A PARADISE FOR STARTERS

an affordable, adaptable, and collective way of living for starters

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INTRODUCTION

The costs for renting are nearly twice as high as the average monthly mortgage payment. On average, rent costs are 41,2% of an individual's salary, whereas homeowners only allocate 23,4% towards housing expenses (CBS 2021). The Netherlands is currently facing a housing crisis, posing challenges for starters. A significant scarcity of ground-level single-family houses has resulted in a challenge for 43% of first-time buyers who aspire to acquire a detached property with a garden. This shortage has made it increasingly difficult for them to easily find such housing options.

Abstract

The aim of this research is to explore the potential for achieving affordability in starter homes. The search for innovative housing models should not solely revolve around the ongoing reduction of living spaces. It is crucial to strike a balance between the urgency for compactness, the aspiration for increased spaciousness, adaptable architectural designs and the concept of communal living. Living in close proximity to one another increases the visibility and exposure of the boundaries between private and public spaces.

Objective

The aim of this research is to create a housing typology that is affordable for starters, with a focus on ensuring the quality of compact living spaces. By incorporating adaptable design principles, individuals can comfortably reside in smaller spaces and modify the layout according to their specific requirements and activities. This approach promotes efficient space utilisation, enabling multiple functions to be accommodated within a single area.

Adaptable architecture addresses the problem of expensive housing by enabling functional and compact living. However, it is rarely applied and lacks adequate research. Adaptable architecture focuses on the use of spaces and functions, minimising the transition between architecture and interior design. This specific relationship has been inadequately researched and is often addressed using standard housing dimensions and building regulations such as the Building Code and Woonvisie

Hypothesis

The Netherlands faces a substantial housing shortage, posing challenges for starters. To address this issue, a new housing typology is proposed, featuring adaptability, high density, and an emphasis on collective living, aiming to enhance affordability for starters. The modification of spatial characteristics in line with specific functions enables multiple functions to be accommodated within a compact area. Nonetheless, it is essential to ensure the preservation of characteristics such as natural light, ventilation, and communal living while compacting housing units

Starting statement

Architects intend to design a program that anticipates the future needs of the users. However, in the event that the building is capable of adjusting to the users' program at that time, it provides an opportunity for space optimization. Through new adaptable and collective typologies, we enable people to share, adapt, live smaller and only use what they need.

Shift

A new typology that is adaptive, collective and affordable for starters.

Expectation

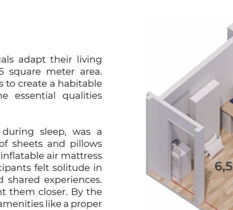
By carefully analyzing various optimizations, we can identify and incorporate the most effective elements into the design that emphasizes quality of life and communal living.

- It is difficult for starters to buy a house
- Our living efficiency suffers due to the need to adapt to the fixed living environment.
- Dutch residents have a large living area of 63 m².

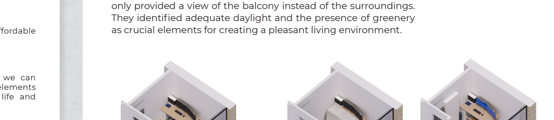
Experimental research
LIVING ON 6,5 m²

The study aimed to explore how individuals adapt their living spaces for different activities within a 6,5 square meter area. Participants were provided with furnishings to create a habitable environment. The participant learned the essential qualities required for effective functionality quickly.

Noise, particularly from the refrigerator during sleep, was a notable annoyance. Strategic placement of sheets and pillows served as effective sound barriers, while an inflatable air mattress proved inadequate. After a few days, participants felt solitude in the confined space, desiring intimacy and shared experiences. However, watching a film together brought them closer. By the eighth day, they desired more comfortable amenities like a proper bed or sofa due to discomfort. The inflexibility of the space and the constant adjustments required posed challenges. An adaptable space design was preferred to allow easier modifications and eliminate inconvenience. Additionally, the participants expressed a desire for a connection to the external environment, as the window only provided a view of the balcony instead of the surroundings. They identified adequate daylight and the presence of greenery as crucial elements for creating a pleasant living environment.

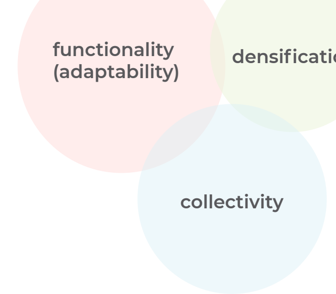


starting position


first night sleeping with noise from fridge — second night sleeping — studying, no distraction — sound from watching a video

"Noise is often the first irritation" "adapting is creating space" "adaptation should be easy"

HOW



AFFORTABLE LIVING FOR STARTERS

ADAPTABILITY ▶▶

GROUND FLOOR

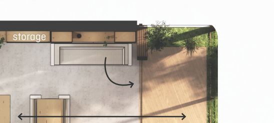
FIRST FLOOR - ADAPTION 1

FIRST FLOOR - ADAPTION 2

The dwelling can be adapted in various ways. For instance, the function of the living area can be adjusted by sliding elements containing furniture. During a large part of the year, these elements can be moved outside into the winter garden. The winter garden features integrated louvres that allow for sunlight blocking and the creation of privacy. The plants situated in front of the winter garden are also adaptable. During the summer, they provide shade by obstructing the sun, whereas in the winter, they allow the passage of light. Furthermore, residents have the freedom to choose the type of plants they prefer, whether to enhance privacy or create a more open atmosphere.

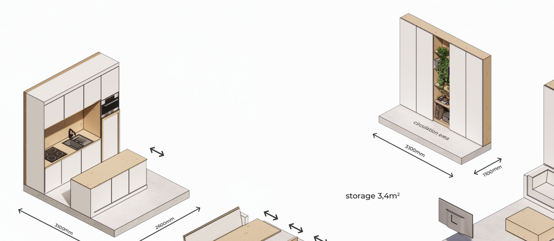
The apartments feature side-by-side bedrooms with slightly protruding sides to allow for ample natural light through the facade window. The angled design of the apartment enhances direct light entry into the bedroom, while the hallway wall offers indirect lighting for adequate illumination. The transparent and sliding partitions along the corridor enable the utilization of corridor space as an extension of the bedroom, providing additional functional space and allowing more light to brighten the bedroom for a spacious and pleasant feel.

ADAPTIVE LIVING ROOM



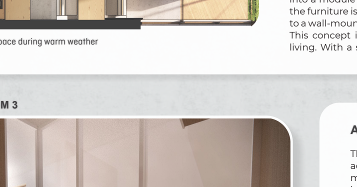
movble kitchen and dining room

increase living space during warm weather

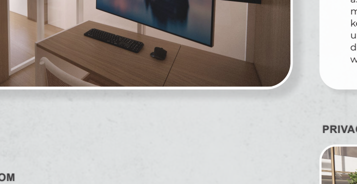


Inspired by filing cabinets, the furniture is incorporated into a module that can be slid. The module, to which the furniture is attached, has wheels and is connected to a wall-mounted rail driven by a silent electric motor. This concept is already proven by the company Ori living. With a simple press of a button, the modules can be moved to create space for another function. By minimizing the space occupied by unused furniture, room can be made for a different purpose. However, only two out of the three functions can be used simultaneously. Additionally, the dining room benches can be rotated to change their orientation and be used for other purposes. The element containing the sofa can also be rotated to be used in the winter garden, while also allowing for improved access to the cabinets located behind it. Furthermore, cabinets have been integrated into the walls to utilize this traffic space effectively for dual purposes.

LIGHT TEST BEDROOM 3

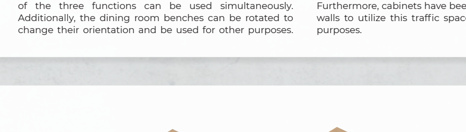


INTERIOR LIVING ROOM



ADAPTIVE PRIVATE SPACE

The experiment "Living on 6.5 m²" demonstrated that adaptable design allows small spaces to incorporate multiple functions. The concept includes a movable backrest that serves as both a bed and a TV viewing area. A slide-out foot panel allows for a reclining position. The backrest also functions as a mattress, forming a double bed. The slatted bed base can be stored underneath to accommodate two mattresses. The TV screen is mounted on an adjustable arm for height adjustment and dual use as a computer monitor. The desk features a foldable mechanism and provides space for accessories such as a keyboard and mouse. Storage boxes are integrated above, under the bed, and along the side walls. This compact design efficiently accommodates all desired functions while maintaining a sense of spaciousness.

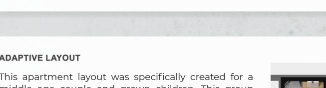

watching tv 3,6 m² — studying & single bed 2,8 m² — double bed 3,2 m²

PRIVACY WITH PLANTS AND SCREENS

ADAPTIVE LAYOUT

This apartment layout was specifically created for a middle age couple and grown children. This group posed the biggest challenge, as the adult children needed a space for studying, gaming, watching TV, and often desire a double bed. To better accommodate other target groups, all the walls on the second floor are movable, allowing for a customizable layout. Additionally, a water supply and drainage system have been added to the space, enabling the creation of a laundry area instead of the third bedroom.

empty second floor layout


respace adaptive wall element

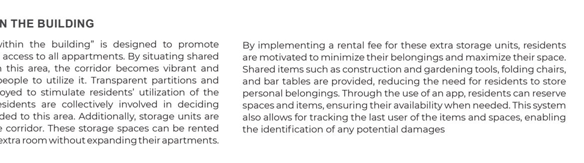
COLLECTIVITY ▶◀

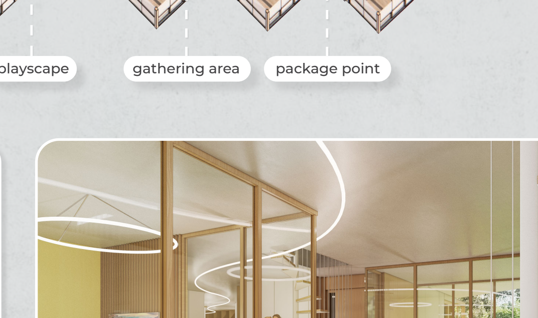
THE STREET WITHIN THE BUILDING

The concept "street within the building" is designed to promote interaction and provide access to all appartments. By situating shared spaces primarily within this area, the corridor becomes vibrant and inviting, encouraging people to utilize it. Transparent partitions and lively colours are employed to stimulate residents' utilization of the space. Furthermore, residents are collectively involved in deciding which functions are added to this area. Additionally, storage units are incorporated within the corridor. These storage spaces can be rented when residents require extra room without expanding their apartments.

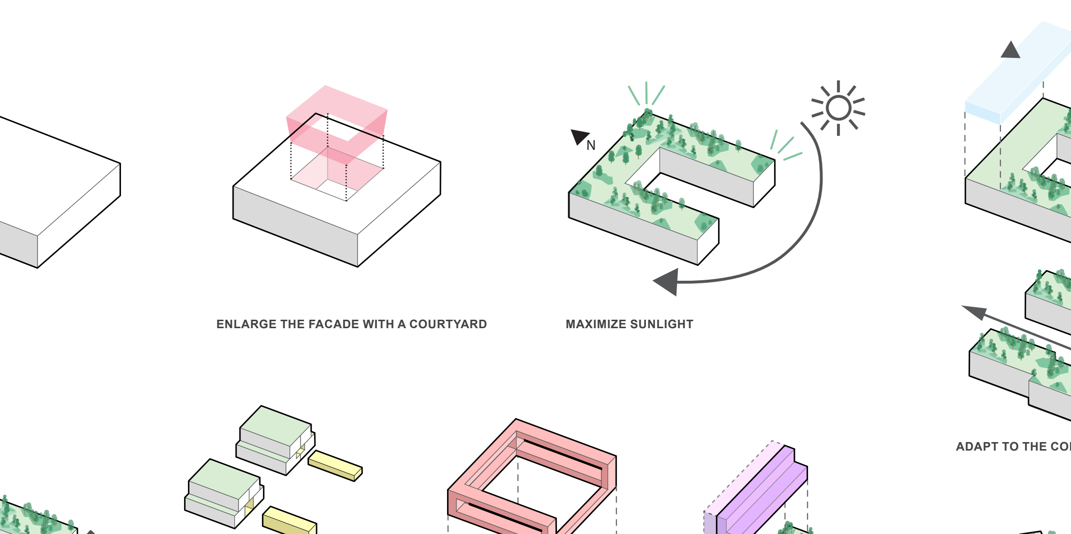
By implementing a rental fee for these extra storage units, residents are motivated to minimize their belongings and maximize their space. Shared items such as construction and gardening tools, folding chairs, and bar tables are provided, reducing the need for residents to store personal belongings. Through the use of an app, residents can reserve spaces and items, ensuring their availability when needed. This system also allows for tracking the last user of the items and spaces, enabling the identification of any potential damages

SHARED SPACES

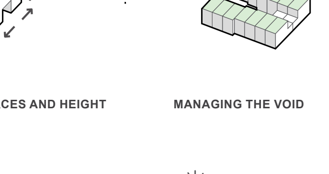




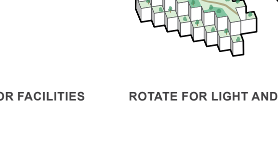
TYPOLOGY



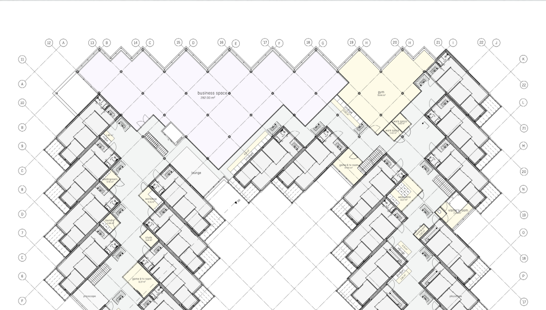
START VOLUME — ENLARGE THE FACADE WITH A COURTYARD — MAXIMIZE SUNLIGHT — ADAPT TO THE CONTEXT — CREATING TERRACES AND HEIGHT — MANAGING THE VOID — CIRCULATION FOR INTERACTION — REMAINING SPACE FOR FACILITIES — ROTATE FOR LIGHT AND PRIVACY



The design emerged from a quest for quality of life in high-density living, emphasizing the significance of sunlight and air. A courtyard garden has been introduced to increase the surface area of the facade. By creating an open side in the building block, sunlight is able to penetrate into the core of the building, illuminating the garden and interior. The building can adapt to its surroundings by providing an open or a closed building block option. It can even have a setback to provided better integration. By arranging the building in a staggered formation, sufficient space was created to accommodate a garden without impeding the flow of light to the level below. Furthermore, the apartments were made double-height to increase privacy and direct light towards the living areas. It also provides a separation between the space of being together and being alone. Furthermore, in order to increase privacy, the circulation space is situated in the centre of the building. Additionally, if the program allows it, a new type of apartment can be added to remove the void in the core on ground level. In order to avoid dead-end spaces and stimulate circulation and interaction, a circulation is established by interconnecting all the hallways with each other. The remaining vacant areas on the north side can be utilized for incorporating additional functions. Thereby increasing the overall mass and enhancing the affordability of the entire plan. Inspired by the work of Charlotte Perriand, the apartments were rotated a quarter turn, allowing light to penetrate deeper and creating longer lines of sight from within. This also provides a private space for the residence in-between the apartments, which is a suitable location for a garden.



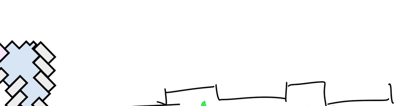
FLOORPLANS


FIRST FLOOR

SECOND FLOOR

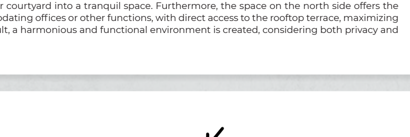
LOCATIONS ▼

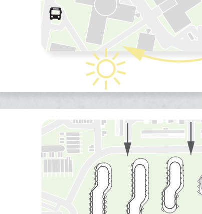
Merwedekanaalzone



The design for the location in Utrecht establishes a sense of seclusion from the surroundings, given its placement in an industrial area. This is achieved through the implementation of a closed building block, transforming the inner courtyard into a tranquil space. Furthermore, the space on the north side offers the potential for accommodating offices or other functions, with direct access to the rooftop terrace, maximizing its utilization. As a result, a harmonious and functional environment is created, considering both privacy and optimal usability.

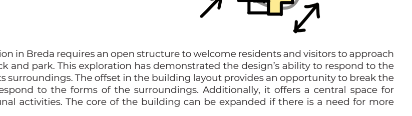
BREDA
Brabantpark

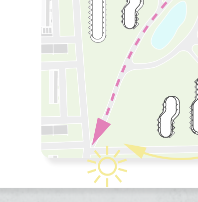




The design for the location in Breda requires an open structure to welcome residents and visitors to approach the new residential block and park. This exploration has demonstrated the design's ability to respond to the contextual nuances of its surroundings. The offset in the building layout provides an opportunity to break the repetition and better respond to the forms of the surroundings. Additionally, it offers a central space for circulation and communal activities. The core of the building can be expanded if there is a need for more shared or retail space.

AMSTERDAM
Grachtengordel-Zuid





The concept on the location in Amsterdam requires the addition of a new elevated ground level to enhance the quality of the gardens. The elevated level enables individuals to create a sense of separation from the bustling environment. The north-facing area and the space beneath the new ground level can be used for offices, retail, and shared spaces. The rooftop terrace is accessible from the entire building and serves as a distinctive feature within the city.

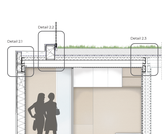
OPEN BLOCK

CLOSED BLOCK

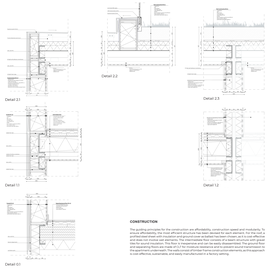
SECTION

The typology includes two distinct types of apartments: Apartment A, which is the most common and standard type, and Apartment B, which serves as an addition to the standard layout. The key difference between the two lies in the bedroom configuration. In Apartment B, it comes at the expense of the bedroom in the second floor, which is reduced in size to accommodate a mezzanine level located in the area of the upper floor. This arrangement enables the residents to meet the requirements of the Construction Ordinance, ensuring flexibility and adaptability.

TECHNICAL SECTION



DETAILS

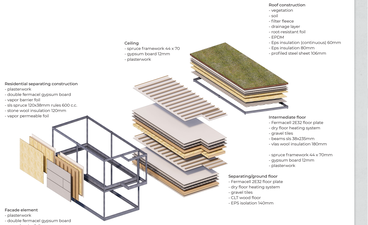


CONSTRUCTION

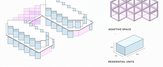
The guiding principles for the construction are affordability, construction speed and modularity. To ensure affordability, no more efficient structure has been desired for each element. For the roof, a cold roof with a wooden structure was chosen, which is lightweight and allows for the installation of a grass roof and ideal insulation and sealants. The intermediate floor consists of a beam structure with gravel fill, which provides good sound insulation and thermal mass while being cost-effective. The ceiling and separating floors use a hybrid CLT structure, balancing cost and performance. The facade element is a prefabricated wooden frame with insulation and cladding, ensuring rapid construction and high quality. The staircase and balcony are made of prefabricated concrete elements, which are cost-effective, sustainable, and easily manufactured in a factory setting.

CONSTRUCTION

CONSTRUCTION UNIT



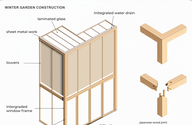
CONSTRUCTION CONCEPTS



CONSTRUCTION

The construction is divided into two parts. The residential area is constructed using a wooden structure, ensuring rapid construction on a large scale. The remaining space on the other side is chosen structure to allow for free space selection. Various construction methods were considered for the unit and a choice was made based on factors such as affordability, sustainability, rapid construction, and environmental impact.

WINTER GARDEN CONSTRUCTION



ARCHITECTURE

ARCHITECTURE

The architectural concept is inspired by the notion of porosity, as the project aims to create an urban environment characterized by a dynamic interplay of green spaces. The concept seeks to evoke a sense of tranquility and harmony with the surrounding nature.

In ancient times, porosity was described as a narrow passageway and regulated natural environment. The concept of porosity in this project is interpreted as a dynamic and stressed-out urbanist arrangement of all natural elements, including the residents themselves, ensuring it was a safe haven amid everything else nearby.

"The concept of porosity envisions the harmonious arrangement of various elements"

FACADE COMPOSITION

Facade and the concept of porosity, our chosen materials such as stone, wood, and glass, underscore this ethos. The stone facade, for instance, features DUCTILITE coated with a rough texture and powder elements for the corner pieces, mirroring the porous nature of natural stone while maintaining structural integrity. The wooden slats on the balconies and shared spaces further enhance the porosity, allowing for the interplay of shadows in the composition. This reference to porosity extends to the glass windows, which are designed to be easily cleaned by residents, in effect, porous and dynamic, resulting in a changing animation of light and shadow throughout the day.

CONCLUSION ▲

The living space of the apartment is expanded through various means. Despite the apartments' compact size, the layout maximizes functionality and accommodates a family of four within a total floor area of unit price of 114,000,- (excluding land and shared spaces). Additionally, there are multiple shared spaces that enhance the advantages of the apartment, which is at least 20% m² for the cost of 22m². Moreover, the design incorporates a variety of sustainable features, including rainwater harvesting, photovoltaic cells, and a green roof, aligning with the project's sustainability goals and contributing to overall cost savings. The construction methodology also presents opportunities for efficiency and cost reduction. By prioritizing space and light, the apartment offers high-quality living conditions comparable to a terraced or detached house, yet at an affordable rate.

REFLECTION

During the design process, numerous decisions were made, leading to a range of potential outcomes and the current design is one of them. In this project, choices were informed by experimentation, research, and personal preferences, with the ultimate goal being to create a high-quality living space. The balance between different priorities, for example, creating a higher density was not preferred, as this had a negative impact on quality of life and building cost. While the design is not completely customized for the specific site, the concept could be adapted to other sites with similar conditions. The decision-making process and testing of the concept should show whether the concept is affordable. By testing out the concept at a specific location, the concept can be improved over time, resulting in a more efficient design. The concept of this project could be further developed by incorporating more sustainable features and conducting more numerous experiments and the use of a diverse set of tools. An interrupted design has been achieved.

apartment (min 18m²)		living space		adaptive room		semi-climate		total area
58 m²	+	12 m²	+	8 m²	+	8 m²	=	86 m²

28 m²

shared spaces (approx.)		
3,5 m²	=	224 m²