

## A Home For All

### A Home for All.

In the period 2020-2040, the age group 80+ is expected to double, with a significant increase in the need for comprehensive health and care services. The transformation of health and care services in Norway has resulted in a shift towards home care services for the elderly, with nursing homes now primarily catering to those with more significant care needs. This change has impacted the mix of services and social programs offered, as healthy pensioners prefer to utilize the city as a meeting place rather than nursing homes. Trondheim, being one of the fastest-growing municipalities in Norway, faces urban development pressures, particularly in areas like Lade, which offers housing potential and, at the same time, is characterized by a rich biological heritage. The challenge is to preserve the distinct landscape of Lade while accommodating urban densification. In light of this context, the project *"A Home for All"* seeks to satisfy the programmatic requests of the brief, preserving the natural presences of Lade, making the site a domestic landscape for both humans, animals and plants. Circularity plays a central role in the project, ensuring a sustainable loop of resource management. By connecting existing ecological corridors to create an ecological ring, we enable the continuous flow of flora and fauna, promoting biodiversity and maintaining the ecological balance within Lade. Additionally, we adopt a responsible approach to demolition, selecting specific buildings (all of them identified as "planned to be demolished" by the brief) to reduce the impact on green spaces, and reusing all materials on-site to minimize waste. Water management is also integral to our circularity strategy, with rainwater efficiently channeled into storage tanks from rooftops and subjected to thorough filtration for sustainable use. Through these interconnected elements, the project embraces a holistic and sustainable vision for Lade, where nature assumes a prominent role in facilitating a harmonious relationship between humans and the environment.

### Care comes from knowing: identification and preservation of natural interactions.

The core objective of this project revolves around establishing an ecosystem that sustains and accurately identifies natural interactions between humans and various elements of the environment. The main focus is not merely to facilitate favorable conditions for human-animal interactions but to meticulously conserve these interactions in alignment with the project's guidelines. The ultimate aim is to uphold Lade as a home for a diverse array of life forms, encompassing animals, flora, insects, trees, microorganisms, and human beings. The underlying vision is to foster a holistic and non-hierarchical relationship among all these elements while actively contributing to the conservation efforts of endangered indigenous species. To preserve the indigenous species, a specialized conservation program will be implemented, integrating habitat restoration, captive breeding, and reintroduction initiatives. This program will prioritize the protection of endangered species while ensuring that the delicate bal-

ance of the ecosystem is maintained.

### Two corridors make a ring: landscape and social strategy for new natural infrastructures in Lade.

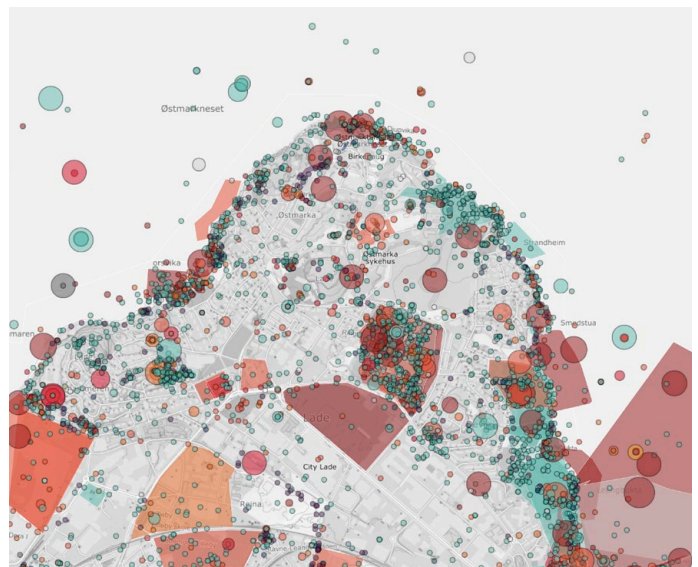
Two existing green corridors are connecting the project site to the coastline, a grand ecological and cultural system connecting several historical remains of different ages (bunkers, coastal buildings, etc). The project aims to connect these two corridors in order to create a ring to facilitate natural exchanges and easier connections to the coastline. To understand how to design this connection, a comprehensive reading and mapping of animal and plant life within the study area is conducted. Identifying challenges related to non-native and endangered species is also part of the strategy. A participatory approach is adopted to enhance human-nature interaction, repopulate endangered species and raise the awareness about the natural richness of Lade peninsula. The citizens will be called to help constructing bird-houses, wild deer feeders, bee hives and cultivating endangered flower and fungi pastures.

### Mind your step: no construction zones and ecological care.

Through the mapping of the significant natural presences within the site, areas with high biological diversity are identified and designated as "no construction zones." This decision aims to minimize encroachment on green spaces and land consumption. When new buildings are introduced, careful consideration is given to demolishing existing structures, with a commitment to reuse 100% of demolition materials on-site. The architectural morphology is mainly based on finding the right spot between already inhabited spaces.

### Program follows site: strategic placement of the program.

Proper placement of various programs is crucial to the competition's success. Site selection takes into account soil cha-



Mapping of the the flora and fauna on Lade Peninsula.

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characteristics, topography, exposure, and potential interactions with other contextual elements. For instance, the elderly care facility is strategically positioned in an area with a gentler slope to facilitate logistics and in close proximity to cultural institutions, such as schools, kites, and the “Retired sailors’ home”. The new housing is located where ecological concerns are minimal, benefitting from the area’s favorable slope, exposure, and integration with the green corridor.

### 4 Habitats: green spaces strategy.

The Green Spaces Strategy of the project encompasses four distinct habitats, each with its unique concept and purpose. In the northern sector, characterized by the pentagonal volumes, the habitat revolves around the principle of new afforestation and expanding the green corridor. This approach aims to create a thriving ecosystem with diverse plant and animal life, promoting biodiversity and ecological connectivity. In the central sector, where the rare mushroom pasture is located, the focus is on a conservative habitat strategy. Here, the emphasis is on preserving and protecting endangered species, maintaining the mushrooms mycelia. This conservation effort contributes to maintaining the ecological balance and safeguarding the diversity of the area.

Within the garden of the Nursing Home, a “healing” habitat is established, with the intentional planting of species on the brink of extinction, particularly flowers. This activity serves a dual purpose, not only contributing to the preservation of endangered flora but also offering a therapeutic environment for the residents of the nursing home. The presence of such diverse and vibrant plant life enhances the well-being of the elderly inhabitants.

Lastly, on Kanonhaugen, a “liberated” habitat emerges, returning the area entirely to its pre-existing natural landscape. This comes as a result of the removal of the dog area, which was incongruent with the ecological context of the hill and disrupted its balance. By restoring the hillside to its original state, the project embraces the value of ecological harmony and respects the intrinsic ecological dynamics of the site. Through these carefully curated habitats, the Green Spaces Strategy not only aims to promote biodiversity and ecological resilience but also seeks to create spaces that are beneficial and healing for both the natural environment and the human inhabitants of Lade.

### Mobility:

The Mobility aspect of the project focuses on enhancing public transportation and promoting sustainable modes of travel. This is achieved through the reinforcement of the existing road network with a new bus stop, facilitating convenient access for residents. Additionally, dedicated cycling and pedestrian paths are introduced to discourage car usage and encourage eco-friendly alternatives. To minimize the impact on green spaces, the number of new parking spaces is limited, with underground parking provided for the Elderly facility and an expanded parking lot for the psychiatric hospi-

tal to cater to the housing project’s needs. Moreover, minor green paths are incorporated along the edge of the green ring, connecting to the soft mobility system along Lade’s coast. These measures aim to create a balanced and eco-conscious environment, where the needs of both people and nature are met, preserving Lade’s unique ecological heritage and promoting sustainable development.

### Let’s meet in the backyard: the Nursing Home.

The decision to locate the Elderly House in its current position was influenced by several factors, including the desire to create an environment that promotes the well-being of elderly residents during their final years. The integration of nature plays a vital role in enhancing the quality of life for the elderly, with an internal garden designed to facilitate both group activities and leisure time. This garden will be also used by the citizens of Lade in order to reduce the isolation of the patients and to stimulate a trans-generational encounters. Placing the Nursing Home where the brief was suggesting (on the slope in the central sector of the design site) would have meant destroying the fungi pasture and 3 residential buildings. The decision to place this building in the southern side of the project area derives also from the very complex program of the building. This area is characterized by a very flat orography that will allow to organize in an easier and more efficient way the different parts of the building. The divestment of the Viktoria Center it’s already planned and having a new partially cultural institution to substitute it could be a good way for the citizens to not be disoriented. The Nursing Home will be only 100 meters away from the Psychiatric Hospital and it will install a series of proxemic relationships with other cultural buildings in the area, like the Tiriltoppen kindergarten, the Ring high-school (planned to be used again soon), the Sailor home and the new kindergarten planned to be built in the South side.

To preserve the natural landscape and avoid disrupting the scenery, the building’s design emphasizes a non-rigid and non-monumental form. It is intentionally designed to be lower than the surrounding trees and concealed by the hillside. This layout not only blocks the cold northern wind but also opens up the southern side to allow ample sunlight during the summer in the common areas. The building interiors are designed to recreate a very domestic feeling, with common areas rendered as common living-rooms overlooking a “backyard” in the woods. The non-rigid shape of the building don’t affect the clarity of circulation systems and the dispositions of the patients’ rooms.

The program for the Nursing Home is organized into four interconnected volumes. The main entrance is located in the western two-stories volume. Next to the main entrance there’s the vehicular entrance leading to the underground parking and logistical facilities, including the retrieval of goods and technical spaces for building automation. On the ground floor, the cultural center, with a communal hall overlooking the main garden, provides space for indoor and outdoor activities. The first floor houses the administrative offices and lo-

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gistical center for the elderly care facility. The three taller volumes are dedicated to the residential department, with each floor serving as a separate department featuring all necessary technical and functional spaces. Each department is composed by three groups, one for each of the three taller volumes. Each group is composed by 7 rooms for a total amount of 63 units. Common areas face south towards the shared garden, while the individual rooms have private garden views, screened from the street by trees and the blind wall of the building volume. Technical elements and vertical circulation are located within the core.

An additional function added in the cultural center block is the Biodiversity Hub, a multifunctional and publicly participative space where experts can educate residents and visitors about Lade’s natural richness. It also serves as a logistical center for monitoring mapping activities, landscape structure maintenance, repopulation efforts, and flower and pollinators insects cultivation.

Regarding the technology employed in the construction, the entire building is constructed using wood, except for the four concrete cores. The structural system incorporates a core-supported design to reduce the structural spans by providing multiple support points for the beams before reaching the core. The façade is made of cross-laminated timber (CLT), while the beams are made of LSL (Laminated Strand Lumber). The demolition remnants from the Viktoria Center will be utilized to create these beams in the form of flakes to be layered together and bonded with a moisture-resistant natural adhesive.

Inspired by the aesthetics of Norwegian stave churches, the building’s cladding consists of recycled wood tiles impregnated and rendered waterproof before being applied to the walls. The design also draws inspiration from these churches with the concept of large roofs that encircle the volumes of the Elderly House. These roofs are going to be clad with photovoltaic panels capable of meeting the building’s electricity needs. The solar panels’ cells are rotated to emulate the material used for the vertical walls, creating a cohesive design.

The roofs are further enhanced with small rooftop gardens, enabling rainwater storage. To avoid the need for an underground water tank, the water storage cistern is positioned externally, doubling as a bird-watching tower or an observation deck for anyone who wants to enjoy a view of Lade from above. This cistern will supply water to both the Elderly House and the southern housing sector.

As part of the building’s commitment to sustainability, it is entirely powered by electricity and does not rely on fossil fuels. The combination of green architecture, renewable energy sources, and the integration of nature aims to provide elderly residents with a comfortable and environmentally conscious living environment. By fulfilling the elderly’s emotional and physical needs and promoting collaboration with the community, this project could set a precedent for future urban developments focused on compassion and sustainability.

## “We already have a house at home”: refurbishment and renovation design of the listed buildings.

It often happens that we forget the value of what we have or lack the willingness to fix what we already possess, and we choose instead to seek something newer and easier. It’s a bit like those children who ask for a new toy, and the conscientious mother responds that the same toy is already present at home. The project take on the scalable housing sector is to find the correct balance between conservation, renovation and innovation. The decision to retain all residential buildings, including those that could have been demolished, was driven by a more conservative approach for buildings facing Ostmarkveien and a renovation operation for those located further North.

Upon thorough analysis, it was observed that, by refurbishing the existing listed buildings and implementing the remaining

Scalable Housing - Lade

|                       | Building codes | # flats   | refurbished | new       | 2room     | 3room     | 4room     | 5room    |
|-----------------------|----------------|-----------|-------------|-----------|-----------|-----------|-----------|----------|
| Refurbished Buildings | 2138           | 4         | 4           | 0         |           | 4         |           |          |
|                       | 2139           | 4         | 4           | 0         |           | 4         |           |          |
|                       | 2140           | 5         | 5           | 0         | 1         |           | 4         |          |
|                       | 2141           | 7         | 7           | 0         |           | 7         |           |          |
|                       | 2142           | 2         | 2           | 0         |           | 2         |           |          |
| Renovated Buildings   | 2143           | 8         | 4           | 4         | 4         | 3         | 1         |          |
|                       | 2144           | 8         | 4           | 4         | 6         | 2         |           |          |
|                       | 2145           | 8         | 4           | 4         | 6         | 2         |           |          |
| New Housing           | NS-RW-01       | 3         | 0           | 3         |           |           |           | 3        |
|                       | NS-RW-02       | 3         | 0           | 3         |           |           |           | 3        |
|                       | NS-RW-03       | 3         | 0           | 3         |           |           |           | 3        |
|                       | (v1) NS-HB-01  | 12        | 0           | 12        | 5         | 4         | 3         |          |
|                       | (v1) NS-HB-02  | 12        | 0           | 12        | 5         | 4         | 3         |          |
|                       | (v1) NS-HB-03  | 12        | 0           | 12        | 5         | 4         | 3         |          |
|                       | (v2) NS-HB-01  | 8         | 0           | 8         | 1         |           |           | 5 2      |
|                       | (v2) NS-HB-02  | 8         | 0           | 8         | 1         |           |           | 5 2      |
|                       | (v2) NS-HB-03  | 8         | 0           | 8         | 1         |           |           | 5 2      |
| <b>total (v1)</b>     |                | <b>91</b> | <b>34</b>   | <b>57</b> | <b>32</b> | <b>36</b> | <b>23</b> | <b>0</b> |
|                       |                |           | 37,4%       | 62,6%     | 35,2%     | 39,6%     | 25,3%     |          |
| <b>total (v2)</b>     |                | <b>79</b> | <b>34</b>   | <b>45</b> | <b>20</b> | <b>24</b> | <b>29</b> | <b>6</b> |
|                       |                |           | 43,0%       | 57,0%     | 25,3%     | 30,4%     | 36,7%     | 7,6%     |

### Residential Units Calculations.

three (that were initially marked for demolition) with an addition design, we could fulfill over 50% of the demand for 80 apartments. The cost of refurbishing these buildings proved significantly lower compared to expenses related to demolition, waste disposal, and reconstruction. Moreover, we aimed to avoid disturbing the mushroom area within the green open space, transforming it into a leisure zone for residents. By refraining from constructing new volumes, we also addressed the citizens’ desire to limit the densification of Lade.

This approach facilitates the grassroots associations to engage in simpler self-construction operations rather than building an entirely new residential sector. We believe that this strategy aligns with the community’s wishes and promotes sustainable development.

Existing Listed Buildings: Our approach towards these buildings centers on pure conservation, following the feasibility study conducted in 2017. We implement technical enhance-



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ments focused on utilizing 100% electric energy and adding an internal thermal insulation layer to improve the buildings' energy performance while retaining their original appearance. By reclaiming the apartments in these buildings, we can achieve 22 units, including 2 rooms, 3 rooms, and 4 rooms configurations.

**Renovated Buildings:** These structures are designed as practical examples to be replicated in other parts of Lade. Many neighboring buildings share similar characteristics, and by duplicating the existing building's layout with a new intervention, we can avoid demolition while consolidating and technologically enhancing the structure. The architectural language retains elements from the existing building, reinterpreting the typical pitched-roofed house volume. While preserving the staircase, a new elevator shaft (the only concrete element in the building) is introduced to make the residences accessible to individuals with disabilities. The superficial layer of the walls and roof is ground and reused as material for internal partitions, mixed with a natural adhesive.

The new wooden structure is a straightforward balloon frame that leans against the existing wall (which is reinforced beforehand). The south-facing roof is fully clad by solar panels capable of meeting the energy demand for all utilities. By repurposing these buildings, we create 24 apartments, including 2 rooms, 3 rooms and duplex 3 to 4 rooms units.

The integration of both existing listed buildings and renovated structures not only fulfills the demand for residential units but also promotes sustainability, heritage conservation, and a sense of community within Lade. This approach is driven by the desire to utilize existing resources efficiently and minimize the environmental impact of new constructions while providing modern and comfortable living spaces for the residents.

### Houses in the wood: a new habitat.

The positioning of the new volumes in northern sector of the project site was carefully planned to minimize the number of trees to be cut and to avoid interfering with the underground bunker's presence. The placing of the buildings also takes advantage of the orography in order to dig less earth and to obtain the best possible orientation. The project's morphology aims to maintain a porous morphology, allowing the forest to permeate the central communal space of the housing development, creating a sense of living in a series of houses within the woods. This porous configuration was thought to have more flexibility in the scalability concept proposed by the brief. Depending on the circumstances and request, decision to don't build the entire number of buildings can be done, without changing the idea of having a immersive housing in the woods. Moreover the good typological flexibility of the housing can allow to have many different configurations and different amount of flats.

**Row Houses:** The decision to include housing units with a closer resemblance to single-family homes led to the design of three interconnected row villas in a closed form. The ground floor of each villa accommodates a shared space for

communal activities such as workshops, party halls, and meetings. On the upper floors, the lower volume becomes a large communal terrace. The building is entirely constructed using cross-laminated timber (CLT) and laminated wood, and all heating, plumbing, and electrical systems are 100% electric. For the exterior cladding, recycled wood collected on-site was cut into tiles and colored with a red natural paste to replicate the traditional color scheme of residential buildings in Trondheim. The site hosts nine row villas, each measuring approximately 150 square meters.

**Housing:** The housing units feature an extremely compact design, with an efficient distribution-to-living-area ratio. They also offer a high degree of flexibility, accommodating various configurations, ranging from a minimum of three apartments per floor (two 4 room units and one 5 room unit) to a maximum of five (including 2 room, 3 room, 4 room units). The ground floor includes a large multifunctional communal space, a storage area, and cellars in the basement. On the rooftop, a series of communal gardens have been planned, serving as small vegetable gardens, apiaries for beekeeping, or butterfly farms. The structural design consists of a series of concentric cores, with the loggia layer supported by a steel structure attached to the external CLT façade and the internal reinforced concrete core (obtained from the reuse of demolition concrete from the pre-existing building on the lot). The housing units feature the same exterior cladding as the row houses but with a distinct color scheme. The total number of apartments can range from a minimum of 24 to a maximum of 36, resulting in a total count of 79 to 91 units in the scalable housing section.

The project aims to create an harmonious coexistence between residential spaces and the surrounding forest, promoting sustainability, flexibility, and a sense of community. The combination of different housing types allows for a diverse and inclusive living environment, catering to varying needs and preferences of residents while preserving the natural identity of the place.



Project study maquette.