

## CROSSING THE ICEBERGS

date: 10.2022-12.2022

type: academic project

site location: ilulissat,Greenland

instructor: Ni kixin

group work : Li Xinru & Jiao Liulu

contribution:55%workload

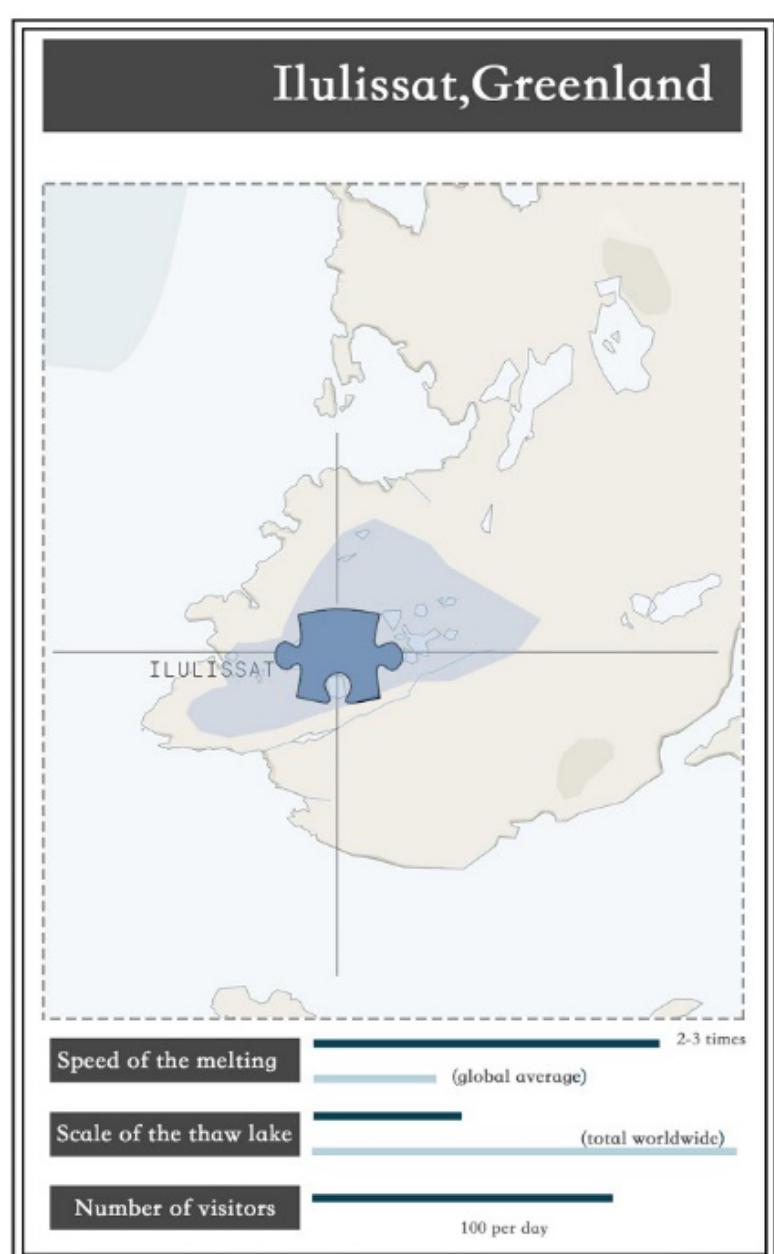
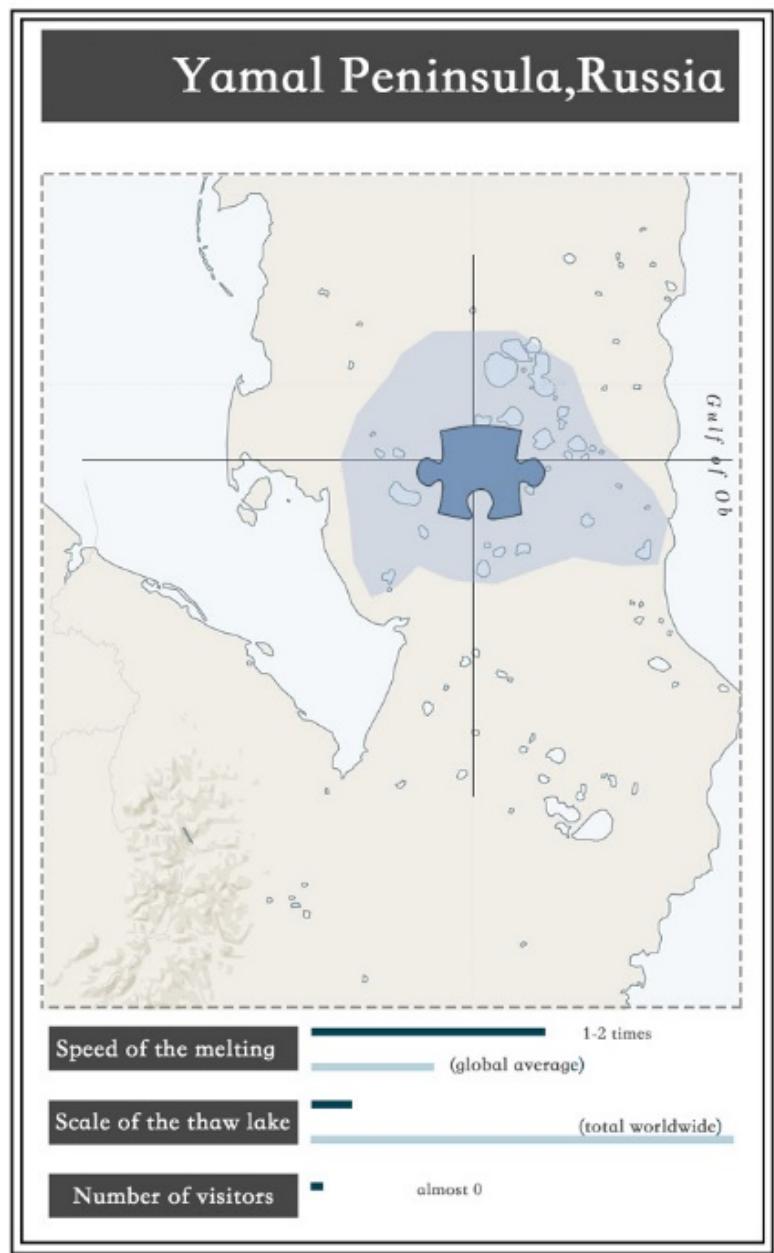
(including:concept design 50%/modeling  
60%/drawing 50% )

The project is based on the theme of sustainable development and focuses on the environmental problems of melting glaciers caused by global warming. Through the design, it is hoped to raise awareness of this serious problem and to reduce heat radiation through the building skin materials, building forms and installations to slow down the melting of glaciers.



## THAW LAKE PHENOMENA

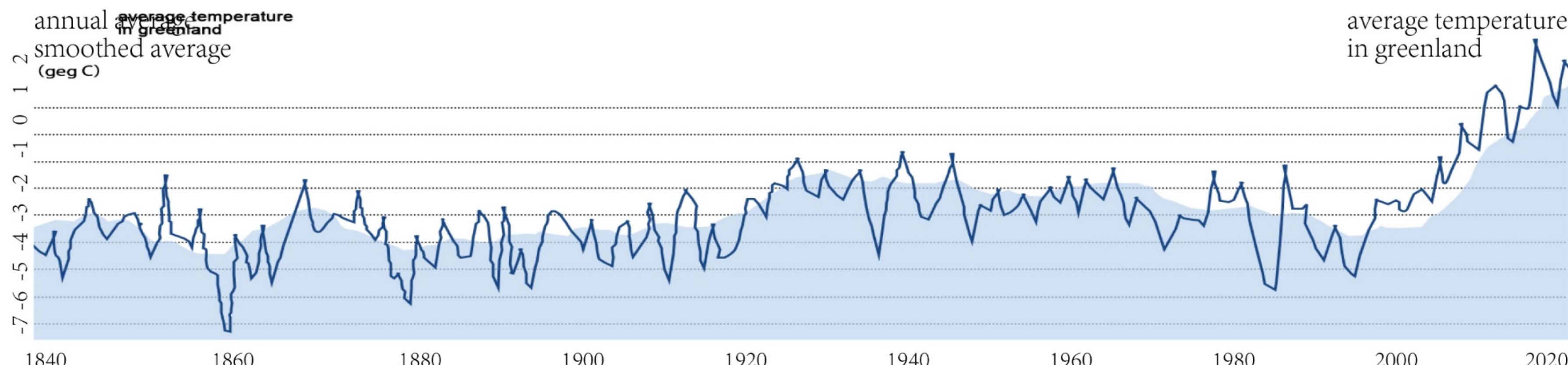
### A-A SECTION



### MAPPING

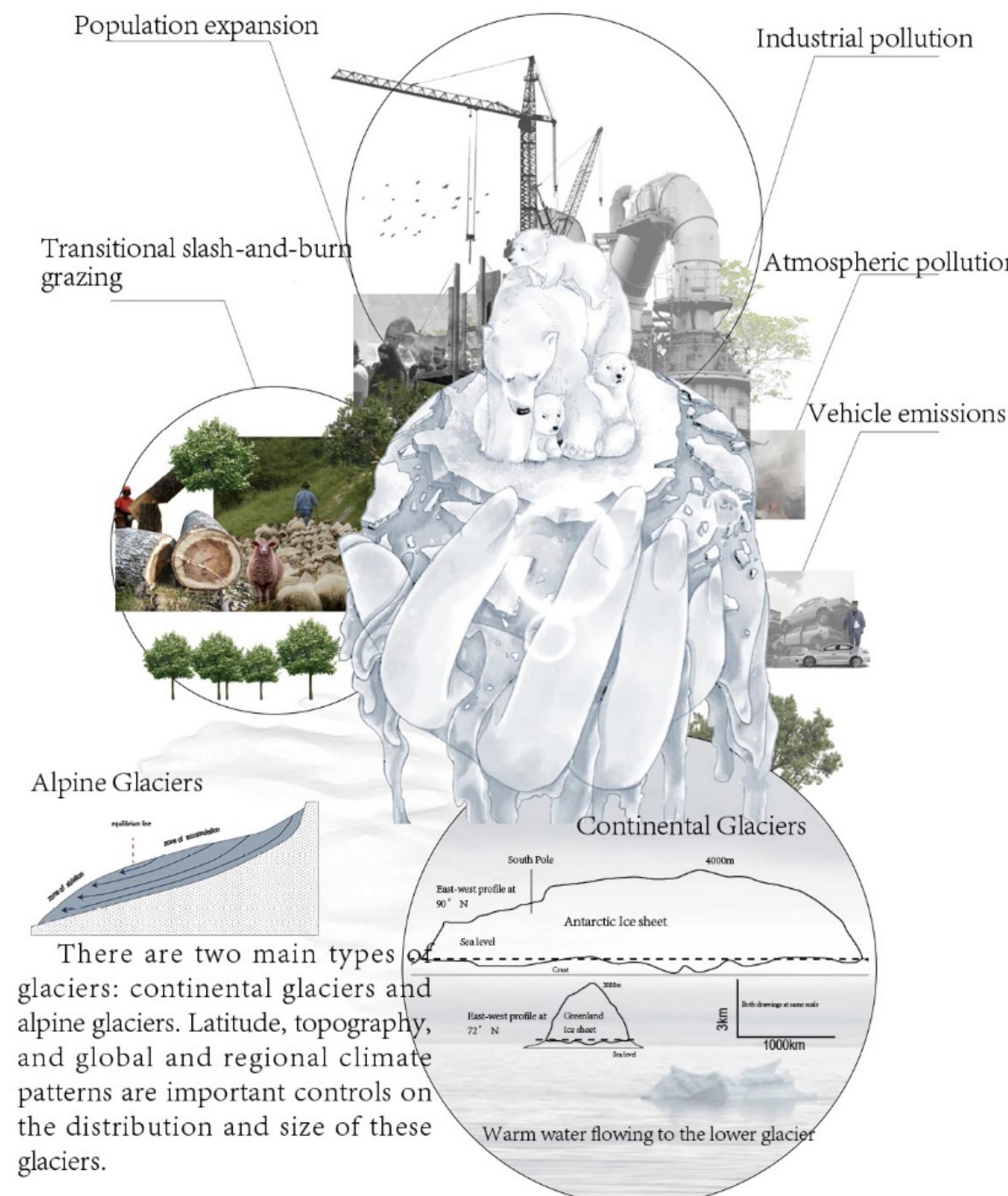


### AVERAGE TEMPERATURE IN GREENLAND

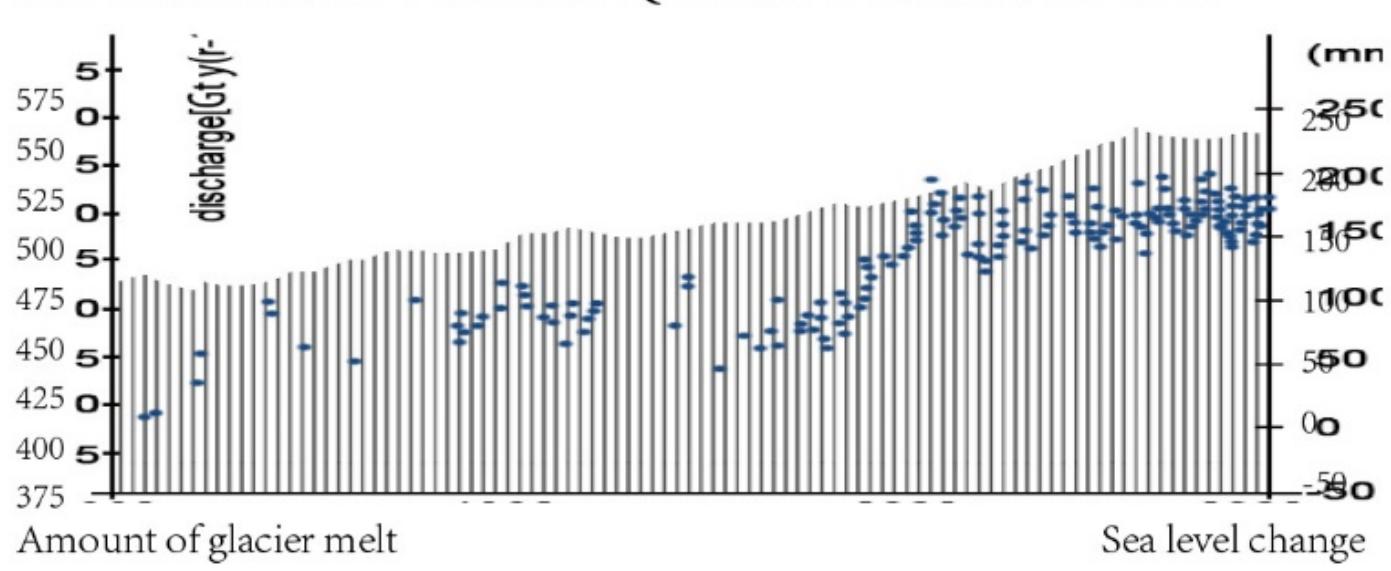


Global warming has always been a worldwide problem, and is particularly pronounced in glaciated areas such as Greenland. The data shows that both the mass of the ice sheet and the sea level have been decreasing , especially in the last two decades. Many glacier areas are experiencing thermal melt lakes, which can release large amounts of carbonaceous gases and thus accelerate environmental degradation. I wanted to create buildings and installations that would address the melting ice and educate visitors at the same time, so we started with the largest and most visited Ilulissat.

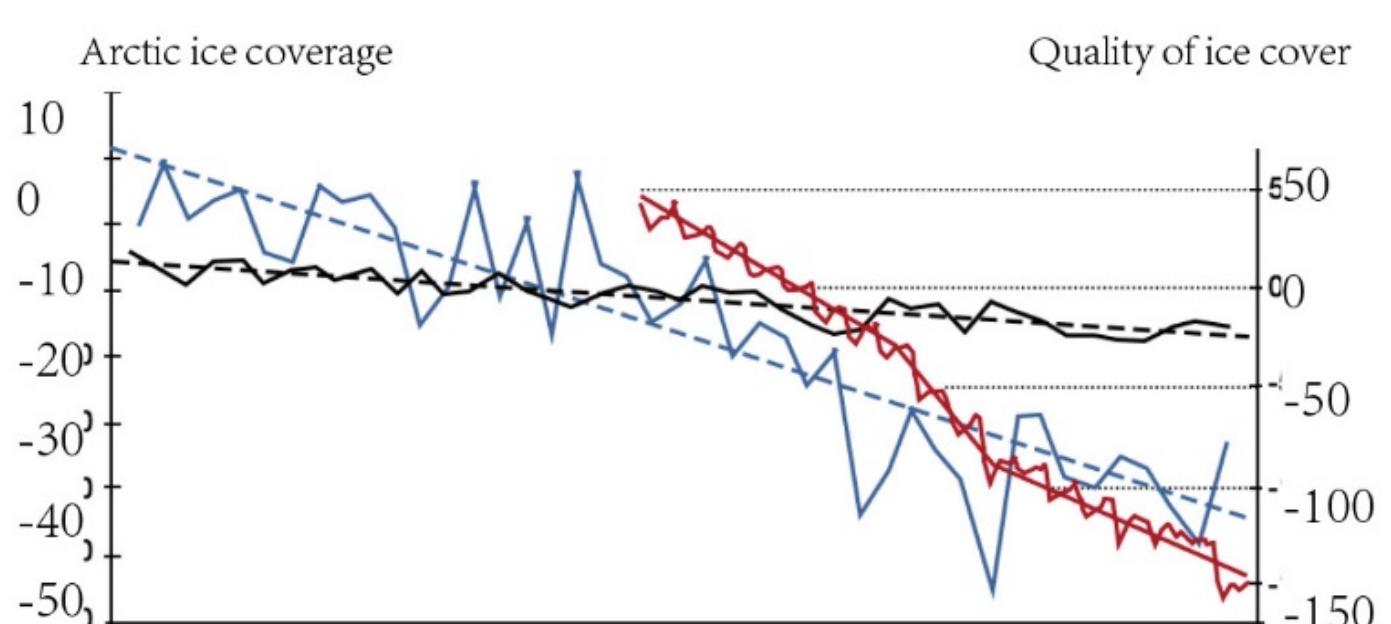
### CAUSES OF GLACIAL MELTING



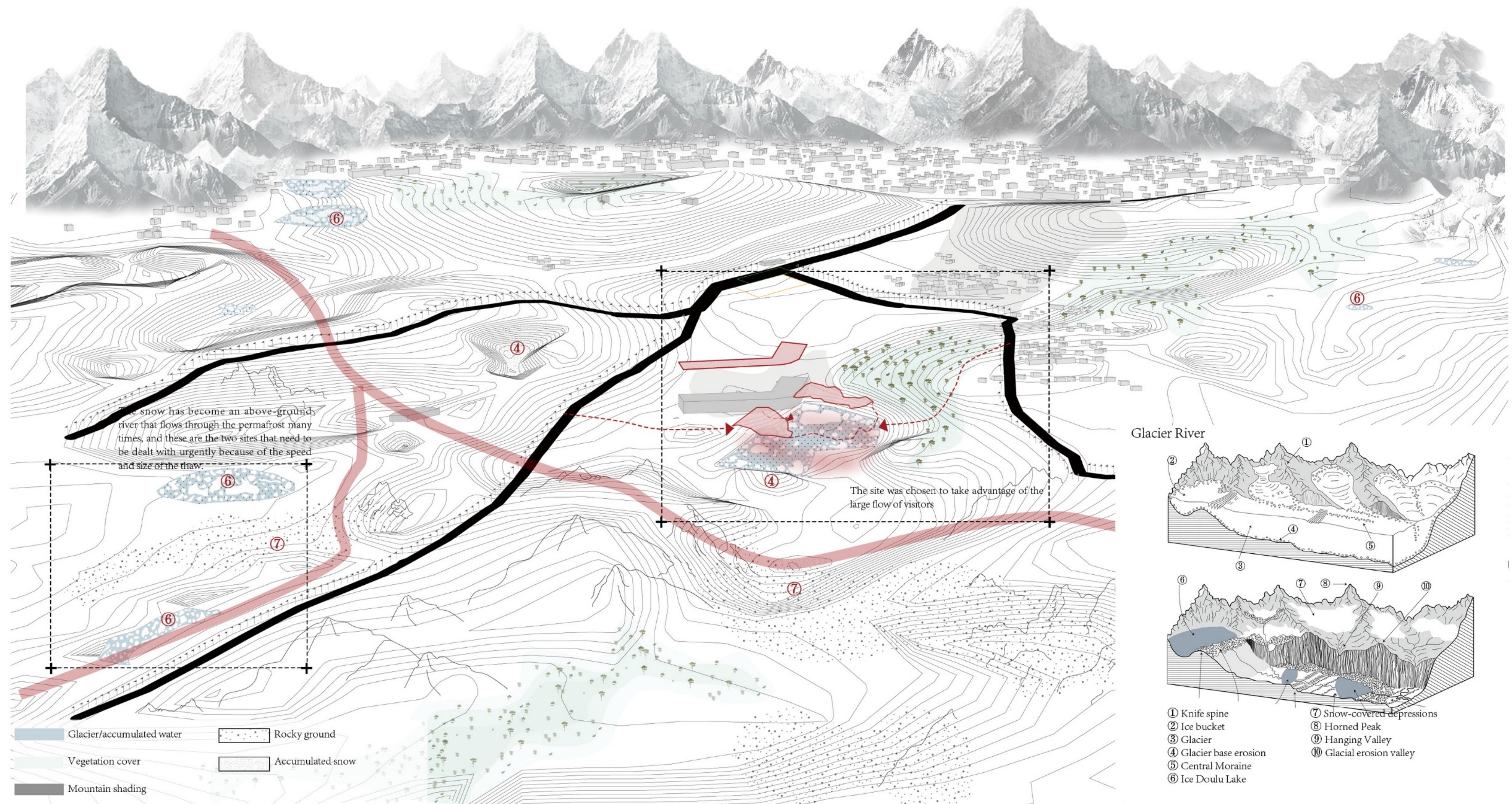
### ARCTIC ICE COVERAGE/QUALITY OF ICE COVER



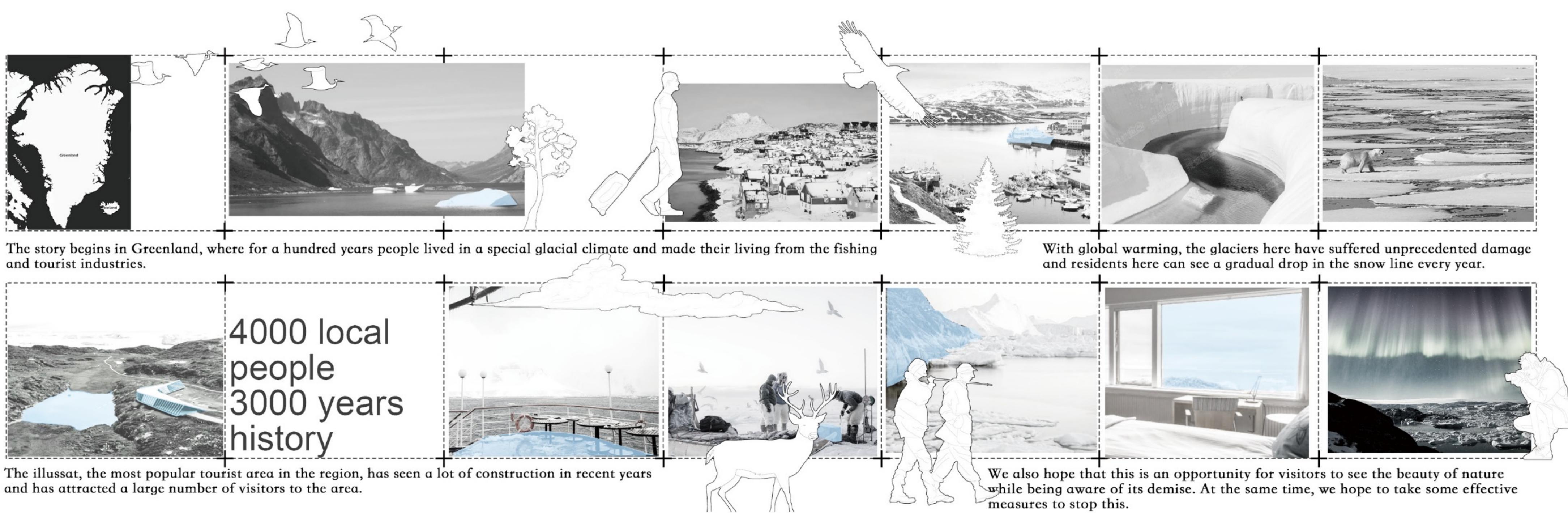
### AMOUNT OF GLACIER MELT / SEA LEVEL CHANGE



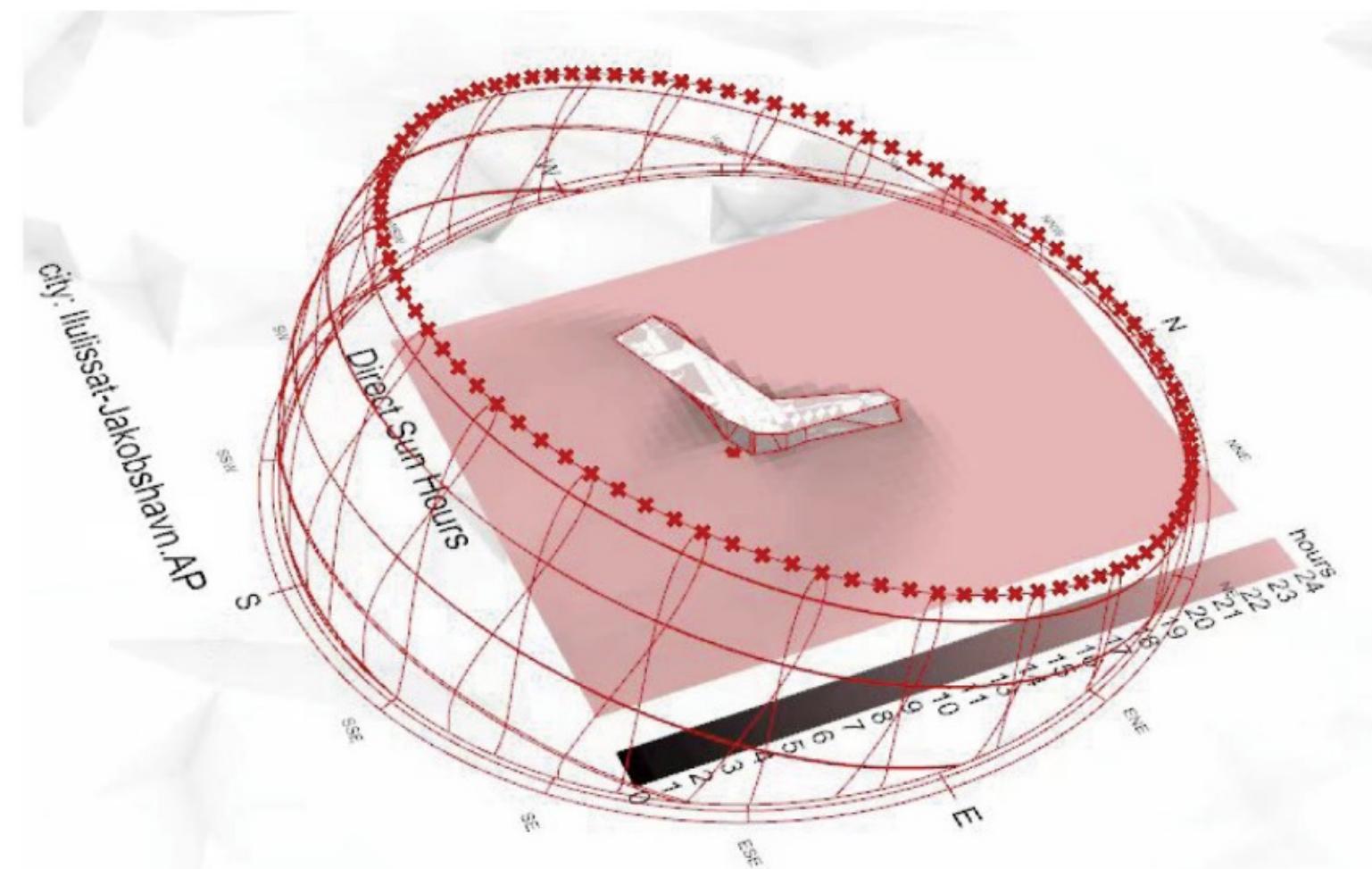
## ICE STATUS



## LIFE OF ILLUSSAT

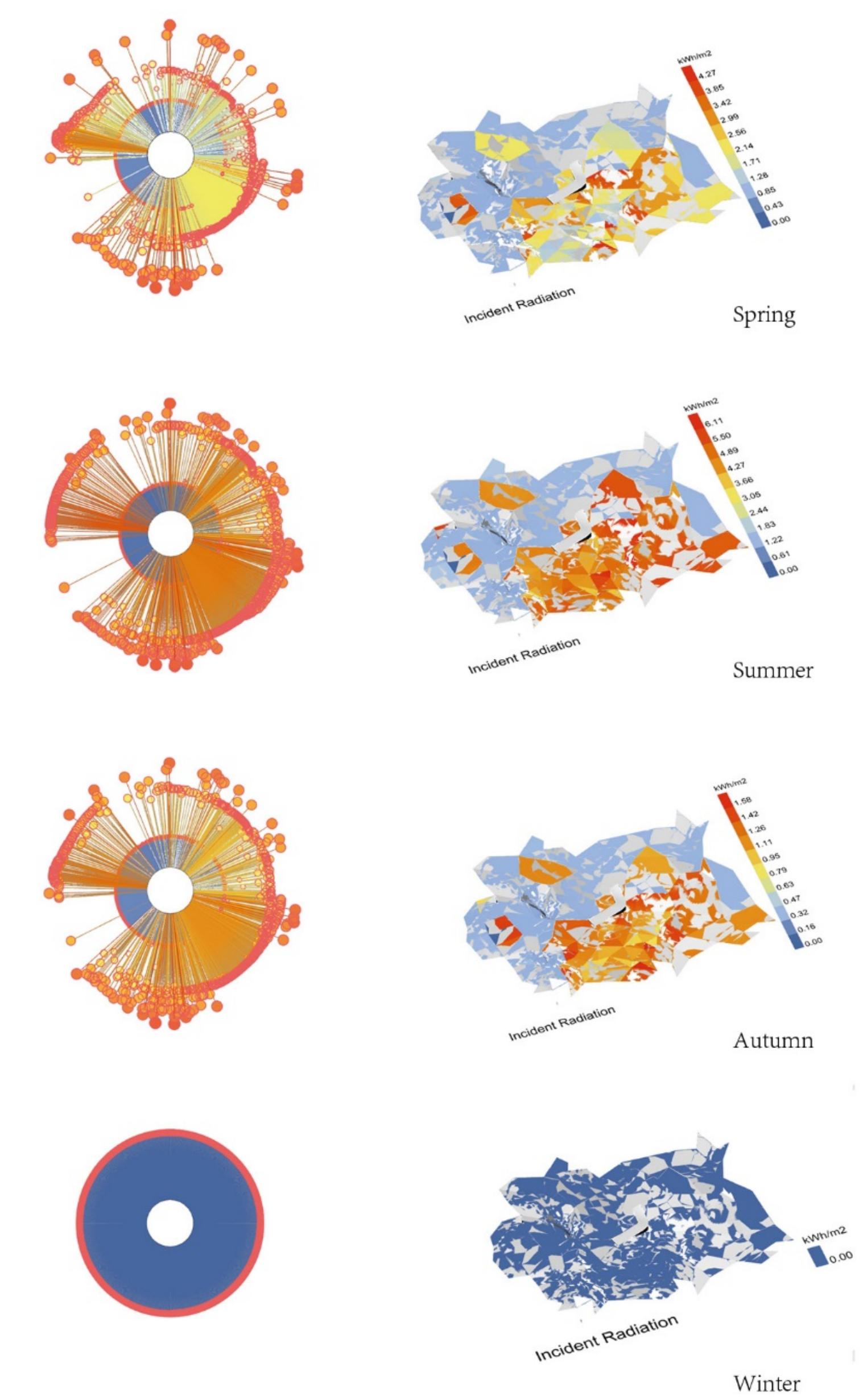


## SUNLIGHT ANALYSIS



Zooming into the site, we found that there was an established glacier museum , which I used as an opportunity to analyse and design. The distribution of light and heat radiation on the site dictated the main locations for construction to reduce glacial melt. And the four seasons of radiation changes determined where the ice on the lake was most in need of protection.

## Thermal Radiation Analysis



# CONCEPTUAL DEVELOPMENT

REASON  
PROBLEM

thaw lake Phenomenon  
thaw lake phenomenon

global warming  
global warming

Ice Crack  
Ice Crack

Ice cube  
Ice Cube

Ice water  
Ice Water

PROBLEM  
REASON

High carbon emissions  
High carbon emissions

poor travel locations  
Poor travel locations

Ground subsidence  
Ground subsidence

coast changes  
Coast changes

STRATEGY  
STRATEGY

↑ Photothermal reflection reduces melting  
Photothermal reflection reduces melting

▶ Educational exhibition to raise awareness  
Educational exhibition to raise awareness

◀ Melt to form inland rivers and increase the use  
of ice water surface  
Melt to form inland rivers and increase the  
use of ice water surface

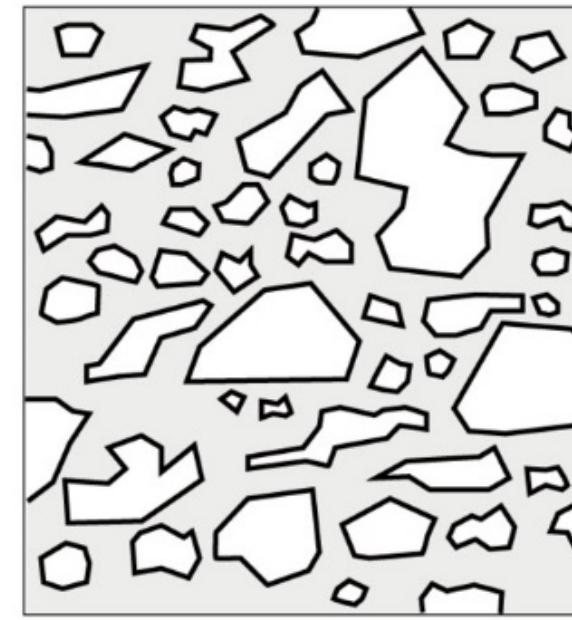
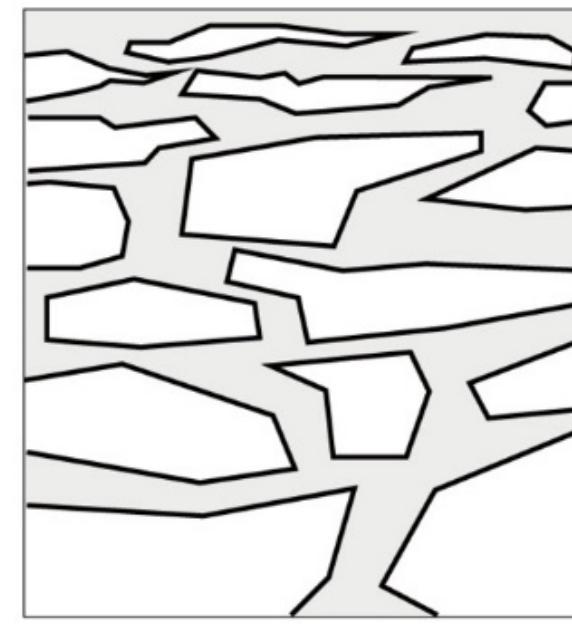
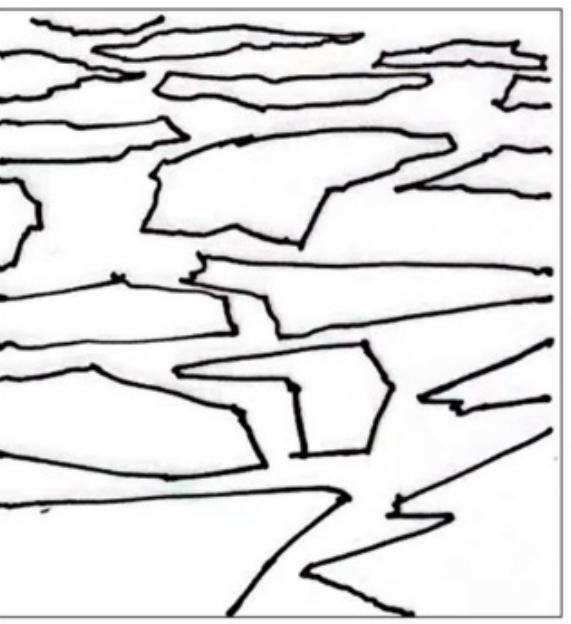
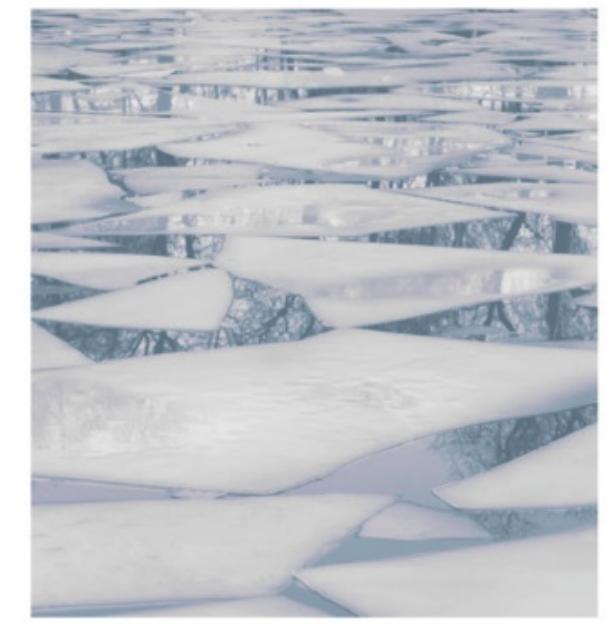
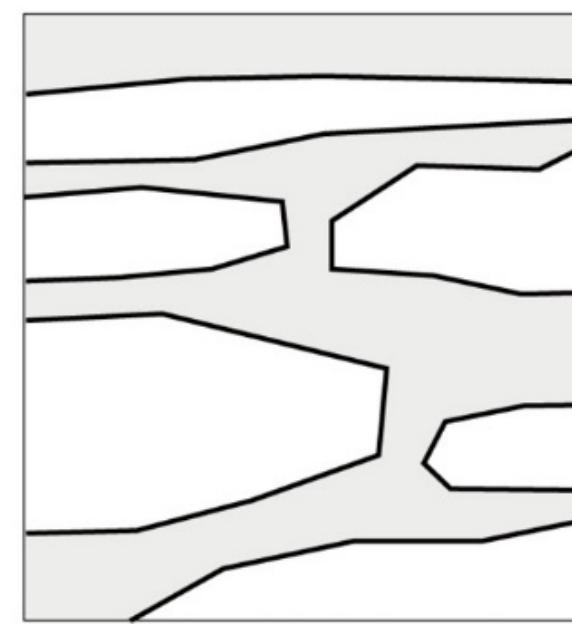
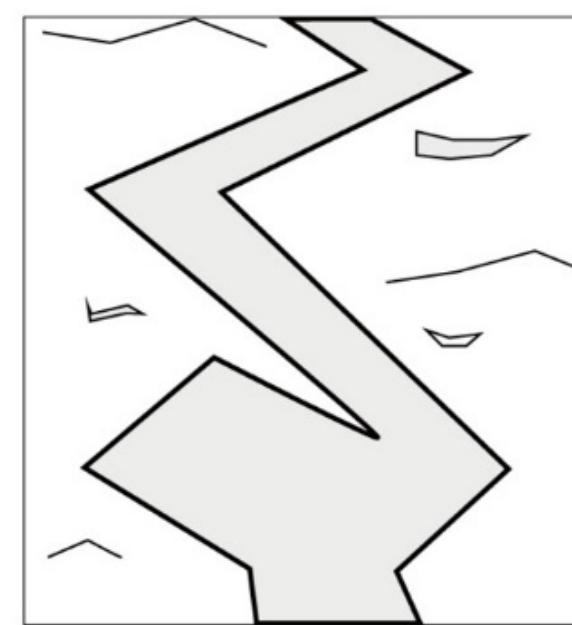
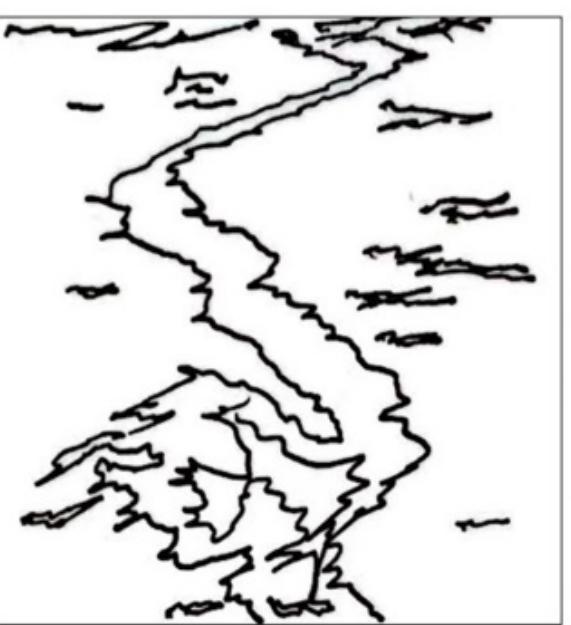
GOAL  
GOAL

corresponding with hot melt  
Corresponding with hot melt

Environmental education  
for tourists

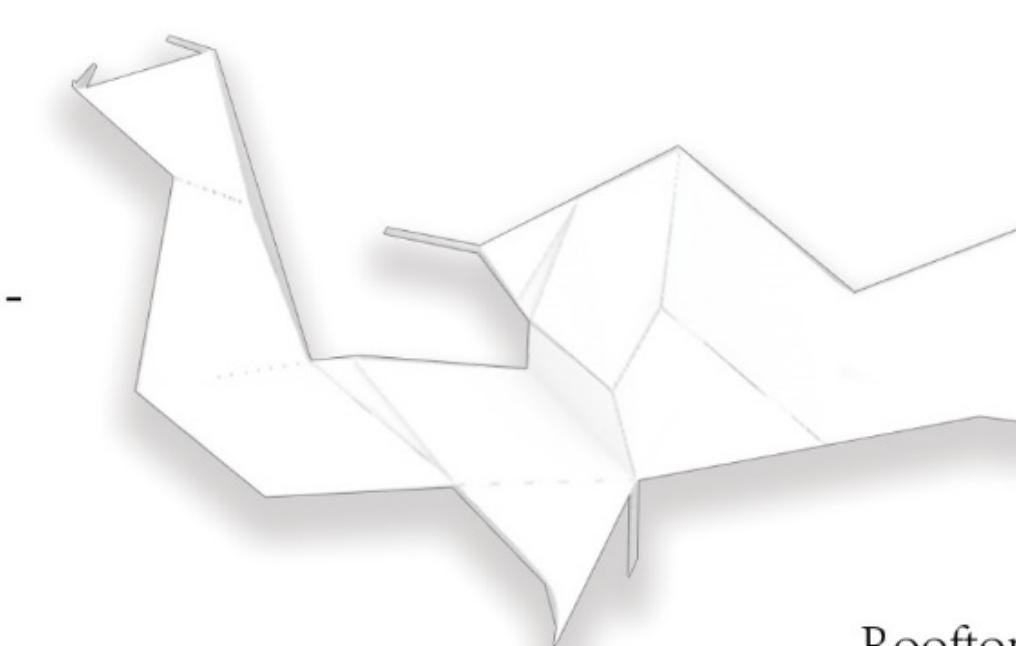
Glacial Landscape System  
Glacial landscape system

## ICE STATUS



plane

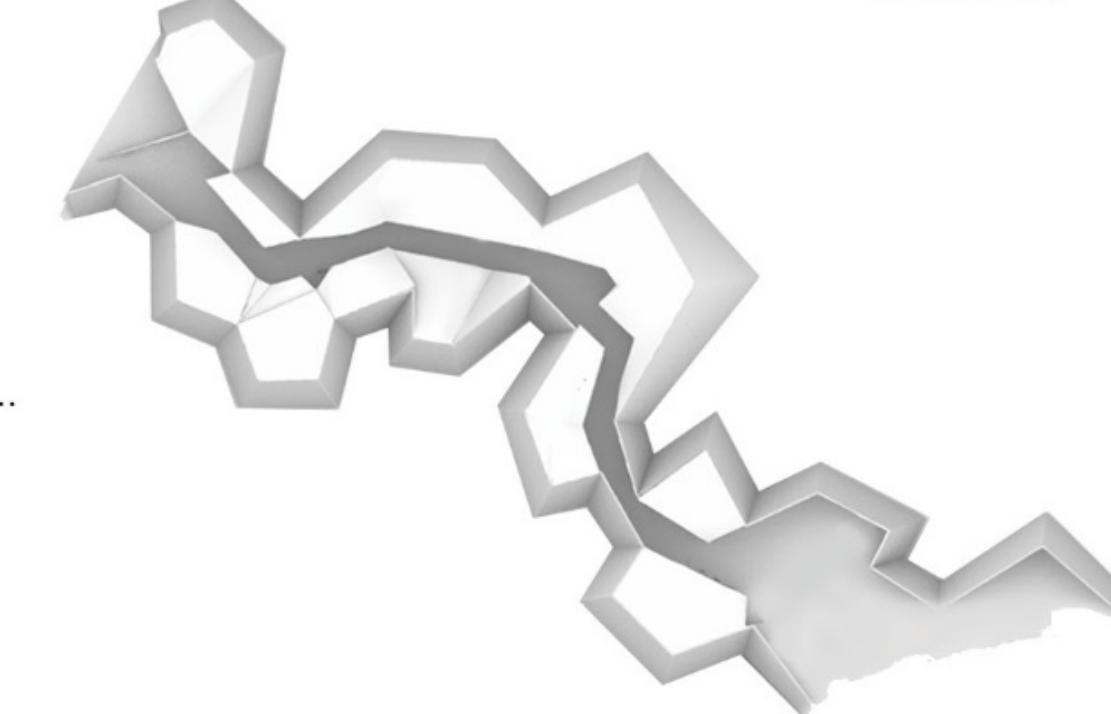
PLANE



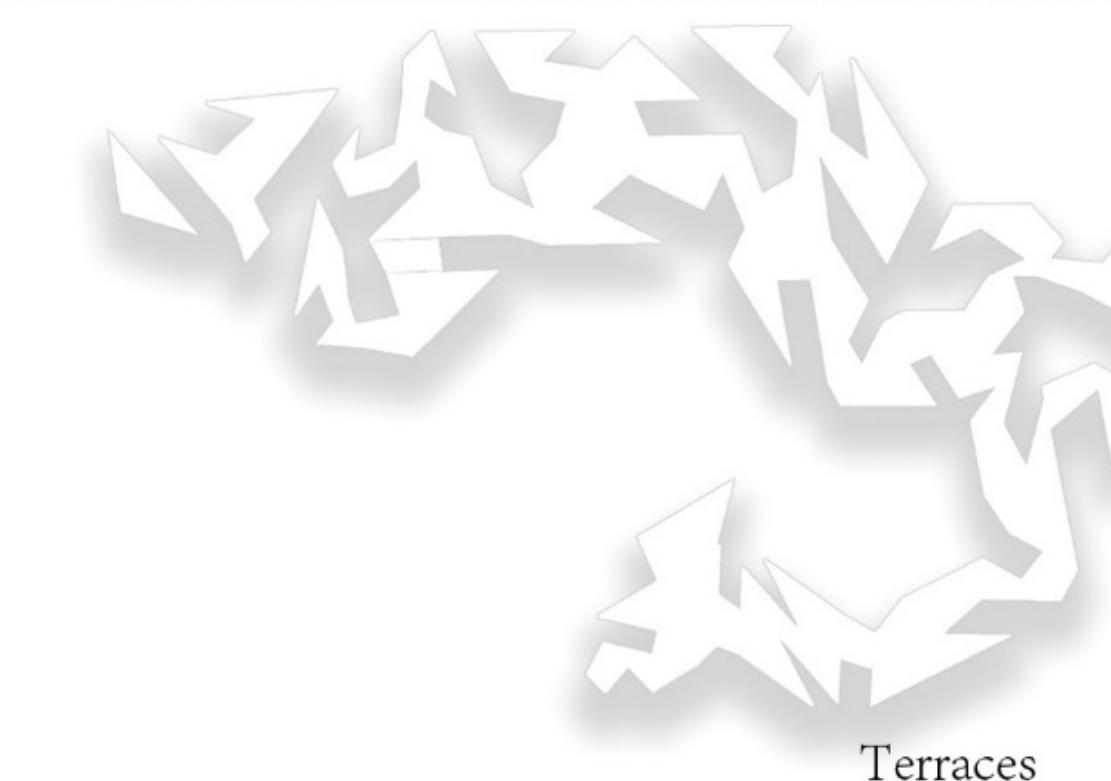
Rooftops



Corridors



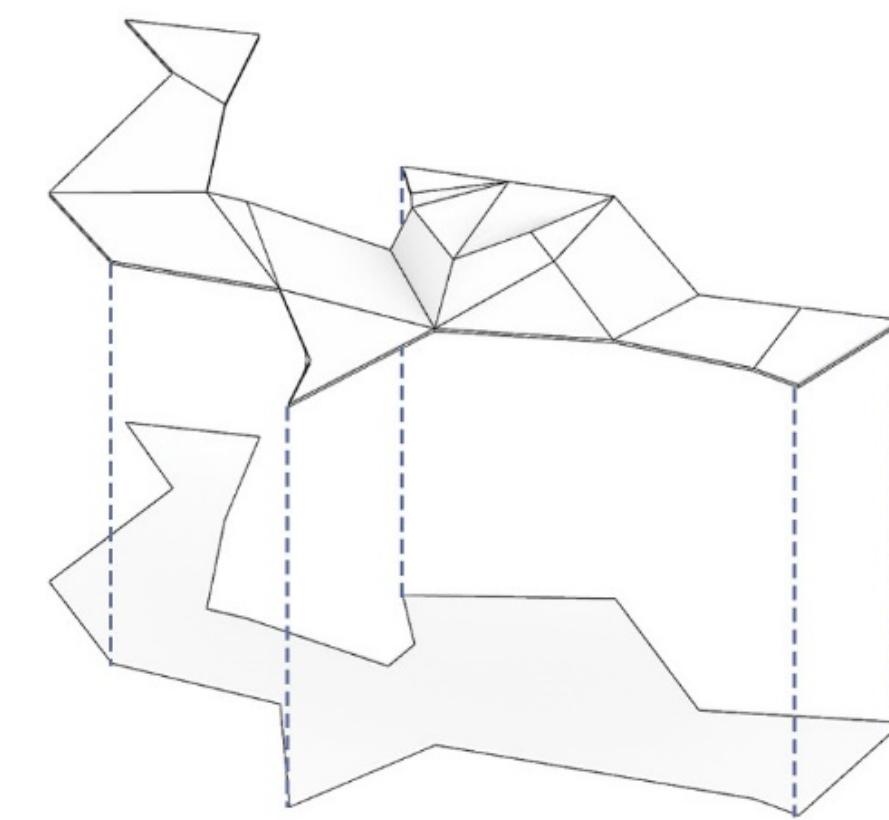
Pavilions



Terraces

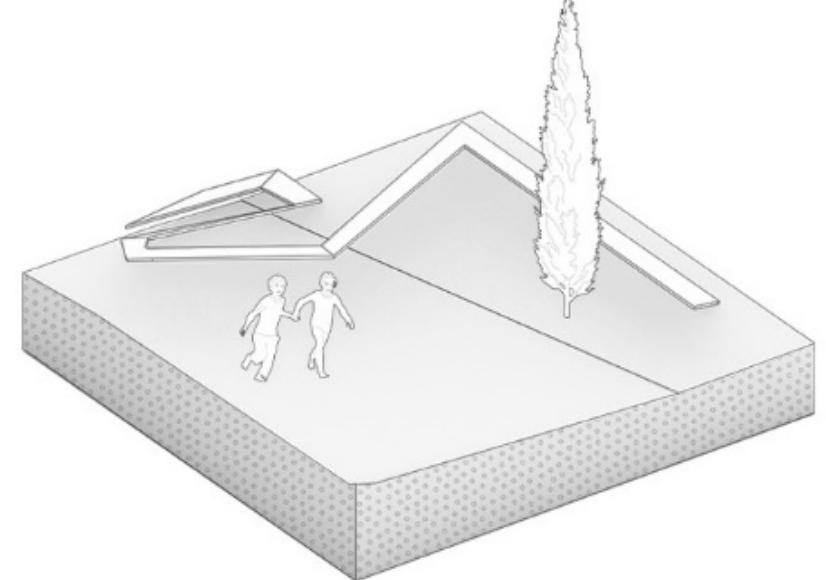
Surface

SURFACE

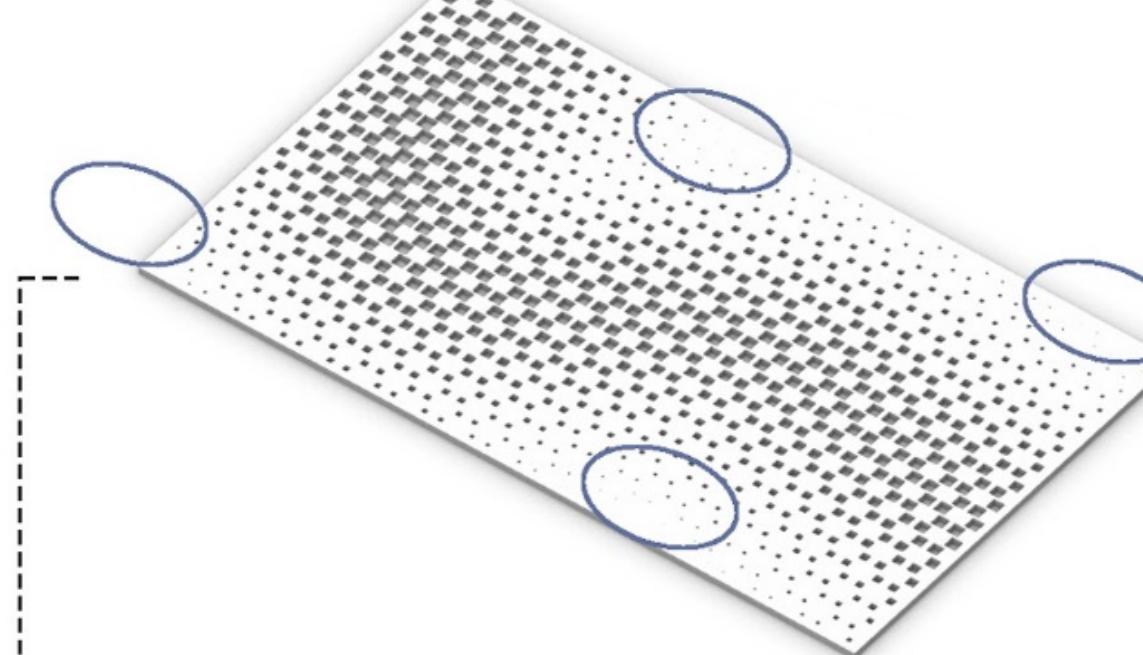


scene

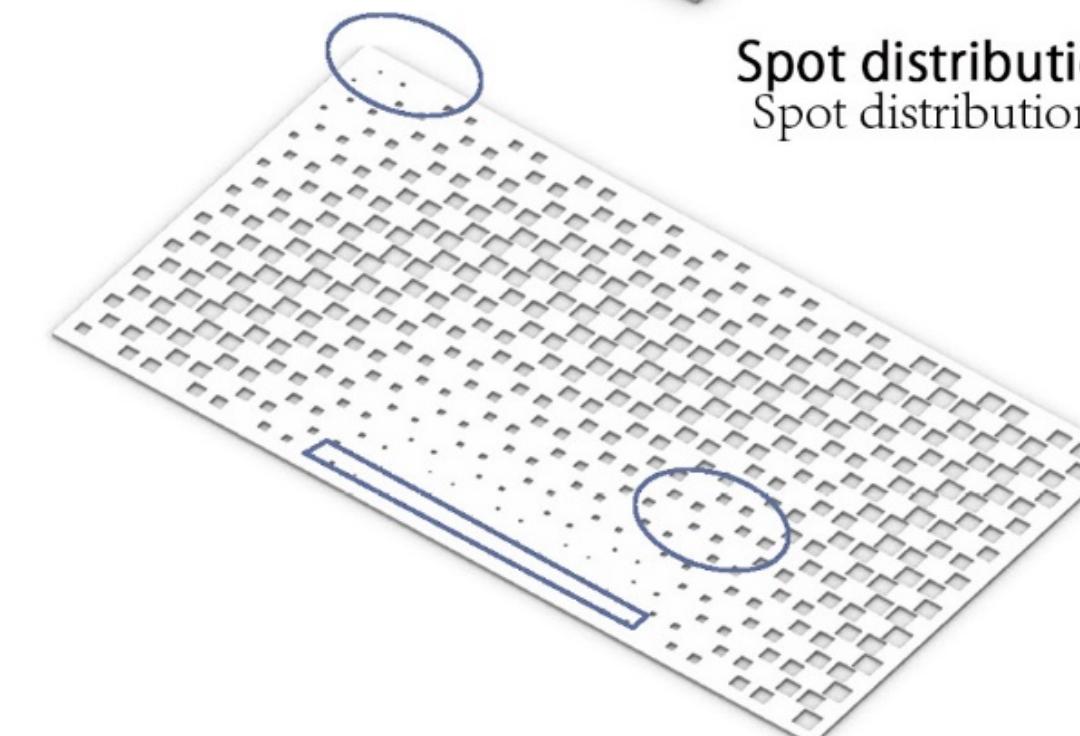
SCENE



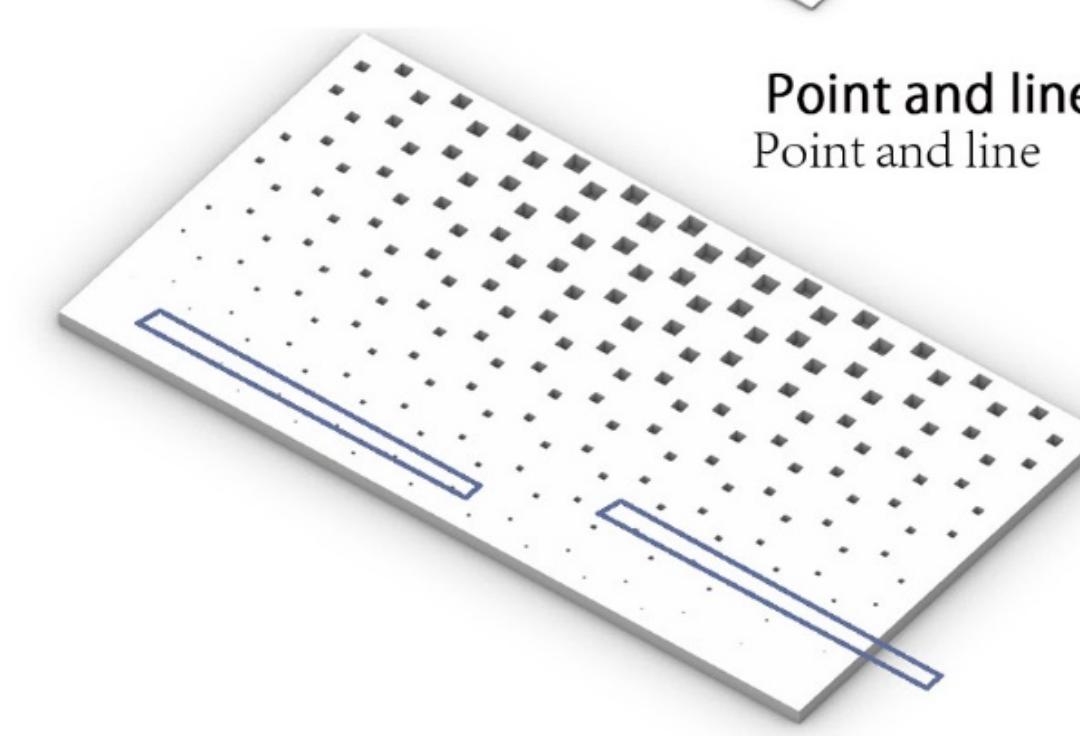
Viewing trail



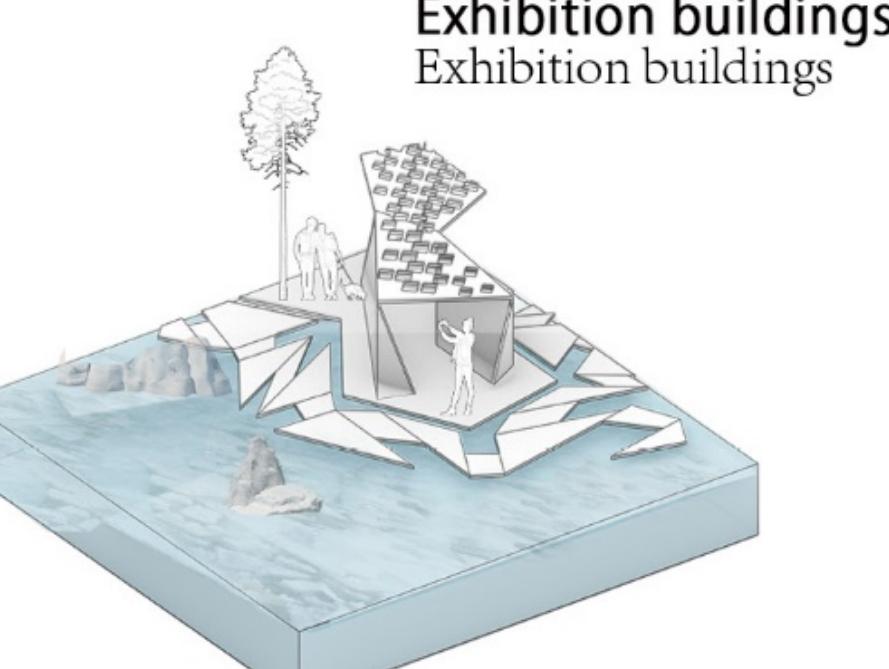
Spot distribution



Point and line



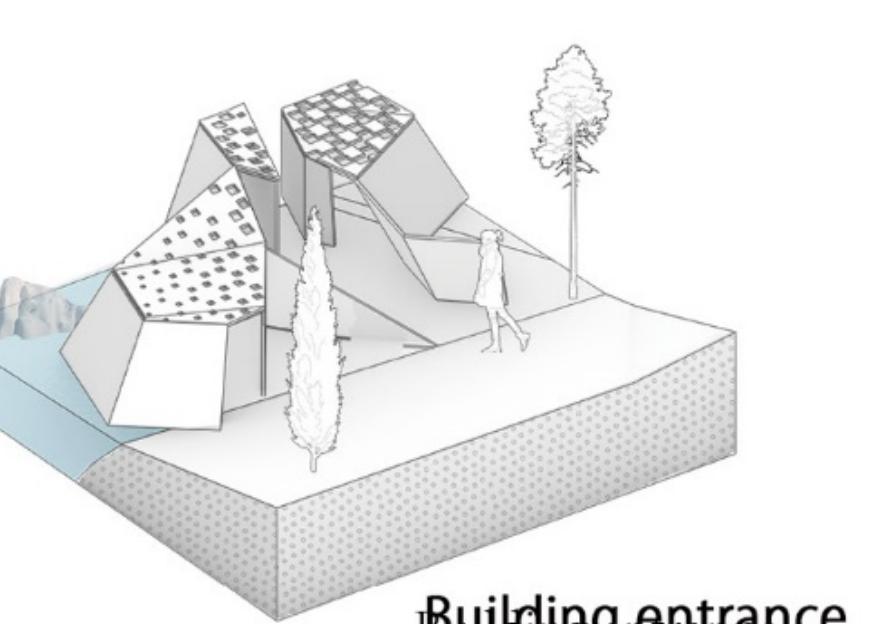
Distribution on one side



Exhibition buildings

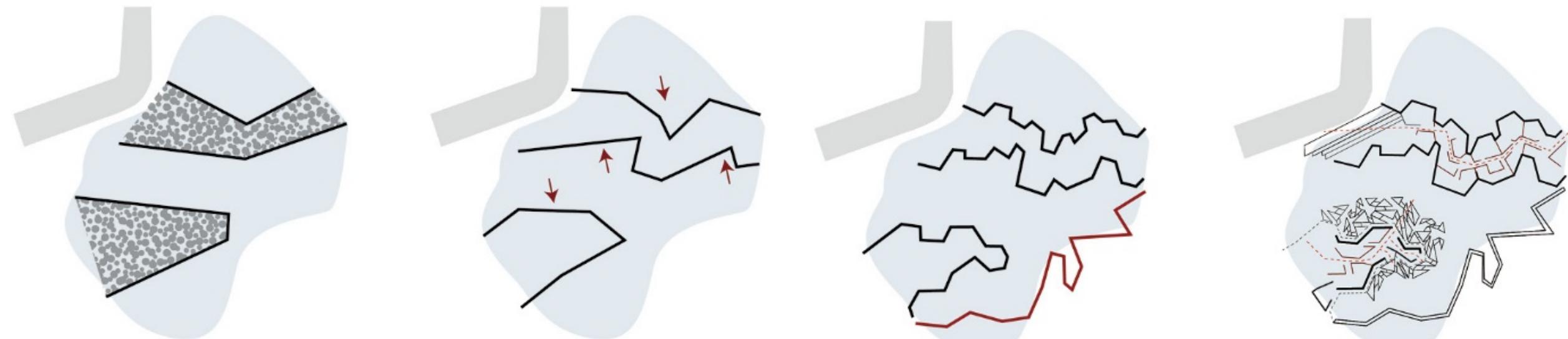


Outdoor terraces



Building entrance

## SHAPE COMPOSITION

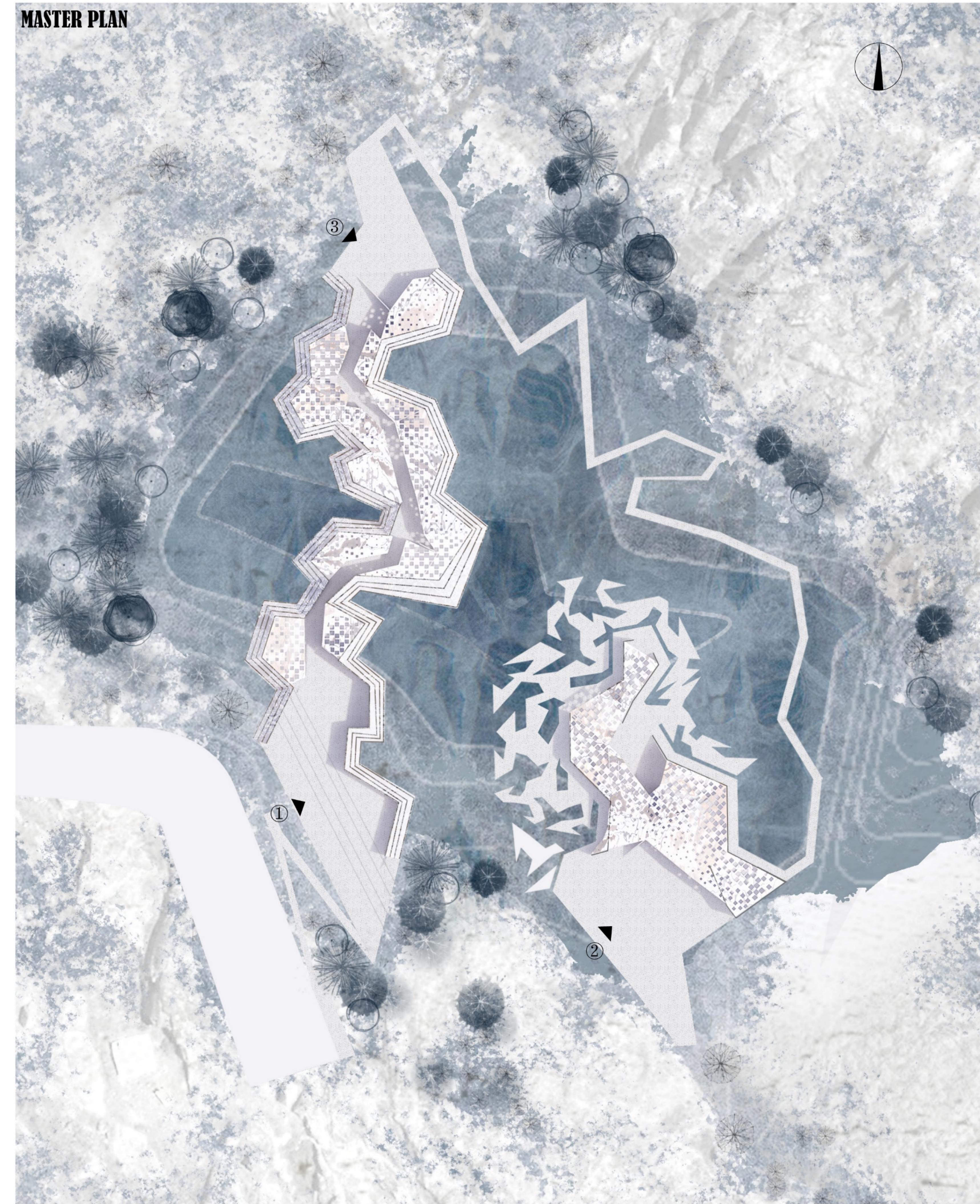


1. Delineate the construction area and location
2. Generate outlines based on sight lines and staggered pedestrian flow boundaries
3. New and old buildings, different construction connections
4. Adding details , creating platforms

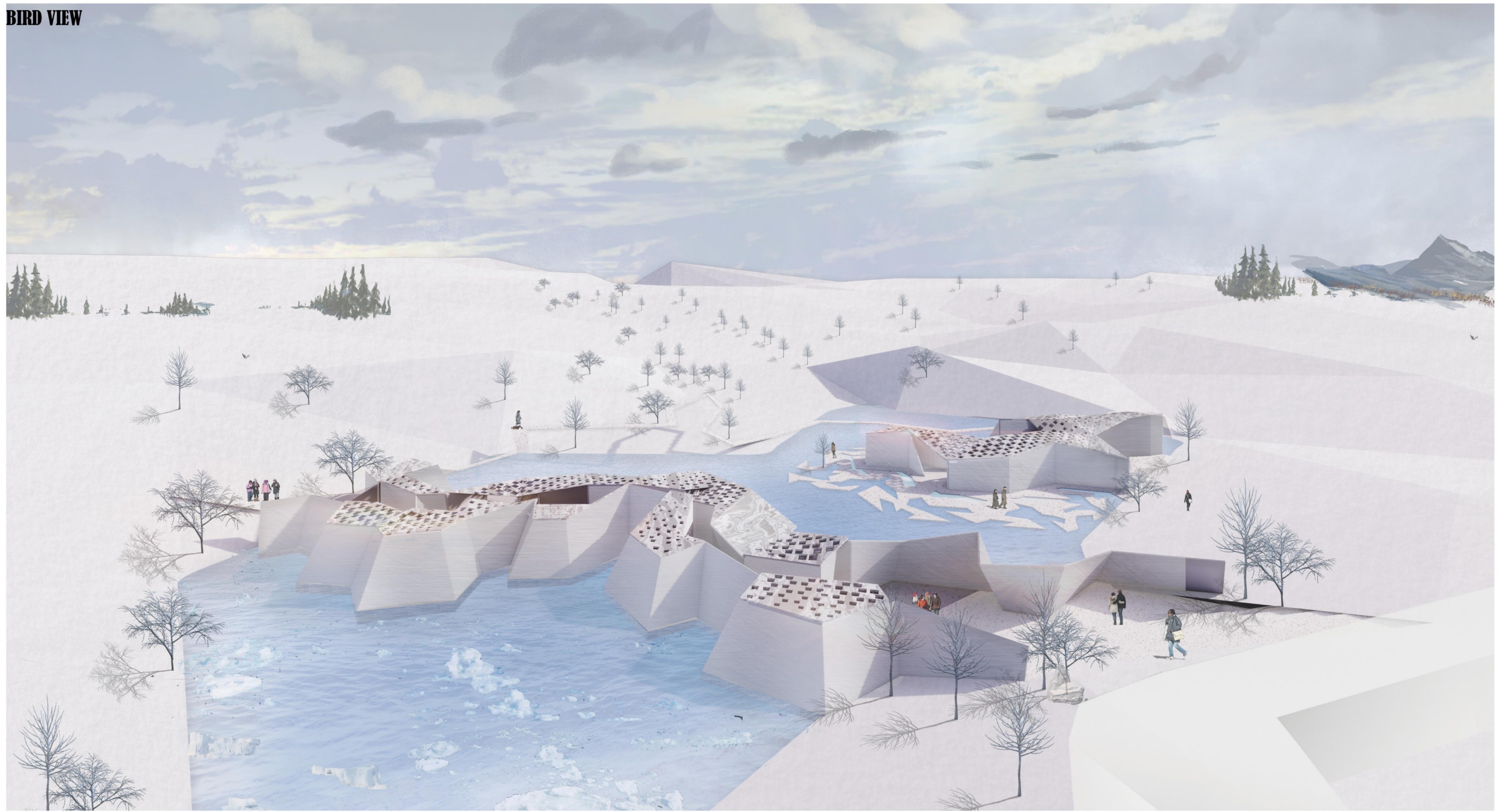
## GROUND FLOOR PLAN



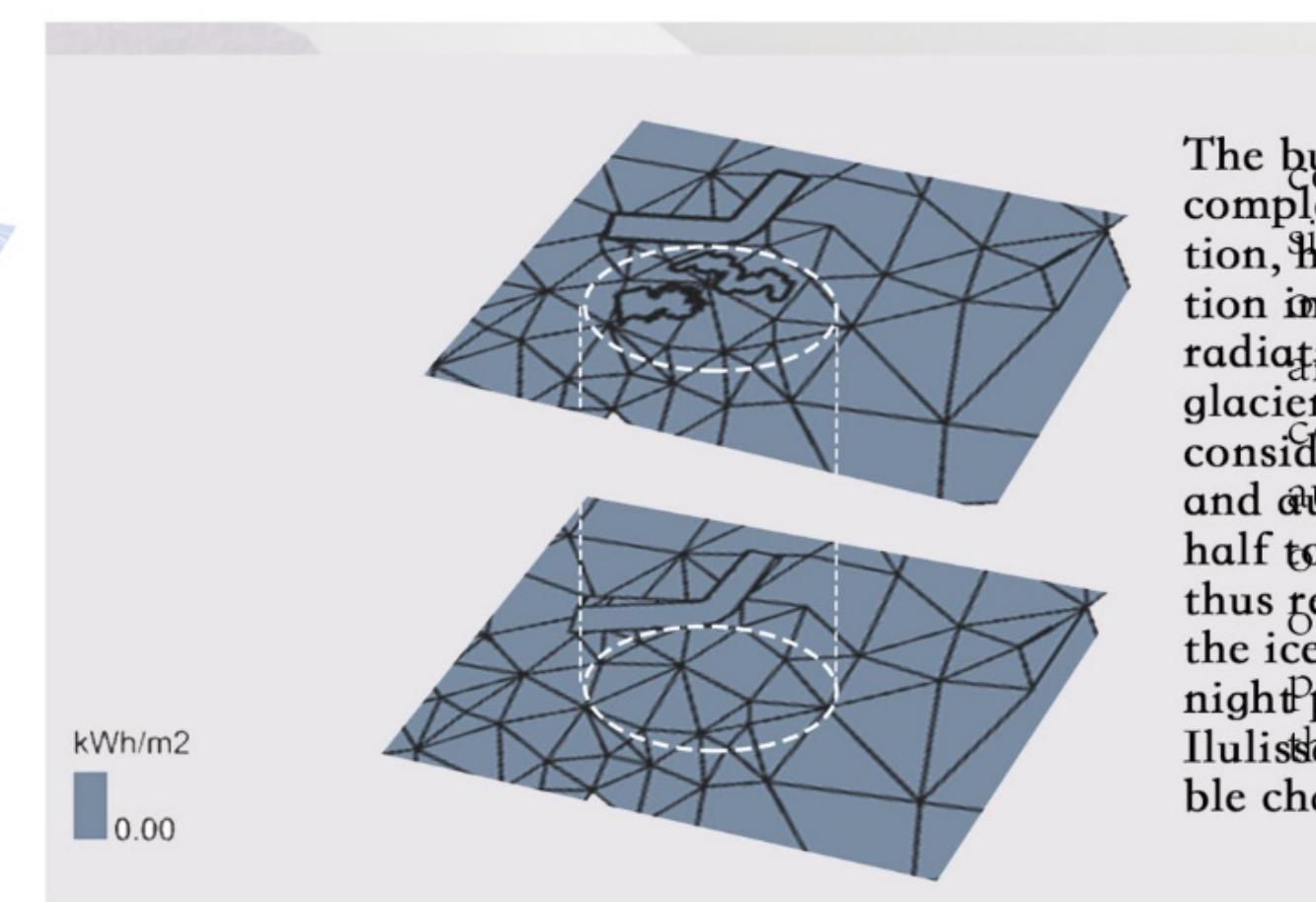
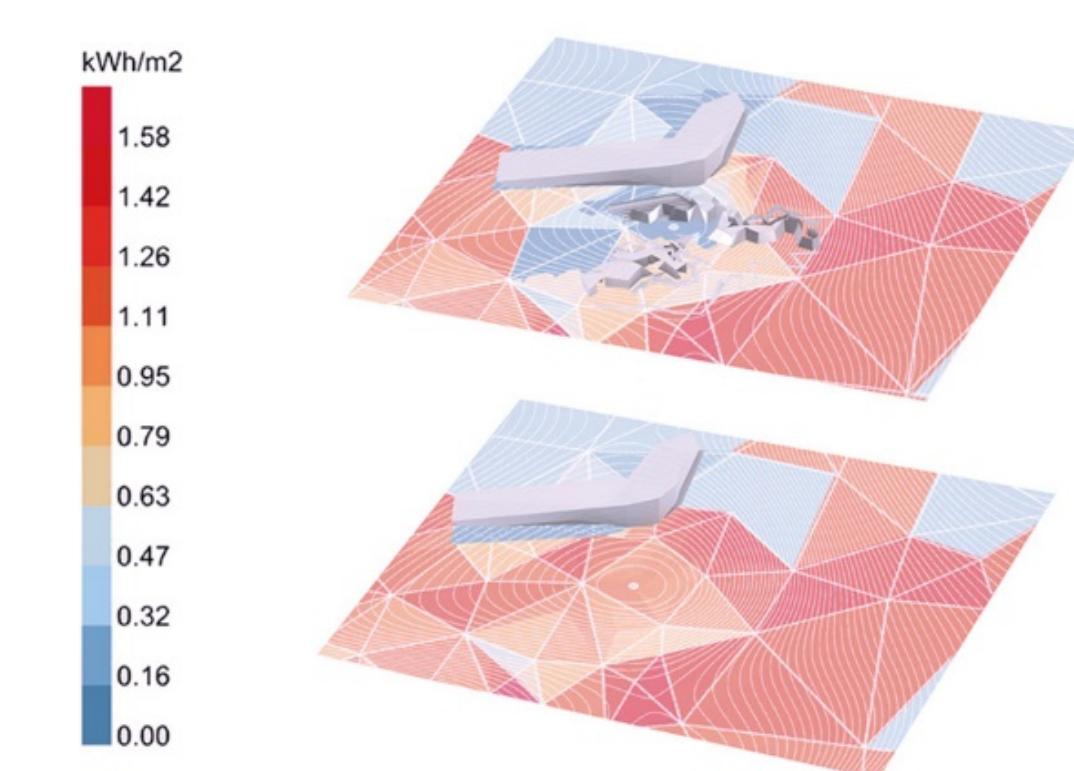
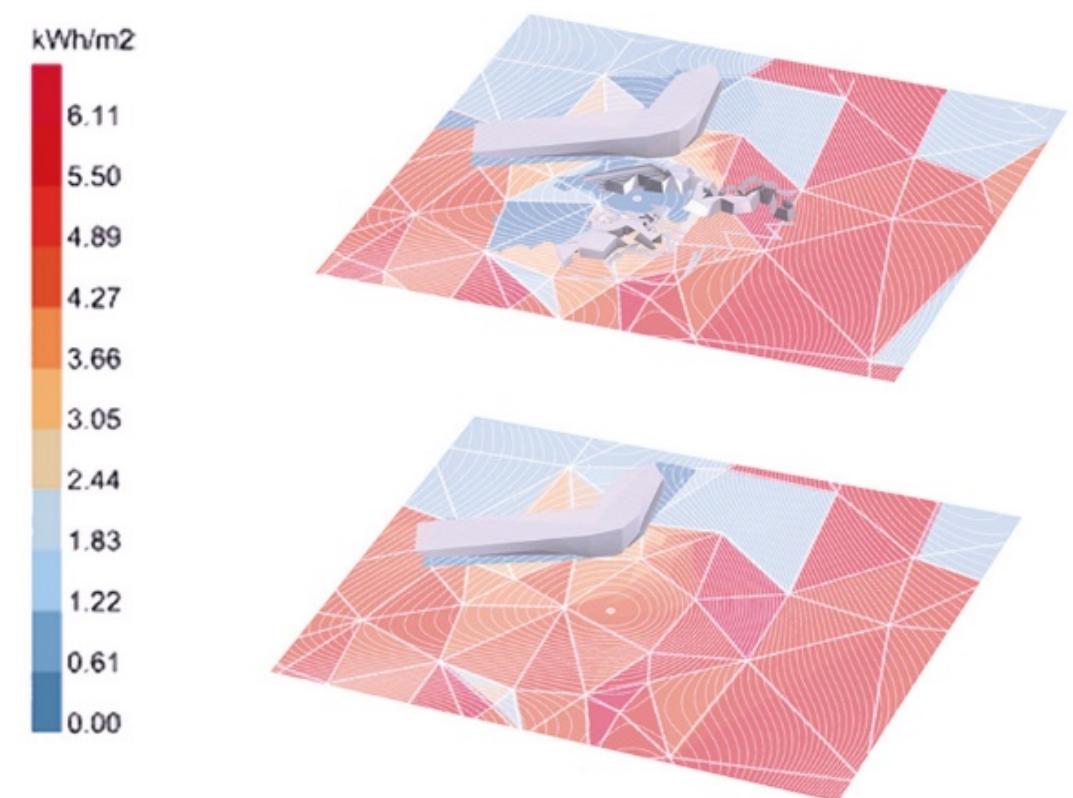
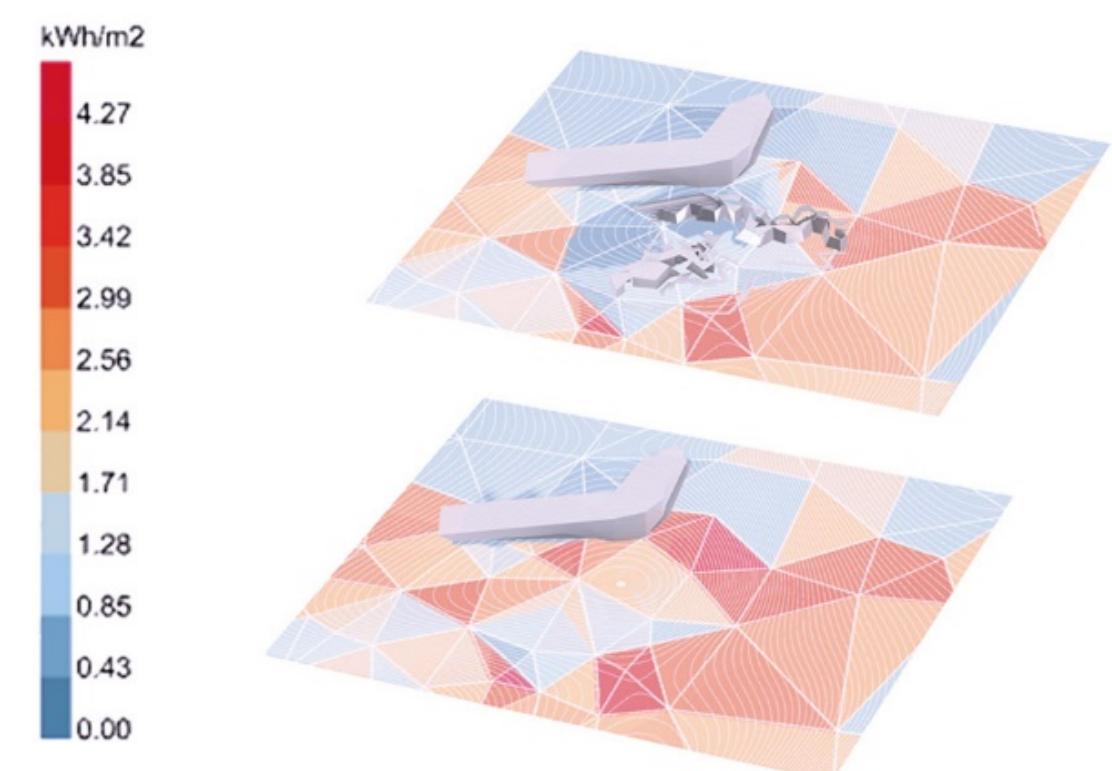
## MASTER PLAN



## BIRD VIEW



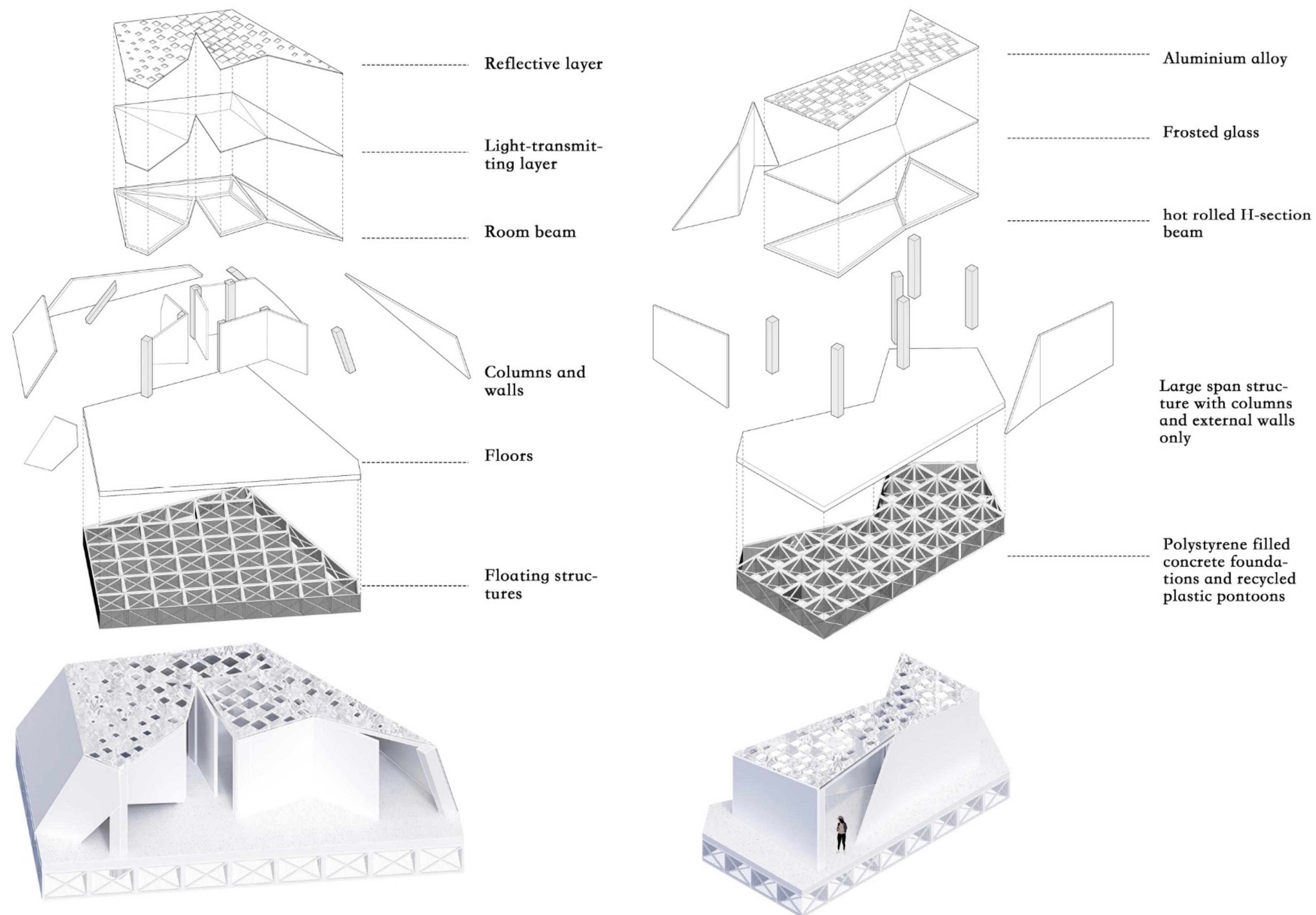
## THERMAL RADIATION ANALYSIS



The building, as well as the completion of the installation, has a significant reduction in the amount of heat radiation to the site soil and glacier. The reduction is most considerable in the summer and autumn, usually up to half to a third of the heat, thus reducing the melting of the ice. In winter the polar night phenomenon occurs on Ilulissat, so there is no notable change.

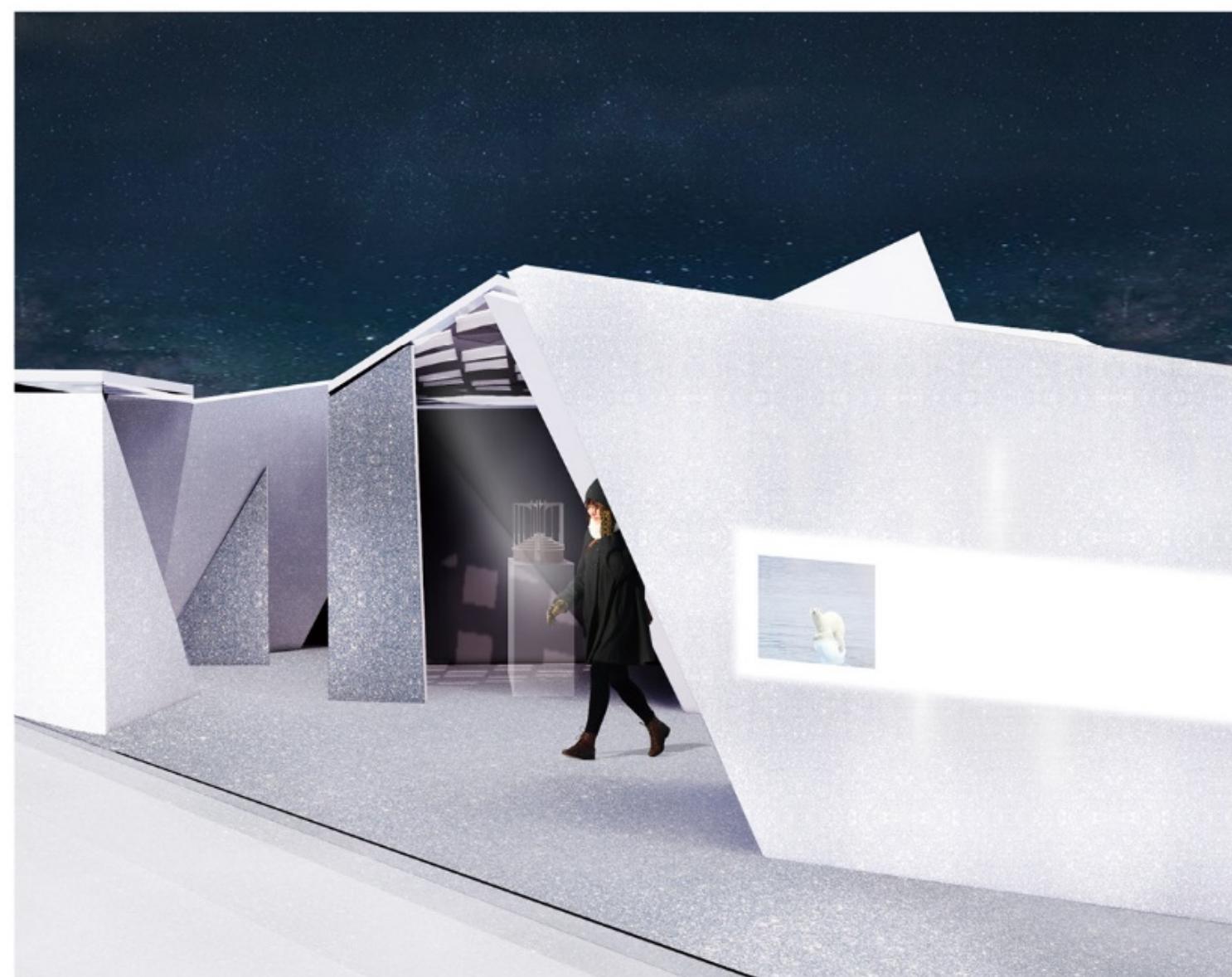
## STRUCTURE

A simple flat module made from reinforced recycled plastic to create a safe, floating base structure for building spaces over water.



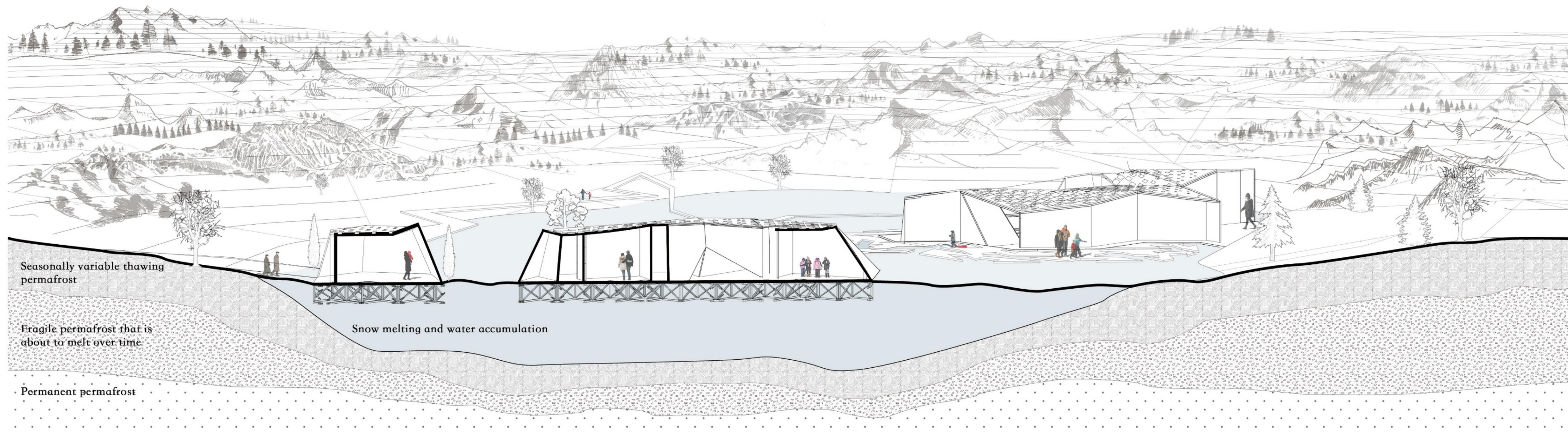
## WALKING EXPERIENCE

The immersive exhibition hall gives visitors a deep sense of the disasters caused by global warming and fosters awareness of environmental protection.



After experiencing the exhibition space inside the building, one steps outside to experience the melting of the glaciers even further.

## ANATOMICAL PERSPECTIVE

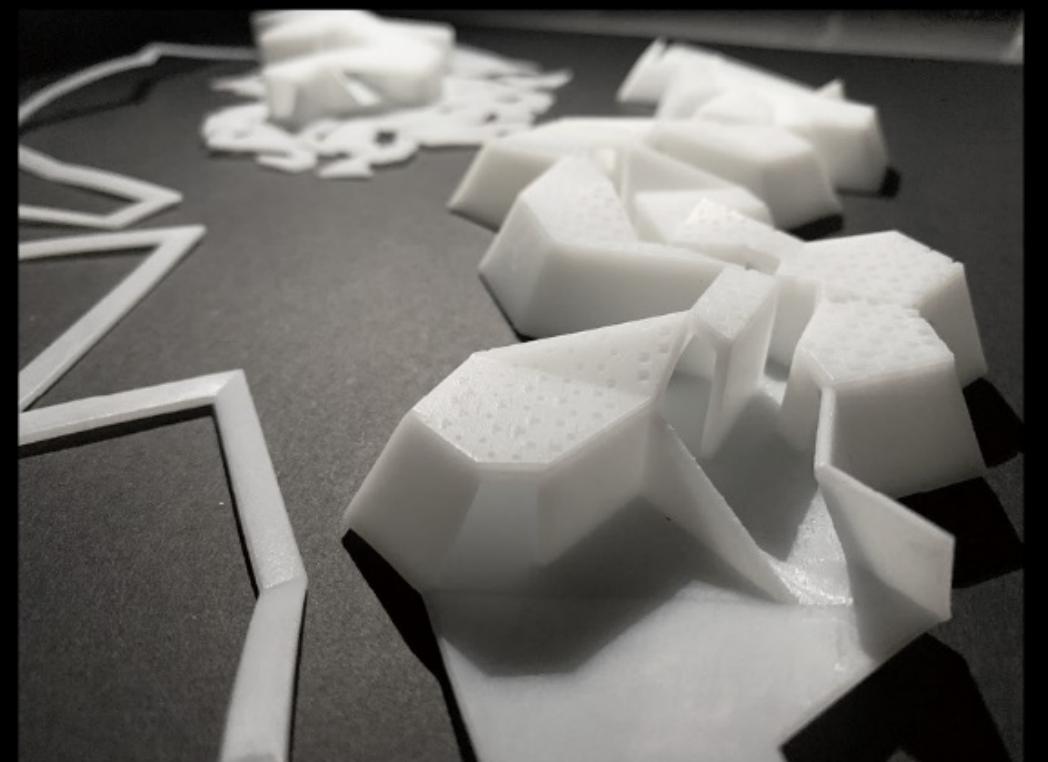


## WALKING EXPERIENCE

Here is the aerial view of the model of the site in different types .

In the site , the main building areas as well as the building form were identified through a preliminary analysis . The physical model again envisages human activities (viewing , reflection , resting , walking , etc . ) from a three - dimensional perspective , while considering the connection to the original building.

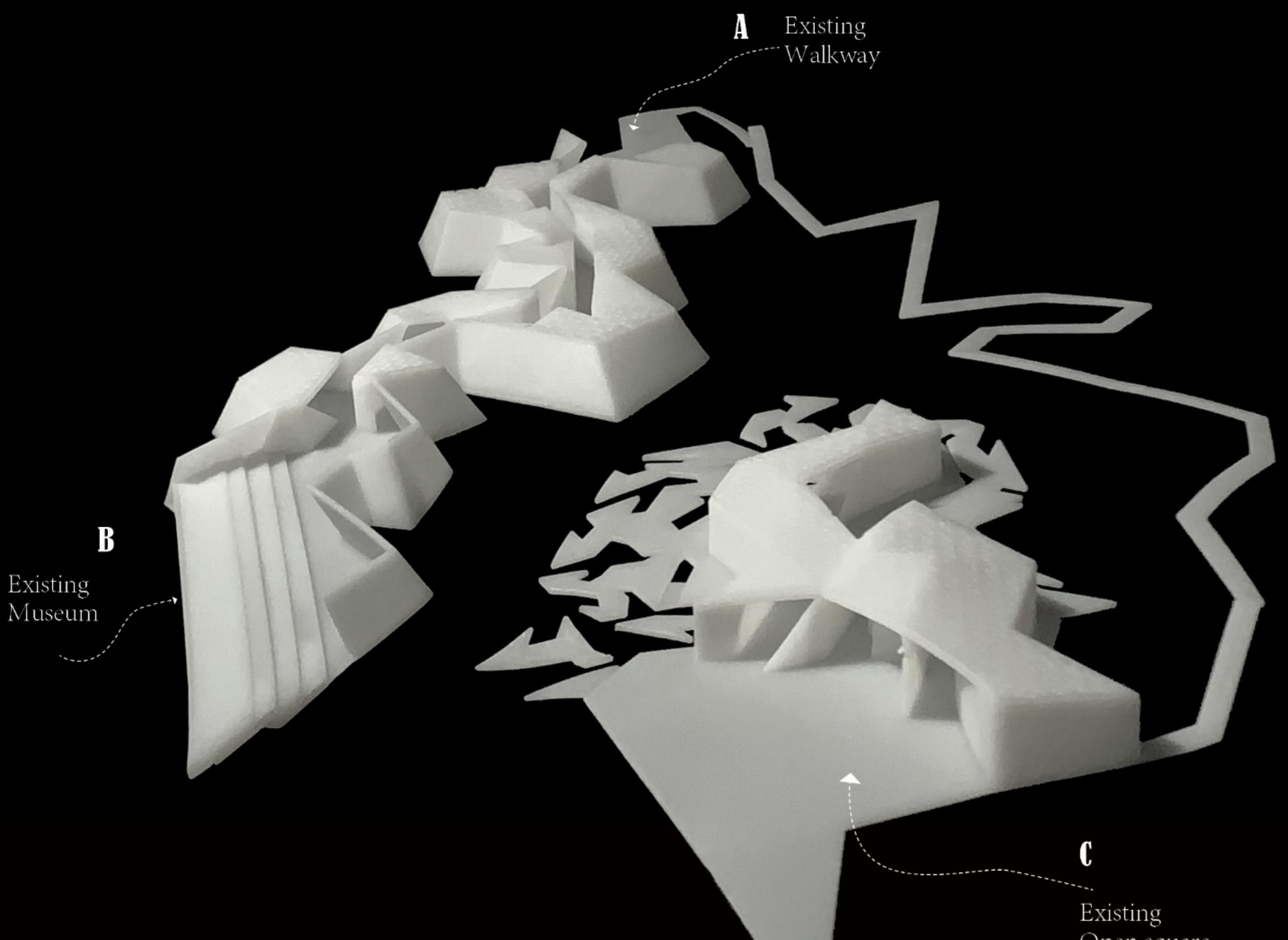
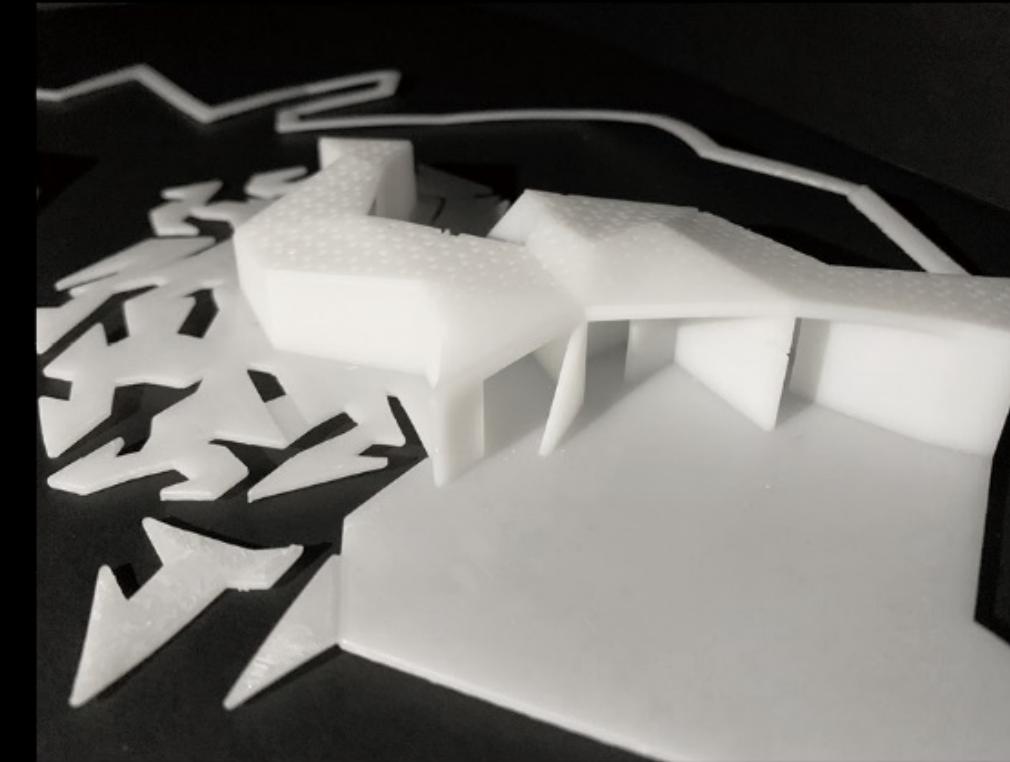
Entrance A



Entrance B



Entrance C



B

Existing Museum

C

Existing Open square

