



**ICE  
LAB  
III**



**#THE PROTOTYPE**

**#WHAT IS IT**

**#THE SITE**

**#TIMETABLE**

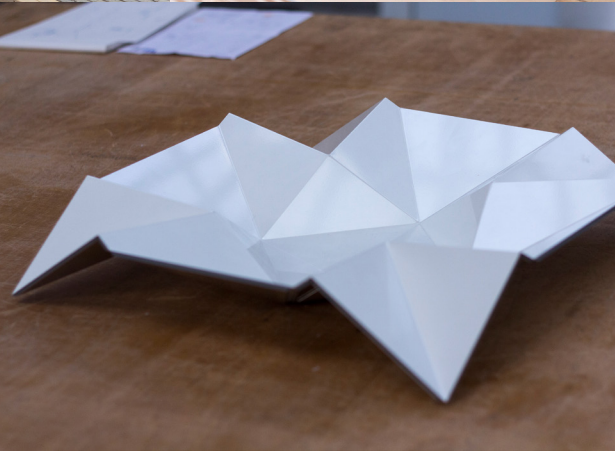
**#THE RESEARCH**

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## PROJECT ICELab III

## #THE PROTOTYPE



The prototype was designed by Architecture students of the KIT Architecture Faculty, Karlsruhe in close collaboration with María Dolores Muñoz (Territorial Planning Unit, EULA Environmental Research Center, Universidad de Concepción) with the aim to be used as experimental unit for scientific research and at the same time to serve as a constructional and energetically self-sufficient infrastructural prototype. Furthermore, it will deliver information about the materials behaviour in remote areas under extreme climatic conditions -to be considered for future interventions in the Magellan region. This pilot unit was temporarily mounted in a hangar in Karlsruhe. Subsequently it will be dismantled to be shipped to its final destination in Chile, to be built up in the site on Navarino Island, Tierra del Fuego. Karlsruhe Institute of Technology (KIT) will loan the ICELab III Prototype to Universidad de Concepción for a period of four years.

## PROJECT ICELab III



## #WHAT IS IT?

ICELab III is a project developed by Karlsruhe Institute of Technology (KIT) in cooperation with Universidad de Concepción, consisting in a Laboratory Unit Prototype for Environmental Research Scientists operating in remote areas.

The ICELab III Prototype was specifically designed to work under extreme climatic conditions, as usually found on areas which are subject of environmental research on exposed marine and terrestrial ecosystems; species protection on ecologically vulnerable areas.

Therefore, it was decided to install the prototype in Caleta Tortel, a small town in the south of the Chilean mainland. A place which presents these extreme environmental conditions.



The site on which the prototype shall be erected is situated in Caleta Tortel, a small harbour facing a large fiord at the estuary of Baker river, one of the few inhabited places in the northern area of the Chilean Patagonia. The site itself is property of Universidad de Concepción, one of the partners of the ICELab III Project.

Caleta Tortel (around 430 inhabitants) is, considering the population density of the whole Magellan region not exceeding 0,1 inhabitants / km<sup>2</sup> a quite important centre. From here the Oceanography department of Universidad de Concepción starts a number of research expeditions to the Magellan fiord region.

The climate in this particular area is relatively mild, with temperatures usually ranging between -2 to 15°C; an average rainfall of 512,3 mm a year and an average relative humidity of 79%.

## Phase\_1

Background Research, Lab-Design, first fundings, Construction and building process by KIT-students in Karlsruhe and finally shipping the Lab to Chile.

Status: completed



## Phase\_2

Field trip to Patagonia to set up the IceLab at site. The fieldtrip will be well documented in pictures motion pictures.

Status: upcoming in Feb. 2022 - funding needed



Phase\_3

Research and development for sustainable Insulation in extreme conditions based on collected data from the IceLab while used by the oceanographic Scientist from Universidad de Concepcion.

Status: upcoming





Phase\_4

Exhibition in Santiago de Chile and Berlin to promote the IceLAB and further international Projects and collaborations between Chile and Germany.

Status: upcoming in 2022 - funding needed



PROJECT ICELab III

#THE RESEARCH



**WOOL**



In late 19th and early 20th centuries, sheep farming expanded across the Patagonian grasslands making the southern regions of Argentina and Chile one of the world's foremost sheep farming areas. The sheep farming boom attracted thousands of immigrants from Chiloé and Europe to southern Patagonia.[1] Early sheep farming in Patagonia was oriented towards wool production but changed over time with the development of industrial refrigerators towards meat export.[2] Besides altering the demographic and economic outlook of Southern Patagonia the sheep farming boom also changed the steppe ecosystem.[3]

The amount of wool as industrial waste increased and another purpose for this valuable natural material could be the use as insulation for housing.



Sheep's wool can absorb moisture up to a third of its own weight without losing its insulating properties. It improves the indoor climate by slowly releasing this moisture and also neutralizes air pollutants such as formaldehyde, ozone or other housing toxins.

So far the rear sheep's wool is vulnerable to moths and many other kinds of pests and insects. It has to be prepared with pesticides what makes it a less sustainable product as it could be.

In this research the rear and local wool will be monitored as insulation in between the wooden-frame-construction and the alu-dibond facade and compared to other more common used insulation materials.

## PROJECT ICELab III



## #THE CONSTRUCTION

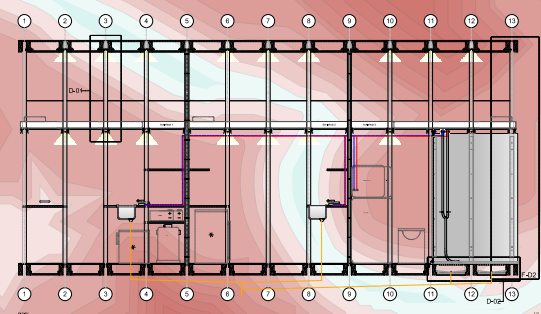
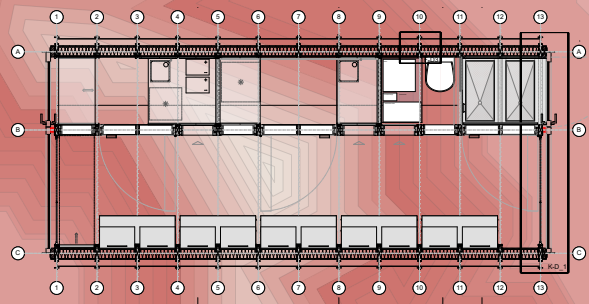
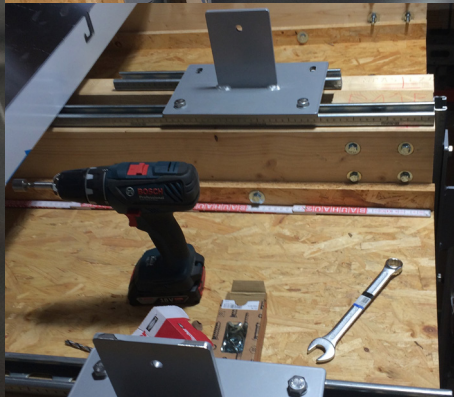
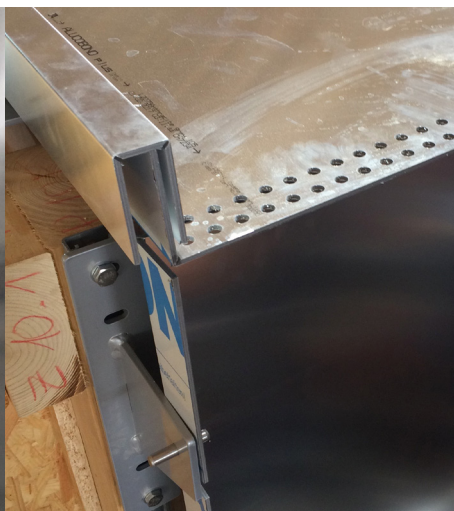
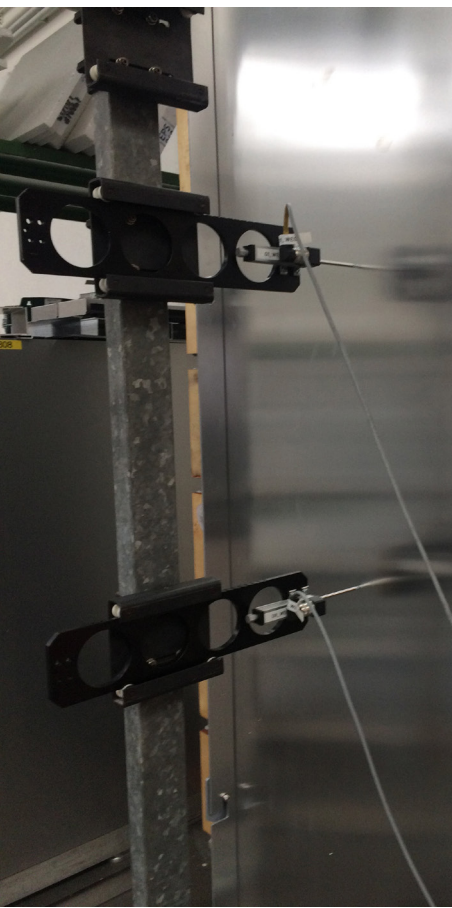
The Lab itself it's basic construction is a rectangle timberframe construction with certain OSB sheets layered on the inside. In between the frames the insulation will set place and on top the Alucobond-hull will protect the Icelab from any wind, rain and snowfall.

The simple and modular construction allows a quick mount and unmount of the whole Lab. Due to the lightness of the timber-aluminium-construction, the building can stand on stilts like any surrounding houses traditionally do. It's impact to nature is due to this minimized plus it's construction technically and the choice of material makes as sustainable as it can get.

The Interior is kept modular as well and is optimized to it's further use as a scientific lab for Oceanographics from all parts of the world.

# PROJECT ICELab III

# #THE CONSTRUCTION



## CONTACTS

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## SPONSORS ICELab Construction

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tallverformung GmbH + Co. Stanzwerk Burgau, Christian Bestler |

Proterm Energieberatung Feuerland, Manfred Hellwig, Chile |

Powerball-Systems Solothurn CH, H. Grässl

We're still in need for further sponsoring and funding for the Fieldtrip to

Patagonia, research, documentation and realisation of the exhibitions in

Chile and Germany.