Design sustainable buildings simply and effectively with the Compass

It’s not always easy building green

Architects are all too familiar with the challenges of building sustainably. From affordability to aligning stakeholders, it’s an unfortunate truth that sustainable construction comes with its own set of complexities.

That’s where the Compass comes in. This free tool offers a simple, holistic framework for the planning, ideation and design of sustainable buildings. Using seven design drivers, the Compass streamlines collaboration between teams, while ensuring quality and integrity throughout the entire design process.

You’ll be able to make more informed, sustainable design decisions from the get-go, with little cost and effort. And the earlier these considerations are thought into the process, the greater the impact.

The model

The Compass model provides the foundation for Living Places and serves as a strategic tool which outlines seven points of relevancy to guide the building and development process.
The Compass provides an incremental approach to guide the building and development process and is layered in three steps:

1. Each new project begins with an evaluation of the 'Strategic Drivers' that are most pertinent and can ensure the greatest positive impact.

Strategic drivers

Relevancy drivers are used in the early stages of a project. This enables the team to constantly benchmark ideas and concepts against these drivers.

2. Project teams then draw on 24 'Design Drivers' as input for the concept development process, based on the brief and specific needs of the project.

Design drivers

Design drivers are used when the user has developed a concept/strategy for their project. This stage provides a wider range of parameters to be aware of and use in the design development of a project.

3. An extensive set of 'Performance Drivers provides targeted solutions and strategies for the more advanced stages of design.

Performance drivers

The Compass provides a list of Impact drivers to ensure that the ambitions from stage 1 & 2 are achieved. The list of decisions ensures that the drivers are turned into tangible solutions for the project.

Seven strategic drivers

The Compass is structured around seven key drivers, each representing a different aspect of the design process. By considering these drivers and the way they work together, the Compass allows us to priorities design decisions and identify any areas that may require extra attention.

Flexible

Our homes must be responsive to changing life patterns and different ways of living. By designing homes that can be easily dissembled, we can reduce waste and make it simple to make updates based on our needs. Smart, responsive systems allow for ultimate flexibility, and allow us to connect to innovative community services and opportunities.

Quality

good quality building is designed and built to last. With the typical user in mind, homes are designed for longevity, using quality materials and low-maintenance solutions that can be loved and lived in over and over again. It's about merging aesthetics, function and sustainability without compromising on quality.

Environment

More than 70% of a building's environmental impact comes from its materials. Homes should be designed, delivered and maintained in respect for planetary boundaries. By carefully considering the impact of each material and choosing durable alternatives, we can create homes with smaller footprints, longer lifespans and minimal environmental impact.

Healthy

A healthy indoor climate can do much more than alleviate chronic diseases and allergies it can improve the safety, productivity and overall health of its occupants. Homes should therefore be designed a focus on creating an optimal indoor climate - one filled with daylight and natural ventilation to leave a positive impact on mental and physical health and wellbeing.

Community

Beyond its walls, buildings have a huge impact on their surrounding environments. Homes should be designed as part of a community, where people can connect and engage, share and support. Communities designed in this way can provide the benefits of social contact, sharing space and resources, and reducing negative environmental impacts.

Local

Homes should explore contemporary approaches to traditional building designs. Seeking context and inspiration from local building and climatic traditions, each home should be designed with respect to its surrounding environment, apply materials, technologies and solutions that have proven valuable over time.

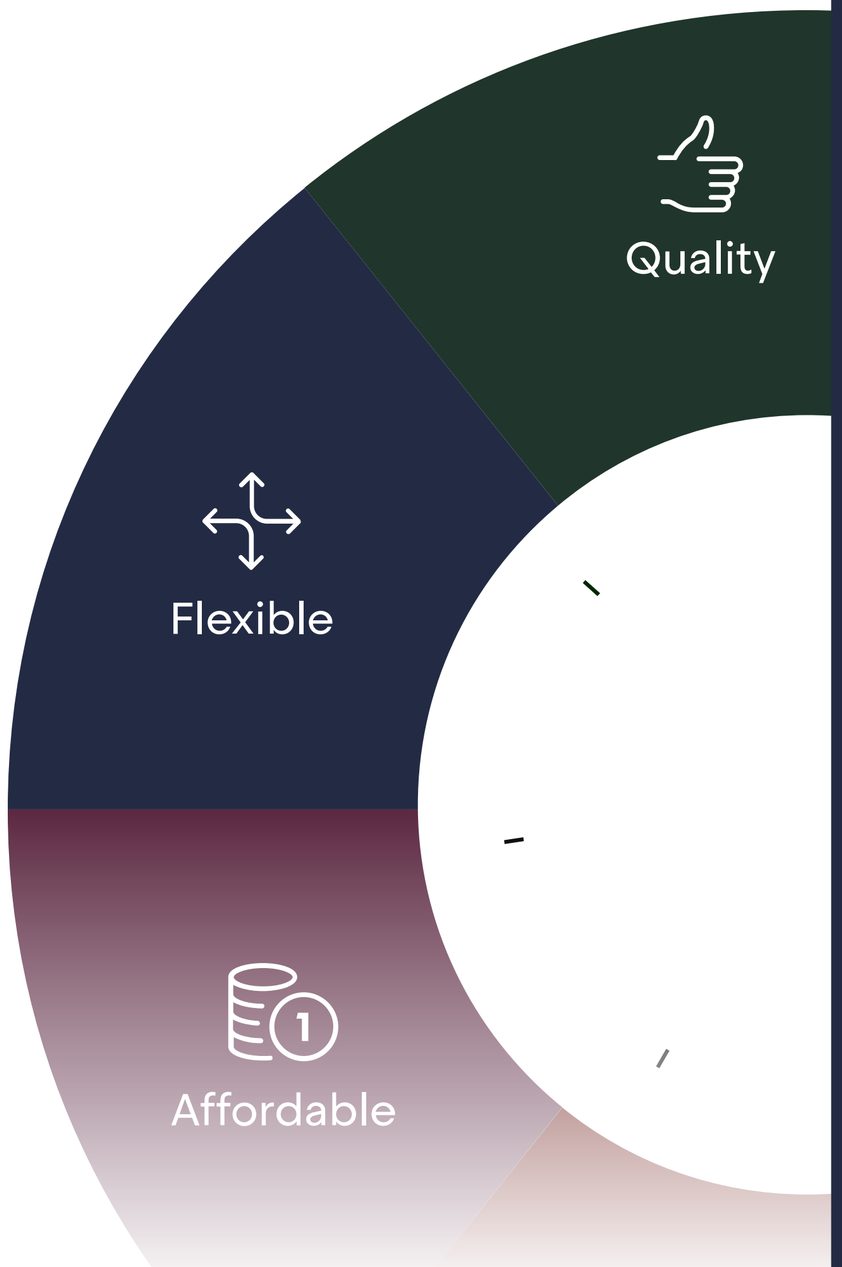
Affordable

It is economically feasible for the average European citizen to live in a home that is healthy, sustainable and costeffective without negatively impacting life on this planet. Homes should challenge the one-size-fits-all logic and adapt to enable diverse ways of living at an affordable price

02

Strategic driver

People can actively shape their home, environment and community to everyday life needs through smart, responsive tools and services. Homes must be re- sponsive to changing life patterns, situations and needs. Through smart systems, people can control homes and connect them to innovative community services and opportunities.



Flexible

Building typology

Developers can choose from a rangeof modular building typologies that best suit their specific requirements.

Performance drivers

Set of typologies

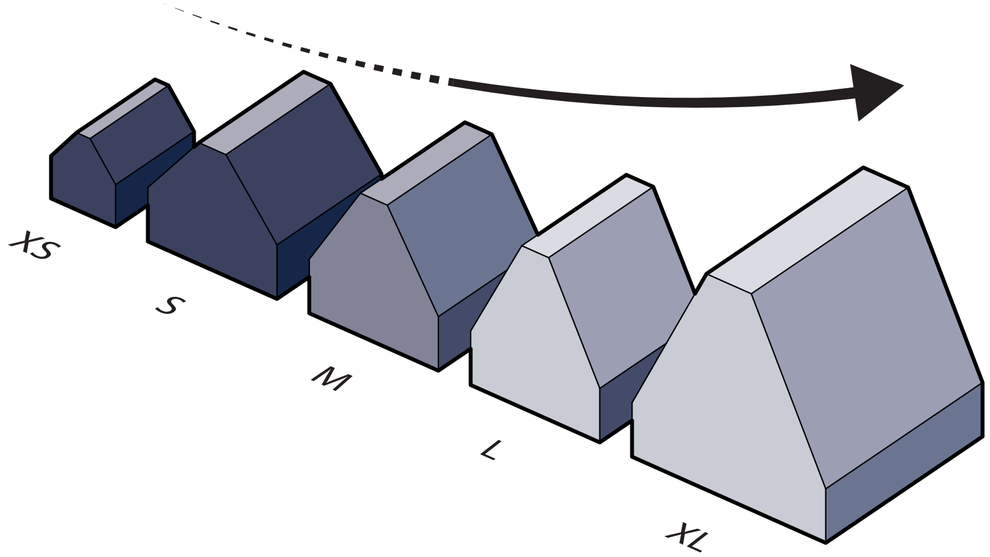
Catalogue of different sizes that can accommodate different user groups and the functions that they can have.

Future proof

Capacity to adapt to different types of interventions (new construction, renovation or expansion).

Location flexibility

Capacity to adapt to different environments (rural, urban and suburban).



Interior

An adaptable interior floor plan meets the homeowner's needs through their phases of life.

Performance drivers

Flexible furniture & appliances

Furniture and appliances with various functions that can be arranged according to the user needs.

Flexible storage

Storage space that can be rearranged and reconfigured to adapt to changing needs.

Flexible partitions

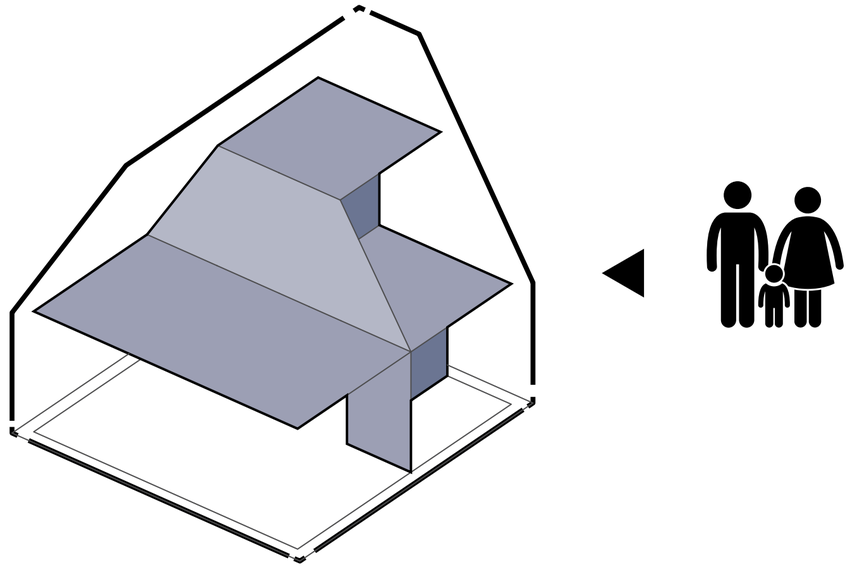
Partitions can be moved or disassembled allowing users to modify the interior arrangement of the building.

Flexible floor plan

Floor plan can adapt over time to meet the changing needs of the homeowner.

Flexible map

Services and elements can be easily connects, replaced and updated.



Shared spaces

Flexible shared spaces enable a wide range of activities for different users through the day.

Performance drivers

Common spaces

Common spaces that enable residents the flexibility to include various programs, that suits the communities needs. Common spaces can both be designed for internal use only or be publicly accessible.

Common green areas

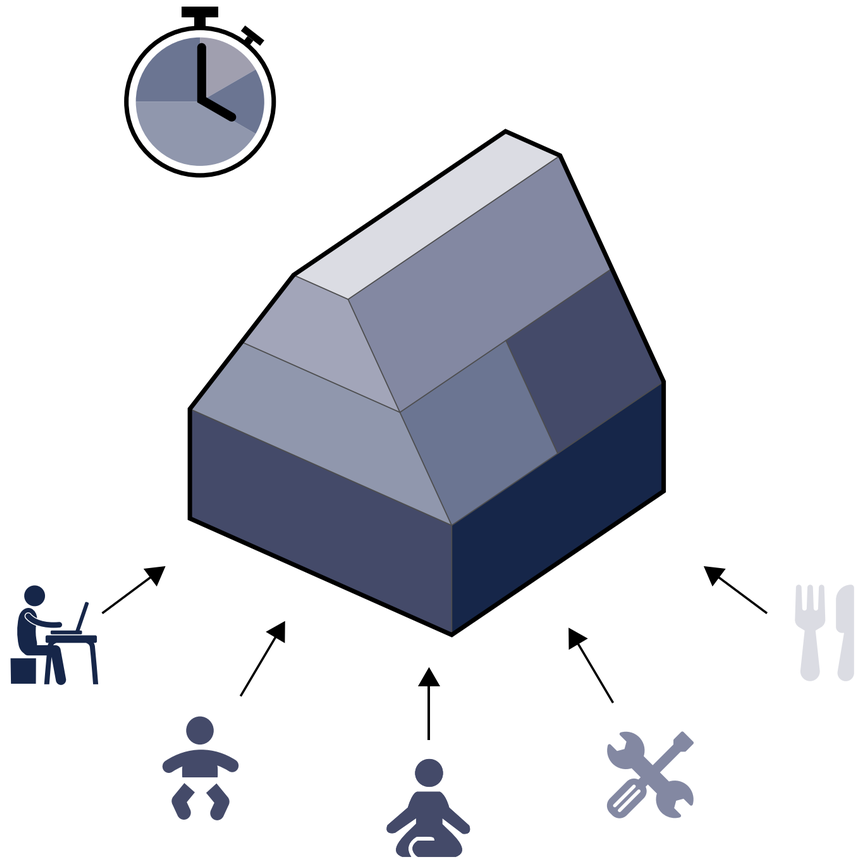
Opens up for the informal meeting between residents. This enables them to create points of interactions between the buildings. Thereby enhancing the usage of the outdoor areas and widening the boundaries of what they consider home.

Common facilities

Increase affordability and flexibility by sharing the space for some functions that do not happen often. Guest room, workshop and repair room, playroom and kids space, sport facilities, greenhouse, etc.

Function stacking

Ensure that each space can hold several functions (efficiency) and that main activities can take place in several spaces (resilience).



Responsiveness

Integrated systems ensure that homes can adapt to a dynamic everyday life based on the user's needs, to meet evolving individual, social and environmental demands.

Performance drivers

Feedback on indoor climate

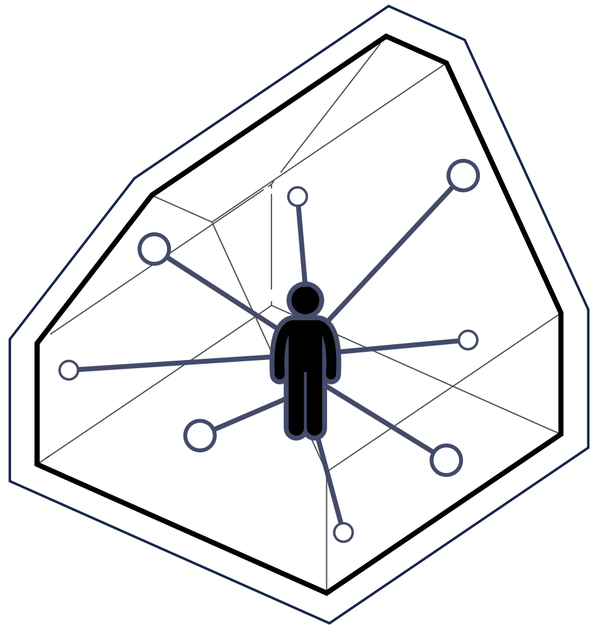
Indoor climate measurements are visualized to the users to inform and enlighten how the building is performing. For example with a Netatmo solution and visualizations on the manufacturer's own app.

Feedback on consumption

Real time consumption patterns are monitored and visualized for users, promoting responsible use of energy, water, etc.

Best practices manual

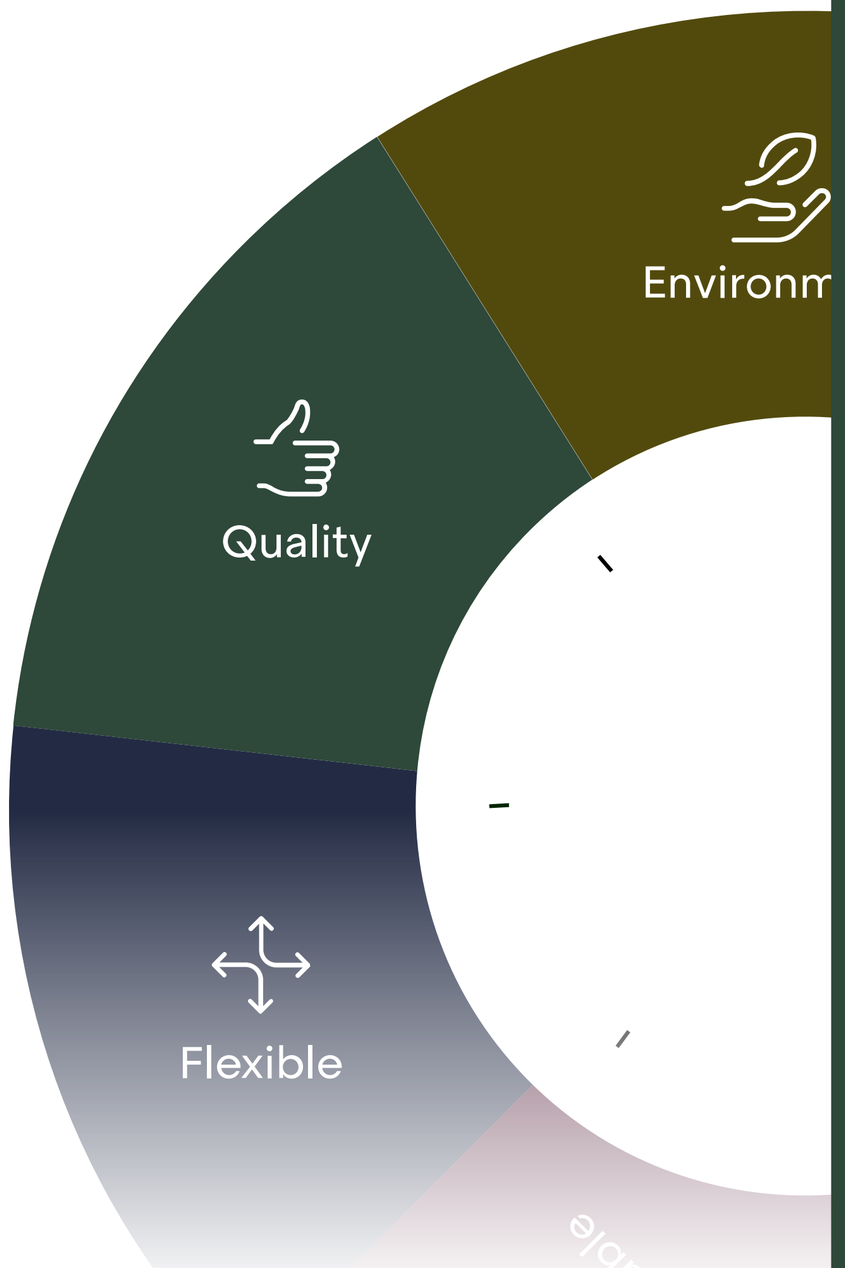
Provide users with the needed knowledge on how to efficiently control their space. User oriented perspective to the operation and maintenance of materials, indoor climate and energy systems.



02

Strategic driver

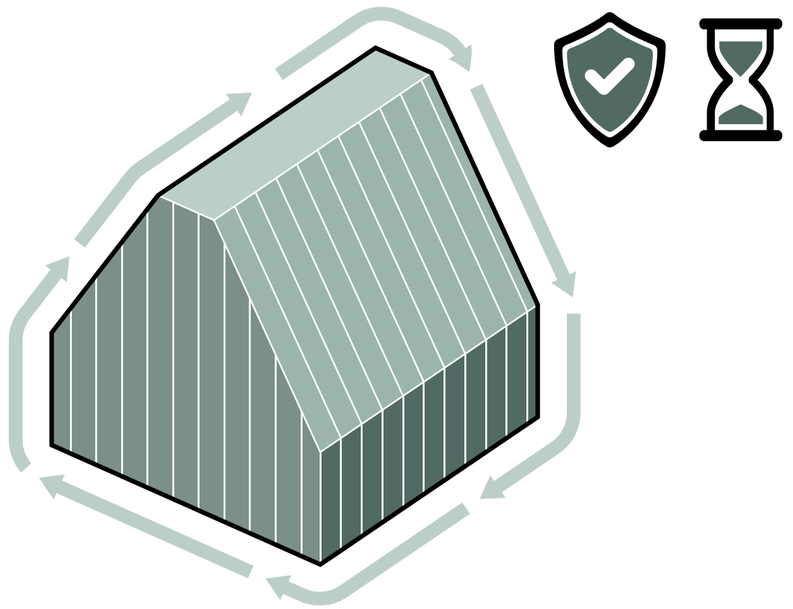
Homes are designed for longevity, using aesthetics and functional design to enable caretaking and durability. Homes are designed with a user-centric approach. Quality materials and solid solutions designed to last equals longevity, and creates a sense of home.



Quality

Durability

Homes are designed for durability and their individual components are chosen based on their intended use and lifetime.



Performance drivers

Durable materials

Material selection with long durability in relation with the intended lifetime use.

Easy cleaning

Select easy to clean surfaces, and materials that do not need chemicals to be cleaned.

Easy repair & maintenance

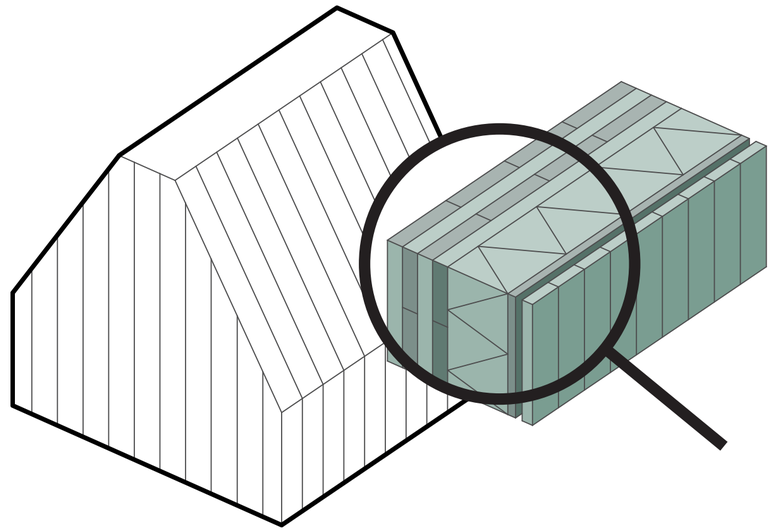
Designed for easy repair and maintenance to increase durability of the system.

Trade-off

Balance between sustainable materials and their lifetime spam.

Assembly

Careful consideration of how the different parts of the building come together, ensuring balanced and aesthetically pleasing interfaces.



Performance drivers

Design for disassembly

Select products and systems that allow disassembly and reuse.

Easy replacement

Solutions and materials with reduced maintenance and longer times between replacements.

Safe assembly

Select building systems that ensure safety for workers.

Nature of the space

Careful consideration of how the different parts of the building come together, ensuring balanced and aesthetically pleasing interfaces.

Performance drivers

Material connection with nature

Incorporation of wood-based surfaces in the indoor environment. Visible wood has proven to have a beneficial effect on users' experience of well-being and should help to create a feeling of living in a wooden building.

Thermal & airflow variability

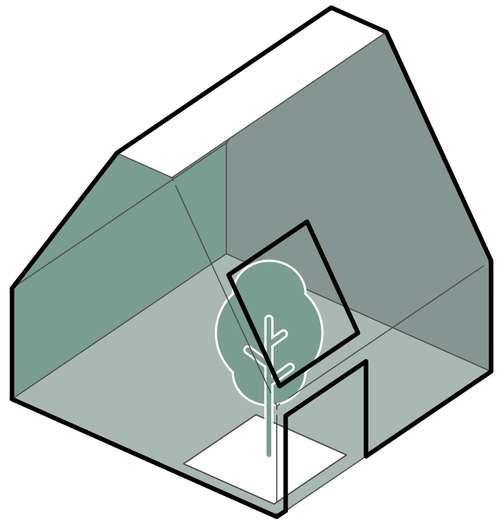
A space with good Thermal & Airflow Variability feels refreshing, active, alive, invigorating and comfortable. The space provides a feeling of both flexibility and a sense of control.

Bring the outdoors in

Introducing nature internally has the same effect as externally - well-being and fewer sick days.

Dynamic & diffuse light

Dynamic & Diffuse Light leverages varying intensities of light and shadow that change over time to create conditions that occur in nature.



Outdoor connection

Outdoor and semi-outdoor areas are designed to be easily accessible, visible and inspiring.

Performance drivers

Direct view of nature

Direct view of nature has proven to have a beneficial effect on users' experience of well-being. Sky or earth must visible from the living room via a 30-degree angle.

Direct access to nature

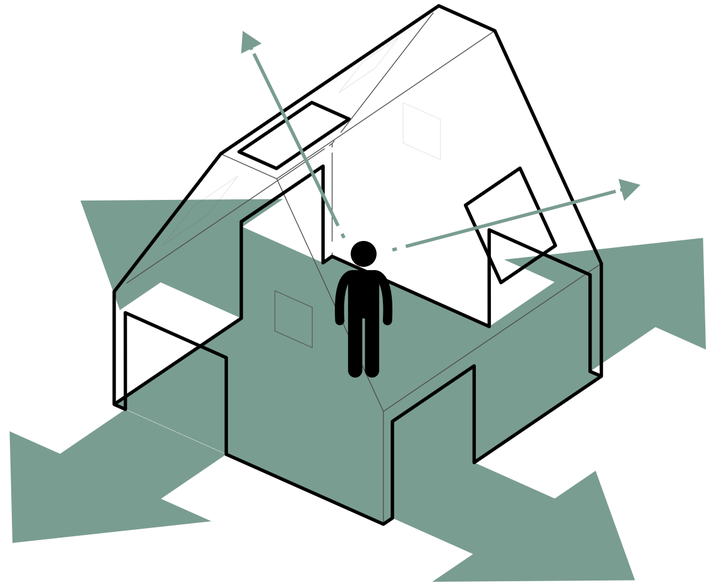
Direct access to nature ensures increased hours spent outdoors. Being more outdoors has multiple health benefits.

Semi-private open space

Creating a semi-private open space outside the home, makes it possible to open up the home without inviting the public inside.

Presence of water

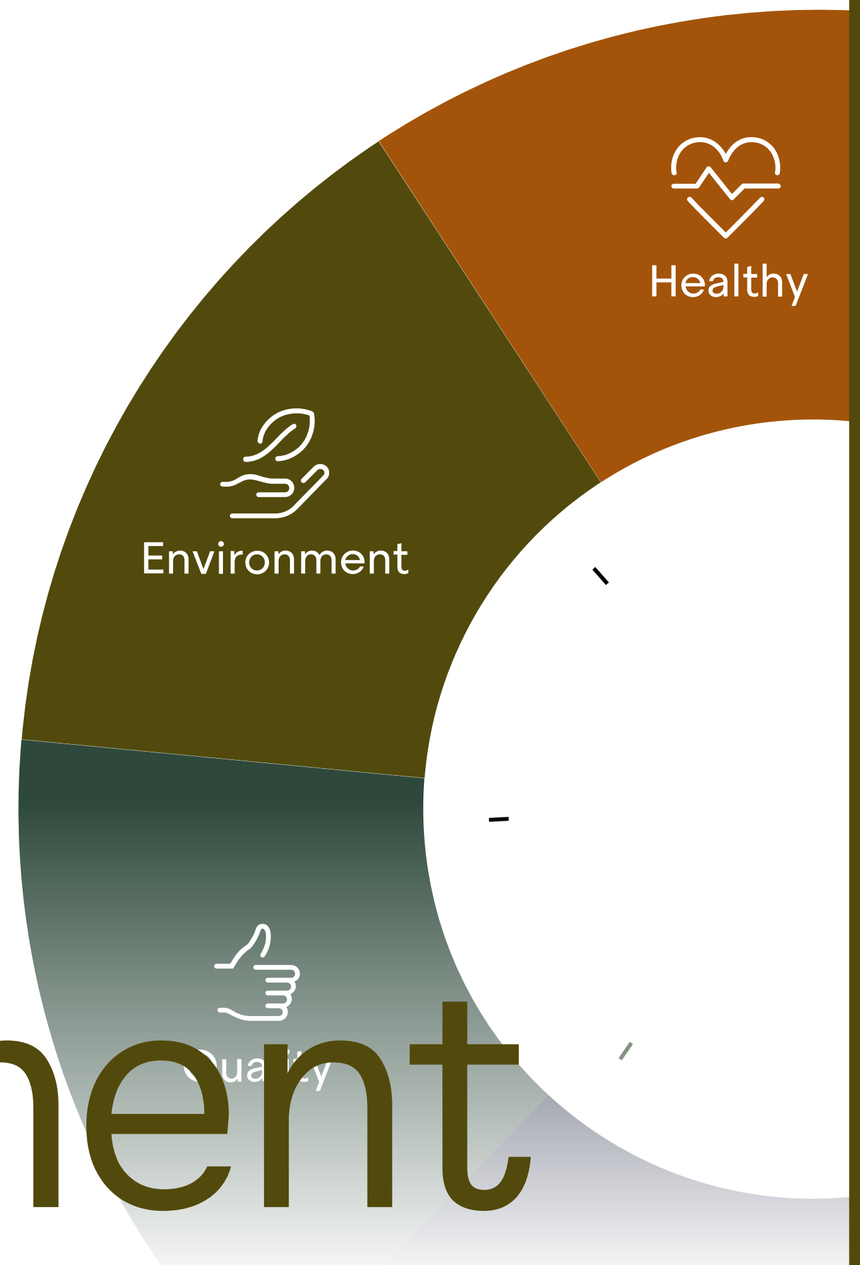
Presence of water is a condition that enhances the experience of a place through the seeing, hearing or touching of water.



03

Strategic driver

Our homes, and the way they frame our lifestyles, are designed, delivered, and maintained in respect for planetary boundaries. The footprint of a home adheres to best practice targets in all aspects, and must account for total service life of a building including emissions and consumption impact.



Environment

Embodied energy

Homes are designed and built with a high level of material efficiency to minimize carbon footprint.

Performance drivers

Low impact materials

Accounting of all the embodied carbon emissions (tCO2e) from the construction process (including energy consumed during construction).

Optimize floor area

Multifunctional spaces and optimized floorplans with fewer “dead areas” greatly reduce the amount of materials used.

Prefab construction

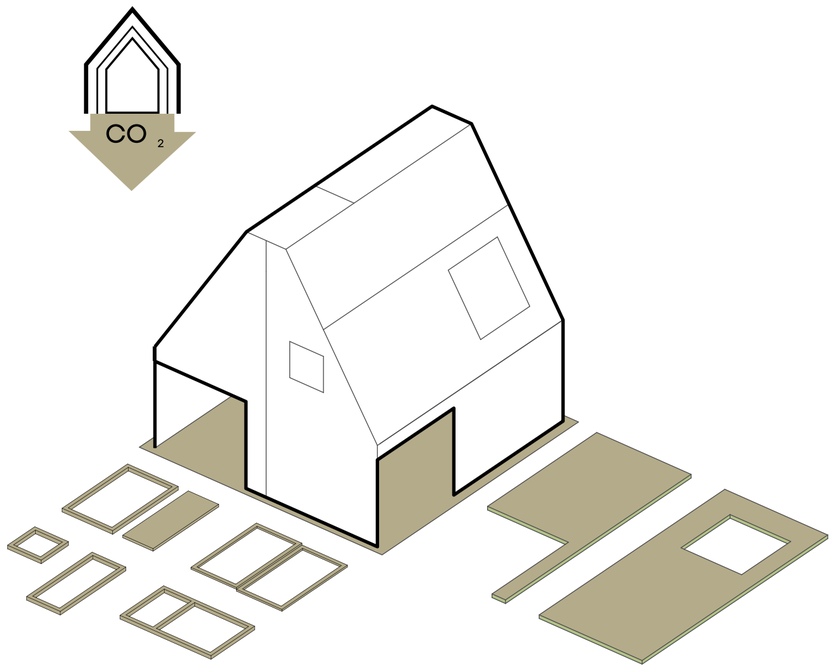
By using prefab elements waste is reduced during construction significantly. This reduces embodied emissions and ensures resource efficiency.

Material efficiency

Select constructive solutions that reduce the amount of material needed.

Biobased materials

Select natural materials wherever possible to offset the carbon footprint of the building, to increase well-being for occupants.



Operational energy

Best practice building principles increase the home's energy efficiency and resilience in the use phase.

Performance drivers

Motion sensors

Motion sensors in selected indoor and out- door areas can automatically turn off the light when there is no activity, thereby saving on electricity.

Water-saving faucets

Use of water-saving faucets and showers. The lower water consumption also results in a smaller heating consumption, as less water has to be heated.

Renewable energy

Installed on the roof or in the community to provide free and renewable energy for use in the household or to operate a electrical appliances.

Energy efficient systems

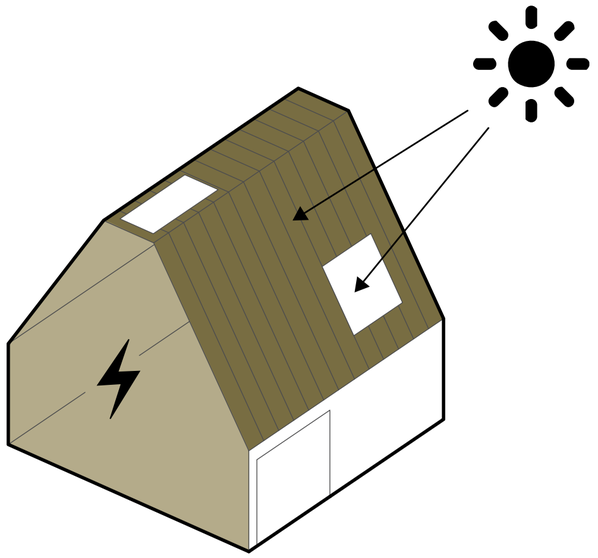
Use energy effective system like a heat pump to efficiently utilize the energy in the outdoor air to heat water for heating and domestic hot water.

Energy-saving design

Optimized orientation of windows and shading systems. Shape and location of the building. Constructive solutions.

Energy-saving appliances

Installation of efficient services (Lighting, heat pumps, extractors...).



Lifecycle

Homes are built for responsible disassembly to increase possibilities for future recycling of materials and components.

Performance drivers

Focus on reducing the LCA emissions

Understanding a building's LCA allows to focus on how to reduce the emissions, and benchmark materials and systems in order to select the best option. Perform LCA including all the phases of the building.

Utilize/optimize recycling potential

Investigate the possibility of reusing or upcycling materials considered "waste" that would otherwise be demolished, incinerated or sent to landfill.

Improved lifetime of systems

Use technology to extend the lifetime of utilities and services if possible to reduce waste. Examples: Controlled systems, filters for soft water.

End of life strategies

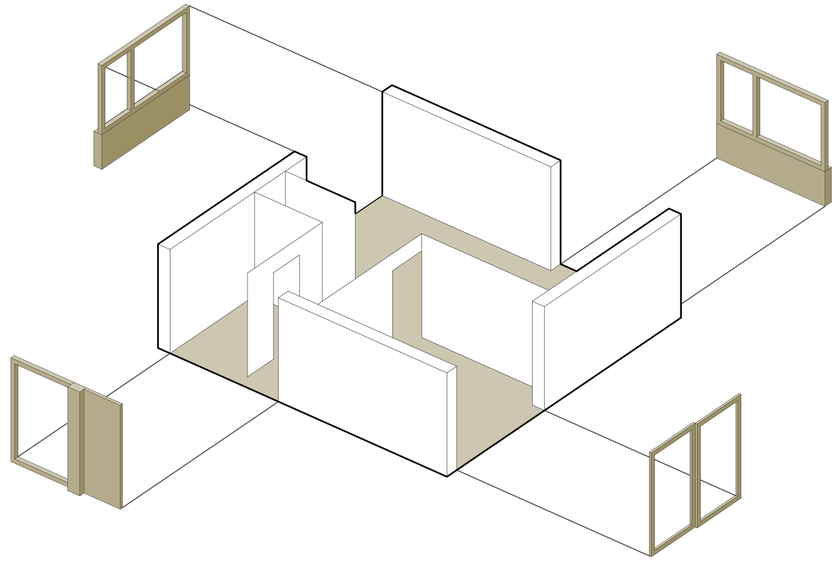
Define what strategies will be implemented at the end of use of the building for the different components and materials and take back schemes.

Materials with a long lifespan

Use materials with a long lifespan to ensure an extended lifetime for the building.

Digital twin

Digital twin of the building to have an overview of all components and facilitate maintenance and management.



Material sourcing

Ethical and environmental profile is improved by using components where sustainable raw materials are sourced responsibly through proper documentation.

Performance drivers

Certified materials

Prioritize the selection of materials with documented environmental product declaration (EPD).

Local sourcing

Set a target for the distance that material can travel until the construction site.

Healthy materials

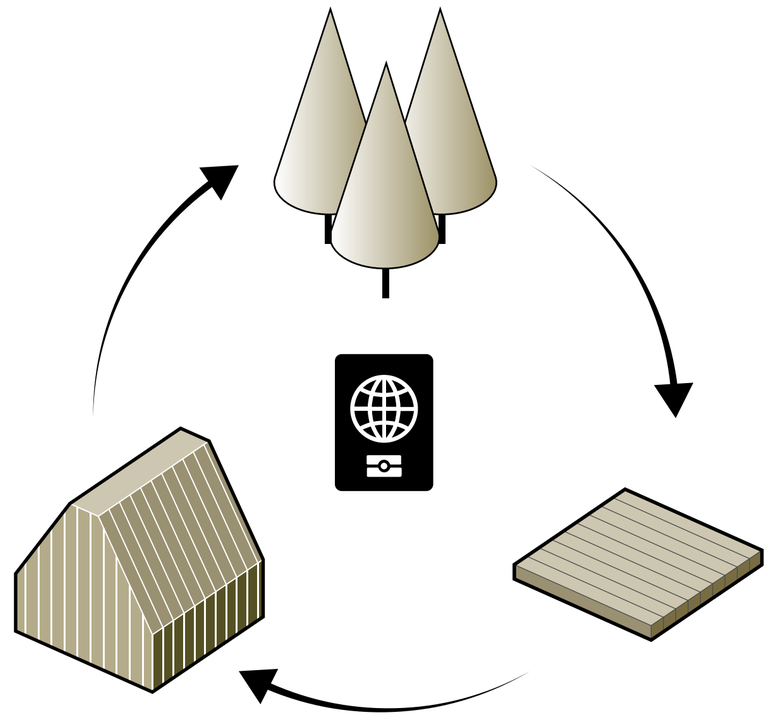
Select materials that do not have any known ad- verse effects on the health of users and the natural environment.

Material passport

Securely stored, digital record of information on the material source and processes until installed in the construction site.

Building passport

Securely stored, digital & up-to-date record of information on a building throughout its lifecycle.



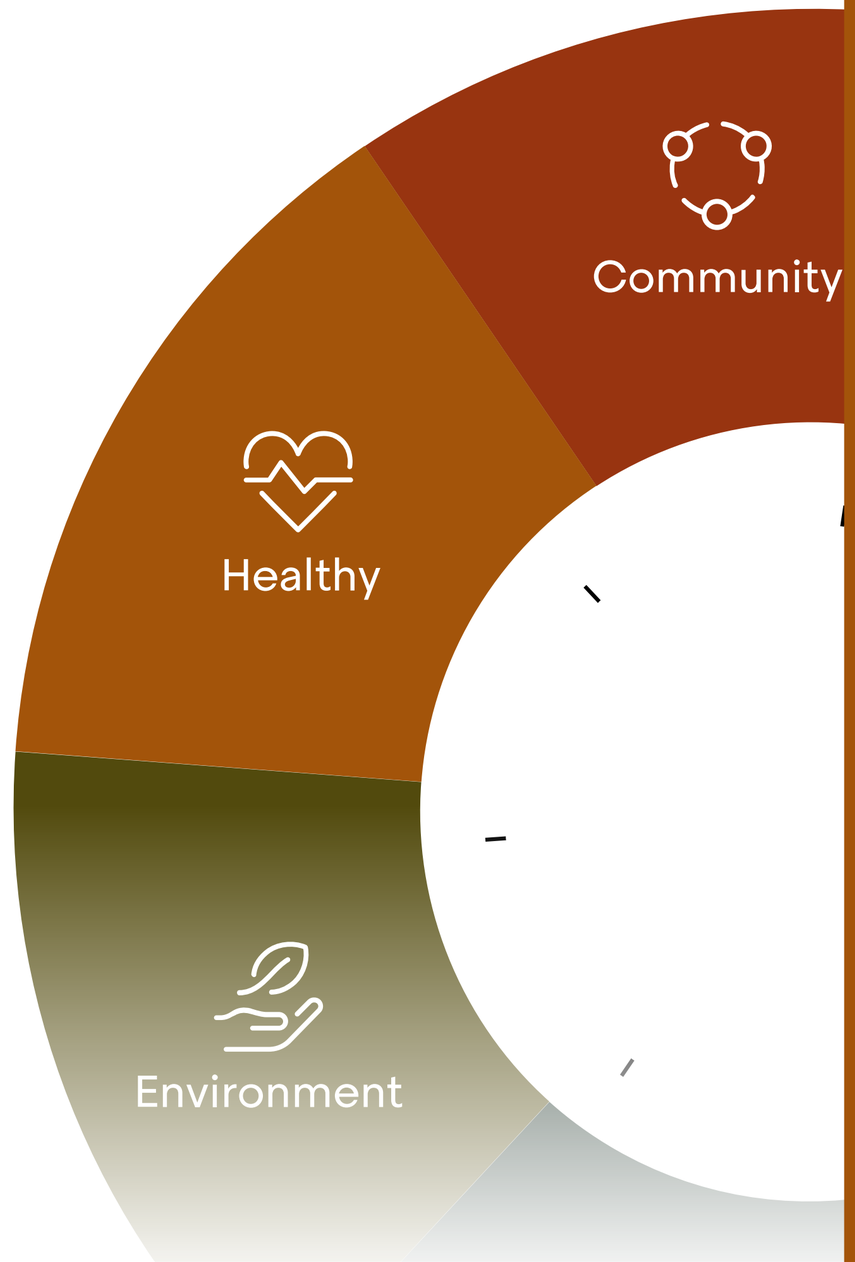
Compass
Flexible
Quality
Environment
Healthy
Community
Local
Affordable

04

Strategic driver

Homes enable an indoor climate that is regenerative and focused on humans, mental and physical health and well-being. How homes are designed and operated plays a crucial role in supporting physical and mental health. Enabling an optimal indoor climate is an essential aspect in house design. Chronic diseases and allergies can be alleviated through a healthy indoor climate.

Healthy



Visual

Typology ensures plenty of daylight to eliminate the need for artificial lighting during the day.

Performance drivers

Increased daylight

Secure sufficient daylight by optimizing the windows in relation to the use of room.

Daylight in circulation spaces

Hallways and stairwells can be used to allow daylight to enter spaces where proper daylighting may not possible.

Quality of electric illumination

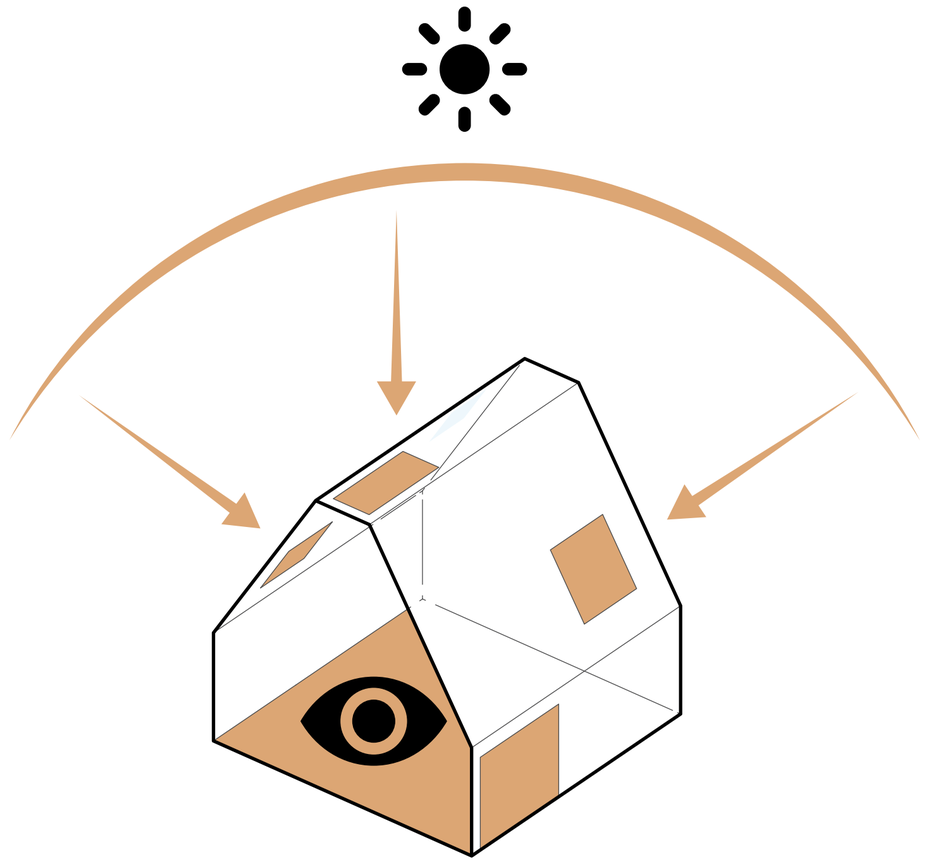
The electric lighting sources must have sufficient drivers that protect against flicker. CRI values and color temperature must be of high quality (focus on CRI9).

Utilize direct sunlight

Ensure the access to direct sunlight for the different spaces and uses.

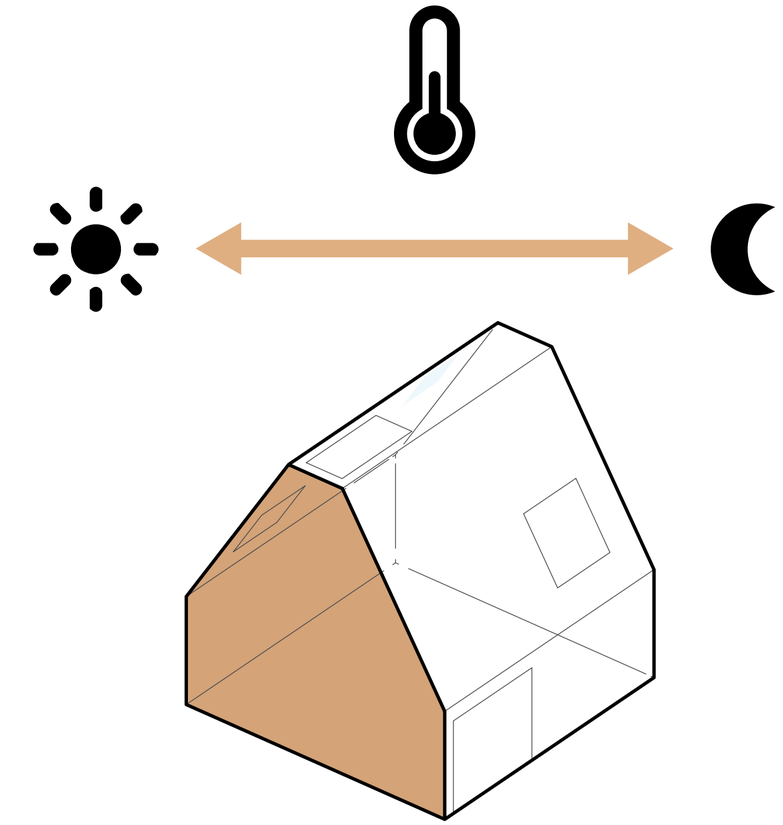
Reduce risk of glare

It is important that no contrast glare is created. This can be done with carefully composed materials which do not constitute significant luminance contrasts. Define surface reflectance.



Thermal environment

Designing for year-round comfort, while ensuring temporal and spatial variations in the thermal environment.



Performance drivers

Sufficient ceiling height

Increased ceiling height gives a feeling of spaciousness. In addition, it acts as an active buffer in relation to air quality.

Building depth

Design of building volume and depth, should be designed in a way that contributes to good daylight and wind conditions and optimal location of living room.

Opening windowssources

Opening windows enables to quickly ventilate the home with outdoor air on hot summer days and in case of air pollution. Quick removal of moisture and odor nuisance from bathroom.

User control of the indoor climate

Users must be able to regulate the indoor climate themselves - light, temperature, air, solar shading / glare (focus on not creating too large temperature zones).

Indoor air quality

Maximizing ventilation potential through stack effect and optimal positioning of windows.

Performance drivers

Indoor climate labeled products

Use materials with a low offgassing that are certified.

Cleaning-friendly surfaces

Select materials that are easy to clean and maintenance, this increases indoor air quality.

Proper filtration

Filtration of external pollen particles so that the indoor climate is cleaner than the outdoor climate.

Robust ventilation system

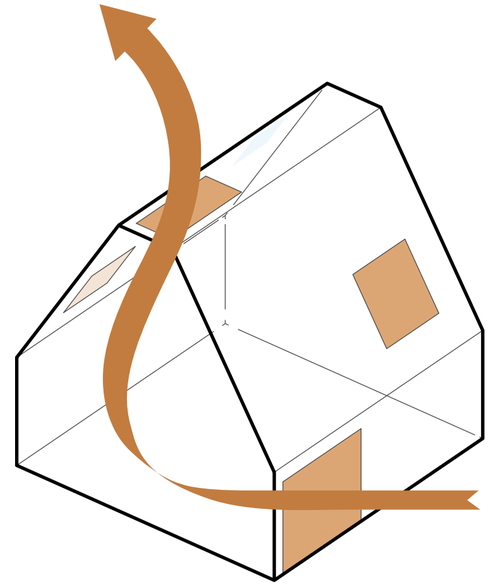
Design properly of the extraction points in wet spaces and the correct flow of air to avoid smell contaminations.

Demand-controlled ventilation

Air is supplied as needed in the individual rooms (bedrooms + living room). This requires sensors which regulates the air supply according to a prioritized list of indoor climate parameters.

Zone subdivision

Changed floor plan with a focus on health by designing independent kitchens that can be closed off during cooking, separate clothing rooms so that children do not sleep with toys.



Acoustics

Ensuring sound is transmitted and spread at optimal levels, through considerations in design, operation and construction.

Performance drivers

Acoustic ceiling

Low reverberation time in all living rooms.

Location of engineering shaft

To avoid or minimize technical noise and possible sound transmission, the engineering shaft is de- signed and placed with as little contact to bedrooms as possible.

Impact noise

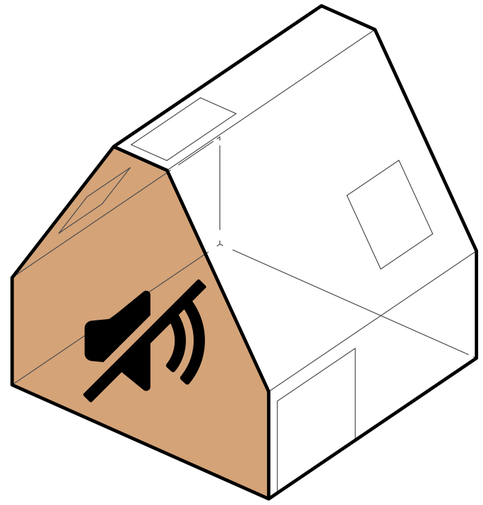
Focus on the floor structure in relation to impact noise. Requires weight, thickness and sound-absorbing materials.

Reduction of ventilation noise

Extended focus on ventilation ducts and diffusers, which must be larger due to noise.

Sound transmission

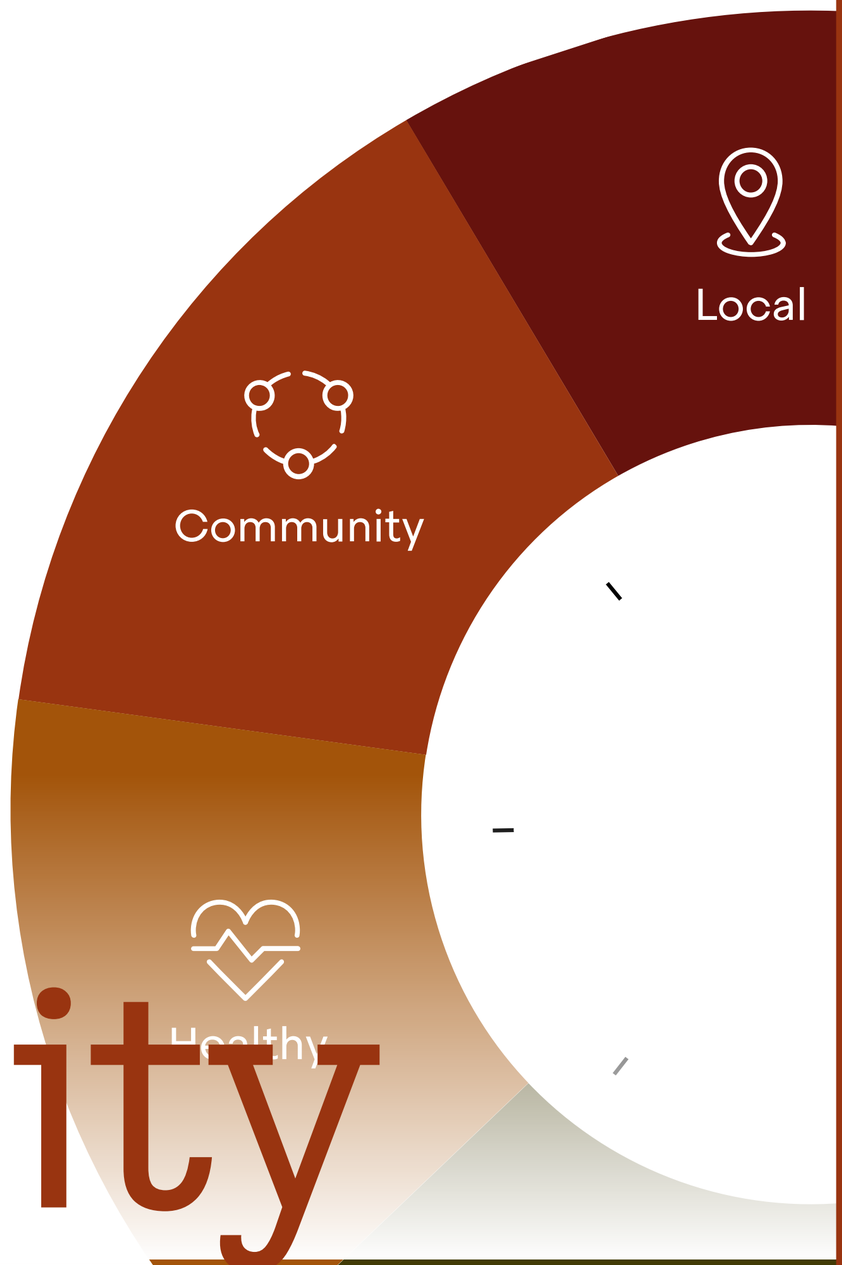
Sound absorbing walls and doors in relation to reducing sound transmission between bed and living rooms.



05

Strategic driver

Homes are designed as a part of a community, where people can connect and engage, share and support. Future communities will be interconnected and gather around shared interests and purposes. Communities can provide benefits in relation to social contact, sharing of spaces and resources, smaller footprint, economy etc.



Community

Identity

The sense of belonging to a community with a strong identity fosters social cohesion, as well as mental and physical well being.

Performance drivers

Architecture

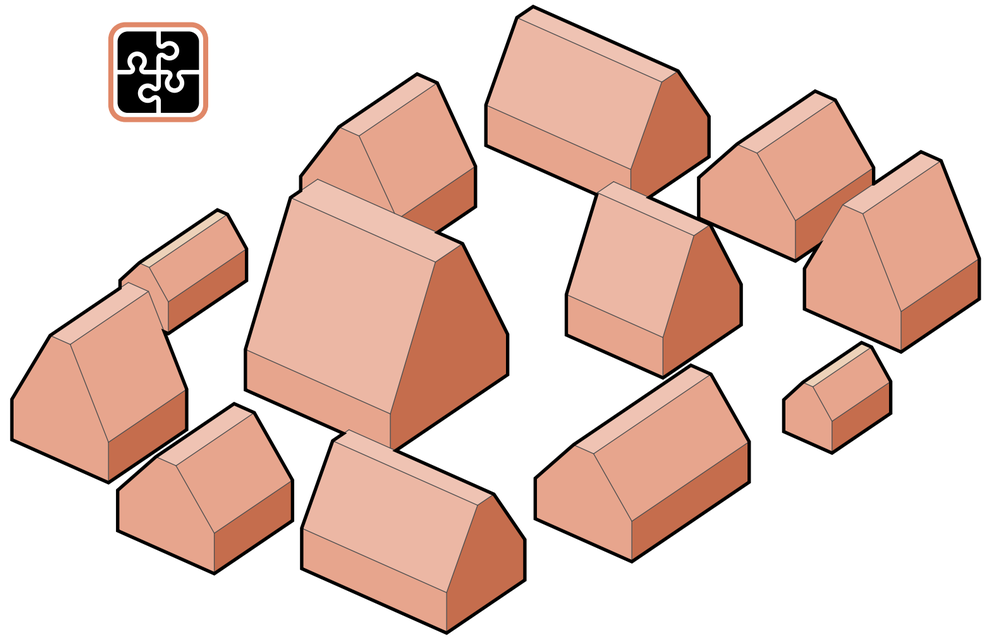
Architecture can enable identity and enhance a sense of belonging. This can happen either by form, planning principles or materials choice.

User groups

Specific user groups can enhance a sense of belonging and community and create a clear identity for the area.

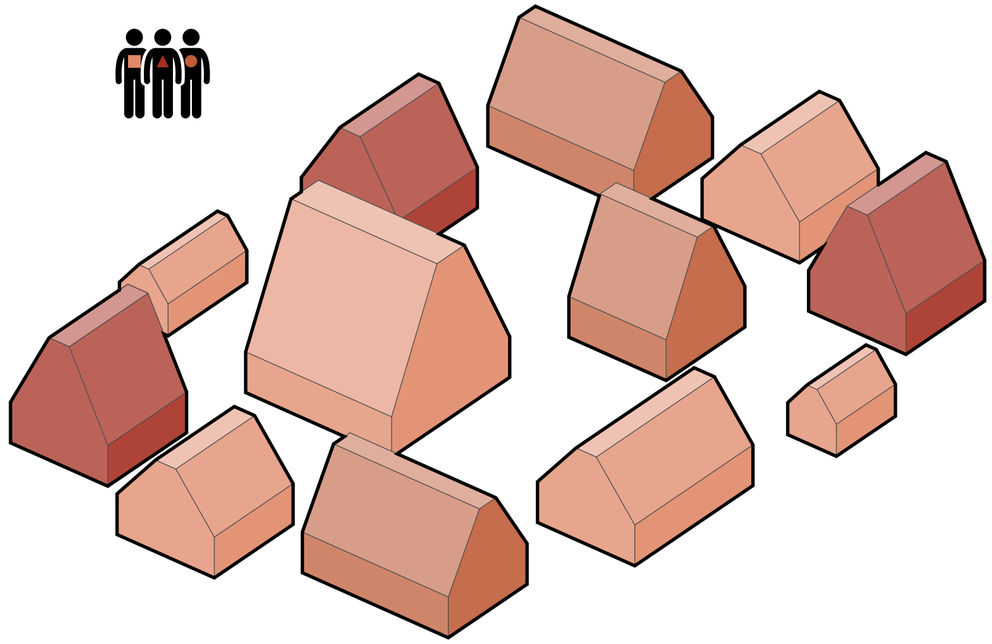
Lifestyle & culture

Lifestyle and culture can enable a strong identity and sense of coherence between residents and occupants.



Diversity

Monotonous regularity is perceived as unnatural and should be avoided by ensuring structured variation in scale, typology, materiality and users.



Performance drivers

Scale

Variation in scale can enliven a project by breaking up monotonous repetition.

Materiality

Subtle or distinct variation in materiality.

Typology & floor plan

Diverse typologies and floor plans ensure inclusion for multiple user groups.

Varied price points

Creating settlements with varied price points, enables access for the many, and this enables a higher degree of diversity.

Trust & security

Living closer together with people you know and trust can increase the sense of both experienced and perceived security.

Performance drivers

Natural surveillance

Connect flow areas and social areas while reducing blind spots. Visuals and direct connection between the flow areas and the social areas promotes interaction between people and increases security.

Outdoor lighting

Design outdoor spaces with an integrated lighting system, inviting people to be outside and promote a sense of security.

Ground floor edges design

The design of the ground floor areas with qualitative edge increases natural surveillance and increases informal interactions.

Strategic positioning of windows

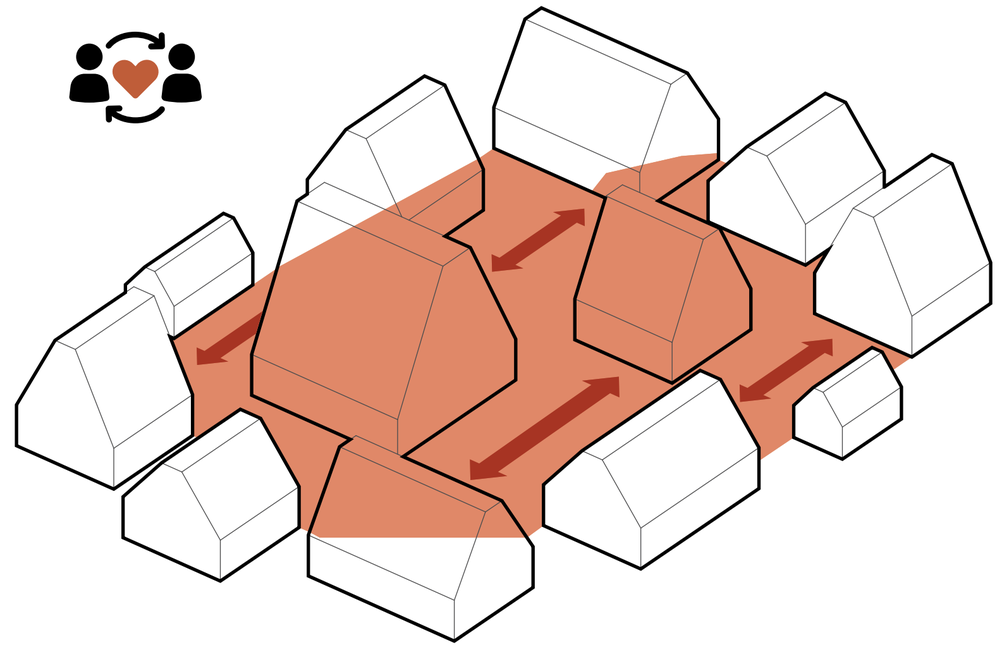
Windows should be oriented to common spaces to prevent dark design.

Community organization

Proven system that promotes sense of safety and belonging to the community. “Naboværn”.

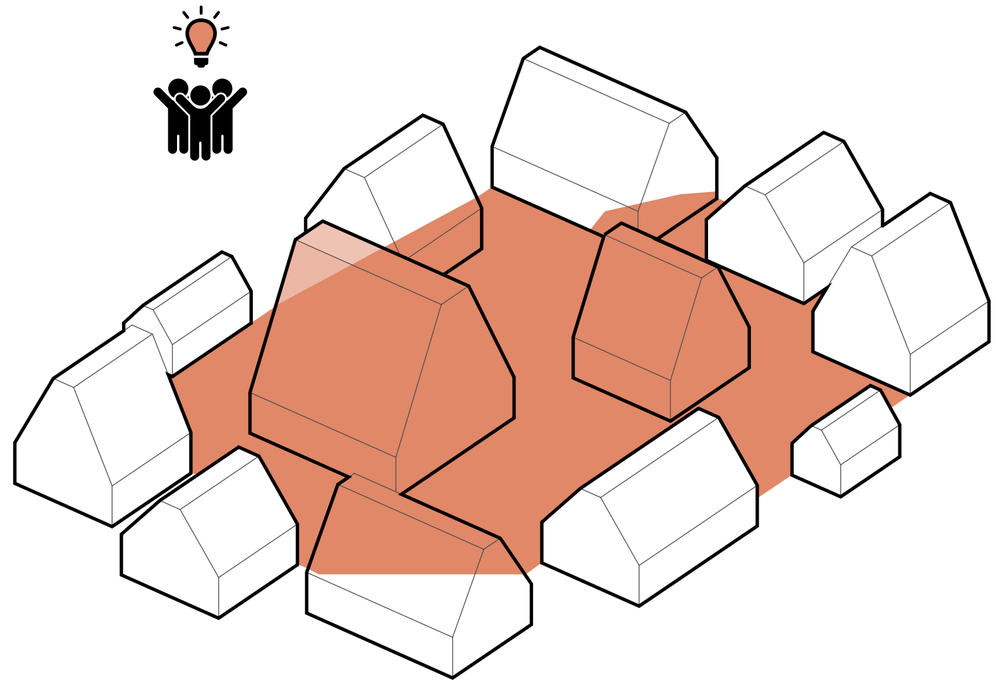
Green outdoor

Green areas invite people to spend more time outdoors, facilitating a natural form of ‘neighborhood protection’, while providing cohesion and interactoins between users and residents.



Participation

A stronger sense of place and community arise when people are proactively engaged in shaping the spaces they inhabit.



Performance drivers

Common meeting & work spaces

Provide the community with spaces where they can meet and have activities together. A space that extends their sense of home.

Co-creation

The capacity of the residents to influence the future of the place ensures that the residents feel ownership and thus automatically participate in the community.

Promote local initiatives

Maintenance and reparation workshops, collective food activities, local job initiatives, etc.

Inclusive public spaces

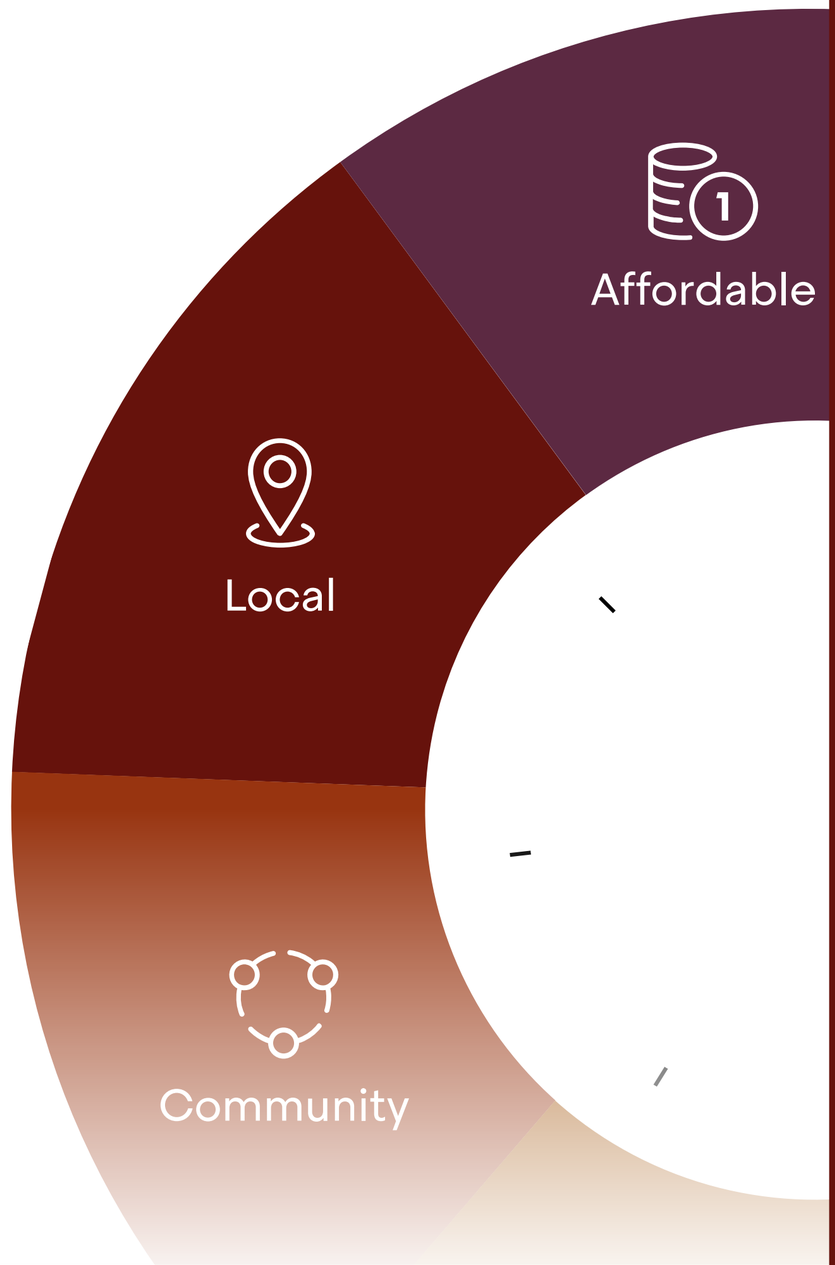
Ensure that common spaces offer functional and recreational qualities for all users with particular attention to different age groups and interests.

06

Strategic driver

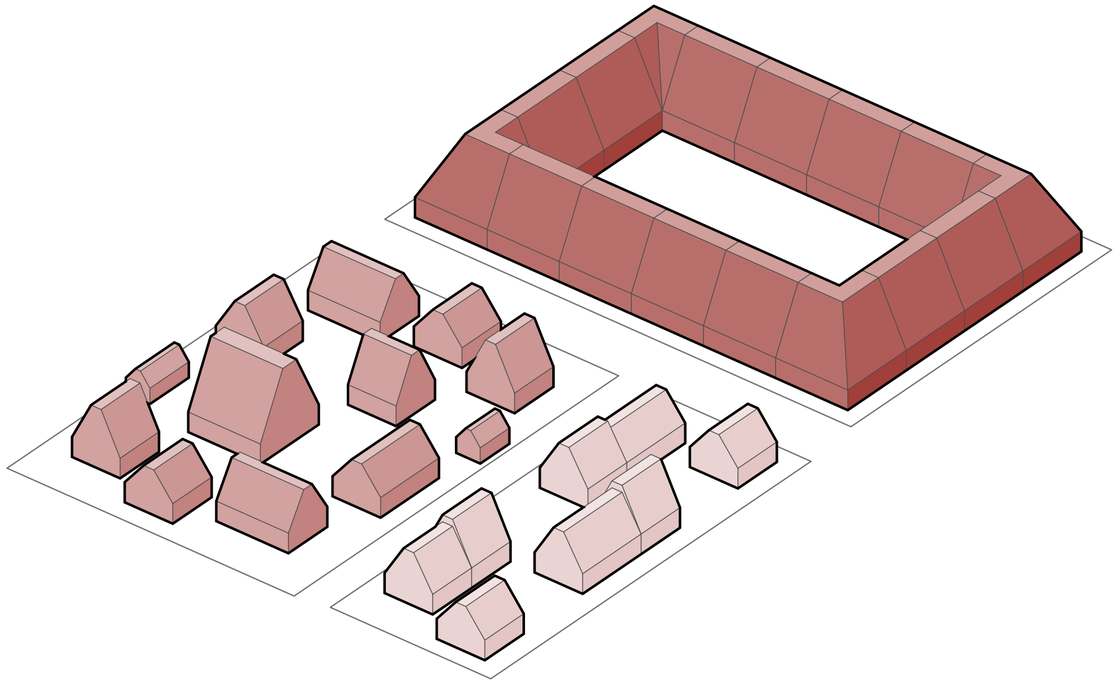
Homes explore contemporary and innovative approaches to traditional building designs, materials, and crafts. Homes are designed to apply materials, technologies and solutions proven valuable locally over time. Shaping homes with solutions, lessons and learnings from local building and climatic traditions, in a contemporary design.

Local



Context

The building typology and program can be configured to adapt, respond and connect to a wide range of contexts, scales and densities.



Performance drivers

Ecology of site

Gain understanding of physical context, scale, size, typology materiality etc, which helps to design naturally and adapt to the local conditions.

Microclimate

Gain understanding of physical context and the impact of a project on the microclimate, to ensure that a given project benefits the natural environment that surrounds it.

Socio-cultural, economical and political

Gain understanding of the non-physical elements, to ensure that the project benefits the surrounding systems.

Building culture

Building on the benefits and promoting local cultural and environmental conditions.

Performance drivers

Vernacular principles

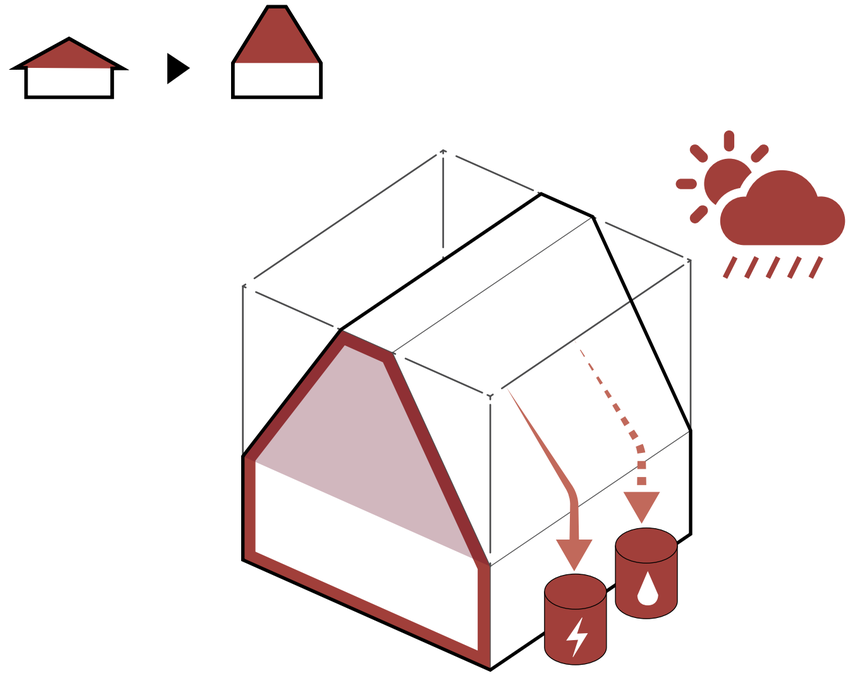
The understanding vernacular practices, of typology use, ventilation techniques, material usage, can strengthen projects so they benefit from the natural surroundings. Using best practices from the context of the site.

Quality & aesthetics

A building should be designed in order to satisfy requirements regarding safety, serviceability, durability, and aesthetics (Unity, Proportion, Scale, Balance, Symmetry, Rhythm), assuring proper structural performance through the entire service life.

Ripple effect

Buildings themselves do not exist in isolation. Each project has a ripple effect that impacts both socio-cultural, economical, and political needs. The building culture of a given location offers great opportunity to strengthen a project by understanding the effect that it will have.



Nature & biodiversity

Valuable ecosystem services are provided when local wildlife habitats become an integral part of the urban fabric.

Performance drivers

Functional & recreational green

Consider how plants and trees can help support community and provide useful ecosystem services such as food production, LAR, windshield, play, private spaces, etc.

Regenerative landscaping

Green areas should consider its regenerative properties ensuring that nature becomes healthy and thriving while simultaneously enhancing biodiversity, and natural habitats for wildlife.

Soil regeneration

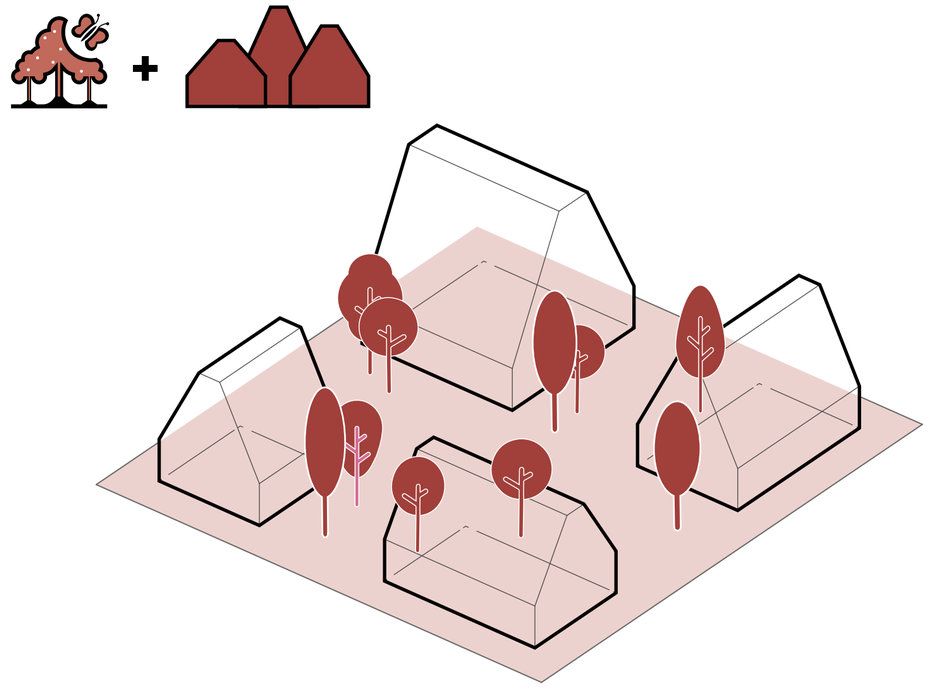
Promote the regeneration of the fertility of soils in the green areas by not using chemicals, right selection of plants and management techniques. Avoid soil pollution and use strategies to reduce polluted soils.

Water management

Projects must consider water management on site, this helps boost biodiversity and natural habitat for wildlife while simultaneously mitigate flooding risk and help alleviate the sewage system.

Soil contamination

Reduce contaminated soil by utilizing strategies fit to best deal with the level of contamination.



Accessibility & inclusion

The settlement is designed to be accessed and used by as many people as possible, regardless of age, gender and diversity.

Performance drivers

Connectivity

The project should enable connection to the surrounding context, and emphasize a varied and diverse web of access points for multiple modes of transportation. Connectivity is about opening up, rather than shutting off.

Different ownership models

In order to ensure accessibility and inclusion, projects must have a varied price point, ensuring that people from different socio-economic backgrounds have access to good accommodation.

Car-free areas

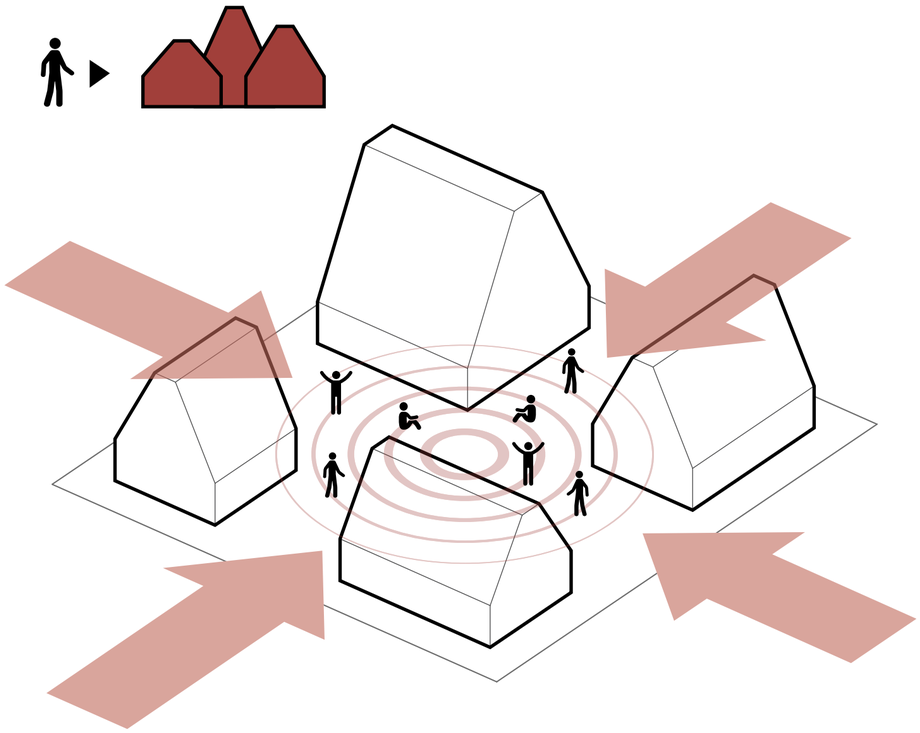
Parking should be centralized as much as possible and access for cars must be kept to a minimum (for example, disabled access and emergencies).

Inclusive design

The project should be designed for inclusion. Designing for the majority of people to have access to good living conditions, promoting level free access, varied sizes and typologies to ensure the project can accommodate a diverse mix of people.

Fossil-free transportation

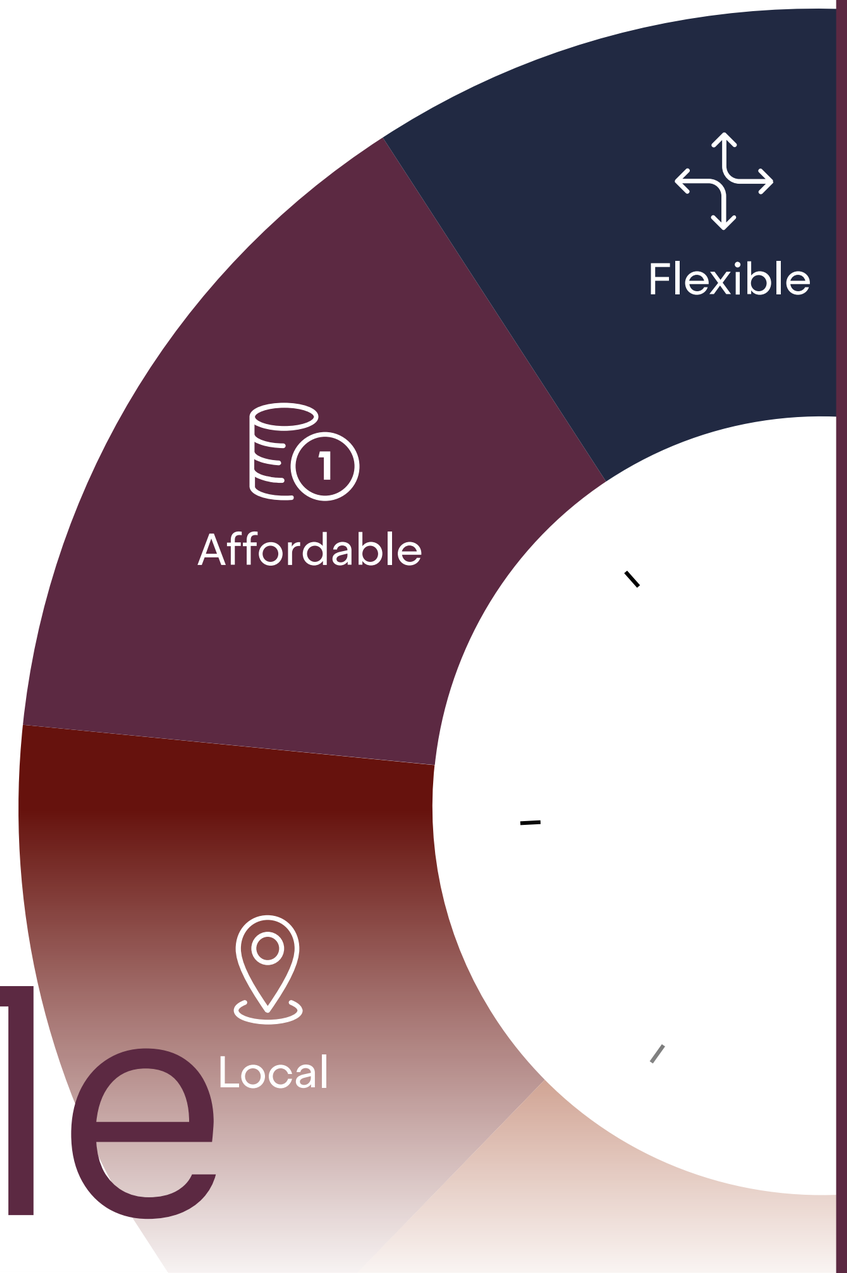
Roads, paths and parking should be designed for shared use and prioritize cyclists and pedestrians.



07

Strategic driver

It is economically feasible for the average European citizen to live in a home that supports their personal needs and is societal responsible. Homes are designed to be healthy, sustainable and cost-effective to give access to live in safe, quality housing, without having to compromise the impact on people, society & environment.



Affordable

Financing

It plays a key role in how to create new affordable homes for the many, therefore It is needed to rethink of how It is possible to finance our homes to make them affordable for the many.

Performance drivers

New form of ownership models

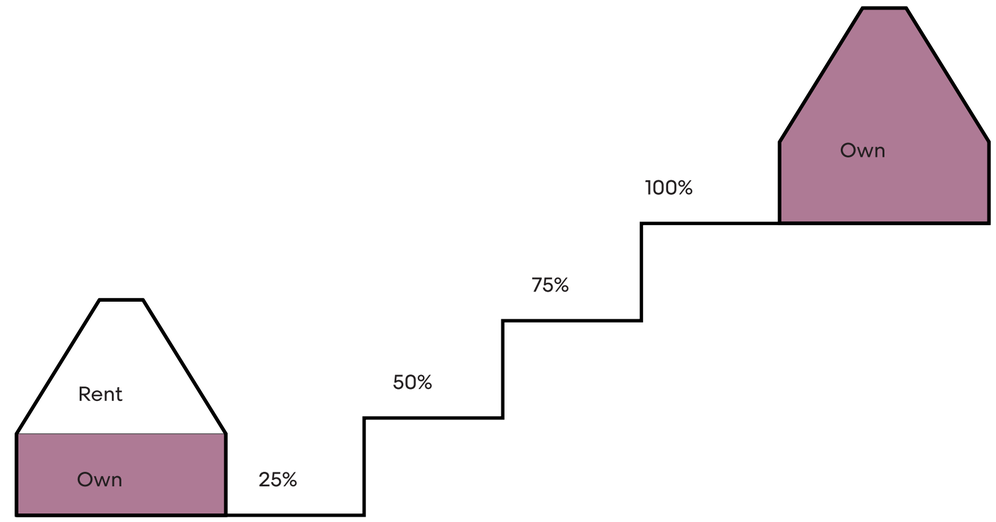
Choosing new forms of ownerships models - these can include Community land trust (Coop, self provide), Shared equity, Self-produce, Customized (architect-led), Self-build.

Public & private partnerships

Creating public / private partnerships can significantly reduce financing for a given real-estate project. Private or public stakeholder can help finance a part of the project, in order to gain access to the part of the project that they want.

Crowdfunding

The approach has become a feasible alternative to traditional ways of raising funds for investments. It pools small amounts of finances from various investors (lenders) to finance a real estate asset or a portfolio of properties.



Access over ownership

Reducing costs associated with unused square meters by pooling resources into common facilities, goods and services that promote access over ownership.

Performance drivers

Shared spaces

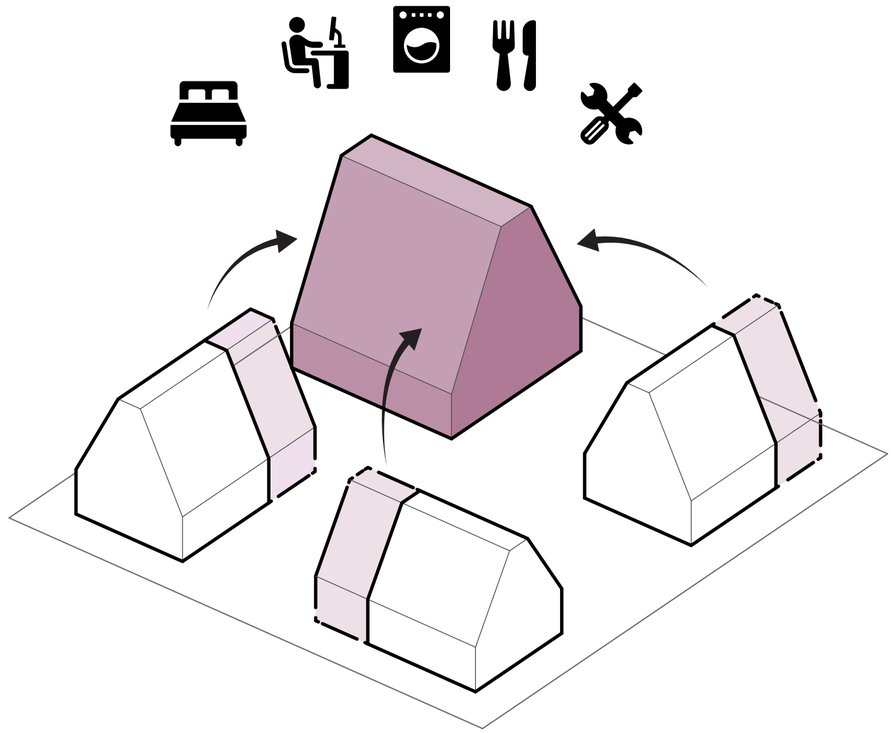
Creating shared spaces both inside and outside can reduce the area need for each house. Communities can share kitchens, guestroom, laundry, playground, green areas etc. It can reduce cost significantly.

Shared stuff

By sharing stuff (Tools, furniture, books, electronic equipment, mobility etc.). It can reduce cost for the individual occupant, and at the same time reduce consumption within the communities.

Product as a service

Allows occupant to subscribe and lease technical equipment (solar panels, heat-pumps, lighting etc.). This can reduce upfront cost for the products and reduce cost of maintenance and repairs.



Affordability by design

Making better use of available square meters and enabling incremental building to lower upfront costs.

Performance drivers

Optimized design

By designing new and optimized typologies that utilizes the square meters of each home optimally. It is possible to reduce cost for production and purchase price.

Prefab wood construction

A prefab wood construction increases productivity and thereby reduce cost while simultaneously reducing embodied CO2.

Envelope + self build

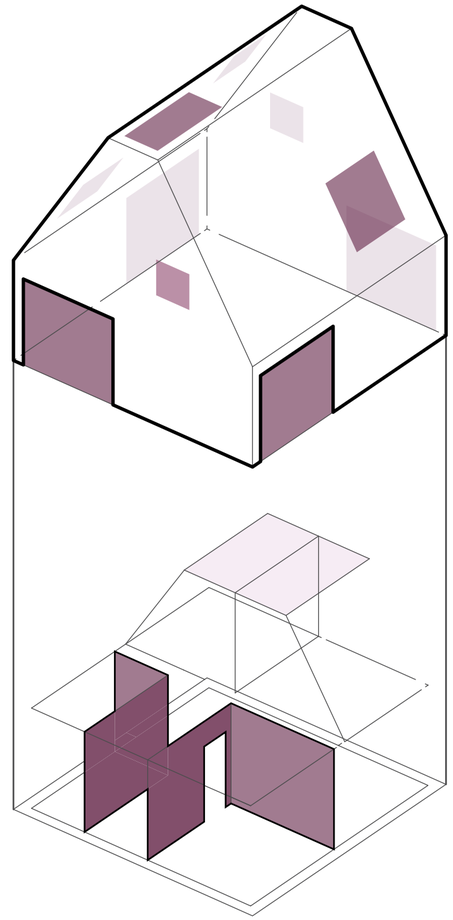
By designing the homes as envelopes where people will have to create the interior finished themselves (like kitchens, floors and interior walls). This reduces cost for each occupant and enhances ownership.

Separation of building system and technical system

The separation of the technical system from the building system minimizes the need for coordination and increases productivity. Thereby reducing the cost. Avoid soil pollution and use strategies to reduce polluted soils.

Shared storage space

By creating shared storage space our homes become much more flexible and adaptable, this helps reduce cost as it enables us to build fewer square meters without compromising on usability.



Resource loops

Promoting circular resource loops within the site to maintain value and extract nutrients from what is typically regarded as waste.

Performance drivers

Energy comminities

The resource loops can be optimized by creating energy communities, becoming more efficient and thereby reduce cost for the entire community This will also reduce cost per unit for plug-in fees.

Bundle effect

Communities can go together to purchase services at a reduced rate (Foodcrates, Internet services, entertainment services etc.).

Appliances that optimize energy use and reduce water usage

Energy, heat and water system utilizes most efficient solutions, this will reduce cost and reduce emissions from operational energy.