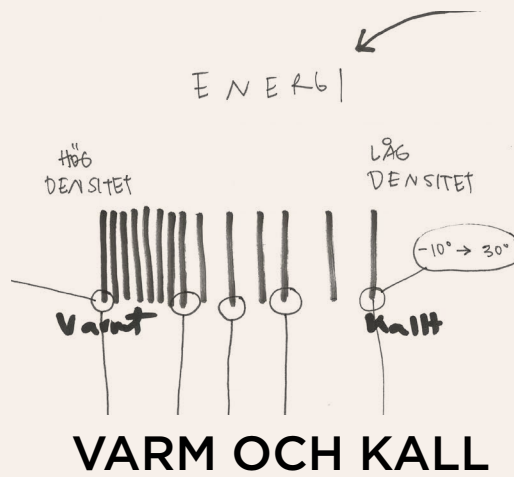


# *Varm och Kall*



HOUSING FOR SOCIAL AND CLIMATE CHANGE.



A PROJECT BY  
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CHALMERS' MASTER PROGRAMME MPDSD  
PLANNING AND DESIGN FOR SUSTAINABLE  
DEVELOPEMENT IN A LOCAL CONTEXT  
DECEMBER 2017

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## CONTENT

**VARM & KALL** is a project that gives back the possibility to live and dwell in the archipelago. It is an updated version of housing where the focus and drive of the design is social and environmental sustainability.

**VARM & KALL is a project that aims to inspire and raise discussion about who and how we live in coastal areas.**





AXONOMETRIC **MOLLÖSUND**

PHOTO **HÄLLEVIKSSTRAND**

## CONCEPT

We have been inspired by the local building-tradition on Orust. The tradition along the shoreline is to have homes with a warm dwelling on safe distance from the sea and a cold boathouse that meets the sea. The two are placed in an interplay with each other, the Sun, wind and rain.

We consider the dwelling and boathouse as two parts of a whole. A unit with closeness to the environment.

We wanted to use this as a starting point for our design, to make the two different spaces into one. To **design dwellings with the variety of warm and cold space within an envelope that communicates with the existing** in terms of proportions, material and origin.

A sustainable addition that is a part of its surroundings.





PHOTOS EDHULTSHALL

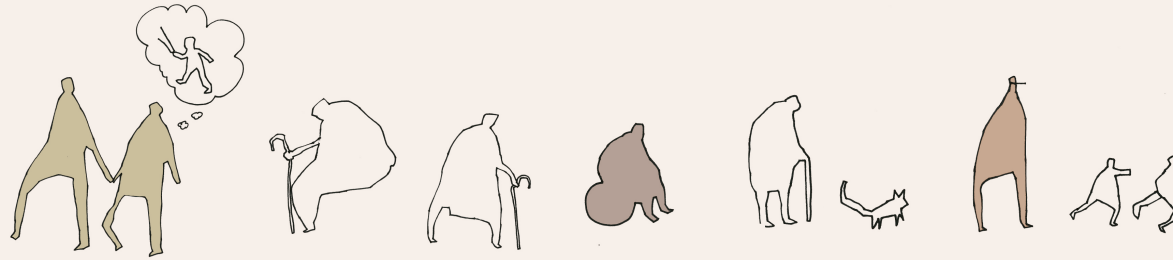
## WHO IS IT FOR?

Orust lacks housing for young people, especially on the west side of the island. Young adults can not afford to buy a house and the rental market is practically non-existing. This trend makes the young people of Orust leave the island, which contributes to problems like decreasing and aging population.

The target group of VARM & KALL is young adults that want to live on their own but can not afford a house. For people that live on the island or in the mainland the one thing in common is a longing for a daily life in connection with nature.

The project **brings the possibility to live and dwell in the archipelago to those who today can not afford to live near the sea.** Small footprints in combination with a well planned density reduces the costs and rentals can be realized.





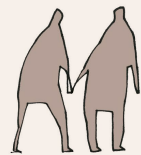
For **two** with a  
plan to be three

For people  
from **the city**

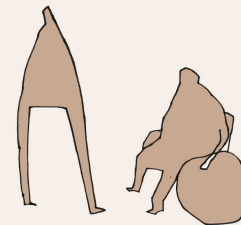
For people  
from **Orust**



For best  
**friends**



For **couples**  
with a dog



For **couples**




For **singles**

## BASED ON STRATEGIES & ANALYSIS

By mapping on different scales and social focus points together with the studio of Chalmers Architecture and Planning Beyond Sustainability master programme we have made a SWOT analysis and formulated objectives for the sustainable development of Orust. Here are the strategy and SWOT that formulates VARM & KALL.

**STRATEGY: The coastal villages on Orust are functioning human habitats, where humans live in line with the environment now and in the future. Floods and storm do not create permanent destruction.**



### SWOT ANALYSIS:

#### Strengths

- A rich cultural heritage, identity and history
- Alternative rural living possibilities

#### Weakness

- Homogenous housing market and a lack of apartments and affordable housing.

#### Opportunities

- Increased environmental awareness
- Rural/ Slow/ Sustainable lifestyle

#### Threats

- Rising sea level and flooding.
- Aging population

## DENSITY AT THE COAST

There are different norms of density in the area closest to the sea compared to the dwelling area on distance from the sea. At the coast the boathouses are placed close to each other, while the dwellings have more personal spaces and gardens.

The climate in terms of sea, rain and wind have played its roll in this. But the practical placement reinforce the idea of what a coastal dwelling is: big and privately located with its private sphere intact.



## THE SUSTAINABILITY FOCUS

Climate change needs to be a part of the architecture. **We want to emphasize the necessity of climate solutions in order to the society of Orust to live, grow and preserve.** We are focusing on a development that interacts with its surroundings.

We have worked with a social and environmental sustainability focus throughout the project. We believe that these two aspects of sustainability combined creates architecture that does not take but gives.





**Small footprint**

Minimizing the ground surface



**Energy efficiency**

Placing the units tightly together



**Challenge the norm of size**

Creating affordable and compact living



**Sharing certain spaces**

Saving energy with common spaces and social interaction

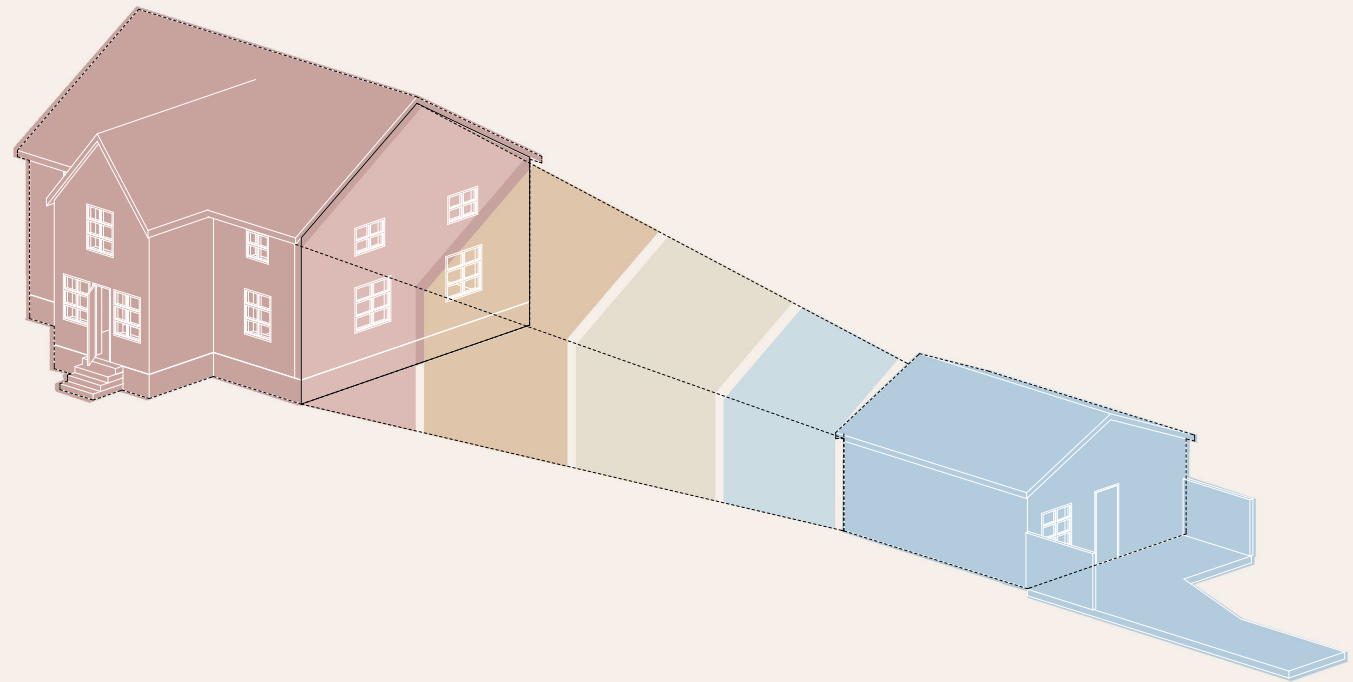


**Heating from the ocean**

Using local resources for sustainable energy production

## WARM & COLD SPACE

Today we design warm space. But just by going back a few generations we find a tradition of cold space as a design tool to minimize your energy use by moving into the kitchen and leaving the rest of the house cold during the winter. **We worked with these different zones and added layers of in-between space into the design.**



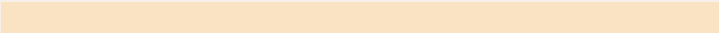
The dwelling and the boathouse are two parts of a whole representing one warm and one cold space. What is going on in between the two and what could take place in the transition from warm to cold?

**AXONOMETRIC TYPICAL DWELLING & BOATHOUSE IN EDSHULTSHALL**

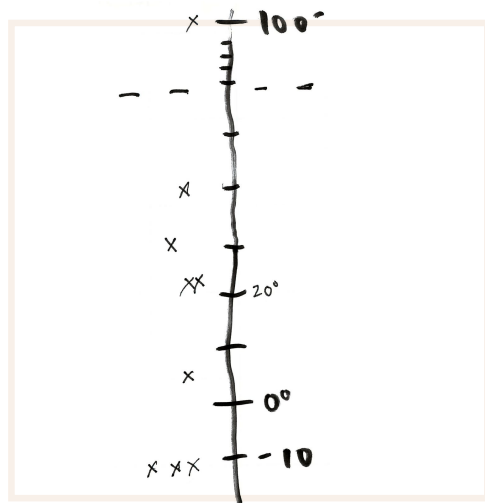
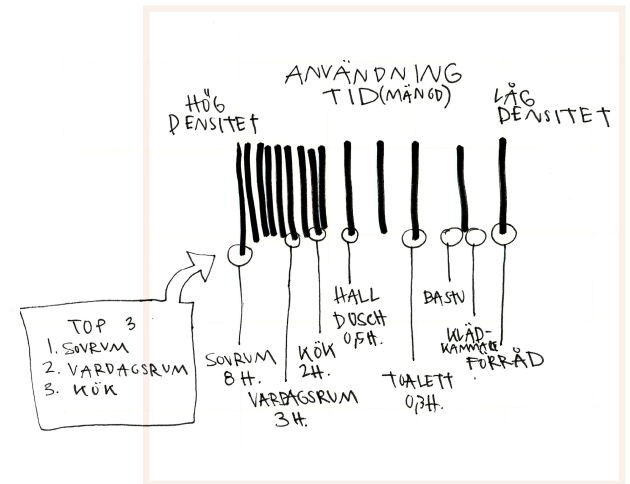
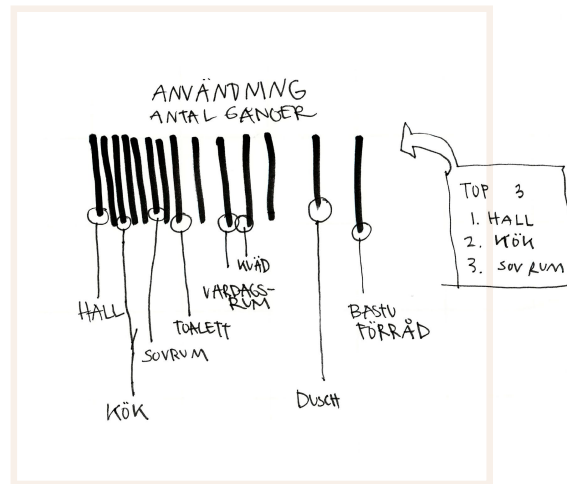
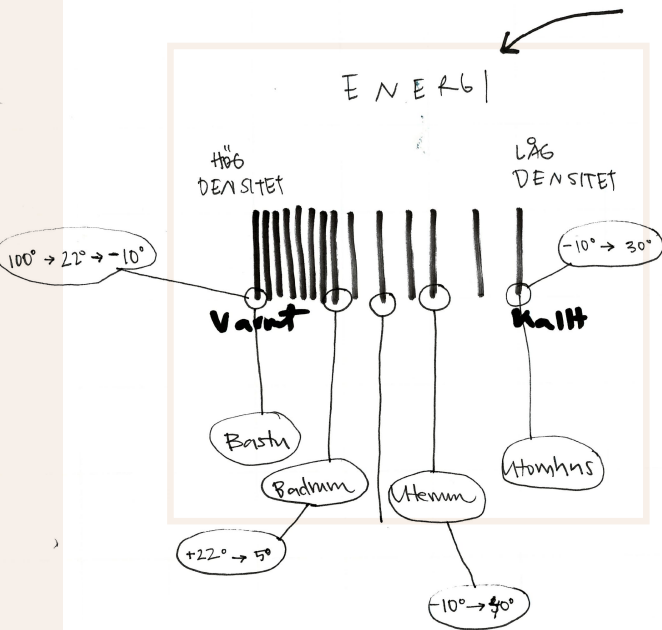
## ANALYSIS OF WARM & COLD

We started the design process of warm and cold by breaking down the built in minor components. **We wanted to find a spatial density to be able to design unheated space without affecting the quality of life in a negative way.**

We studied the density in three different scales: temperature, frequency and duration. Looking on the classical characteristics of spaces (living room, kitchen, entrance etc.) from this new viewpoint helped us to identify and to let go of old perceptions of space, temperature and design.

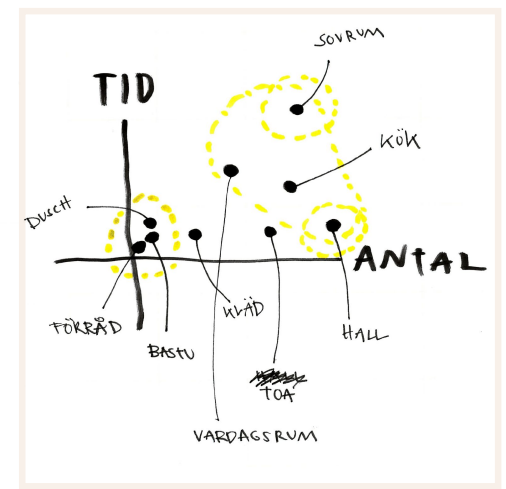






**VAR DAG**


✓ KÖK: 3 GGR/DAG ~ 2 H/DAG	GEMENSAMT
✓ SOVRUM: 8H/DAG	PRIVAT
✓ TOILETT: 1 GGR/DAG ~ 20 MIN = 0,3 H/DAG	PRIVAT
✓ DUSCH: 1 GÅNG/DAG = 0,5 H/DAG	PRIVAT
✓ VARDAGSRUM: 3 H/DAG	GEMENSAMT
✓ HALL: 0,5 H/DAG	GEMENSAMT
✓ BASTU: 3 H/VECKA	GEMENSAMT
✓ FÖRRÅD: 1 H/VECKA (EXTERN)	GEMENSAMT
✓ KLÄDKAMMARE: 0,75 H/VECKA	PRIVAT



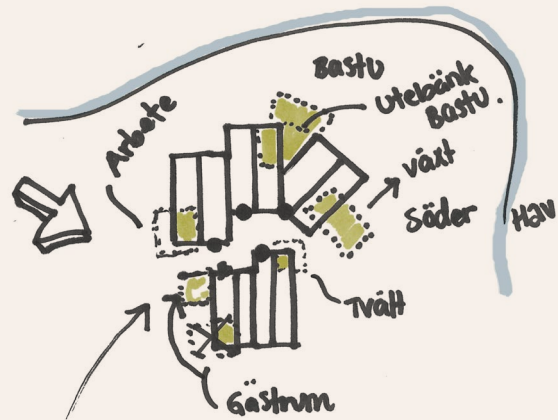
ANALYSIS SKETCHES

## VOLUME STUDIES

As a basis for the volume studies we singled out a few characteristics of the built environment and **let the building tradition of the island guide the design**. We learned from the existing on how to build in an exposed coastal climate.

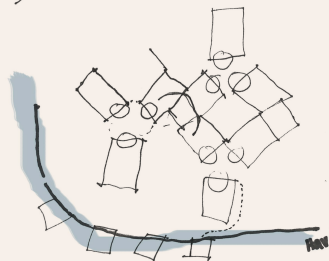
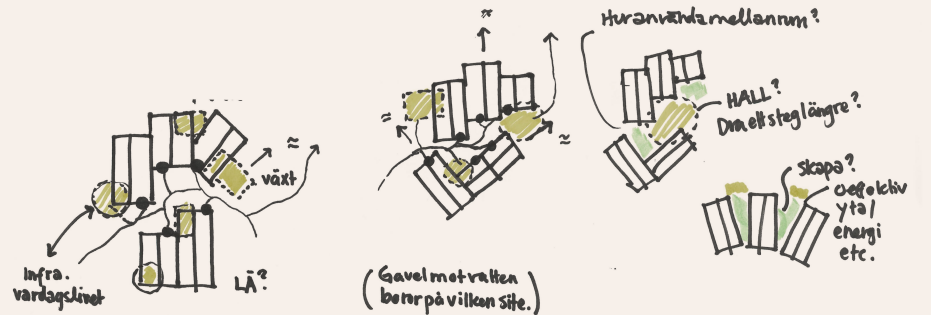
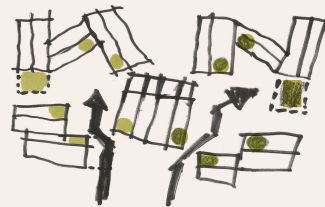


1. The boathouses are placed tightly together. The houses protect each other from sea, rain and the hard wind and gives the area its unique characteristics.
2. Despite the fact that the houses are placed tightly there is a clear order of what is yours and what is mine.
3. The spaces in between the houses often have triangular shapes.
4. One can not distinguish planned outdoor spaces. This does not necessarily mean that there are no common spaces or meeting places.



"COMMON"

- ETT HUS M. VÄXTHUS, STOR?
- ETT HUS M. BASTU
- ETT HUS M. TVÄTTSTUGA
- ETT HUS M. GÄSTRUM (SAMMAR GÄSTRUGA)
- FÖRRÄD



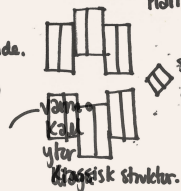
• strandskyddet Dispens → Fördelning privat/gemensamt. Balanserat. Ej hindra allmänheten beträda område.

\* MARKYTA pressa ner - KOSTNAD

Lysande exellan. mer släpp



5 HUS

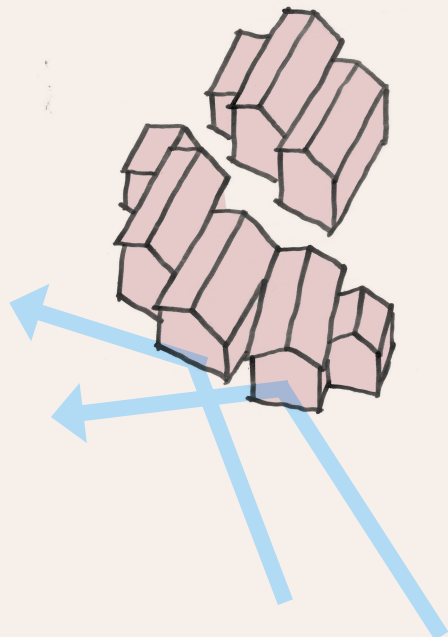


## ENVIRONMENTAL SUSTAINABILITY

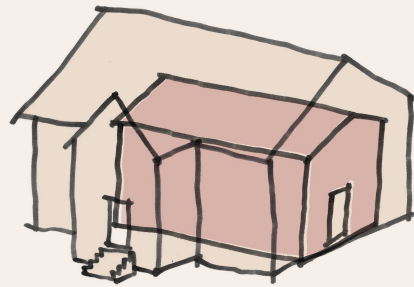
The units are placed densely and they share walls to minimize heat loss. The impression of individual houses is given with the irregular pattern according to the boathouse tradition. At the same time the orientation of the houses creates spaces protected from climate stresses and hard wind.

**With variation of warm and cold spaces the heated area in each unit is minimized by 40-45 %.**

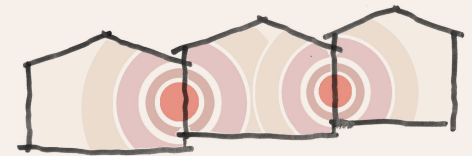
VARM & KALL is challenging the norm of size that today means that large space is a synonyme for high quality space. All units are 30-35 sqm in size and have its architectural richness in well-planned and well-defined spaces with variation in height.



SHELTER FROM WIND  
BY ORIENTATION



CHALLENGING THE NORM  
OF SIZE




SHARING WALLS  
TO SHARE HEAT

DIAGRAM ENVIRONMENTAL SUSTAINABILITY

## SOCIAL SUSTAINABILITY

The dwellings are placed and integrated with common spaces. A design solution that enables more qualities to the living standard and establish social interplay among the dwellers. **To break the preconception that living on the countryside means living lonely.**





## LOCATION

Edshultshall is a community situated on the west coast of Orust. The site has a diverse landscape with cliffs, streets, dwellings, gardens and the sea.

Edshultshall has about 60 residents and a trend of population declining with the counter-trend of the number of summerhouses increasing.

We want to inspire and raise discussion about how to develop a small coastal community with a few permanent dwellers.

Jensholmen is an islet known by the local inhabitants of Orust. We have placed our project there **to start the discussion in Orust in something familiar and to show that a site for rentals could be something else than the conventional one.**



ORUST

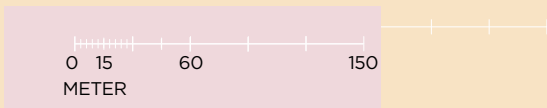




ORUST

EDSHULTSHALL

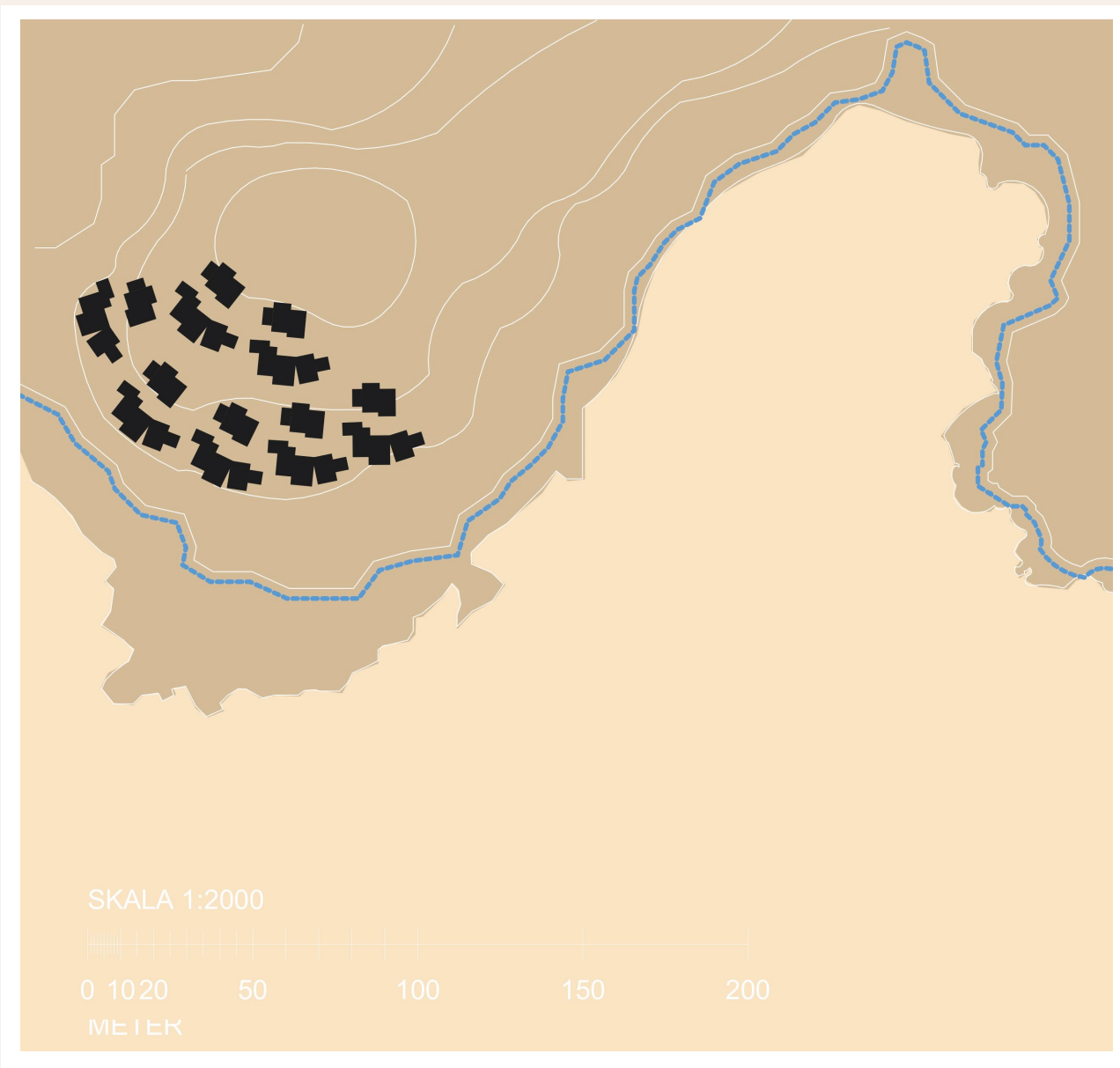
- - - Expected sea level in year 2100
- Road for vehicles
- Outdoor space for dwellers
- Pedestrian walk



## OPPORTUNITIES FOR OTHER LOCATIONS

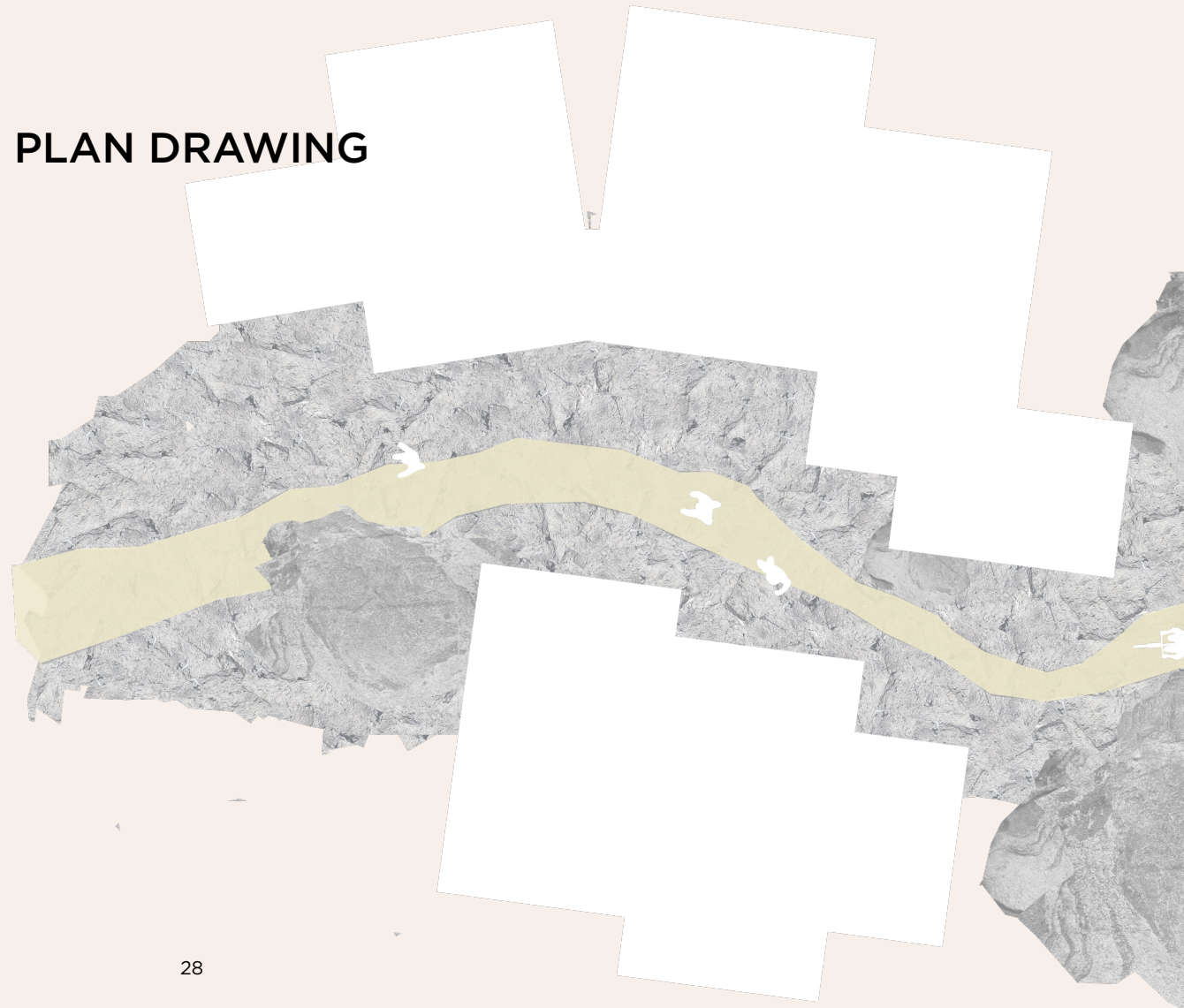
The units create an organic joint facade that **protects the dwellings from climate stresses in a coastal setting regardless of the site.** By placing the units closer or further away from the sea line the structure can be adapted to the current site and extended with the width of the site. Creating each site's specific expression.

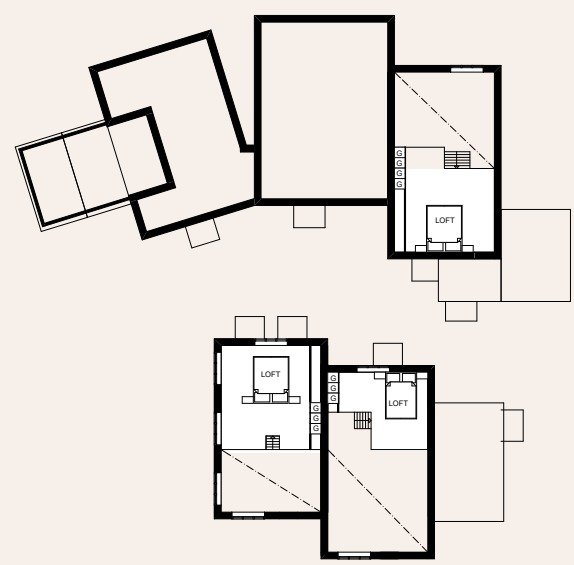




ALTERNATIVE SITMAP **HÄLLEVIKSSTRAND**

# PLAN DRAWING





LOFT PLAN  
1:200



GROUND FLOOR PLAN  
1:100

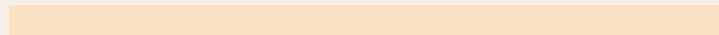
## THE DIFFERENT STAGES OF WARM & COLD SPACE

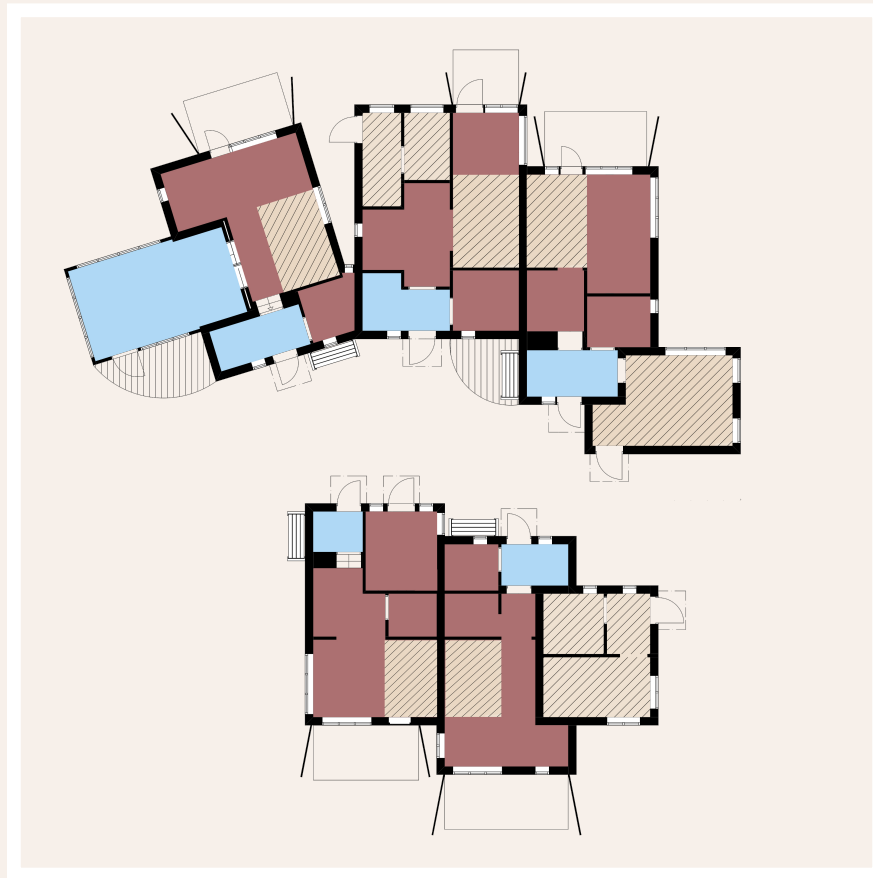
A. Cold space that is allowed to be cold and work as transition space from outdoors to indoors. These spaces are used frequently but briefly each time (entrances).

B. Cold space that works as warm space when it is used. Internal heat sources heat the space (people, kitchen appliances, etc)

C. Warm space that heat up other spaces.

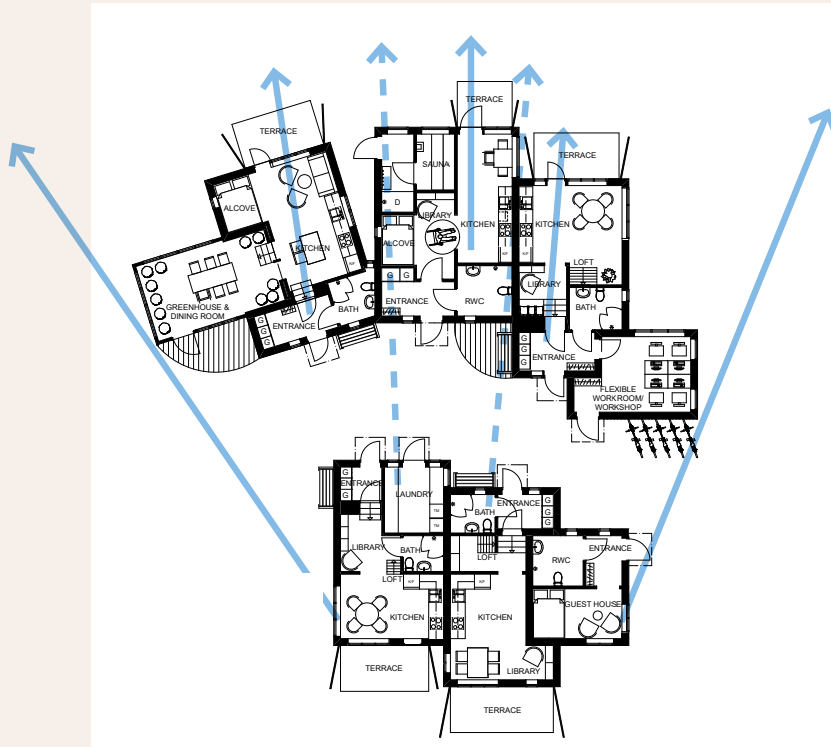
These A, B and C spaces in combination with the fact that heat rises were the basis for our design.





VARM, COLD AND SEMI-COLD

- A
- B
- C



SEA VIEW

- VIEW FROM GROUND FLOOR
- VIEW FROM LOFT



PRIVATE VS. COMMON SPACE

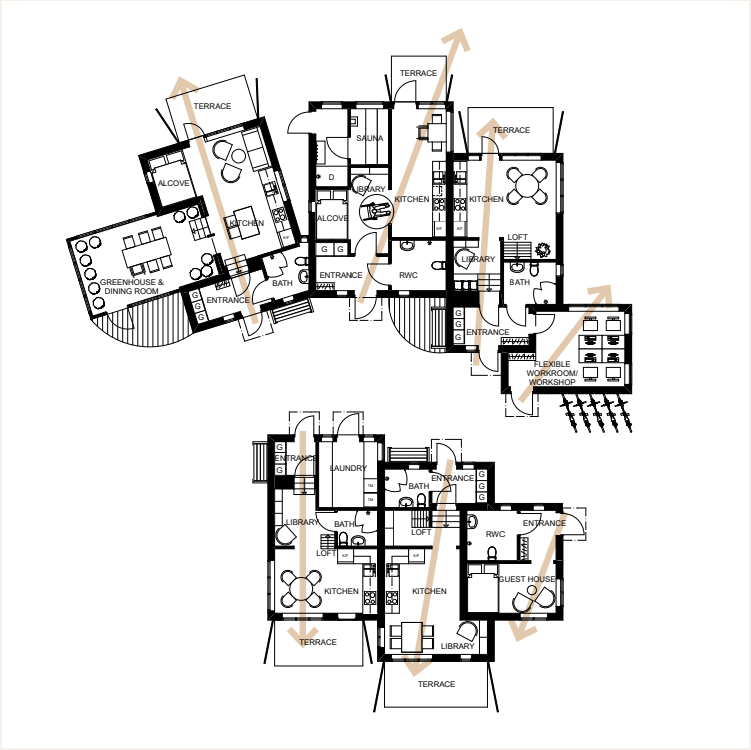
- PRIVATE SPACE
- COMMON SPACE





VARIETY OF HEIGHT

- 2200 mm
- 2700 mm
- 4500 mm



LINE OF SIGHT

- UNBROKEN LINE OF SIGHT

## COMMON SPACE

**To challenge the norm of how we live the common space in each private dwelling is introduced.**

The common spaces give a high quality living and create social bounds between the dwellers. A broader variety of living is realized despite the fact that the private dwellings are no bigger than 35 sqm.

The dwellers share a social greenhouse with room for dining and socializing, sauna, work space/workshop, laundry room and guest room. All common and outdoor spaces meet the requirements of accessibility.





COMMON  
BOARDWALK

COMMON  
SAUNA

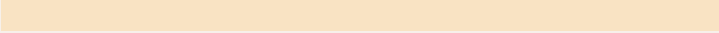
COMMON  
ENTRANCE SPACE

SECTION **COMMON**

## PRIVATE SPACE IN 35 SQM

Due to the size of the dwellings we have payed particular attention to the plan design. The main characteristics of this are volume and view **with the ambition to create big space in small scale.**

The sequence experienced going through the dwelling is achieved with defined spaces with varying height. This enhance the feeling of going from room to room despite the small scale. The design also uses the small size as a design tool. Unbroken line of sight from the entrance to the sea and outdoor spaces is realised in every dwelling.



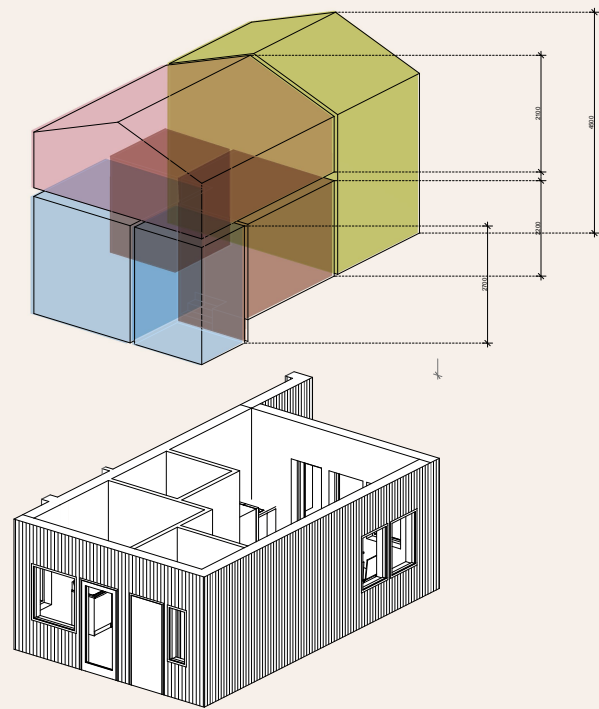
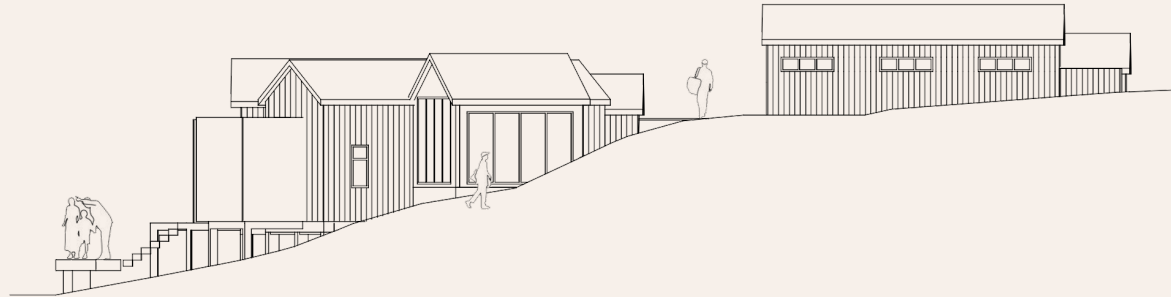


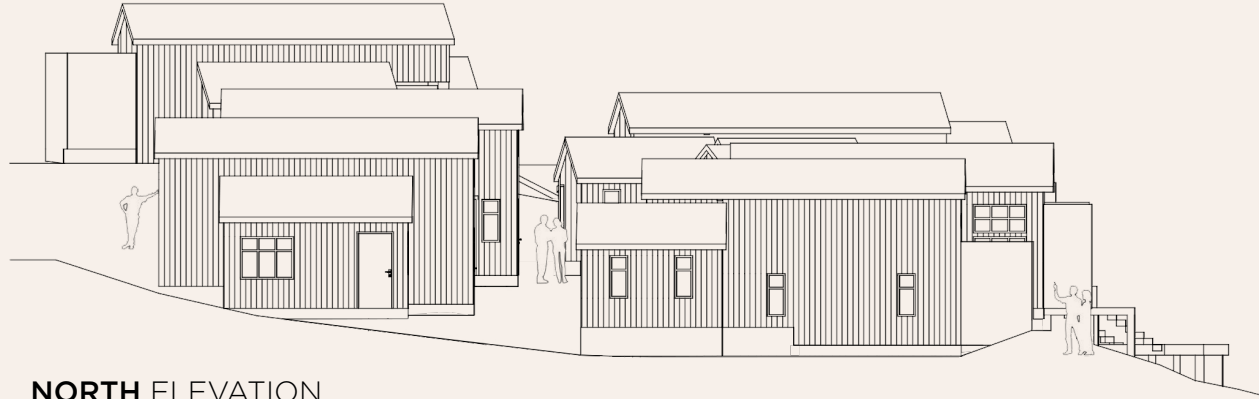
DIAGRAM AND VISUALISATION **PRIVATE SPACE**



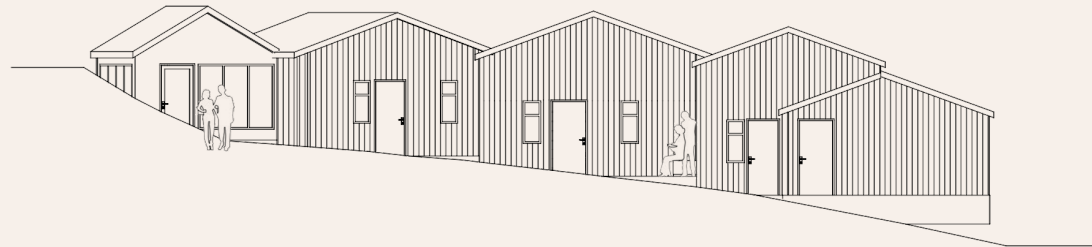
**SOUTH** ELEVATION



**WEST** ELEVATION



**NORTH** ELEVATION



**EAST** ELEVATION IN-BETWEEN SPACE

# MATERIALS

The focus points for our selection of materials have been the following:

- Big impression, small imprint
- Big life span for a sustainable development of the coastal areas
- No materials harmful for human and animals
- High quality materials that can be reused
- An expression that interact with the existing.





## REFLECTION

In this project we have challenged our conventional conception about what a dwelling should be. We have been working with Orust as an active client and got to know the local situation in a way that inspired us to do a humble addition that interacts instead of going solo. We have realized that the sustainable approach can always be applied in an architectural project.





## **CONCLUSION**

With inspiration from the traditional way to dwell we have created a starting point for discussion on how to live and dwell in a updated way in coastal areas.



VISUALISATION **COMMON SPACE**

## REFERENCE LIST & THANKS TO

**NILS BJÖRLING** for all your questions

**THE MUNICIPALITY ON ORUST** for your curiosity

### LITERATURE

*Climate Design*

*Design and Planning for the Age of Climate  
Change - AECOM + Professor Peter Droege*

*Designing Sustainable Communities - Avi Friedman*







**CHALMERS** ARKITEKTURSKOLA

Masterprogram Arkitektur och planering för hållbar utveckling 2017/2018  
Designstudio Planering och gestaltning för hållbar utveckling i lokalsamhället: ORUST - Den rurbara ön  
Del B / Fördjupningsprojekt  
Olga Peterson & Ellen Ugglå