larger volume, reference the geometries from Institute for (X) and the industrial history.

The Boxes provide a sense of individuality to help the residents take ownership of their own environment and is therefore chosen for further development.





ILL. 98 - THE COURTYARDS

ILL. 99 - PERSPECTIVE VIEW OF THE COURTYARDS



ILL. 100 - THE STAIRS



ILL. 101 - PERSPECTIVE VIEW OF THE STAIRS



ILL. 102 - THE GRID

ILL. 103 - PERSPECTIVE VIEW OF THE GRID

PLACEMENT OF THE VOLUMES

In order to secure sufficient sunlight into the courtyard and on the roof garden, different concepts of the volumes were made and analysed in order to secure the optimal conditions. As **concept 1**, illustration 104, illustrates the placement of the volumes will provide access for the evening sun in the southwest corner of the centre, while the placement of the volumes creates different atmospheres and zones, however the courtyard received a small amount of sunlight all year.

Concept 2, see illustration 105, consists of rotated volumes, which creates great outdoor spaces in the southern part of the building, however the other volumes are placed closely which creates poor solar conditions in the spaces, with no optimal space for social activities.

Concept 3, see illustration 106, and **6**, see illustration 109, creates the possibility for the sun to provide the roof garden with sunlight most of the year and creates good conditions in the courtyard. Compared to the other concepts, **concept 3**

and its volumes take up most of the outdoor space on the first floor, which minimizes the possibility for social interaction. Furthermore, **Concept 4**, illustrated on illustration 107, **and 5**, on illustration 108, are of similar character with slightly varying volumes where **concept 5** have implemented an additional semi-private niche of the larger green roof space. The notching of the building volume, that creates private roof terraces, offers improved solar conditions in the outdoor spaces on the ground and first floor. See appendix 7 for sunlight hours in the winter.

CONCLUSION

For further development of the placement of the volumes, the composition of **Concept 1** is chosen, which is combined with the notching of the volumes from **Concept 6**. This combination creates different spaces for use throughout different hours of the day, while improving the solar conditions in the courtyards and 1st floor. In addition to this, Concept 6 creates the opportunity for private outdoor spaces on the top floor of each block.



ILL. 105 - CONCEPT 2 - SUNLIGHT HOURS - APR. - SEP.



ILL. 104 - CONCEPT 1 - SUNLIGHT HOURS - APR. - SEP.





ILL. 106 - CONCEPT 3 - SUNLIGHT HOURS - APR. - SEP.





ILL. 108 - CONCEPT 5 - SUNLIGHT HOURS - APR. - SEP.

CONCLUSION

VOLUME AND SIZE

- Full use of the site's footprint allowed for more freedom and space improves solar conditions and spatial quality.
- The Volume studies showed a desired maximum of 5 storeys towards north, while 2-3 storeys towards south and east is optimal for a human scale and sensitivity towards Institute for (X).
- enables the remaining volumes to be of a smaller character helping the descaling towards Institute For (X) and the solar conditions, while it as a key building in the area.
- Illustration 110 highlights the advantages of implementing roof terraces on each living block. The notching of the building volumes improves the garden and thereby the comfort for the residents.

CONTEXTUAL RELATION

- larger and smaller volumes that can relate to the diverse scales found in the surrounding context.
- A larger semi-public vibrant ground floor relating to the surrounding context enables the centre to become a place that has a strong relation to the

surrounding life

SPATIAL CONSIDERATIONS

- from 1st floor and upwards, which Implementing different outdoor spaces will provide the residents with spaces for recreation and relaxation while creating green surroundings that can support a mental healing process.
 - A central courtyard can improve the visual indoor environment and improve wayfinding and internal transparency to help staff and residents navigate the building.
- A larger volume towards the square Creating a front garden provides a transition zone between private and public, ensuring a more gradual transition between the two zones.
 - helps to establish the asylum centre An opening towards west (see illustration 110) will enable the concept to create another semi-private niche and allow for the implementation of a sheltered sensory garden on ground floor while improving radiation on the 1st floors outdoor spaces.
 - solar conditions of the 1st floor roof Creating individual living blocks enables the users to identify their specific block to increase the feeling of belonging and individuality.
- The centre should consist of both
 Communal spaces should be clearly highlighted and emphasised in volume and visual expression.
 - Private atmosphere on the upper levels ensure the needed privacy for the residents.



GROUND FLOOR WORKSHOP

WHAT A series of workshops that focuses on the contextual relation, outdoor spaces, internal organization, furnishing and flow of the semi-public and social ground floor of the building.

WHY To ensure a logical internal organization and the addition of life and activity to the context on the ground level.

HOW Through themed workshops that uses a combination of 3D modelling, plan sketching and solar studies of the proposals.

This part of the design process focuses on the development of the semi-public ground floor of the building. The previous volume studies showed the benefits of fully utilising the ground floor to free up space for outdoor spaces on the first floor, and this part therefore focuses on a fully used ground floor.

The urban location of the building increas-

es the importance of a ground **floor that** relates well to the context in both in an aesthetical and functional manner, to ensure that the building adds quality and life to the surrounding context.

In addition to the building's relation to the context, the investigations also focus on the **internal organization and flow** of the building and how the spaces can be connected in the most optimal way. In extension hereof the overall form and **aesthetical relation between base and top** is investigated to understand how the building relates to different parts and heights of the context.

In addition to this, it is also investigated how **outdoor spaces** can be placed and accessed within the building to improve spatial quality and wayfinding in the building. Lastly, different **principles of furnishing** in the key areas of the ground floor were investigated to understand the functions and atmospheres of the spaces.



PLACEMENT OF THE FUNCTIONS

Following the initial concept studies, that showed the benefits of a fully used ground floor, more detailed investigations of semi-public and social functions were made to investigate how the ground floor can relate to the context. The investigation also included extending key spaces common kitchen and office area to the first floor to provide a connection between the apartments above and the social spaces on the lower level, while implementing outdoor spaces in different locations and of different characters. Lastly the access to the building was also investigated to clarify flow from the context to the building and how that influences the internal flow of the ground floor.

CONCEPT 1

The entrance of the building is located in the north eastern facing façade located between the offices and the common space. The common space serves as the living room of the building where different social activities can take place and is connected to the internal courtyard, along with the external public outdoor space that opens up towards Institute for(X). The ground floor extends towards north and meets the public square with a workshop space and a second-hand shop just behind it, thereby adding to the life of the area while allowing interaction between the users of the centre with the users of the city. Exercise facilities are located between the second-hand shop and the offices, which are in close connection to the common space to ensure an easy access and strong connection between the two spaces for the residents and the staff. The design uses an internal courtyard that allows for good internal transparency and circulation, while providing a sheltered outdoor space for the residents of the centre. On the southern side of the courtyard is the learning facilities that include classrooms for teaching along with a smaller common space that should work as a creative environment for reading, group work and other types of studying. In addition to the learning environment a small day-care is located at the southernmost part of the building with a sheltered outdoor space, see illustration 112.






CONCEPT 2

In the second concept, the entrance is located in the southern end of the building close to the vibrant area of Institute for (X). Similar to the previous proposal a central courtyard plays a significant role in the circulation and internal transparency of the building and allows for users and staff to maintain an overview of the activities on the ground floor.

The common space, offices and exercise facilities are located next to each other in the centre of the building, surrounding parts of the courtyard, allowing both staff and residents to use it, while ensuring a strong relation between the staff and residents of the centre. On the southern and western side of the courtyard a daycare and the learning facilities are placed, which allows for recess to take place in a social outdoor space and allows the children in the day care to play in a sheltered outdoor space.

The ground floor extends north towards the public square where another workshop space along with a second-hand shop can be found. Both functions add life to a part of the context where an active façade is experienced by a large flow of people accessing the area.



CONCEPT 3

The entrance to the third concept is located in the same part of the building as concept 1. Following the entrance lies the common space, which also stretches to the first floor in some parts of the space, while other areas are double high to maintain auditory and visual connection in the space. The offices are located next to the common space on the ground floor level, however the connection between the two is less optimal compared to the earlier concepts, which will reduce the chance of informal meetings between the staff and residents.

Workshop spaces are located towards the

public square in the north and towards the south, similar to earlier proposals.

The learning facilities are located to the south of the building in two levels with the day care right next to it on the bottom floor, allowing for quick access to the green spaces found in the context. This concept has no courtyard space, which could make the lighting conditions difficult, and the navigation in the building is less transparent.

CONCEPT DEVELOPMENT

Through previous workshops it became clear that the ground floor of the building should contain the semi-public functions for the users and the upper floors should be the temporary homes. This workshop aims to improve the understanding of general function placement on the ground floor while exploring the placement and appearance of the living blocks above. The following three concepts of exploration are all based on a geometric and squared appearance with the homes rising from the ground floor with different proposals of zoning on the ground floor.

CONCEPT 1

Concept 1 manages to create a clear zoning and separation of the different public functions found in room program. The heart of the centre, the common space, is centrally located and naturally divides the building with a public and active wing towards north and a semi-public zone towards south (see illustration 115). The courtyard further emphasizes the division with its placement that enables separation between the common space and the functions towards south. The learning and office functions are placed towards northwest that creates retraction from the vibrant zone towards north.

Concept 1 contains a minimized number of living blocks resulting in a balanced and homogenous expression (see illustration 115). However, the lower number likewise results in enlarged volumes that influences the solar conditions of the 1st roof garden and the two living blocks of SW and W create particularly poor lit and uncomfortable spaces. Furthermore, does the location of the courtyard result in a separated roof garden and therefore appears as split space rather than a uniform social outdoor space, see illustration 116 and 117.

The concept however enables the roof garden to consist of smaller private niches while ensure spaces for social interaction.



CONCEPT 2

Concept 2 fragments see illustration 118, the workshop spaces across the ground floor which creates a lively, overall expression complimenting the character of the area. This results in a vibrant ground floor across the entire level minimizing the spaces of quietness, relaxation and contemplation. The placement of day-care, learning facilities and common space creates a shared space in between ensures informal meetings between the residents. The concept consists of a few larger living blocks that optimizes usable space of the 1st floor green space.

The volumes open towards south allowing solar radiation to penetrate the building creating improved conditions for stay. This proposal however creates the limitation of semi-private spaces at the roof garden as a result of block placements, see illustration 119 and 120.



CONCEPT 3

Concept 3 has the largest number of living blocks rising of the ground floor which creates the possibility for improved affiliation among the users building, compared to previous concepts. The result hereof is a smaller number of usable outdoor spaces and more shade on the roof garden, see illustration 121.

This concept creates a shielded appearance towards NW and SW creating an uncomfortable and dominant meeting with the city however the distribution of mass allows for an intimate and elegant meeting with the creative institute for (X). To supplement the 1st floors green spaces more semi-private roof terraces are incorporated for overview and a clear zoning of atmospheres.

CONCLUSION

The analysis showed a necessity for outdoor spaces that allows for interaction between the residents, while providing natural qualities, which can be found in the plan and 3D view of each concept. However, concept 1 is chosen due to its placement, number of volumes and its ability to create different types of outdoor spaces for the users. In relation to the sunlight hours it is likewise the concept with the best result, but further iterations are needed for additional improving of the solar conditions. For further development of the ground floor, a more divided structure of the different rooms and activities is preferred, in order to create and design for the specific activities.

The semi-public ground floor consists of many diverse functions that results in a need for a clear zoning to enhance identity and wayfinding. The placement of learning facilities was in all concepts located towards S and SW and further iterations of the ground floor could benefit a secondary entrance to improve flow internally while offering the opportunity for space sharing among the city and the building.



INTERIOR DETAILING

This workshop was catalysed with a synthesis of previous ground floor findings and explorations that, among other, included the overall placement of the centre's diverse semi-public functions and the implementation of a central courtyard. The users of the building and their functional demands meant that the ground floor should operate with functions of both regular offices, medical office, learning facilities and a day-care while still being a home for the residents.

Therefore, it was chosen to investigate the potential of utilizing flow and atmospheres for a clear zoning of the building, see illustration 124. The centres circulation and flow should provide the opportunity for stay in private areas, while retaining the connection to the internal community of the centre.

The implementation of a centrally placed entrance became the origin of the centre that branched into the ground floors different functions. The idea of an inner courtyard visible in early sketching phases has been implemented as a central design element that enables improved circulation and wayfinding while offering improved daylight conditions along with meditative greenery. Upon entering the building, the residents would be greeted with the social common space enhancing interaction within the building and to the right one was able to find the office space of the centre. This work-related function continued down the hallway leading to a secondary greenspace, the **sensory garden**. The surrounding, more isolated, area are of a private meditative character that reflects the functions of medical facility, psychology and mindfulness. Using the inner courtyard as circulation one could then be led to the space of learning, an area of education in a creative environment.

Different iterations of the ground floor were made with the implementation of above-mentioned thinking. These iterations included, among other, daylight optimization, improved placement of toilet cores and minimizing the circulation to the upper floors enhancing the concept of informal meeting and social interaction.



PRIVATE SEMI PRIVATE PUBLIC SEMI PUBLIC ILL. 124 - ATMOSPHERE ON THE GROUND FLOOR

COMMON SPACE

The heart of the building, the common space, should as previously stated reflect the atmospheres of creativity, social interaction and be welcoming. Initial sketching and findings in the analysis phase, highlighted the importance of a common space dividing into smaller areas of different character. The common space of two stories were quickly divided with the living area on the ground floor connected to a common dining and kitchen area by stairs. While doing so, the larger space was naturally divided by levels while still maintaining a visual connection with the staircase and double high room.

A common denominator of the highlighted examples was a relaxing area linked to the inner courtyard, a creative space for puzzle making, drawing among other and the offering of more private niches with an overview of the space (see illustration 125 and 126). However, a contrasting element of the shown examples were the placement and the role of the binding link, the staircase.

Proposal 1 placed the playful staircase to-

wards southeast giving it an amphitheatre character that allows for overview, while offering younger individuals the opportunity for playing, hiding in caves and a sense of escape. This thinking was likewise applied in the example of **Proposal 2**, where squared grids formed a playful furniture in many levels giving the opportunity for reading in relaxing environments, informal stays while having an overview.

CONCLUSION

The centrally placed staircase of illustration 126 enabled for a natural zoning of the larger space, from a welcoming atmosphere to a more sheltered creative environment to the southeast. This likewise emphasised the placement of the glazing giving the entrance area of a light open appearance and the creative space of minor daylight while still being good and light (see illustration 127). In addition to the above-mentioned conclusion were the need for different zones within the larger common space. This includes a zone for creativity and social gatherings, a zone for relaxation, contemplation and overview along with a zone towards the centrally placed courtyard.







ILL. 126 - COMMON SPACE INTERIOR PROPOSAL 2



LEARNING

The area of learning accommodating the daily lectures of the residents consists of both classroom and a shared central space of a different character to the classrooms. The shown examples of illustraion 128 and 129 combines different ideas for the shared learning space. This space functioning as both a space of recess and learning was, similar to the common space, in early sketching given a centrally placed furniture dividing the space into smaller niches.

The idea with smaller niches, see in **Proposal 1**, created a contrasting atmosphere from the one existing in the classrooms giving the educational element a secondary architectural mean, enhancing the possibility of different ways learning. The shared learning space should accommodate a wide variety of people of different ages and backgrounds to support different ways of learning. This statement called for zones and furniture's in which the diverse user of the space could feel welcome and comfortable in **Proposal 2** utilizes toilet cores in the darkest part of the space, however this results in unusable and transit-based corridors.

CONCLUSION

Further development of the shared learning space should among other include the element of diverse furniture and ways of sitting. The changing perception of the space from high tables, playful sitting areas to built-in niches should all be further sketched, and the element of materiality should be further investigated to enhance the acoustical indoor environment and improve the perception of zoning. As seen on illustration 130 does depth of the learning area likewise require for improved daylight in both the smaller classrooms as well as the shared learning space which catalysed future iterations of classroom placement and sizes as well as placement of wet- and technical-cores for improved daylight and ventilation piping.



ILL. 128 - LEARNING INTERIOR PROPOSAL 1



ILL. 129 - LEARNING INTERIOR PROPOSAL 2

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OFFICE

The office area housing 20 staff members was centrally placed as a wing to accommodate both the public and welcoming character of the reception and the peaceful and vulnerable area of therapy and medical assistance. The transition from public to private should be available while still offering privacy for work related tasks and being an office of an embracing appearance. In **Proposal 2** the office is seperated in two levels which gave the possibility for residents of the centre to always be in close relation to staff if needed without entering the semi-public ground floor, see illustration 132.

This allowed for an improvement of the daylight conditions in the offices ground floor that in early proposals consisted of cell office structures minimizing the daylight in the breakarea see **Proposal 1**. The internal flow of the office area was in the proposal 1 of ill 131 likewise improved. Here, the ventilation, cleaning and toilet cores were used to divide the public reception area and the work area. The ground

floor office space was further developed to consist of both stationary desks and informal office area. The desks and breakarea were naturally separated by an internal staircase leading to the office area of the first floor where residents can easily access a staff member. The implementation of a secondary courtyard improved the daylight of the mindfulness space and psychologists office while offering a green backdrop.

CONCLUSION

Future iterations of the office area should include clear separation between desk related activities, break area for staff and office areas in which the residents of the centre can interact with. Having the office space separated by levels enables for a clear separation between semi-public and private zones of the office areas that benefit not only the asylum seekers but also the staff that likewise needs privacy. Further conclusions to be made are a diverse character of spaces and ways of working including ordinary desk setup and informal working stations and niches.





ILL. 131 - OFFICE INTERIOR PROPOSAL 1





ILL. 132 - OFFICE INTERIOR PROPOSAL 2



CONCLUSION

EXTERNAL RELATIONS

- Entrance towards northeast close to the common space to connect the entrance of the building to Institute for (X).
- Second-hand shop and workshop towards the public square in the north to include the asylum centre in the activity of that area while adding life of its own to the context.

INTERNAL RELATIONS

- Close connection between offices and common space to facilitate informal meetings and easy access both ways.
- Common space that extends to a common kitchen on the first floor.
- A learning area supplemented by a smaller **common space** for a more creative and relaxed learning environment as an addition to the traditional classrooms.
- A daycare close to the **common space and learning** area with access to an outdoor playground.

COMMON SPACE

• A centrally located staircase for circulation and stay that allows for natural zoning of the space.

• Further zoning of the common space to facilitate different atmospheres and activities.

LEARNING

 Classrooms combined with a common creative learning environment with different types of furniture to facilitate different ways of learning.

OFFICE

- Clear division between desks, break area and areas for interaction between staff and residents.
- Office extends to the first floor creating easy access for the inhabitans.

OUTDOOR SPACES

- Internal courtyard that improves wayfinding, internal transparency and provides a sheltered outdoor space.
- Concept 1 is chosen for further development pp 149 illustration 115.
- Access to outdoor spaces that allow for interaction with fellow residents
- Placement and number of volumes along with the best sunlight hours,seen on the illustration Å.



THE ROOF GARDEN

WHAT An investigation and sketching of the centre's outdoor spaces.

WHY To investigate different ideas and their impact on the atmospheres and functions of the primary outdoor space.

HOW By defining and zoning different areas of the roof garden and create diverse atmospheres for different needs.

The phase of analysis highlighted the need to implement larger green spaces at the urban asylum centre. Being an asylum centre located in the dense city of Aarhus meant that a greater percentage of area were emphasised by harder, larger volumes despite the surrounding elements of Aarhus A, The botanical garden and the future green wedge of Aarhus K.

Already in early analysis and preliminary sketching the green spaces were given an important role to substitute the otherwise missing elements of **greenery and nature** found in rural and suburban districts. The footprint of the site was, in earlier investigations, utilized for functions of social and semi-public character including workshops, learning facilities, offices and common spaces.

The direction of the centre's concept included a **larger green roof garden** on the 1st floor consisting of both social and semi-private spaces, see illustration 135. The idea with the roof garden was to become the link between the semi-public ground floor and the living units found above and therefore be a space of transition from the private sanctuary of the resident's homes and the vibrant base.

The concept further gave the opportunity for the residents to always be in visual and close physical connection to greenery having a positive effect on their mental health, see illustration 135.



ROOF GARDEN DISPOSITION

The semi-public ground floor contrasted the levels above with the majority being the homes spread across the four living units, see illustration 136. The idea of dividing the homes into smaller groups gave the opportunity to create smaller communities within while creating individuality and personality. Two of the five blocks were sketched to become semi-public on the 1st floor with the functions of a shared common kitchen and easy access to the centre's staff, see illustration 136.

Early sketching of outdoor spaces included many smaller common spaces that resulted in a high separation of the residents and the architectural means created a widely spread and confusing zoning from both private to social spaces and were decided to be further condensed. Simultaneously were studies made to optimize and make the roof garden most attractive in relation to radiation and sunlight hours.

ZONING OF A LARGER GREEN SPACE

Early sketching of the larger green spaces of the centre rose the idea of having

semi-private green roof terraces see illu stration 138. These terraces found in the four living blocks contrasted the larger roof garden of the 1st floor seen on illustration 137. This larger surface called for a clear zoning to meet the needs of the users covering both private niches and areas for social activity.

The centrally placed courtyard on the ground floor functioned as an element of circulation and wayfinding see illustration 139. This thinking was in the sketching of the roof garden likewise applied as the small meeting space to the west were separated with higher vegetation and the courtyard (see illu. 137). Towards south and north, in connection the blocks, smaller pockets consisting of terraces and greenery was implemented. The vegetable garden centrally located stimulates the different senses and provides the possibility of meaningful outdoor activities. By extending the grid structure onto the roof smaller niches and greenhouses are created that allow for relaxation, common dining and other social activities.



ILL. 138 - THE BLOCKS PRIVATE TERRACES

ILL. 139 - THE DIFFERENT COURTYARDS



TREES WILD GRASS

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CONCEPT 1

The southwest living block were as aconsequence of the radiation studies moved to improve the roof garden which gave the opportunity to implement a sensory garden at ground floor se illustration 140. This created yet another small pocket of the outdoor space on the 1st floor that in extension of the office area could be used for smaller, outdoor informal meetings. This concept has minimal areas for longer stays and social gatherings and became highly controlled and transit based. The few, smaller private niches that were sketched for longer stays were visually linked to the living units and became a branch of the enclosed volumes housing the resident's homes.



TREES WILD GRASS BUSHES



CONCEPT 2

The concept of illustration 141 aimed to minimize the controlled and transit-based appearance and offer improved conditions for stay and social gatherings. The horticultural area was in contrast to the aforementioned concept sketched to become an area where the residents could freely furnish and shape the space for their needs. A greenhouse was likewise integrated to help the perception of a clear zoning. In addition to this, the smaller sheltered semi-private areas towards south and outdoor meeting space were detached from the volumes to illustrate a difference in use and clear zoning. The detaching of the pavilions ensures that they are not affiliated with a specific block but belongs to all users of the centre.

These were sketched to be sheltered with wild growing vegetation and created a sense of enclosure, overview and pocket well-fitting the needs of the user.



TREES WILD GRASS BUSHES

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CONCEPT 3

Further iterations were made, and the third loop of design consisted of a proposal of minimal controlled areas contrasting the earlier concepts of highly controlled and specific for a purpose, see illustration 142. The areas of stay were likewise sketched to become softer in their appearance primarily consisting of greenery rather than harder surfaces. Having a green roof garden of an uncontrolled and natural appearance likewise saw the possibility for the residents themselves to create their ideal outdoor spaces and utilize the space for different functions throughout the year. This was further emphasised by accumulated research that stated that the ability to be in control helped their mental illnesses.

CONCLUSION

During iterative loops of the outdoor spaces it became clear that a clear zoning of both private and semi-public spaces was needed to meet the needs of the user and emphasise the wish to improve socialization between the residents. The variety between private and semi-public spaces allows users of different severities of mental issues to use the outdoor spaces on equal terms.

Early concepts were sketched in a transit based and controlled way and did not utilize the potential of the larger space. The initial sketching therefore became a miscommunication of the initial idea as the preliminary ideas of the green space was to have a larger outdoor area used for both circulation, informal meeting between the residents and social gatherings.

The aspect of user involvement and user influence likewise became an aspect of interest as this would increase the lively perception of the green spaces, create individuality and allowing for different cultures to influnce the environment. The third and final topic of evaluation was the concepts ability to appear natural. The latter of which could be emphasised by the use of greenery that changes during the year with deciduous and colour changing vegetation.

This would give the residents the opportunity to be in an everchanging and diverse environment helping their mental health and create a sense of escape from their state of limbo and unawareness.

CONCLUSION

- The need for a clear zoning of both private, semi public and semi-private spaces.
- Avoid transit based and controlled spaces.
- The area of horticultural doings should contain the attribute of mutability and ability to change to give the residents a sense of control.
- The semi-private niches should be sheltered by taller, wild growing vegetation creating a sense of privacy, escape that likewise enables overview.



THE APARTMENTS

WHAT a workshop that explore the three apartments sizes in different grid dimensions. In relation to that several windows dimensions are likewise investigated. Furthermore, different ways of furnish the several apartments are explored.

WHY to understand the influence of various grid sizes on the apartment layouts, interior design, daylight conditions and thermal comfort levels.

HOW Through iterative sketching and 3D modelling of the apartment layouts in combination with simulations and calculations of daylight and thermal conditions.

Through this workshop the three different apartments were investigated, the **one-person unit** of 15 m^2 , a **two-person unit** of 30 m² and lastly a **four-person** unit of 60 m². In relation to that the grid sizes of the structure were decided before handed illustrated through 3 different concepts, see illustration on the next page.

Furthermore, when deciding on a structure, further investigation of the interior design was made, where **fixed furniture** were compared to ordinary furniture's, in order to use the square meters most efficient. Lastly the workshop explores different placement along with dimensions of windows, to find the optimal solutions.



LAYOUT STUDY

The workshop starts with an investigation of the apartments through different grid sizes, **Concept 1; 5X3m, Concept 2; 2,6x4,4m** and **Concept 3; 3,3x4,2m**. These will determine how the interior of the apartment will appear and have an influence on the placement of windows in the apartments. Initial sketching of apartments included three different types; a single person unit of 15m², a two-person unit of 30m² and a four-person unit of 60m².

Parallel to daylight analysis and spatial investigations, the 24h average of each layout has been explored, however as window area was fixed, the results provide no significant differences in the results. The slight difference in the results are caused by the varying envelope area. Further details can be found in appendix 8 and 9.

THE 1 PERSON APARTMENT

The interior design of the apartments varies greatly in the depth and width along with the location of the toilet core. In **concept 3.1**, see illustration 150, the

toilet-core becomes a room divider and creates a bedroom along with a small living room. This creates a natural zoning of the apartment, without the use of partition walls in a limited space. In relation to that, the **concept 2.1**, see illustration 148, creates a multifunctional core with both a toilet and bed that optimize the limited square meters of the apartment. However this creates poor accessability and inconvincing layout.

Concept 1.1, see illustration 146, places the toilet core away from the façade and attempts to optimize the square meters with integrated and multifunctional furniture.

The daylight percentage is the highest in **concept 3.1** due to the wider spread daylight with the squared windows compared to the high vertical windows of **concept 1.1 and 2.1.** Illustrated on illustration 145, 147 and 149.





ILL. 148 - SPATIAL DIVISION OF AP. 2.1

ILL. 150 - SPATIAL DIVISION OF AP. 3.1





MAXIMUM TEMPERATURE

24-HOUR AVERAGE



177

ILL. 146 - SPATIAL DIVISION OF AP. 1.1



ILL. 145 - DAYLIGHT CONDITION FOR AP. 1.1

24-HOUR AVERAGE 21,8°



THE 2 PERSONS APARTMENT

The illustrated examples of the 2 persons apartments illustrated on illustration 152, 154 and 156, have a varying number of rooms: version 3.2 contains 2 rooms that allow for siblings, relatives, friends etc. to share the apartment. Version 2.1 and 2.2 are designed for couples and therefore allows for at more spacious apartment. Version 3.2 lacks the possibility of social interaction as the size of the living room is minimal.

The daylight conditions are improved in versions 2.2, see illustration 153, and 3.2, see illustration 155, as the change in grid size has reduced the depth of the apartment.





MAXIMUMTEMPERATURE 23,1°

22,2°

24-HOUR AVERAGE

ILL. 151 - DAYLIGHT CONDITION FOR AP. 1.2

ILL. 152 - SPATIAL DIVISION OF AP. 1.2



ILL. 153 - DAYLIGHT CONDITION FOR AP. 2.2



ILL. 154 - SPATIAL DIVISION OF AP. 2.2





ILL. 156 - SPATIAL DIVISION OF AP. 3.2

THE 4 PERSONS APARTMENT

By analysing the different apartments of 60 m^2 , it became clear that a centrally placed living room in close connection to the kitchen is preferred, in order to create a space for social interaction. Furthermore. according to the daylight analysis, the horizontal windows provided the apartment with the highest amount of daylight as 1.4, on illustration 157, and 2.4 on illustration 159, illustrates. The use of a central living room, that naturally divides the apartment, allows for good daylight conditions, as partition walls can be avoided. Furthermore, this creates a zoning that considers the needs of both parents and children. The study showed that the square meters of the apartments were not fully optimized, and this resulted in empty and unused space in the apartments, that could be moved to other social spaces or the common spaces.

CONCLUSION

Through these different analyses it became clear that the grid size was a determining factor in the daylight conditions in the apartments. The concepts of 1.1, 2.1 and 4.1 has, due to the depth of their gridsize, the lowest daylight percentage. In relation this the depth results in other interior problems, especially in the 4 persons apartment, where the grid size created a longer corridor near the rooms, which could be optimized to social spaces. A common denominator for all 4 persons apartments were unused square meters in the living spaces which could contain the same function on fewer square meters. The studies showed that the size of a 1 person apartment is too small and could have a negative influence on the spatial comfort of the user. This resulted in an additional iteration with larger 1 person apartments, where kitchens were integrated in the apartments. The limited square meters of the apartments highlighted a necessity to utilize built-in furniture to optimize the use of space, as seen in the concepts of 2.1, 2.2 and 2.3. This furniture could thereby create a furnished apartment, that contains all the basic furniture, which allows the users to decorate and personalize the apartments turning them into their homes.


ILL. 159 - DAYLIGHT CONDITION FOR AP. 2.4



24-HOUR AVERAGE MAXIMUM TEMPERATURE





ILL. 160 - SPATIAL DIVISION OF AP. 2.4



ILL. 157 - DAYLIGHT CONDITION FOR AP. 1.4

24-HOUR AVERAGE MAXIMUM TEMPERATURE





INTERIOR DESIGN

In the early stages of the design process the idea of a controlled grid structure was developed enhancing the opportunity for modular solutions for the users of the present while thinking about the future. The minimal square meters available for the temporary homes of residents called for minute consideration of furniture placement and apartment organisation. The unpredictable future and the displaced people's economic status have, in current asylum centres, resulted in unfurnished **homes**.

The idea of having integrated furniture was already visible in early sketching in which consisted of larger personal walls where the concerned residents could themselves build and decorate for the apartment using the supplies and tools in the wood workshop facility.

After several iterations of sketching, both with and without a predetermined grid, the idea of having integrated essentials were still to be found. This time however, with the integration of ventilation channelling and centrally place water cores to improve pipe lengths, daylight conditions as well as the overall spatial quality of the already small units. When highlighting the illustrations of 164 and 165 it is clearly visible that having built-in furniture soften the interior spaces and enable the residents to focus on their wellbeing.

The daylight conditions of the apartment reflects the layout and supplies the space with a sufficient and evenly distributed daylight where it is needed, illustrated on illustration 166.



ILL. 164 - APARTMENT OF 4 WITH INTEGRATED FURNITURES



ILL. 165 - APARTMENT OF 4 WITH FURNITURES



DAYLIGHT WORKSHOP

In continuation of the layout study the window placement and dimensions were investigated, six of which can be found on ill 167-172. The floor to ceiling types of 2 and 4 possessed a high degree of contextual relation and compliments the grid structure used in the project.

Floor to ceiling windows of Concept 2, seen on illustration 168, and Concept 4, illustrated on illustration 170, along with Concept 5, on illustration 171, created the most optimal daylight conditions due to the high glazing area, and therefore a higher line loss. The horizontal orientation of Concept 5 clashes with the verticality of the façade and limits the flexibility in furnishing the apartment.

CONCLUSION

Concepts 2, and 4 has similar external expressions and daylight conditions, despite a difference of 1 m^2 in glazing area. The relation between the glazing area compared to the line loss is considered in the choice of window type, as a larger glazing

area will reduce the line loss of the window, resulting in a more efficient window. The larger glazing area reduces the number of windows needed thereby optimizing the overall line loss of the building. This limits the distribution of daylight and the floor to ceiling window is therefore combined with a smaller vertical window, as seen on Concept 1, seen on illustration 167.

A combination of Concept 1 and 3 resulted in an idea of using smaller vertical windows with built-in flowerpots, that could bring personalized greenery to the façade, while retaining good daylight conditions.



CONCLUSION

GRID AND APARTEMENTS SIZES

- Implement a smaller grid size to enhance flexibility
- 1-person apartments should be of minimum 20m² to ensure space for individual kitchen and own bathroom.
- 2 persons apartments are designed for couples, with one dobbeltbed
- Initial sketching investigated 4-person apartments of 60m² however further development called for improved plan composition minimizing these apartments to 45-50 m². This enables for improved semi-public spaces of greater quality.

INTEGRATED FURNITURE

 The apartment should contain built-in furniture, to optimize the few square meters and accommodate basic needs of the residents. This furthermore ensures that the residents, of primarily low income, can focus on the smaller, decorative and personal elements that transforms an apartment into a home. In addition to this it removes the stress of worrying about spending money on furniture for a temporary home.

WINDOWS

 The vertical windows of the investigation were selected. These created a dynamic façade along with the good daylight conditions and strong contextual relation, illustrated on the next page.



THE BLOCKS

WHAT Detailed investigations into the energy performance, plan solution, day-light conditions, indoor climate, facade expression, materiality and structural system of each block.

WHY To ensure a holistic development of the blocks, where techniques, functions and aesthetics developed simultaneously.

HOW Through iterative processes of sketching, 3D modelling, simulations and calculations.

This section of the design process explores the design of the blocks that are placed on top of the ground floor. The blocks are placed on the first floor according to previous solar studies, and the blocks will primarily contain the apartments of the residents. The dimensions of the blocks relate to earlier sketches of apartment sizes, and each block were confined to **modular grid sizes**.

This allowed for detailed development of one block, which could then be transferred

to other blocks.

The blocks were developed in stages with the exploration of circulation, outdoor spaces, energy demand, daylight and apartment plans as the first stage, followed by façade studies to ensure a well detailed and balanced façade expression.

The façade studies were followed by explorations of different types of façade materials and their patina, while the effect of interior materials was investigated through simulations of **indoor environment** along with **spatial representations** of each type to understand atmospheres. Lastly, the **structural principles** of the building were investigated through an assessment of material use, aesthetics and structural logic, se the parameters illustrated on the next page.



BLOCK ITERATIONS

This workshop is a further development of The Apartment with updated apartment sizes of; 1-person 20 m², 2 persons 30 m² and 4 persons 50 m². The investigated blocks are made of three different grid sizes in order to explore different solutions and potentials and therefore not limiting the design to one size. The sizes in question are 2,5m x 2,5m , 3,1m x 3,1m and 4,2m x 4,8 m.

Concept 1 and 2 have integrated outdoor spaces in the façade, see illustration 175 and 176, creating a homogenous appearance, whereas **concept 3** utilizes externally placed outdoor spaces and circulation, which influences the daylight conditions in the apartments as illustration 177 shows.

Concept 2 and 3 has divided the apartments into modular sizes that allow for easy duplication of the apartments throughout the building complex, as seen on page 193 - 194. **These flexible apartments** create a reasonable placement and pipe length for the ventilation strategy, due

to the placement of the cores. However, this strict and predefined grid resulted in larger transition area, unusable for stay compared to concept 1, illustrated on page 192 illustration1 178.

The plan solution of **Concept 2**, seen on illustratin 180, shows how built-in furniture solutions have optimized the relatively small spaces of the apartments, as seen in Layout Study on page 176. These furniture's can be a design driver for further development with different functions like kitchen, toilet, room for ventilation piping, smaller niches etc.

The plan solution of **concept 1** illustrates on illustration 178, the integration of a common space for the residents, which will be used for circulation and creates informal meetings between the residents of the block.

Using the calculation tool of Be18 the three concepts have been analysed according to their total energy frame and understand basic thermal conditions of the











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concepts. **Concept 2** and **3** have a lower total energy frame compared to **concept 1**, due to their compactness.

CONCLUSION

For further development of the building blocks, the design will take some elements from the three concepts into further processing. This includes the optimization of the relatively small apartment areas where the design of integrated furniture's will allow the users to personalize the smaller things in the apartments that makes it a home, ass illustration 180 shows.

The modular solutions for the different apartments will be preferred in order to create a flexible building, that can meet the possible changes of functions in the future. This modularity creates a rational building layout that helps to minimize the pipe – and water length by creating a core for both toilet, ventilation and kitchen.

Furthermore, in order to secure a community between the users in each block, the block should have a smaller common space on the first floor, for playing board games, video games, watching tv and other informal gatherings. This smaller common space for each block also serves as a transition zone from their private space to the semi-public space on the roof and ground floor. The circulation system should be placed in extension of the common space, in order to encourage the users to participate in the social community.

Furthermore, each block will have a smaller roof terrace in order to give the user the opportunity to go outside in a more semiprivate space to enjoy greenery in the city.

FACADE STUDY

The analysis phase concluded the that the use of wood in the building envelope was the most sustainable option, see page 192, and is therefore explored further in the detailing of the façade.

For further development of the volumes, different wooden façade expressions were developed, where different dimensions of windows and types of external cladding were tested.

Concept 1 and 4 shows the façade consisting of floor to ceiling windows mixed with smaller vertical windows. These different types of windows create a dynamic appearance with adjustable shutters. **The first concept** have integrated plant boxes in some of the windows, which creates the possibility for the users to interact with the façade and in this way the residents will be able to personalize and give the external expression an identity.

The second concept have used 2 types of windows, with the same width. This concept have combine the grid structure and the outdoor spaces are combined to create a dynamic facade. **In third concept** uses the glazing area more efficiently and balances the façade through displacement in wood cladding along with changes in orientation.

CONCLUSION

For further development of the facade expression the element of integrated plant boxes was chosen in order to give the users the possibility to personalize the external façade and thereby enrich the expression of the building with a lively element. In addition to this will the external cladding be further developed with the idea of different depths as seen on the façade expression of concept 3. This element will create a dynamic and detailed facade that compliments the old ornamental buildings worthy of preservation. In relation to that does the future building volumes of the area likewise consist of façade expressions containing depth- and shadow-effects, however the majority of these will be constructed of harder materials of steel, glass and masonry.



ILL. 184 - FACADE CONCEPT 1



ILL. 185 - FACADE CONCEPT 2



ILL. 186 - FACADE CONCEPT 3



ILL. 187 - FACADE CONCEPT 4

FACADE MATERIALS

Wood materials have, through iterative loops in the design process, been given a significant role in both the structure and appearance of the asylum centre. The context contains a mix of preservation worthy industrial buildings in wood and brick combined with new buildings in brick, concrete and steel, and the material choice should therefore relate to both new and old. The external expression of the centre depends, among other, of the choice of cladding, which should relate to the context through colour, tactility, orientation and rhythm. In addition to this the chosen material should have the same capabilities of ageing over time, and eventually blending seamlessly with the context.

4 SPECIES TO INVESTIGATE

Four wooden species combined with different treatment types are investigated to evaluate visual expression, treatment process, lifetime and place of origin. The chosen combinations were untreated Western Red Cedar, charred pinewood and clear oil treatments of Siberian Larch and Douglas Spruce.

All species have a high degree of durability in relation to rot and mould due to either minimal resin amounts, strong heartwood or mould hampering substances. A significant difference between the materials can be seen in the difference of region of origin, which is a factor that should be included in the consideration of material choice as it plays a large role in the transportation (A2 in LCA) of each material.

The LCA analysis concluded that the Western Red Cedar, found in North America, performed best when reviewing the Global Warming Potential of the materials, followed by Siberian Larch, Douglas Spruce and Pine, see illustration 188-195. The LCA analysis lacks the transparency to clarify the environmental impacts of the transport of materials, which is supported by the fact that a material located the furthest from the site scores the highest. The conclusion of the LCA analysis of the four species is therefore a more general understanding of the CO₂ absorbing abilities of



GWP : - 766 kg CO₂-Equiv. / kg ILL. 188 - DOUGLAS FACADE CLADDING



ILL. 189 - AGED DOUGLAS FACADE CLADDING



GWP : -876 kg CO₂-Equiv. / kg ILL. 190 - SHOU SUGI BAN FACADE CLADDING



ILL. 191 - AGED SHOU SUGI BAN FACADE CLADDING

the different wood types, and consequent low GWP.

TREATMENT AND EXPRESSION

The manufacturing and treatment of the pine façade involves a process of charring the wood, using a technique called Shou Sugi Ban, developed in Japan, which improves the surface resistance of the cladding by the carbonization of the surface (Sandak et al., 2019). This process leaves the façade in a almost black state which fits poorly with the context while it visually increases the scale of the building, and will therefore not be explored further.

Western Red Cedar can be used for cladding in an untreated state, which will result in a greyish patina after a few years of use. This is possible due to its high resistance to rot and mould; however, the country of origin and environmental impacts of the transportation has excluded it from further exploration.

Douglas Spruce and Siberian Larch have

similar manufacturing and treatment processes, as both façade types are treated with a linseed and tar mix to further improve their resistance to degradation over time.

CONCLUSION

Siberian Larch, illustrated on illustration 194-195, is chosen for the cladding because of the elegance of the annual growth rings combined with its relatively knot free expression. It's warm appearance in the early years matches the materiality and appearance of the historical buildings while the more silver and grey appearance of the aged material compliments the raw appearance of the concrete, steel and brick buildings of the area. An additional parameter in the choice of Siberian Larch for the façade is the availability of the material in Scandinavia, which allows for a minimal environmental impact in the material transport from origin to site.



GWP : -1095 kg CO₂-Equiv. / kg ILL. 192 - CEDAR FACADE CLADDING



ILL. 193 - AGED CEDAR FACADE CLADDING



GWP : - 893 kg CO₂-Equiv. / ILL. 194 - LARCH FACADE CLADDING



ILL. 195 - AGED LARCH FACADE CLADDING

MATERIALS WORKSHOP

During the phase of analysis and early design it became clear that the material of wood suited the demands of the area, users.

Following the investigations of material choices for facade and construction was iterative loops of internal material choices. An understanding of previously accumulated investigations emphasised the further use of natural materials to support the buildings life cycle assessment while creating the best indoor environment for the users - both psychological and physiological. The natural and CO₂ absorbing materials in question were clay, wood which is compared to the commonly used material plaster. The natural materials contained great attributes to enhance the indoor environments of the building whether that be clays moisture absorbing ability, woods psychological role, or the materials acoustical properties. Illustrated on the following pages 204-206.

3 ROOMS OF INVESTIGATION

Three different rooms were chosen for

detailed investigation of the indoor environment covering the acoustical and thermal properties as well other architectural means including shutters, placement of furniture and window placement.

The chosen rooms were the public and vibrant common space, a classroom of learning and a 2-person living unit, and a common denominator for these were their either exposed critical placement in relation to the microclimate or high occupancy. The result of each room can be found on the following pages, Appendix 10 and Appendix 11 for spatial perception of materials. Furthermore, further detailed of Bsim process can be found on Appendix 12.

WOODEN CLADDING 0.025 m INSULATION LAYER 0.22 m FRAMEWORK 0.22 X 0,15 m INSULATION LAYER 0.25 m WOODEN PILLARS 0.027 m INSTALLATION LAYER 0.070 m WOODEN PILLARS 0.077 M WOODEN PILLARS 0.077 M PLASTER BOARD 0.025 m 0.098 m 0.088 [W/m²C°]



ILL. 196 - PLASTER BOARD INTERNAL CLADDING

WOODEN CLADDING 0,025 m INSULATION LAYER 0,22 m FRAMEWORK 0,22 X 0,15 m INSULATION LAYER 0,25 m WOODEN PILLARS 0,25 X 0,15 m VAPOUR BARRIER 0,002 m INSTALLATION LAYER 0,070 m WOODEN PILLARS 0,077 M MDF-BOARD/JUTEFABRIC 0,018 m CLAY 0,025 m

0,62 m 0,063 [W/m²C°]



ILL. 197 - CLAY INTERNAL CLADDING

WOODEN CLADDING 0,025 m INSULATION LAYER 0,22 m FRAMEWORK 0,22 X 0,15 m INSULATION LAYER 0,25 m WOODEN PILLARS 0,05 m WOODEN PILLARS 0,07 X 0,07 m WOODEN PILLARS 0,07 X 0,07 m WOODEN PILLARS 0,07 M WOOD PANELS 0,059 m 0,088 [W/m²C°]



ILL. 198 - WOODEN PANELS AS INTERNAL CLADDING



COMMON SPACE	OPERATIVE TEMPERATURE
WITHOUT SHUTTERS	HOUR > 26 = 141 HOUR > 27 = 39 HOUR < 20 =1148
WITH SHUTTERS	HOUR > 26 = 60 HOUR > 27 = 13 HOUR < 20 =1695
CLAY INTERNAL WALL	HOUR > 26 = 28 HOUR > 27 = 2 HOUR < 20 = 694
PLASTER BOARD	HOUR > 26 = 51 HOUR > 27 = 7 HOUR < 20 =760
WOOD FIBRE WALL	HOUR > 26 = 52 HOUR > 27 = 7 HOUR < 20 = 750



3000

4000

1000

PLASTER WALLS AND
WOODEN FLOOR
WOOD FIBRE WALLS AND
WOODEN FLOOR







7500 7000 6500 6000 5500 5000

WOOD FIBRE WALLS AND CONCRETE FLOOR CLAY WALLS AND WOODEN FLOORS





2491

ILL. 200 - A CLASSROOM

LEARNING

WITHOUT SHUTTERS	HOUR > 26 = 116 HOUR > 27 = 81 HOUR < 20 =
WITH SHUTTERS	HOUR > 26 = 79 HOUR > 27 = 47 HOUR < 20 = 1
CLAY INTERNAL WALL	HOUR > 26 = 33 HOUR > 27 = 15 HOUR < 20 =
PLASTER BOARD	HOUR > 26 = 26 HOUR > 27 = 13 HOUR < 20 =
WOOD FIBRE WALL	HOUR > 26 = 28 HOUR > 27 = 13 HOUR < 20 = 3



DEFINITION D50

OPERATIVE TEMPERATURE







APARTMENT FOR 2	OPERATIVE TEMPERATURE
WITHOUT SHUTTERS	HOUR > 27 = 79 HOUR > 28 = 15 HOUR < 20 =0
WITH SHUTTERS	HOUR > 27 = 65 HOUR > 28 = 5 HOUR < 20 = 0
CLAY INTERNAL WALL	HOUR > 27 = 131 HOUR > 28 = 0 HOUR < 20 = 0
PLASTER BOARD	HOUR > 27 = 40 HOUR > 28 = 4 HOUR < 20 = 0
WOOD FIBRE WALL	HOUR > 27 = 106 HOUR > 28 = 41 HOUR < 20 = 0



REVERB TIME T15

DEFINITION D50





CONCLUSION

The rooms and result of the detailed investigation became an evaluation scheme that included both technical and atmospheric considerations. An initial overview of the scheme gave the impression that the material of clay was of high interest, however as the evaluation likewise show will the remaining two materials in some instances be preferred due the character and function of room. It is assessed that in spite of the spike in the simulation, the overall tendency shown is still accepted as accurate, when comparing the surface properties of clay with the other simulated materials since clay has a rougher and more porous surface than wood and plaster, which matches the tendency in the acoustical performance.

The acoustic and thermal properties of Clay clearly highlight the positive impact of the indoor environment with low reverberation time, clear definition of the sound and minimal temperatures above 26, 27 and 28 degrees Celsius. The latter are as the number suggest likewise being supplemented with the integration of shutters.

A design element in which has been investigated in parallel with external expression, privacy and contextual relation (see page 196-202 for façade study). Clays tactile surface gives warmth to a room well-fitting the atmosphere of the common space and the apartments whereas the traditional and more institutional appearance of gypsum suits the classroom better as the neutrality of the space will help with concentration. Looking at the result of the exploration it has been chosen to utilize a combination of all materials throughout the building and use them to help define the character of the diverse rooms and use their properties to enhance the indoor environment.

CONSTRUCTION WORKSHOP

Investigations of construction principles were done already in the early sketching phases, and a decision was made to utilize a wooden grid structure for the project. The use of wood in the construction is beneficial in terms of environmental impact as investigated in the LCA analysis, while the use of a visible grid structure relates to the old industrial wooden structures of the Godsbane area, thereby linking old and new. The modularity and flexibility available in a grid created the possibility for long-term perspectives in relation to the asylums fluctuating need for capacity as well as other potential changes in function of the future. Having a wooden construction likewise saw the benefit of easier assembly and future disassembly while being a lighter and simpler solution compared to the commonly used material of concrete.

Four different bracing principles were investigated to solve the structural rigidity and bracing of the grid structure; CLT plates, see illustraion 202, diagonal wood brace see illustration 203, torque

rigid joints see on illustration 205 and crossed steel wires as seen on illustration 204. Each principle is assessed based on weight, amount of material used and the flexibility of the system. The use of CLT plates scored the lowest due to its poor utilization of the material and therefore increased weight. The diagonal wood bracing scored higher as this principle uses the material in a way that makes more sense when viewing the structural properties of wood. The highest scoring solutions was the ones of steel cables and torque rigid joints as these allowed for small dimensions and a reduced material use compared to the other principles.

CONCLUSION

The bracing principle chosen for further sketching was crossed steel wires due to its simplicity that allows for high flexibility in relation to disassembly, reorganisation of the building etc. The structural logic of the chosen principle was likewise a decisive factor in combination with the fact that the principle uses the material in an effective manner



ILL. 204 - STEEL WIRE

COMPRESSION STRENGTH : 215 - 410MPa DENSITY : 7850 kg/m³ TENSILE STRENGTH : 360-550 MPa COMPRESSION STRENGTH : 215 - 410MPa DENSITY : 7850 kg/m³ TENSILE STRENGTH : 360-550 MPa ILL. 205 - RIGID JOINT





ILL. 202 - CLT PLATE

 $\begin{array}{l} \mbox{COMPRESSION STRENGTH: } 16\mbox{ - } 32\mbox{ MPa} \\ \mbox{DENSITY: } 400\mbox{ - } 600\mbox{ kg/m}^3 & \mbox{TENSILE STRENGTH: } 8\mbox{ - } 26\mbox{ MPa} \\ \end{array}$

ILL. 203 - DIAGONAL WOOD BRACE

 $\begin{array}{l} \mbox{COMPRESSION STRENGTH}: 16-32\mbox{ MPa} \\ \mbox{DENSITY}: 400-600\mbox{ kg/m}^3 & \mbox{TENSILE STRENGTH}: 8-26\mbox{ MPa} \\ \end{array}$





CONCLUSION

MODULARITY AND GRID SYSTEM

- Work with modularity to increase flexibility and simplicity in construction
- A wooden grid structure braced by steel wires, because of their lightness, adaptability and effective material use

CIRCULATION AND FUNCTIONS

- Smaller common spaces in each block that serves as a transition between private and social, that also allows the users to form smaller comcommunity
- Circulation system placed in extension of common space to increase chance of unplanned social interaction
- Smaller roof terraces as semi-private outdoor spaces

FACADE AND MATERIALITY

- Façade x with the displaced cladding around the windows and facade x with the plant boxes are combined to develop the final facade type, while combining it with vertical wooden shutters, that integrate into the grid structure
- Siberian Larch is chosen for its appearance in the early years as well as its patina, which compliments the industrial appearance of the context
- munities with the large asylum centre A combination of wood, clay and plaster throughout the building, to help create unique character in each type of space, while using each material to enhance the indoor environmental properties of each room







PRESENTATION

DESIGN PROCESS

THE CONCEPT

The asylum centre of Aarhus K is located at a 2400 m² irregular plot of, with surrounding context of great diversity that spans from a larger too a small and scattered volume composition consisting of both new buildings and old freight units highlighting the history of the area, see illustration 207.

The centre will consist of an active, semi-public ground floor with a welcoming facade that ensures a building that benefits and embraces the life of the area as well as the ones of the residents resulting in improved acculturation and a lively environment, as shown on illustration 208.

The centre should likewise accommodate the needed privacy and seclusion of the residents that results in a building of a clear division between community and private spaces, as illustrated on illustration 209. This division can volumetrically be found in composition of the semi-public ground floor and the semi-private volume above that likewise increase overview and clarity.

The volume of the temporary homes is

divided into five smaller units enhancing affiliation and individuality while ensuring a centre in which adapts and relates to the context, as illustration 210 shows, in a complimenting scale. The separation of units is emphasised by improved solar conditions, a humane and manageable scale for the residents.

The placement of the five units enables the centre to contain a larger roof garden and roof terraces of both private, semi-private and semi-public spaces. This natural green roof becomes the link between the resident's temporary homes and their daily chores and life of the ground floor. A place of relaxation, socialization and a green escape in the large vibrant city, see illustration 211.

The centre is constructed of a wooden grid structure that enhances flexibility, contextual relation while the perception of the buildings is descaled. This creates a dynamic and elegant centre with great relation to the history, the varying scale of the area and lastly has a positive impact on the residents of the centre, ass seen on illustration 212.








ILE 213 - THE CENTRES CONNECTION TO THE CONTEXT

1

AF

PLANS

- 1 SECOND HAND SHOP
- 2 WORKSHOP
- 3 TOILETS
- 4 MUSIC WORKSHOP
- 5 ENTRANCE/EXHIBITIONS
- 6 COMMON SPACE
- 7 COURTYARD
- 8 DAYCARE
- O DATGARE
- 9 DAYCARES TOILET
- 10 CLEANING ROOM
- 11 TOILETS
- 12 CLASSROOM
- 13 CLASSROOM
- 14 CLASSROOM
- 15 CLASSROOM
- 16 COMMON ROOM
- 17 TECHNICAL ROOM

- 18 ENTRANCE
- 19 SPIRITUAL ROOM
- 20 OUTDOOR ANNEX
- 21 HANDICAP TOILET
- 22 CLEANING ROOM
- 23 MINDFULNESS
- 24 SENSORY GARDEN
- 25 WAITING ROOM
- 26 MEETING ROOM
- 27 PHYCHOLOGY ROOM
- 28 MEDICAL FACILITY
- 29 BREAK ROOM
- 30 KITCHEN
- 31 OPEN OFFICE
- 32 CLEANING ROOM
- 33 TOILETS
- 34 TECHNICAL ROOM
- 35 RECEPTION
 - Appendix 13 AREA SUMMARY Appendix 14 - 17 FOR DAYLIGT CONDITIONS







- 28 2 PERSONS APARTMENT
- 29 CIRCULATION









CITY AND CENTRE SYMBIOSIS

The analysis phase pointed to the urban location based upon the findings regarding the acculturation possibilities and social life found in an urban environment. The ambitions for the Aarhus K district will provide a wide variety of functions that allows the users to participate in communities outside the centre. In addition to this, the green spaces planned for the area, serves as an extension of the green spaces found in the centre itself while providing the connection between nature found at Aarhus Å and the nature towards the south of the site.

In addition to the activities and nature mentioned above, the urban location of the centre gives the users a high degree of independence in their daily lives through public transportation, walking or biking through the city. This enables a higher level of control in their lives, allowing them to go to meetings with their attorney, visit cultural institutions, go shopping etc., see illustration 220.

Through the abovementioned, the users

of the centre is able to exploit the advantages of the city, however the centre will also enrich the area with new functions that will make the centre an integrated part of the life in the context. This is done through the offering of functions, like a Second Hand Shop, relating to the city combined with the idea of space-sharing, which will make it possible for users of the city to interact with the centre and increase the interaction between centre and the city. The concept of space-sharing is explored on the following spread.



CONTRIBUTION TO THE AREA

An additional part of the symbiosis between centre and city is the idea of space-sharing between the building and the city, which will allow the users of the city the access to certain spaces in the centre creating a functional connection between the two. As seen on illustration 221 the semi-public ground floor offers the possibility of shared spaces in certain zones of the building, separated from the users in the evening and weekend.

The northern zone of the building houses wood, music and paint workshops, that can be booked by different institutions or users of Institute for (X), while the classrooms in the learning area towards south can be booked for courses in computer use for the elderly, lectures, movie nights etc. The events taking place in the shared spaces could provide the users with another layer of activities and social interaction in situations where conversation can happen naturally.

The shared use of these spaces ties the building to the users of the context on a

more profound level and increases the chances of social encounters between residents and users of the context. In addition to this, the space-sharing principles helps to activate parts of the facade when the residents of the centre are using other spaces.

The following spreads will illustrate the daily use of the building and city, as seen from the perspective of three of the personas defined in the analysis phase. The illustrations 222, 223 and 224 have diagrammatically explained an ordinary day in the life of three personas, which spaces they use and when along with the use of the city.





ILL. 222 - SAYAS DAY AT THE ASYLUM CENTRE



ILL. 223 - ZAMIRS DAY AT THE ASYLUM CENTRE



ILL. 224 - BOMANI DAY AT THE ASYLUM CENTRE









ILL. 228 - SECTION AA 1:200



ILL. 227 - SECTION BB 1:200









ILL. 229 - SOUTH-EAST FACADE 1:500



ILL. 230 - NORTH-WEST FACADE 1:500



ILL. 231 - SOUTH-WEST FACADE 1:500



ILL. 232 - NORTH-EAST FACADE 1:500







ILL. 234 - COMMON SPACE





ILL. 235 - SPATIAL ILLUSTRATION OF THE COMMON SPACE







ILL. 237 - THE AREA OF LEARNING

1:200



ILL. 238 - SPATIAL ILLUSTRATION OF THE LEARNING AREA



ILL. 239 - THE COMMON SPACE AT LEARNING



ILL. 240 - THE OFFICE AREA




ILL. 241 - SPATIAL ILLUSTRATION OF THE OFFICE AREA







ILL. 243 - THE 1 PERSON APARTMENT 1:100

1 PERSON APARTMENT

The 1-person apartment contains a living -and bedroom along with a kitchen and bathroom. The fully equipped kitchen is located at the entrance to the apartment along with storage cabinets on the opposite wall, next to the door to the bathroom. The living area contains a built-in single bed and storage unit and leaves a space for the individual user to take ownership of, whether that be a dining table and chairs, an armchair, a couch or something else entirely. The apartment s equiped with a cork wall that enables the resident to personalize the space with pictrues, drawings and artwork which can help the users feel at home. The implementation of private bathroom and kitchen heightens the feeling of dignity and privacy of the residents, allowing them to be in more control of their own space. The spaces and functions in the apartment allows the users to remain private for most of the day, should they feel the need, however the compactness encourages the use of the social spaces spread throughout the asylum centre, thereby improving the chances of social interaction.

NET AREA	18 m ²
UNIT AMOUNT	13
AMOUNT OF GLASS AREA	2,3 m ²



ILL. 244 - SPATIAL ILLUSTRATION OF THE A 1 PERSON APARTMENT



ILL. 245 - THE 2 PERSONS APARTMENT 1:100

2 PERSONS APARTMENT

The 2 persons apartment contains a living and dining area, a built in bed and storage unit along with a kitchen and bathroom. The kitchen and dining area is located in the centre of the apartment where the users have space for relaxation as well as interaction. Behind the kitchen is a bathroom, accessed from the entrance of the apartment. Storage space is found in the cabinets or in the bed unit. The 2 persons apartment is spacious enough to allow each user to be themselves, while providing them with a space where they can interact and support each other. A parent can talk to their child and a couple can discuss the ambitions for the future can support each other in times of sadness. The functions of the apartment allow the users to be independent and focus on creating stability within their own control, while encouraging them to seek the social in the spaces scattered throughout the asylum centre.

NET AREA	38 m ²
UNIT AMOUNT	11
AMOUNT OF GLASS AREA	6 m ²



ILL. 246 - SPATIAL ILLUSTRATION OF THE 2 PERSONS APARTMENT



ILL. 247 - THE 4 PERSONS APARTMENT 1:100

4 PERSONS APARTMENT

The 4 persons apartment contains a living and dining area combined with a full kitchen, along with a bunk bed for the children and an adult zone in the opposite end of the apartment with a bed for the parents. The bunkbeds are designed to provide space that the children can seek refuge in if the impressions of their surroundings become too much at times, while giving them with a space where they can be allowed to stay in a child's world in spite of a difficult situation. The living area is spacious enough for a dining table where the family can gather and eat together or discuss the events of the day. In addition to this the apartment contains a corner that can be furnished by the users themselves in whichever way they see fit, whether that be a sofa, armchair or a third option. A cork wall allows the family to stay informed of each other's lives while enabling the family to personalize the apartment. The functionality and space of apartment allows the family to focus on each other in a situation that is highly uncertain and challenging for the dynamics and emotions of the family.

NET AREA	45 m ²
UNIT AMOUNT	15
AMOUNT OF GLASS AREA	9,6 m ²



ILL. 248 - SPATIAL ILLUSTRATION OF THE 4 PERSONS APARTMENT



ILL. 249 - A 4 PERSONS APARTMENT

T-F





THE OUTDOOR SPACES

The roof garden connects the residents of each block with each other as it also serves as the transition zone between the social spaces on the ground floor and the apartments in each block. It is a place where residents of each block can meet, socialize and interact in various situations and spaces.

The roof garden is divided into a number of zones that contains different activities and functions and is connected by a boardwalk that grants access to the apartment blocks as well. The areas are a mix of planned and unplanned areas that ensures a degree of flexibility which allows the residents to interact in planned situations and activities or create their own. Smaller grass covered areas invite children to play and parents to relax while being able to keep an eye on their children and stay connected to greenery of different types and scales.

A vegetable garden and greenhouse are located right outside the common kitchen where residents can grow their own food and through it, join a community that works towards a common goal. In extension of the common kitchen is also a pavilion with room for outdoor dining where events for residents and staff can take place.

A more private pavilion is located next to the offices where meetings between staff or staff and resident can take place, while remaining in contact with the greenery of the roof garden, that can help in the destressing of stressful conversations about asylum denial. The pavilion is sheltered with greenery and located in a relatively isolated part of the roof garden to improve the feeling of privacy and confidentiality necessary in these situations.

As some residents may not be ready to participate in the larger scale outdoor spaces, private roof terraces are located on the top floor of each block where they can enjoy the outdoors. This allows them to be in more control of their surroundings and retain the overview of the situation, see illustration 251.



ILL. 251 - OVERVIEW OF THE DIFFERENT OUTDOOR SPACES

THE COURTYARDS

The outdoor spaces of the sensory garden and the central courtyard are designed to reflect the diverse use of the spaces. The courtyard, used for circulation and improving visual indoor environment is designed to create small semi-private niches in wild growing vegetation along with a green area of social interaction in close connection to the heart of the building, the common space, see illustration 252.

The sensory garden placed along the functions of mindfulness, therapy, medical facility and the waiting area are designed in relation to previously accumulated evidential based design of green spaces within healthcare settings. The sensory garden of an organic composition contains a small basin of dribbling water surrounded by a gravel path along with spaces for longer stay, see illustration 253.

The use of vegetation in the two courtyards serves different purposes and therefore differ in their expression. The main courtyard contains a mix of deciduous and coniferous vegetation that ensures a green outdoor space all year, while illustrating the seasonal changes. In contrast to the simple courtyard the sensory garden should provide a therapeutic experience of nature. The garden must stimulate all senses of the human body through tactility of surfaces along with olfactory, auditory and visual stimuli. Therefore, the space includes vegetation

Therefore, the space includes vegetation of both flowering and nonflowering plants in varying colours and greenery that shows the changing seasons of the year. The latter element provides the opportunity for topics of conversation as well as highlighting the passing of time, thereby helping the mental state of the asylum seekers. The placement of the greenery has likewise been a factor when designing as these provides a zoning of different spaces and create visual shelter and shade (Nordbø, 2019). Areas for longer periods of stay are located in a sheltered space beneath an overhang that allows use of the space in all weather conditions.



ILL. 253 - SPATIAL ILLUSTRATION OF THE SENSORY GARDEN



ILL. 254 - SPATIAL ILLUSTRATION OF THE DINNING AREA



ILL. 255 - SPATIAL ILLUSTRATION OF THE PLAY AREA



ILL. 257 - SPATIAL ILLUSTRATION OF THE SEMI PRIVATE TERRACES



ILL. 256 - SPATIAL ILLUSTRATION OF THE SEMI PRIVATE NICHE

THE STRUCTURAL SYSTEM

The structural element of the centre consists of a wooden structural system that likewise functions as an element of descaling and contextual relation. The CLT circulation cores of the living units' function as a stabilizing element that is complimented by cross bracings of steel as seen on illustration 258.

The dimensions of the grid structure have been chosen in parallel with design iterations of the centre to be an integrated element of the centre for zoning, separation and division of spaces. The final grid of 2400x2400mm and 3200mm in height has integrated solutions for ventilation channelling and is connected by a hinged connection ensuring a simple that is easily assemble and disassemble.

The structural system, visible before entering the centre and when inside creates structural honesty and a characterful and warm space.

For further detail of the construction principle see Appendix 18.



ILL. 258 - EXPLODED VIEW OF THE STRUCTURAL SYSTEM



ILL. 259 - EXTERNAL WALL WITH FLOWER BED DETAIL 1:20



ILL. 260 - GROUND FLOOR ROOF CONSTRUCTION 1:50

SURFACE PALETTE

The materials used for the asylum centre consists mainly of natural materials that creates warm and welcoming atmospheres throughout the building, see illustration 262. The ground floor of the building is zoned according to its diversity in functions, supported by a difference in material use that influences the atmosphere for each zone, see illustration 266.

The common space uses clay for the walls, oak veneer for the furniture and shelving combined with a polished concrete floor. This creates a space that can withstand heavy use while combining the materials of clay and wood in a way that creates unique and natural patterns on the surfaces in different areas while improving the acoustical environment, see illustration 263.

This material combination is found throughout most of the ground floor, except the offices and learning area where clay is replaced with plasterboard for the walls to provide a more neutral expression in areas of concentration. The use of concrete on the ground floor has increased the thermal mass of the building, which will even out the heat load in the spaces, as it is able to absorb heat during the day and release it during the evening and night, see illustration 261.

The materials of the apartments utilize the same combination of clay and oak veneer for the wall surfaces and built-in furniture, which is supplemented by a wood floor and cork panels on some of the walls. The wooden flooring is chosen for its homely feel while the cork panels provide sound dampening and allows easy decoration of the apartments, see illustration 265.

The external materials of the centre are likewise natural, with the use of larch cladding that will age to a warm silver like colour and blend into the context over time, while an oil treatment of the façade will ensure a longer life span of the material. The overall material palette of the centre is supported by the use of greenery internally and externally of the building illustrates on illustration 264.





LIFE CYCLE THINKING

The final proposal reflects the circular thinking and life cycle considerations made during sketching and synthesis as these were decisive factors in the early decision-making process. Natural building materials were chosen due to their minimal environmental impacts (LCA) and their potential roles in the improvement of human health (Khoshnava, 2020).

NATURE

The centre is primarily constructed of Siberian Larch, supplemented by oak veneer and internal walls with clay finishing, all materials that **stem from nature**. The wood species of the building all have negative GWP impact during the early phases of their life cycle(A1-A3) due to the CO₂ absorption of trees.

SOURCED IN NORTHEN EU

The materials are **sourced in northern Europe** to reduce the environmental impact of the transportation between raw material extraction, processing facilities and construction site.

EASES ASSEMBLY CONSTRUCTION

The final proposal consists of a **lightweight, flexible construction** that eases assembly on the construction site, while allowing for changes of use and thereby space planning in the future.

EASY ASSEMBLY

Easy assembly results in an easy disassembly process that is made possible through a use of bolted joints, that, unlike glue, allows the building to be taken apart at the end of its use.

UP-OR DOWNCYCLING

At the end-of-life the materials are **up- or downcycled** for new uses, thereby reducing their environmental impact that also allows for economic advantages.(Di Maria, 2018).

RETURNING TO FURNITURES

An alternative to the recycling, when using natural materials, is using the biodegradability of materials like clay, thereby **returning the material to its source**.



ILL. 267 - LIFE CYCLE THINKING

APPLIED STRATEGIES

INTRO

To meet the goals of a Zero-Energy Building this project has applied both passive as well as active strategies. The final passive strategies include envelope design, natural ventilation, integrated shading and use of thermal mass and have been implemented in early design to minimize the need for active strategies. This ensures an energy sufficient asylum centre as early integrated passive strategies decrease the total energy demand significantly. The final active strategies applied in the project include rainwater collection and photovoltaic panels. The abovementioned passive and active strategies are further explained in the following text piece.

PASSIVE STRATEGIES ENVELOPE

The building envelope of this project has undergone iterative design loops to minimize material use while maintaining an acceptable u-value of good insulation properties. This investigation has been explored through the be18 to ensure an energy frame unaffected of this material saving. In continuation of this has the design concept of the asylum centre allowed for compactness of the building mass minimizing thermal bridges in the construction. This is supplemented by the thinking of the relation between net area and envelope area while maintaining an indoor environment of spacious quaility.

EXTERNAL SHADING

Early phases of design implemented a grid structure ensuring flexibility and a descaling of the larger building. In parallel indoor environment calculations were explored highlighting a need for shading due to overheating. The grid of the façade allowed for a natural implementation of external shutters and becomes a dynamic and elegant façade expression while maintaining a good thermal indoor environment (Bejder, A.K., et.al, 2014). See illustration 269.

The choice of external shutters likewise saw the benefit of efficiently reducing



ILL. 268 - THE CONCEPT OF EXTERNAL SHADING

solar heat gain by 70-90 %. In relation to this has the implementation of deciduous vegetation provided shading during summer periods while heat gain during winter periods can be increased.

THERMAL MASS

The semi-public ground floor contrasts the functions above and the use of materials emphasises this clear zoning of the asylum centre. The flooring of the vibrant ground floor with a higher people load is polished concrete due to its long lifetime, ability to store, absorb and release solar heat energy. The high thermal mass properties of concrete can be used for both passive heating and cooling as the exposed surface absorbs and stores heat energy which will be released during evening and night.

ACTIVE STRATEGIES

During sketching the tool of be18 were applied to identify the advantages of the above-mentioned passive strategies. Through iterative loops the current Danish building regulations and energy frames (20,0 and 25,0 kWh/m² year) were complied with. To achieve a Zero-Energy building consisting of a balance between energy produced and used the total need for electricity for operation of the building were calculated (See Appendix 19 for Photovoltic calculation).

PHOTOVOLTAIC PANELS

Photovoltaic panels that concert the suns energy into electricity has been applied as an active strategy. The solar radiation of the larger roof surfaces was during sketching investigated to see if any volumes of the existing context would influence the outcome. The highly efficient monocrystalline panels were chosen and placed on the northern placed building block. The high exposure towards south meant that the calculated need for operation of the building (10.973 kWh/m² year) were sufficient. (see appendix å) (Bejder, A.K., et.al, 2014), see illustration 270.

WATER RECYCLING

The thinking of reuse has been applied as a sustainable active strategy in the new asylum centre. The products of wasteand rainwater are filtered and re-used throughout the centre. Water used for laundry, bath, LAR commonly referred to as grey water are recollected and filtered which minimize the water use. The water of the flushed toilets known as black water will be used for watering the larger green spaces found throughout the building. The flexible plan solutions have integrated and allowed for technical spaces on all stories housing both ordinary DHW tanks as well as DWH of grey water, see illustration 270.

GREEN ROOFS

The implantation of green roofs sees the benefit of evening out the collected rainwater and therefore functions as a constricting element when great amounts of rainwater are received within a limited time period. The green roofs furthermore adapt to the centres visual expression and creates a greener perception for the users of the asylum centre. When construction the roof of greenery the use of materials is likewise minimized as the use of natural elements improved the buildings environmental impact.



THE ENERGY FRAME

The energy frame of the building is a result of the previously defined ZEB goals for the project and the passive and active strategies applied to reach them. The calculation of the building is split into two parts as the ground floor and the upper levels have different uses. The ground floor represents non-housing functions and consists of offices, classrooms and cultural spaces that makes the ground floor a multifunctional space, where the upper levels represents housing units exclusively.

The usage time for residential buildings is all the time, meaning 168 hours/week while the ground floors usage time is from 8am to 10 pm, meaning 98 hours/week. In addition to this each usage type must meet two different energy frames: housing must comply with 20 kWh/m²/year while the ground floor must comply with 25 kWh/m²/year, both for Building Class 2020 of the Danish Building Regulations.

The final energy frame has been achieved through an optimization of the material use in relation to the effectiveness of the envelope and the g-values of the windows in the building. The first step illustrates a proposal with a low u-value and higher g-value that results in overheating of the building, which increases the electricity needed for the building operation as BE18 compensates with electricity for cooling when the building overheats. This increases the overall energy demand of the building significantly as a result of the primary energy factor for electricity of 1.8.

The result of the second step is the removal of overheating and thereby the reduction of electricity needed for building operation using windows with a lower g-value, thereby reducing solar heat gain. The third step showed an inefficient material use in the building envelope of the previous proposals when the u-value of the envelope was increased from 0,089 W/m^2K to 0,11 W/m^2K , while the energy demand rose minimally. The last step of the energy frame calculation is the implementation of solar panels, located on the tallest block of the building, to meet the Zero Energy Building standard. Calculations for the monocrystalline panels can be found in Appendix 19.

THE PARAMETRES	THE APARTMENTS THE GROUND FLOO		
BUILDINGS CLASS 2020	20 kWh/m ² /pr. year	25 kWh/m ² /pr. year	
FIRST STEP TOTAL ENERGY CONSUMPTION	25,2 kWh/m ² /pr. year	25,2 kWh/m ² /pr. year	
EXCESSIVE IN ROOM	3,0 kWh/m ² /pr. year	6,6 kWh/m ² /pr. year	
G-VALUE	0,6	0,6	
U-VALUE EXTERNAL WALL	0,089 W/m ² K	0,089 W/m ² K	
HEAT	23,3 kWh/m ² /pr. year	13,6 kWh/m ² /pr. year	
EL. FOR OPERATION	2,9 kWh/m ² /pr. year	3,2 kWh/m ² /pr. year	
SECOND STEP TOTAL ENERGY CONSUMPTION	19,8 kWh/m ² /pr. year	20,3 kWh/m ² /pr. year	
EXCESSIVE IN ROOM	0,0 kWh/m ² /pr. year	0,0 kWh/m ² /pr. year	
G-VALUE	0,4	0,4	
U-VALUE EXTERNAL WALL	0,089 W/m ² K	0,089 W/m ² K	
HEAT	19,3 kWh/m ² /pr. year	11,8 kWh/m ² /pr. year	
EL. FOR OPERATION	1,7 kWh/m ² /pr. year	2,8 kWh/m ² /pr. year	
THIRD STEP			
TOTAL ENERGY CONSUMPTION	20 kWh/m ² /pr. year	20,8 kWh/m ² /pr. year	
EXCESSIVE IN ROOM	0,0 kWh/m ² /pr. year	0,0 kWh/m ² /pr. year	
G-VALUE	0,4	0,4	
U-VALUE EXTERNAL WALL	0,11 W/m ² K	0,11 W/m ² K	
HEAT	20,3 kWh/m ² /pr. year	16,3 kWh/m ² /pr. year	
EL. FOR OPERATION	1,9 kWh/m ² /pr. year	3,7 kWh/m ² /pr. year	
THE TOTAL EL. FOR OPERATION OF THE BUILDING	1.9 kWh/m ² /pr. year * 2418 m ^{2 =} 4594,2 kWh/m ² /pr. year	3,7 kWh/m ² /pr. year * 1724 m ² = 6378,8 kWh/m ² /pr. year	
SOLAR PANELS THE AREA	80 m ²	70 m ²	
TOTAL ENERGY CONSUMPTION	-0,3 kWh/m ² /pr. year	-1,3 kWh/m ² /pr. year	
EL. FOR OPERATION OF THE BUILDING	-9 kWh/m ² /pr. year	-7,9 kWh/m ² /pr. year	

INDOOR CLIMATE

The indoor environment of the asylum centre plays a significant role in their comfort levels and is therefore a determining factor in their healing process. Three critical rooms are selected for investigation using BSim, that, among other, analyses temperatures and CO₂ pollution of the spaces along with the energy use or loss through different systems, found in appendix 20 and 21, Final Bsim results.

The common space is chosen for simulation as it will have a high people load combined with a large glazing area. The simulation showed an optimal indoor climate with low temperatures and CO2 concentration allowing for activities with a higher intensity and an increased people load for larger events. The low temperatures in the common space is possible as much of the glazing area is facing northeast and therefore avoids most of the solar heat, which would otherwise overheat the space. The interior finishes of the common space, along with the built-in furniture contributes to an acoustical indoor environment with a relatively low reverberation time and a satisfactory definition of the sound.

A 2-persons apartment located on the upper floors of the northernmost block, facing southeast is investigated to ensure a satisfactory indoor environment in a living unit that is exposed to significant solar heat gain. The simulation of the apartment resulted in an indoor environment with very low temperatures and CO₂ pollution which leaves room for further optimization of the relatively high air change. The acoustical simulation of the space showed a very high definition and low reverberation time in the apartment, as a result of the acoustical properties of clay combined with the furnishing.

The southernmost classroom of the learning area is simulated to ensure satisfactory indoor climate in a situation that requires concentration for longer periods of time, and therefore relies on a good indoor environment. The calculation confirmed a satisfactory indoor climate and acoustical environment, however further optimization can be made to the air change as the temperatures and CO₂ pollution is lower than necessary.







ILL. 272 - APARTMENT OF 2

APARTMENT OF 2

CO ₂	475,3 ppm pr. year
AIRCHANGE	3,5 h ⁻¹ yearly average
HOURS > 27	34 h pr. year
HOURS > 28	4 h pr. year




CLAY WALLS AND CONCRETE FLOORS

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THE VENTILATION STRATEGY

The ventilation strategy of the future asylum centre has been a combination of both natural and mechanical ventilation, commonly referred to as hybrid ventilation. The energy saving strategy will likewise contribute to an improved atmospheric indoor environment with the help of wind pressure and thermal buoyancy. The natural ventilation which will be implemented during summer periods results in minimized electric demand positively influencing the total energy frame due to the high primary energy factor of 1,8 for electricity.

A mechanical ventilation strategy is applied when the climatic conditions of the microclimate does not benefit of natural ventilation. This strategy has during the phase of sketching seen many iterations of both one shared central ventilation unit and fragmented units across the entire centre. The final proposal consists of a spilt strategy where two VAV system facilitate to semi-public ground floor and the living blocks each house a CAV system placed on the highest floor, see illustration 274. The two VAV units of the ground

floor has strategically been placed to minimize bends and unnecessary piping while maintaining a simple yet effective plan. The choice of variable air volume is based upon the higher fluctuation of people occupancy and the diverse period of use. This contrast the constant air volume of the living blocks where a demand of constant air supply of minimum 0,30 l/s pr. m² heated floor area should be found. The choice of CAV Is based on similar need supply, low fluctuation of people and heat load. In this project a calculated supply of 3,5 h⁻¹ will be used which will ensure a satisfactory indoor environment in the apartments.

The placement of the living blocks ventilation unit results in minimized piping length and easy supply and extraction from the roof (see illustration 276). The integration of a centrally placed circulation, water and technical "core" enables for a simple layout of piping across all plans. Furthermore, the lower ceiling at the core enables for improved daylight conditions while facilitating piping in which can be repeated across all apartments, see Appendix 22-29.



□ SUPPLY → SUPPLY UNIT C EXTRACTION → EXTRACTION UNIT THE CRICTIAL LENGTH THE VENTILATION UNIT ILL. 274 - VENTILATION PLAN FOR THE GROUND FLOOR



□ SUPPLY → SUPPLY UNIT [] EXTRACTION → EXTRACTION UNIT □ THE VENTILATION UNIT ILL. 276 - VENTILATION PLAN FOR THE APARTMENTS BLOCK





ILL. 278 - MEETING BETWEEN CITY AND CENTRE

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CONCLUSION

The new asylum centre, located in the creative and cultural hub of Aarhus K, manages to quietly position itself in a context of history and industry, while remaining a beacon of social and environmental sustainability. The centre is the embodiment of the climate changes and their impact on people, as the centre must take in refugees fleeing from the consequences of climate change, which have had irreversible consequences on their lives.

The urban location of the asylum centre creates opportunities for acculturation between the various cultures present in the centre and the culture of the Danish society. This will assist in the creation of a mutual understanding of each other and our similarities while allowing for the differences. In addition to this the city can offer the users a wide variety of activities, events, sports, culture and other recreational activities that can help in the reduction of the occupational injustice otherwise experienced by the asylum seekers.

In addition to the occupational qualities of

the city, the centre provides opportunities for meaningful participation in social activities in the common spaces, workshops and outdoor spaces, which can accelerate the mental healing process of the users. The activities create informal situations for the users to interact naturally, while providing purpose in a life that otherwise consists of waiting and uncertainty.

The outdoor spaces of the centre have been designed through a horticultural thinking where a variety in vegetation, functions, spaces and activities stimulate the senses, thereby further supporting the healing process. The outdoor spaces are split into three categories: the courtyard, the sensory garden and the roof garden. The courtyard, found in the heart of the building, ensures views to greenery throughout the ground floor, while improving the internal transparency and wayfinding of the building. The roof garden contains a highly diverse green environment with vegetable gardens, pavilions, niches and larger flexible green spaces to allow the users to influence the use of the spaces. Vegetable gardens are used to combine the horticultural therapy with an element of socialization and purpose, while the sensory garden provides a more therapeutic experience of nature in an urban context.

The housing units of the centre are designed in a way that ensures a sufficient flexibility to accommodate the cultural diversity in the asylum seekers arriving from all over the world. This is achieved using built-in furniture that ensures a good minimum spatial quality which allows the users to further decorate and furnish the secondary thing of the apartment to make it their home. The use of natural materials throughout the centre has created a good relation to the Nordic context and building tradition using wood, gypsum and concrete, combining it with low tech material like clay and cork. This palette manages to merge the vernacular materials found in the origin countries of the refugees and merging that with the materials used in a Danish context.

The use of Evidence-Based Design has aided the design process through the meticulous research of academic articles, reports and findings from experiments. This provided a solid theoretical foundation in the understanding of the user group and their needs which have ensured a high degree of empathy in the design process. The theoretical knowledge gained from the existing research have been supported by field studies, interviews and case studies that have allowed the critical interpretation of the knowledge to make it project specific. This method has clarified the concrete measures to be taken in the design of a mentally supporting asylum centre.

REFLECTION

The COVID-19 pandemic has affected people, societies, businesses and academia across the globe, and it is no different for this project. The learning, working and making of the last four years at Aalborg University have relied heavily on the ability to communicate and design in a physical environment using physical tools and processes. The pandemic forced a complete transformation of the usual design process and methods to develop the project under these new circumstances.

The increased digitalization of society and the field of architecture have allowed for a relatively smooth transition between physical sketching and modelling to the exclusive use of software for designing. The technological advancements in 3D modelling tools, BIM software and simulation tools have allowed the maintenance of a high architectural quality, despite the lack of the physical tools usually present in the process. The main concerns regarding the lack of physical models and sketching were the lack of detailing, as the use of 3D software can create a distance between the designer and the physical aspects of a proposal. This has been avoided using targeted workshops that focused specifically on the detailing of certain elements of the building like façade, structure, interior design and surfaces.

User-oriented design has been a cornerstone of the project, which was limited with the new global situation post-COV-ID-19. A secondary visit to Asylum Centre Jelling was scheduled to implement the users' feedback in the project, however this was cancelled due to the effects of the coronavirus. The sparring session with the users could have provided more detailed insights into their preferences in specific spatial situations, and thereby further improved the atmospheres and space planning.

Further explorations of the users' lives in their countries of origin could have been made to further support the design of culturally flexible spaces. This could have led to an increase in the user specificity; however, it could also minimize the cultural flexibility to a degree where users from two different regions might not be comfortable in the same space, negating the social sustainability. In addition to this, it must be considered that the arrival and stay in a space that differs from their original home could help mark the start of a new chapter for the asylum seekers, helping the mental distancing of their past traumas.

The scale, complexity and focus of the project has weighted the detailing of various spaces differently. In further development of the project spaces like the psychologist's office, day care, mindfulness and religious space could be detailed further, perhaps revealing new ways of thinking about the connection between residents, city and nature.

Further investigations into the life cycle of the building could be made to further explore the concepts of flexibility and modularity. The investigation could show how the building adapts to a change in use, which could further support the environmental and economical sustainability of the building. This would require detailing of the structural principles and building envelope to understand the assembly and disassembly process of the building. In addition to this the aspects of up- and downcycling could be investigated to understand how the building elements could find a new purpose in the form of furniture, cladding etc.

The academic approach of the project in relation to the selection of site resulted in an urban location for the asylum centre. The selection of the site at Aarhus K posed a number of challenges in the negotiation between room programme and the sensitivity required in the context. These challenges sped up the development process and ultimately resulted in a highly detailed proposal, which might not have happened with a less challenging site. This priority also matches the general user focus in the project, securing spaces of high quality for the users.

The relation between centre and city has been a key issue throughout the project, and the nature of the relation has changed throughout the process. The question of right of space could be raised as the interaction between city and centre happens exclusively on the users' terms. This is done to ensure that the users can seek out the social voluntarily. This has led to an abrupt meeting between centre and city, softened by the space-sharing ideas mentioned earlier, along with transparent and vibrant spaces on the ground floor. The implementation of outdoor spaces on the border between building and city could soften the meeting between them and provided shared outdoor spaces to allow for an even prioritizing of both user aroups.

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