The Link

Between Land - Human - Water

Zofia | Friso | Berend | Lena

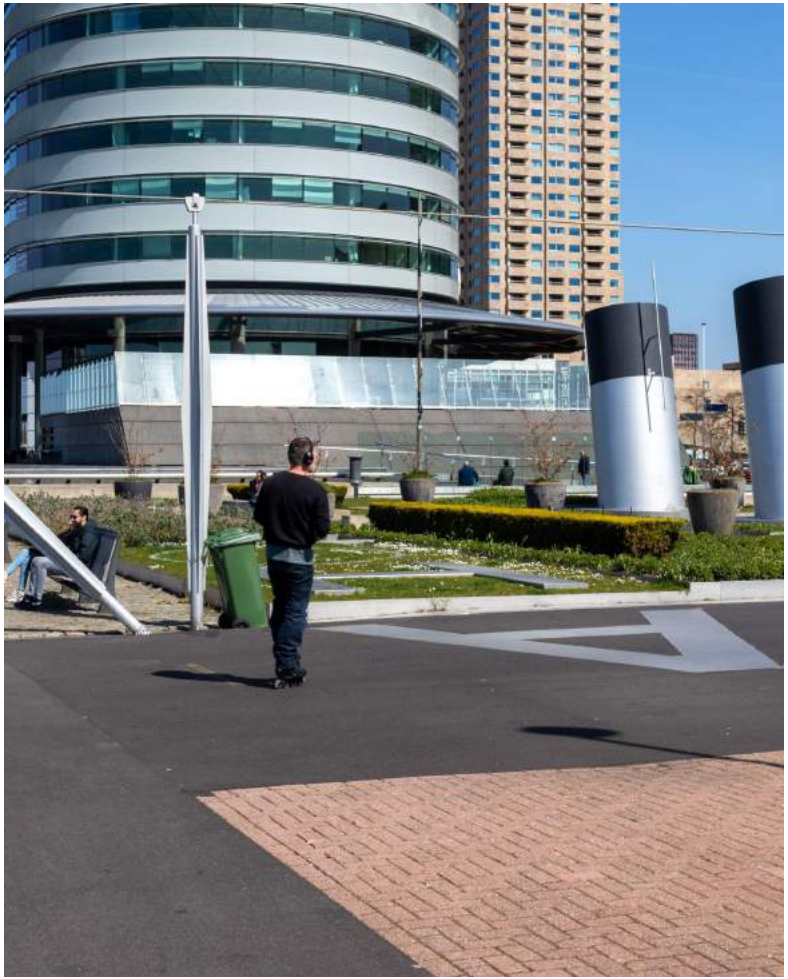
Site Choice

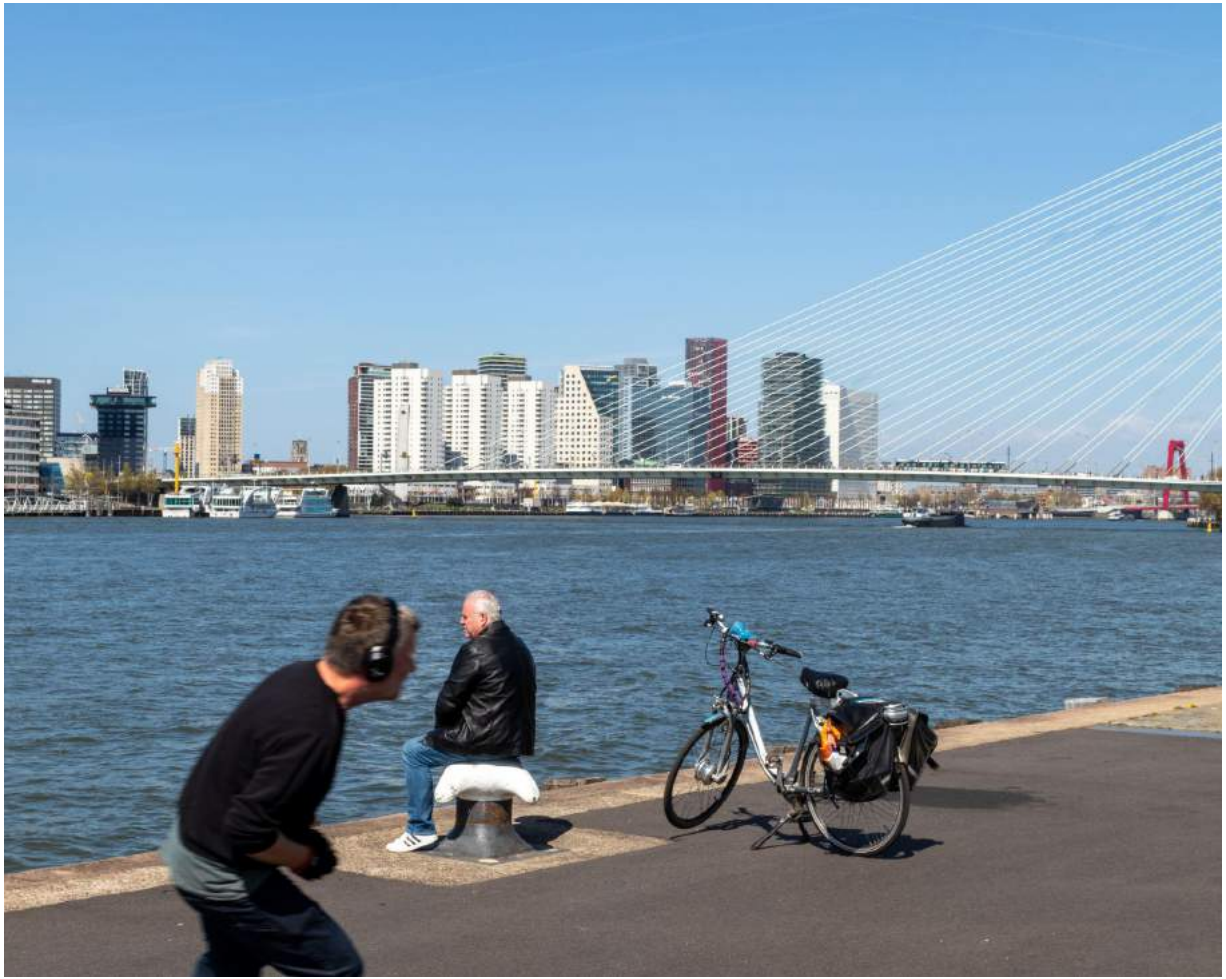
Where do we need to intervene?

ROUTE

SITE


WATERT_XI





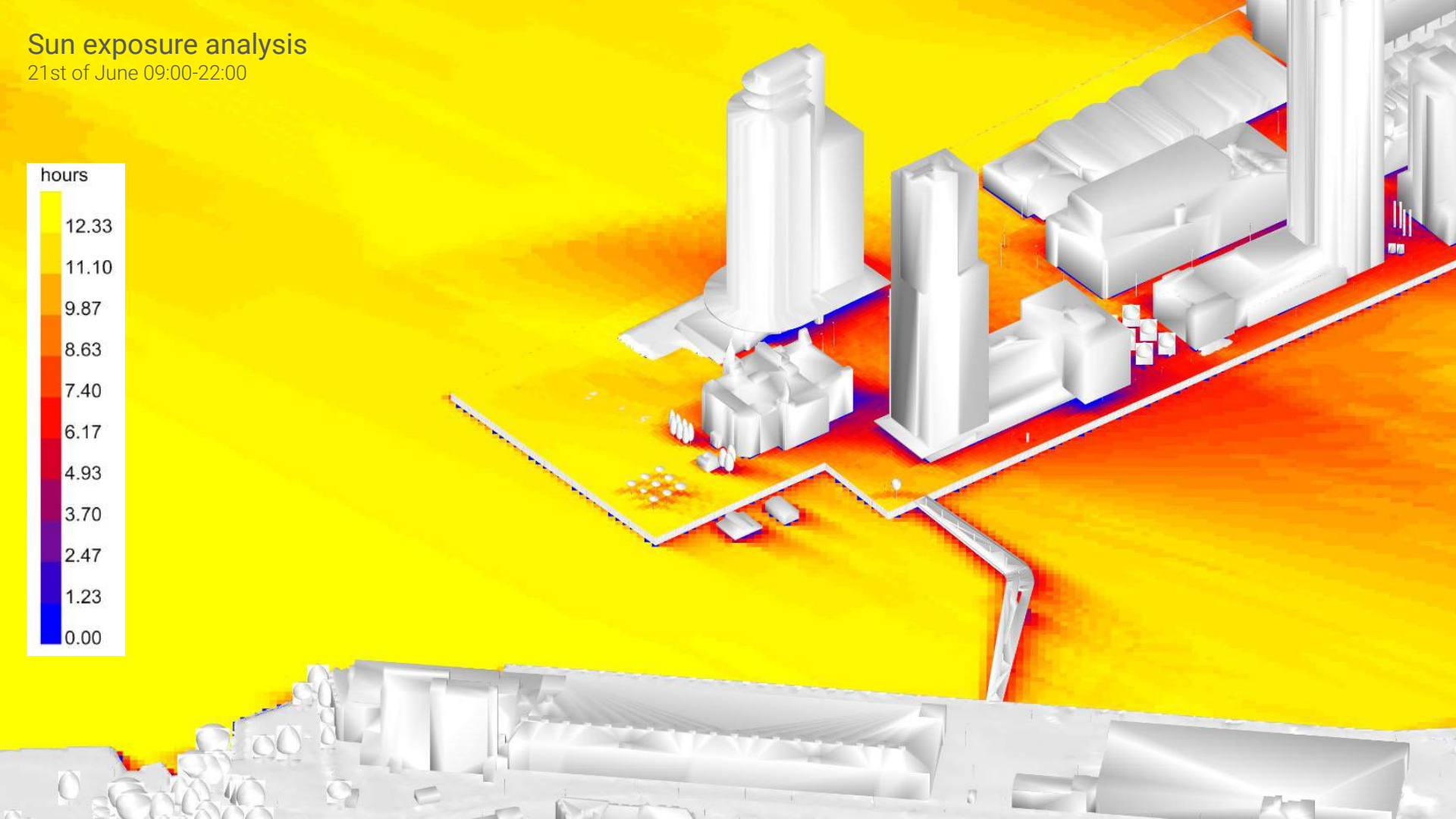

Cargill

Site Analysis

What defines the Kop van Zuid?

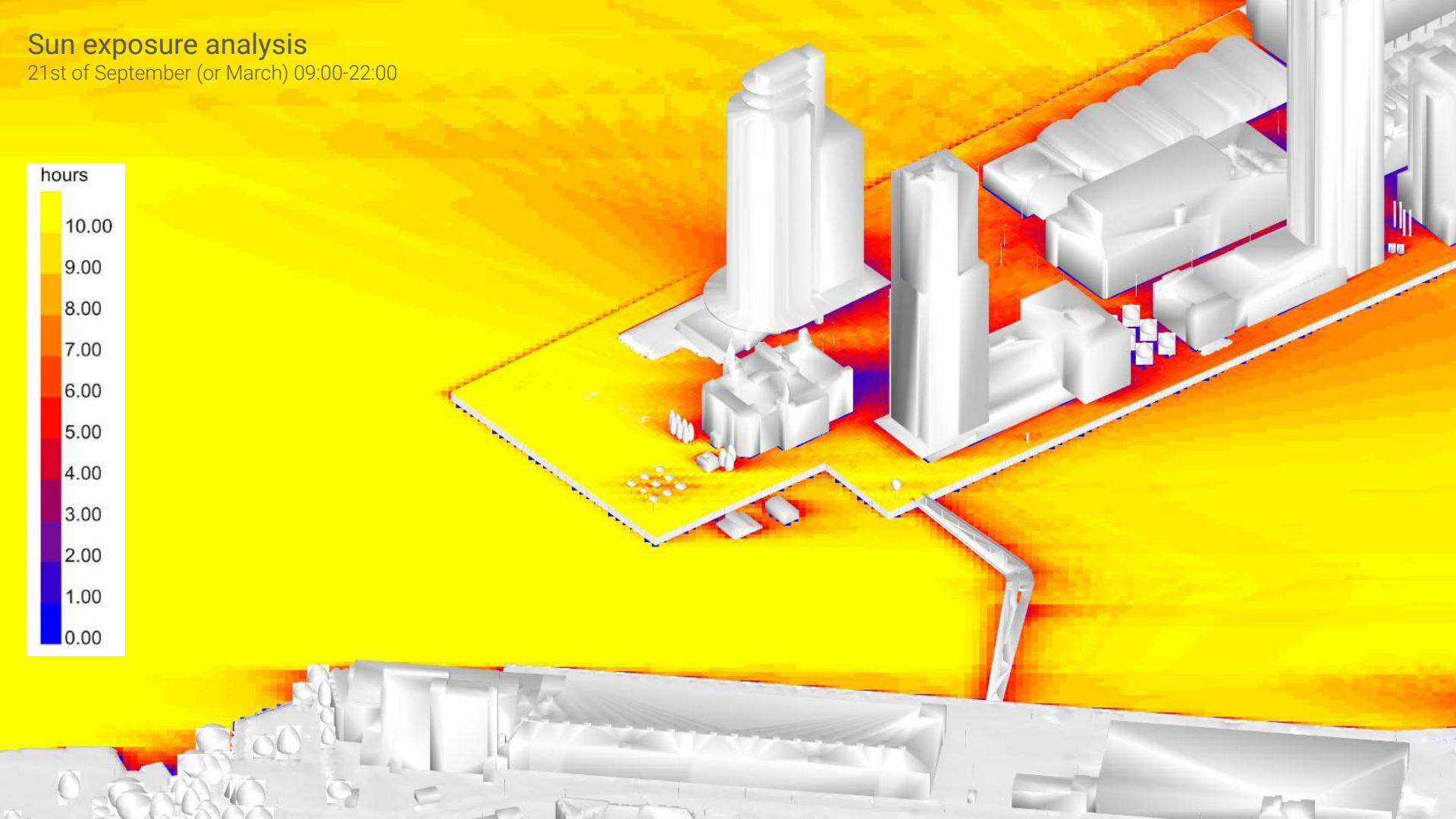
Sun exposure analysis

21st of June 09:00-22:00



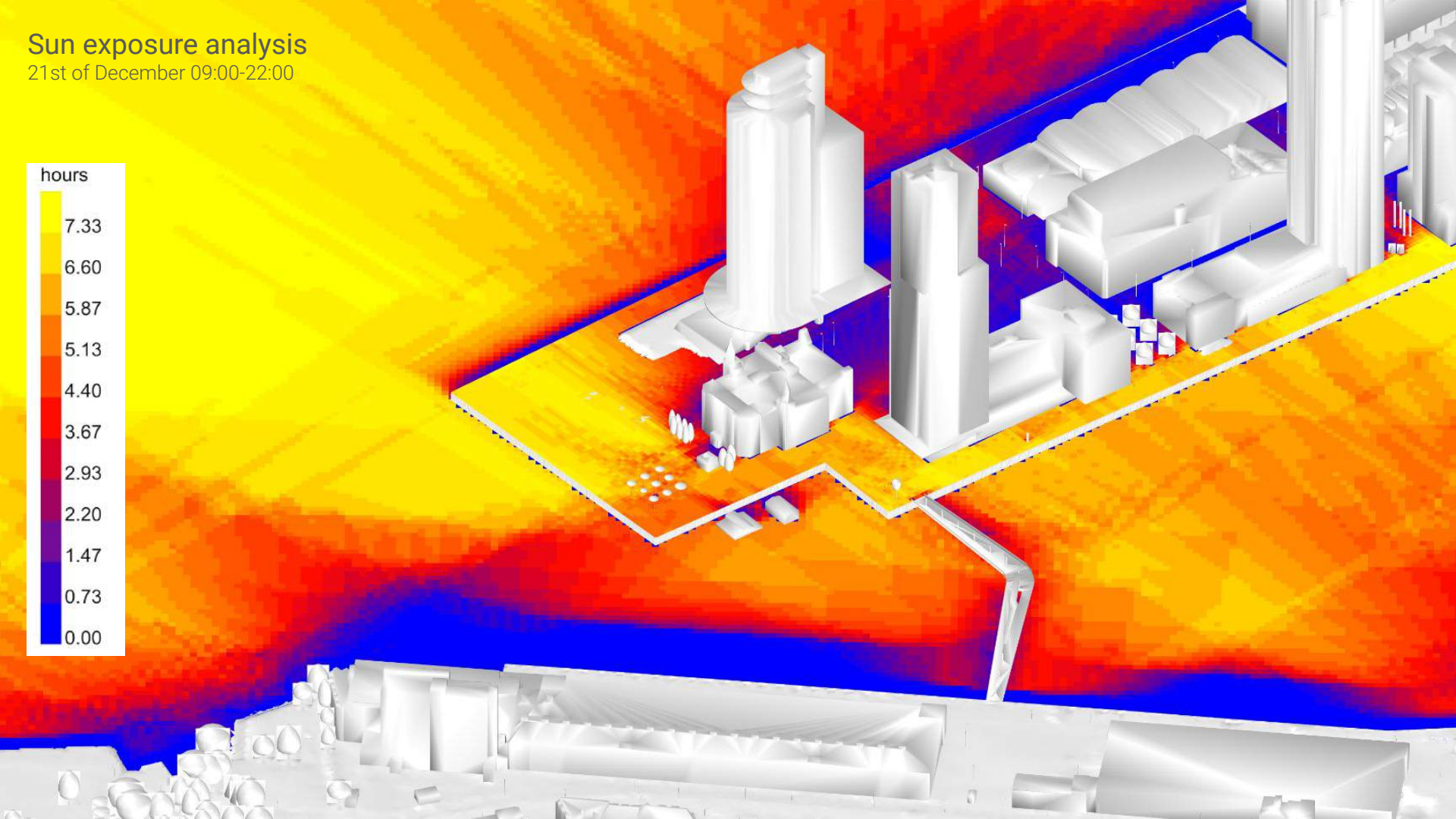
Sun exposure analysis

21st of September (or March) 09:00-22:00



Sun exposure analysis

21st of December 09:00-22:00



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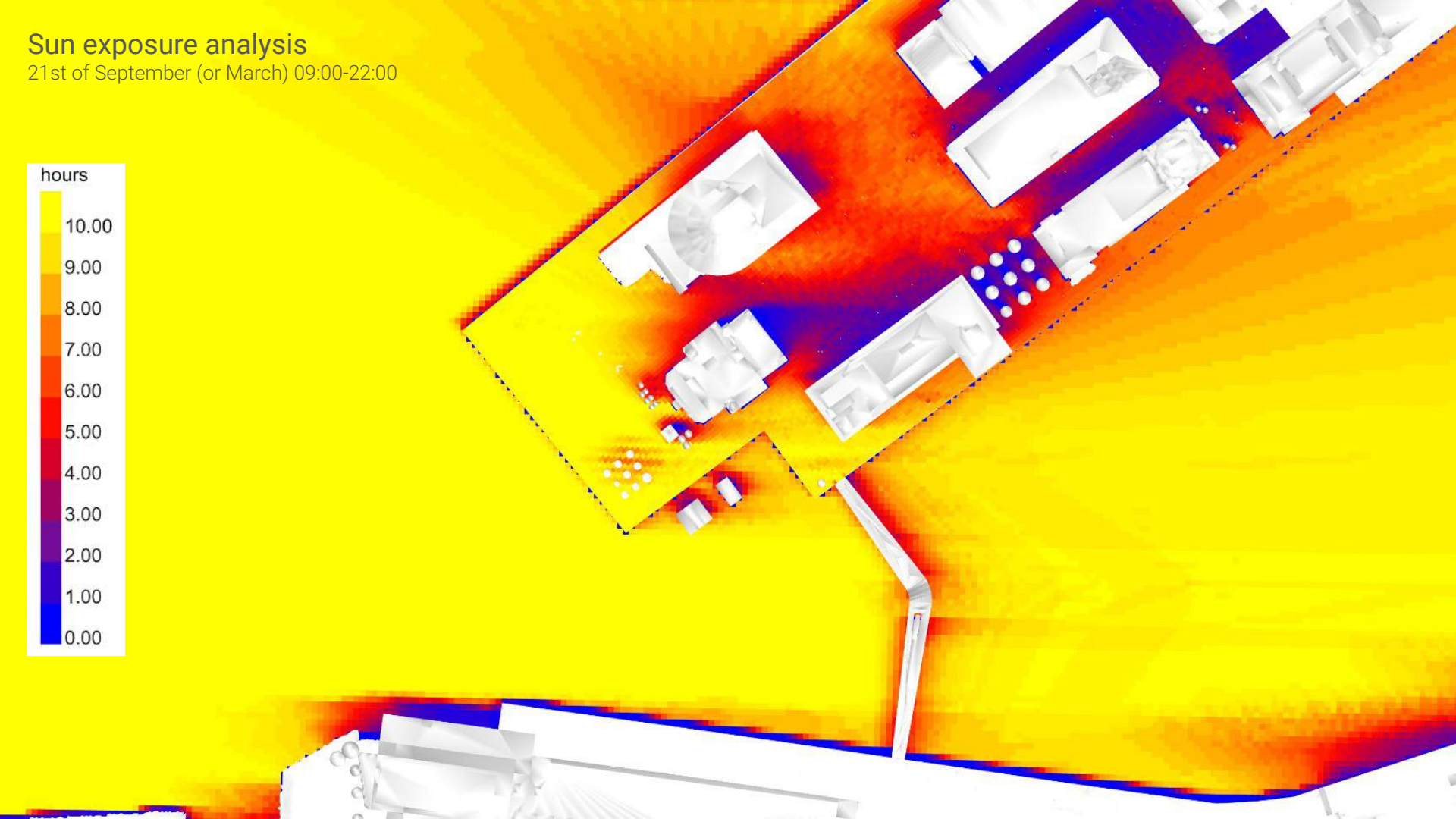

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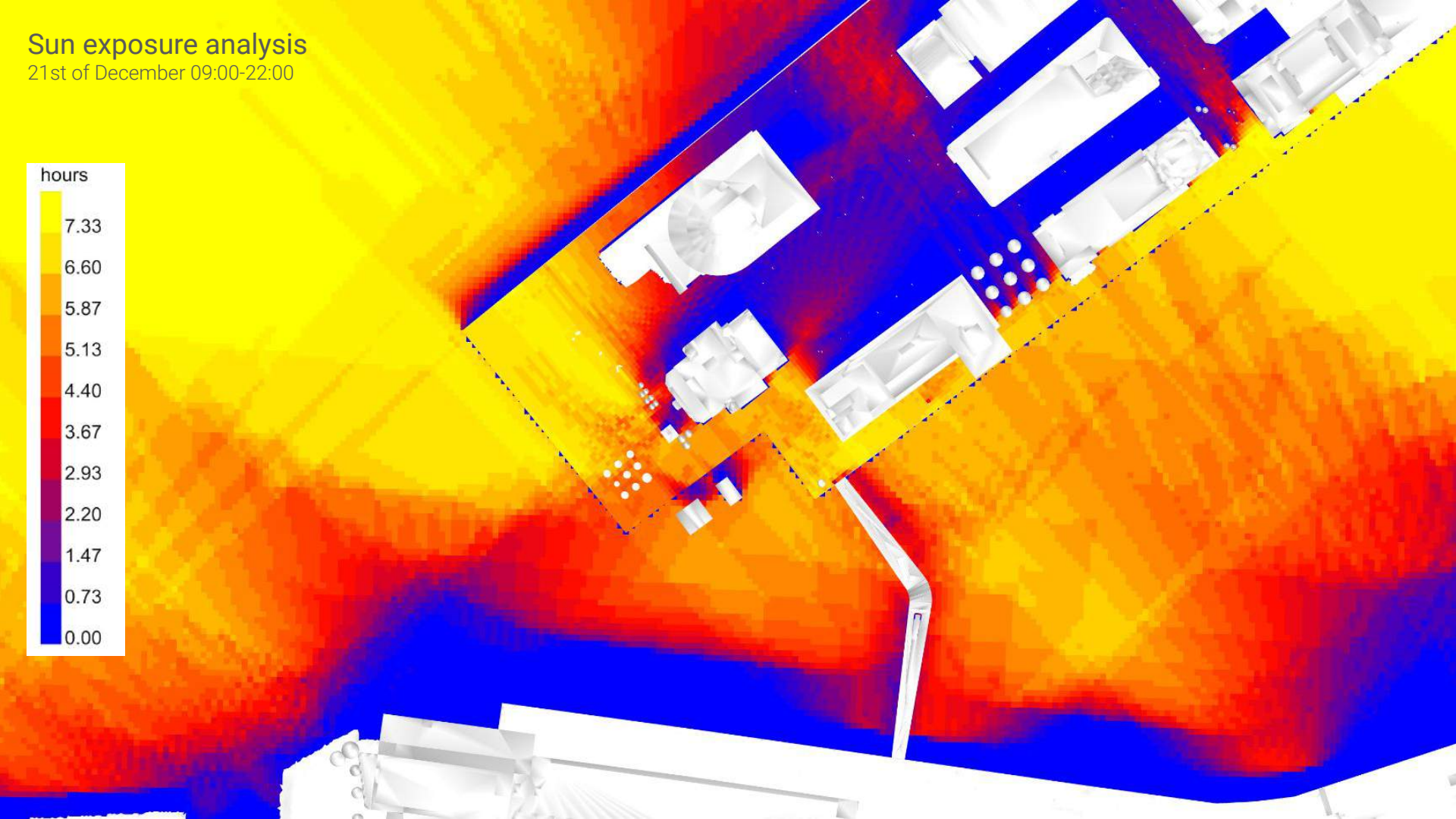
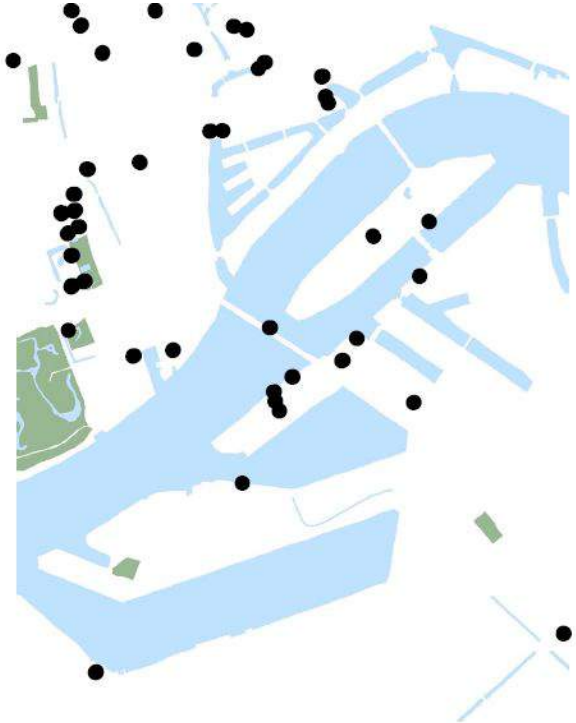
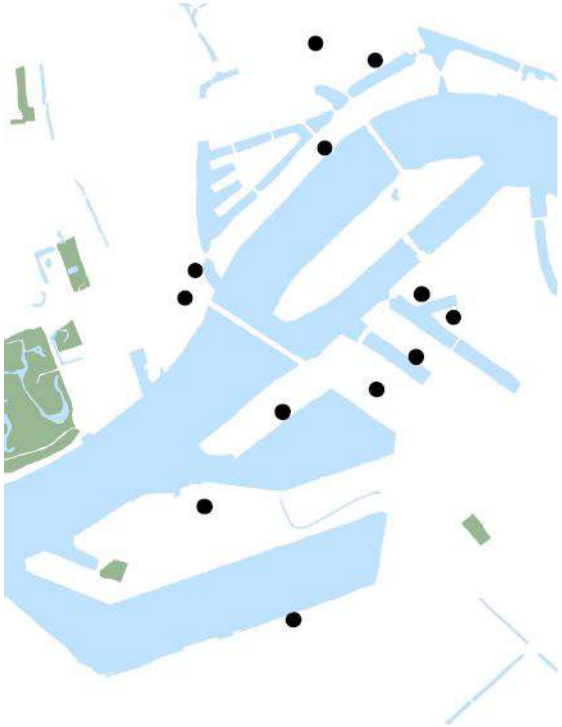


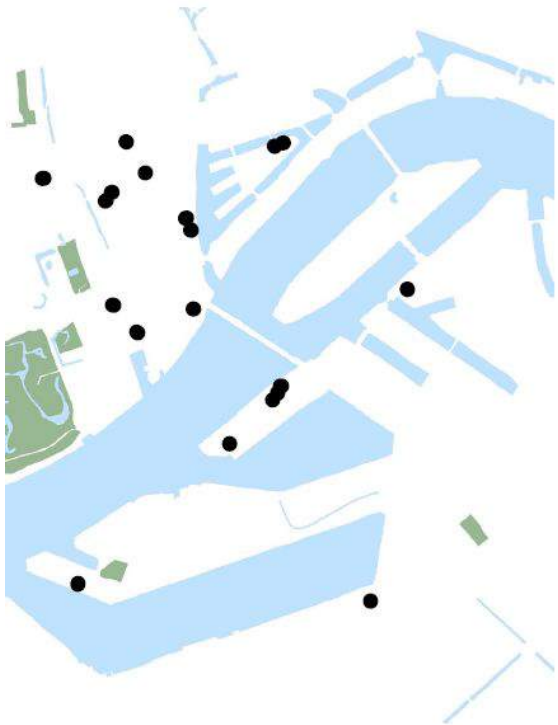
Popular places



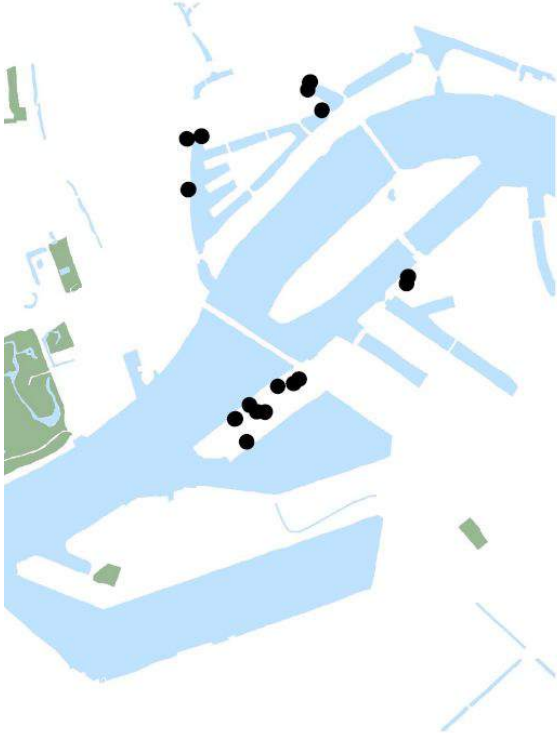
Fitness centers



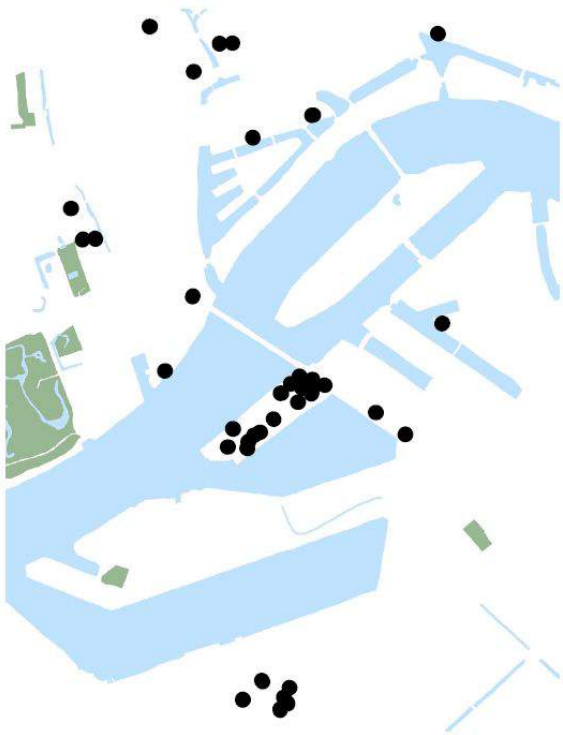
Hotels



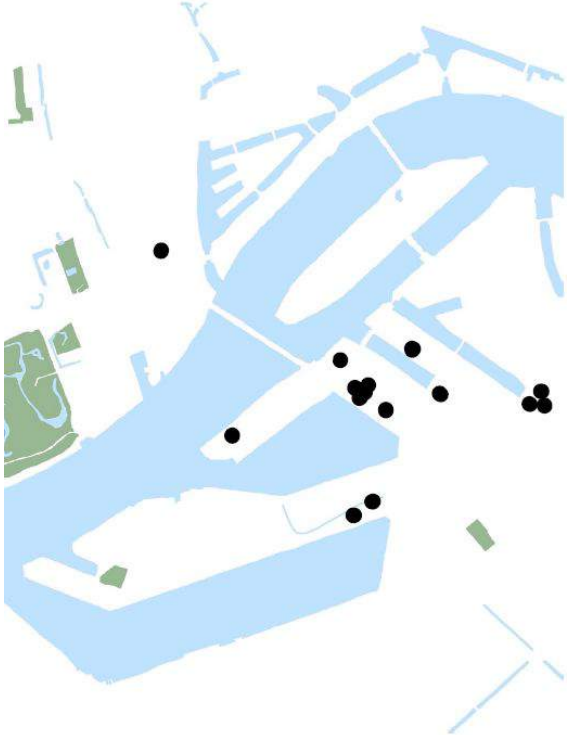
Musea



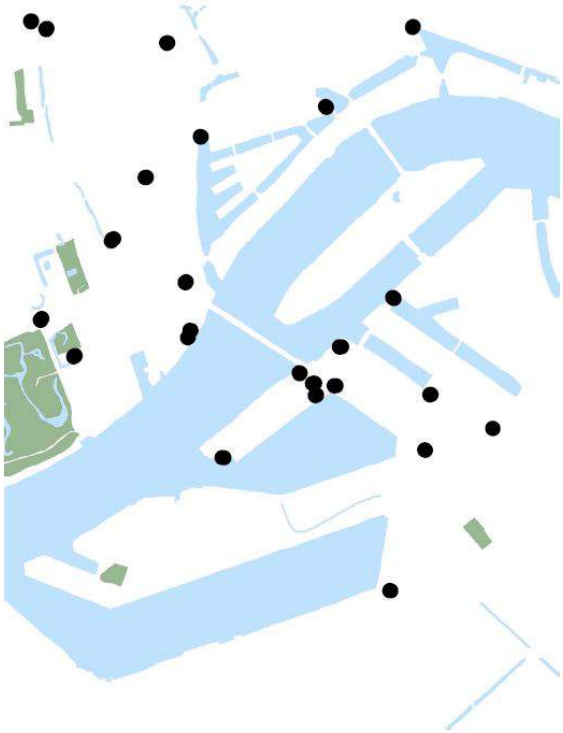
Restaurants



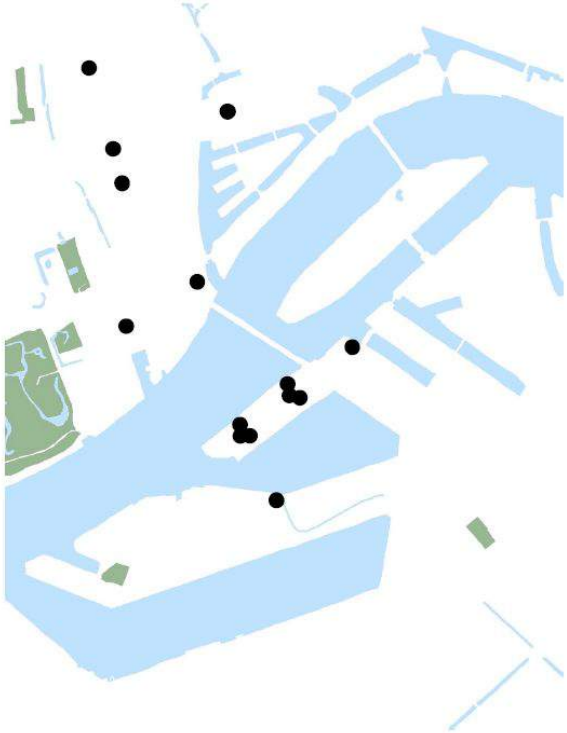
Education



Public transport

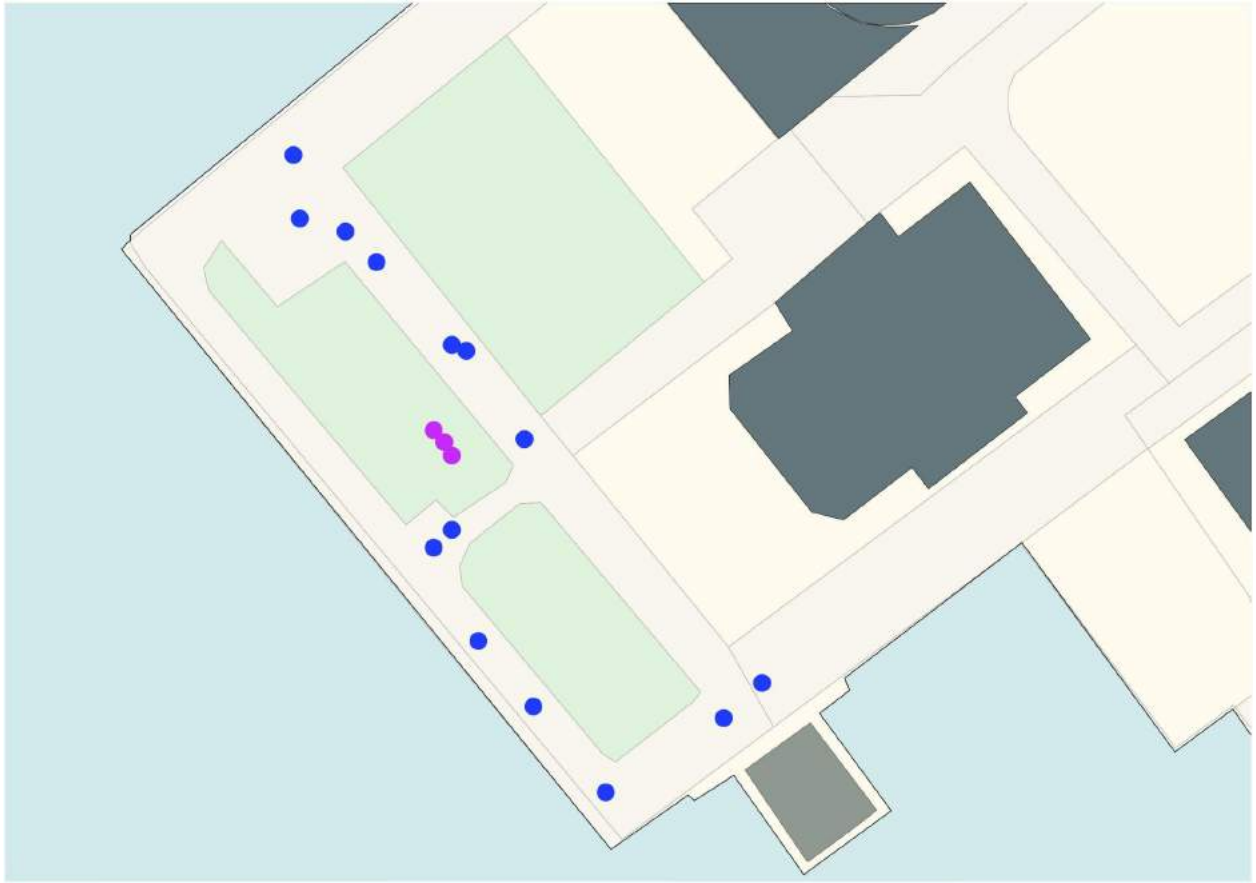


Parking spots



Use of Space at different times of the day

Morning- working days

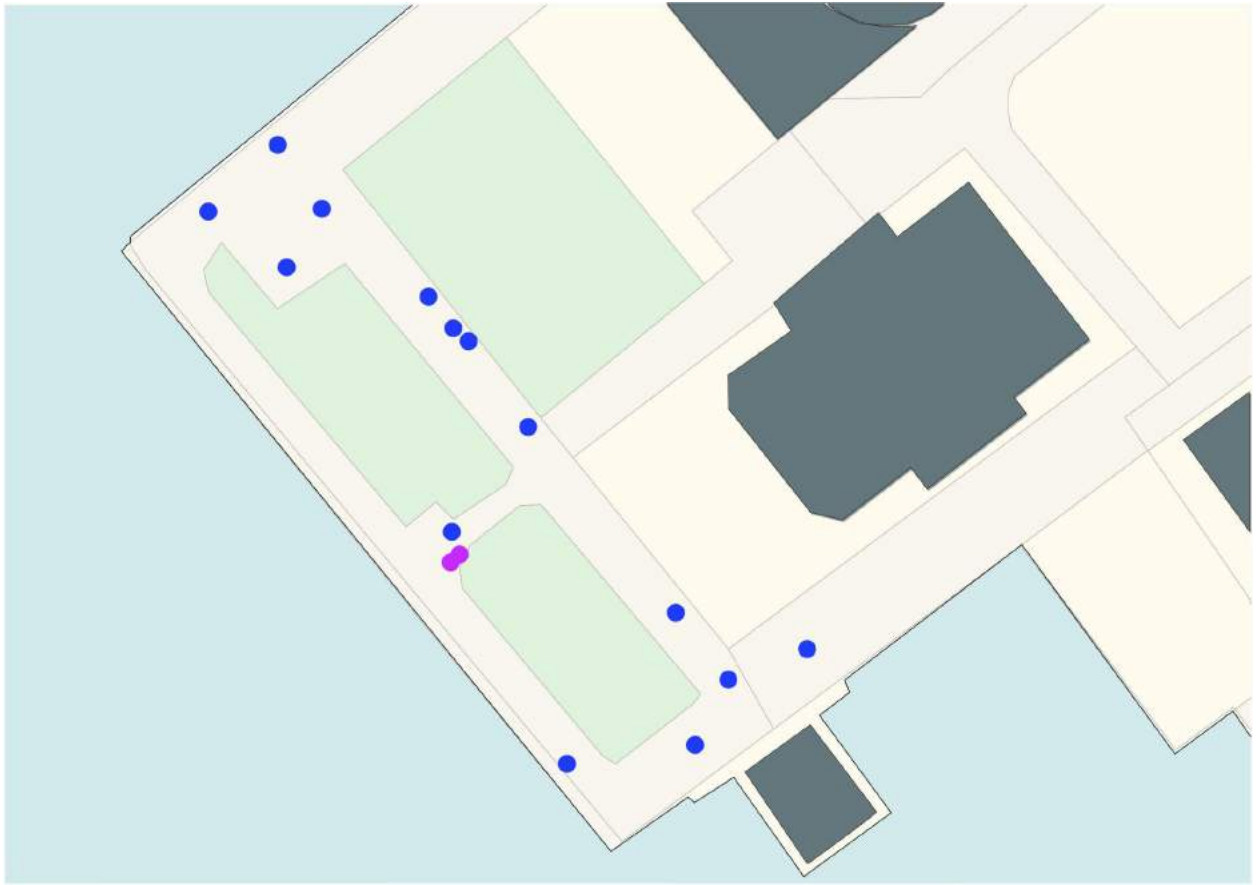


Sitting people

Walking people

Use of Space at different times of the day

Afternoon- working days

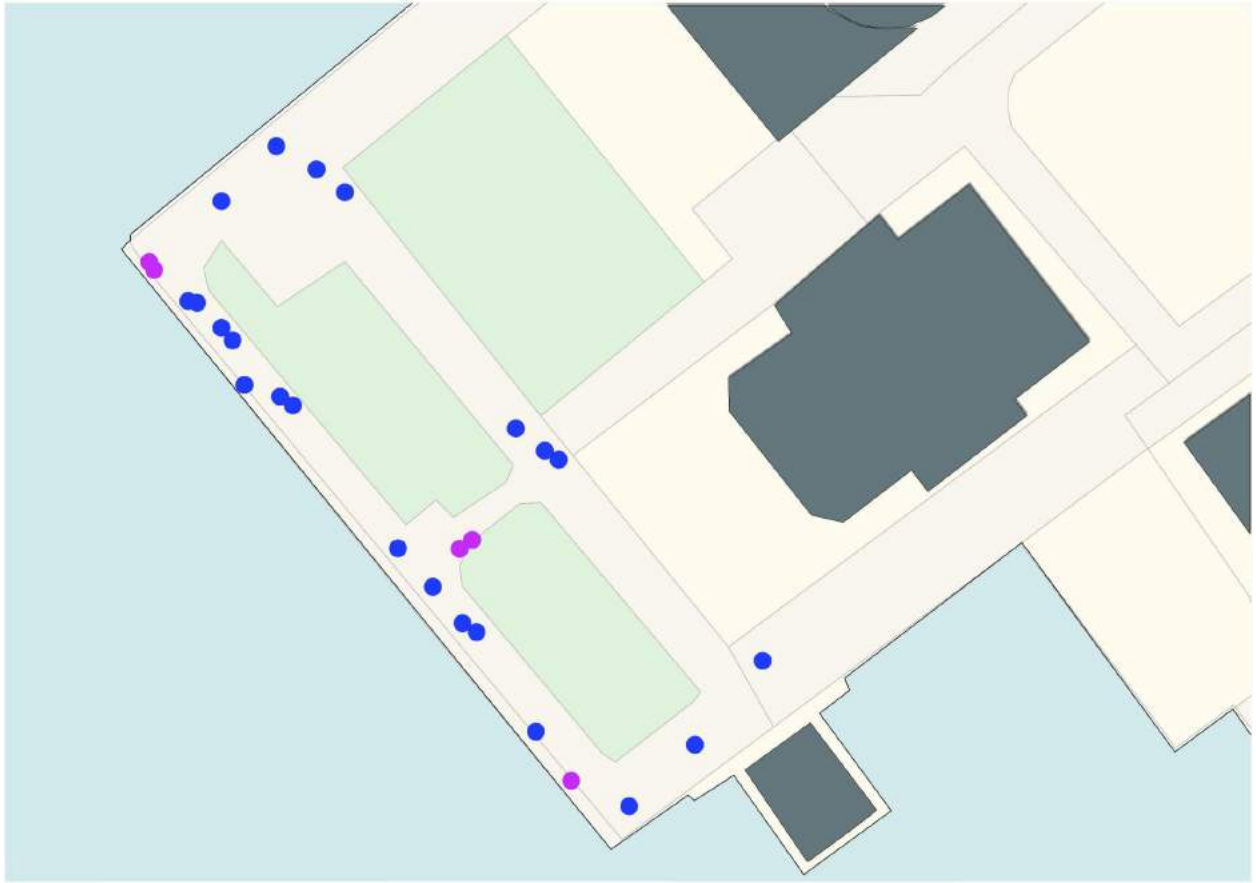


Sitting people

Walking people

Use of Space at different times of the day

Evening- working days

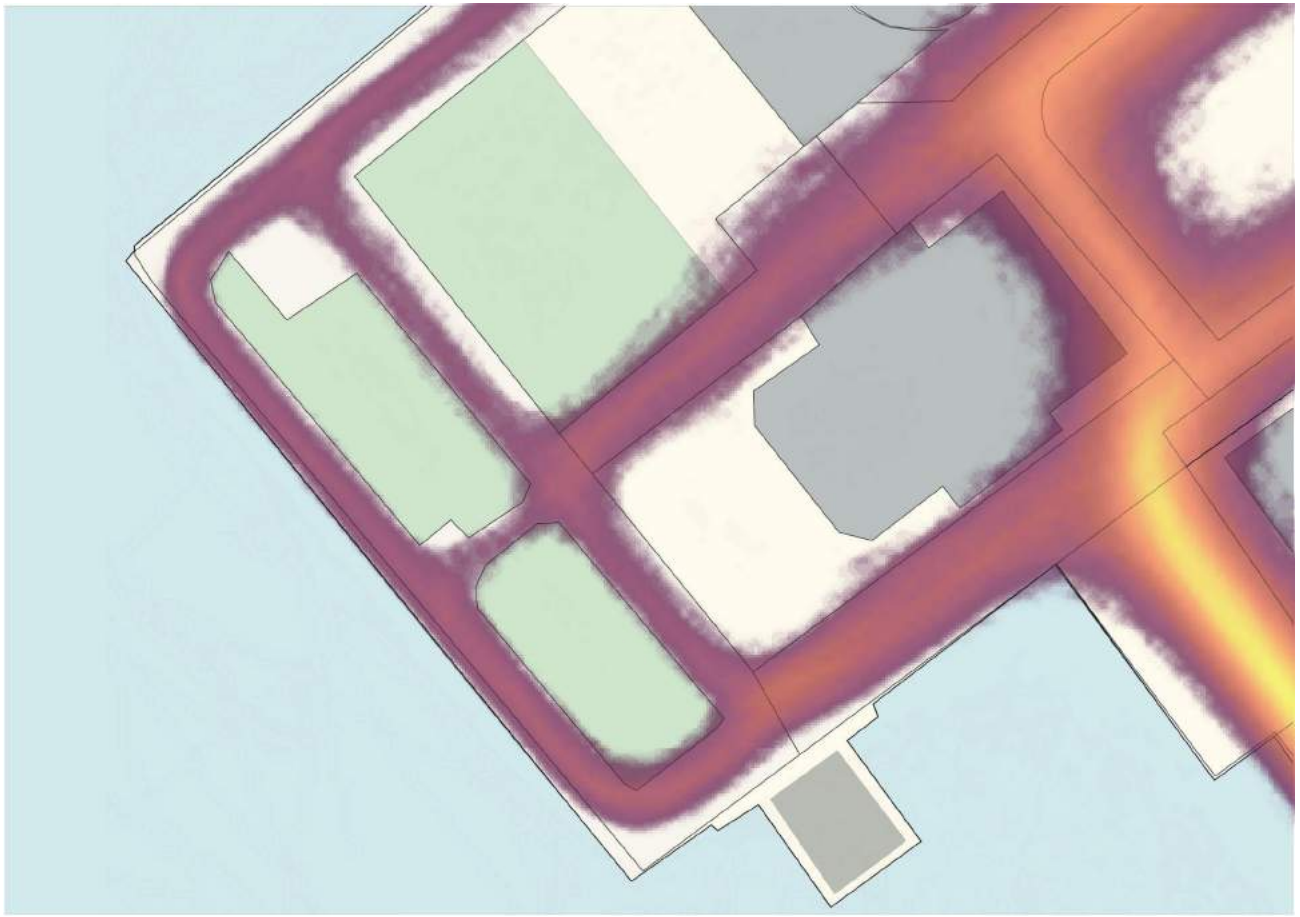


Sitting people

Walking people

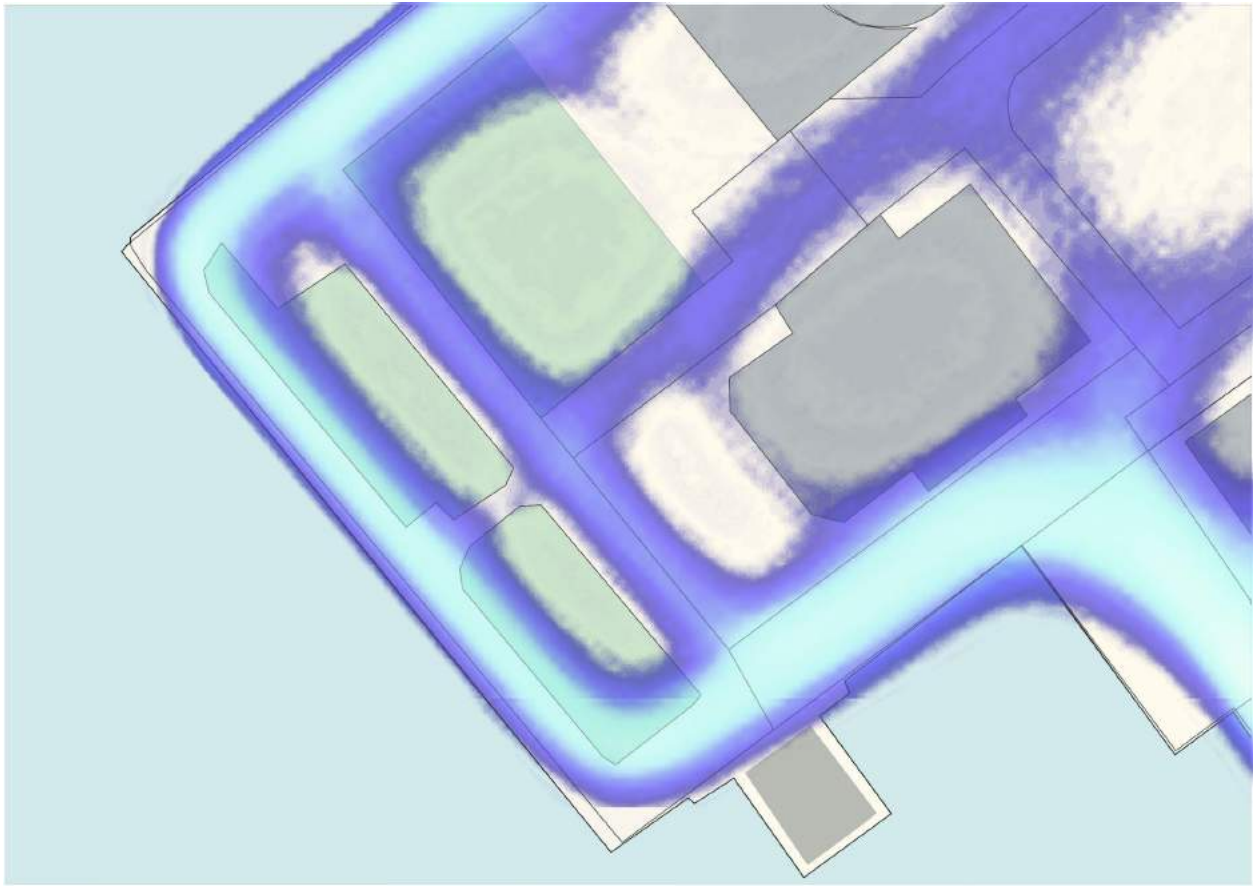
Workout density - Based on Strava Data

Cycling Density



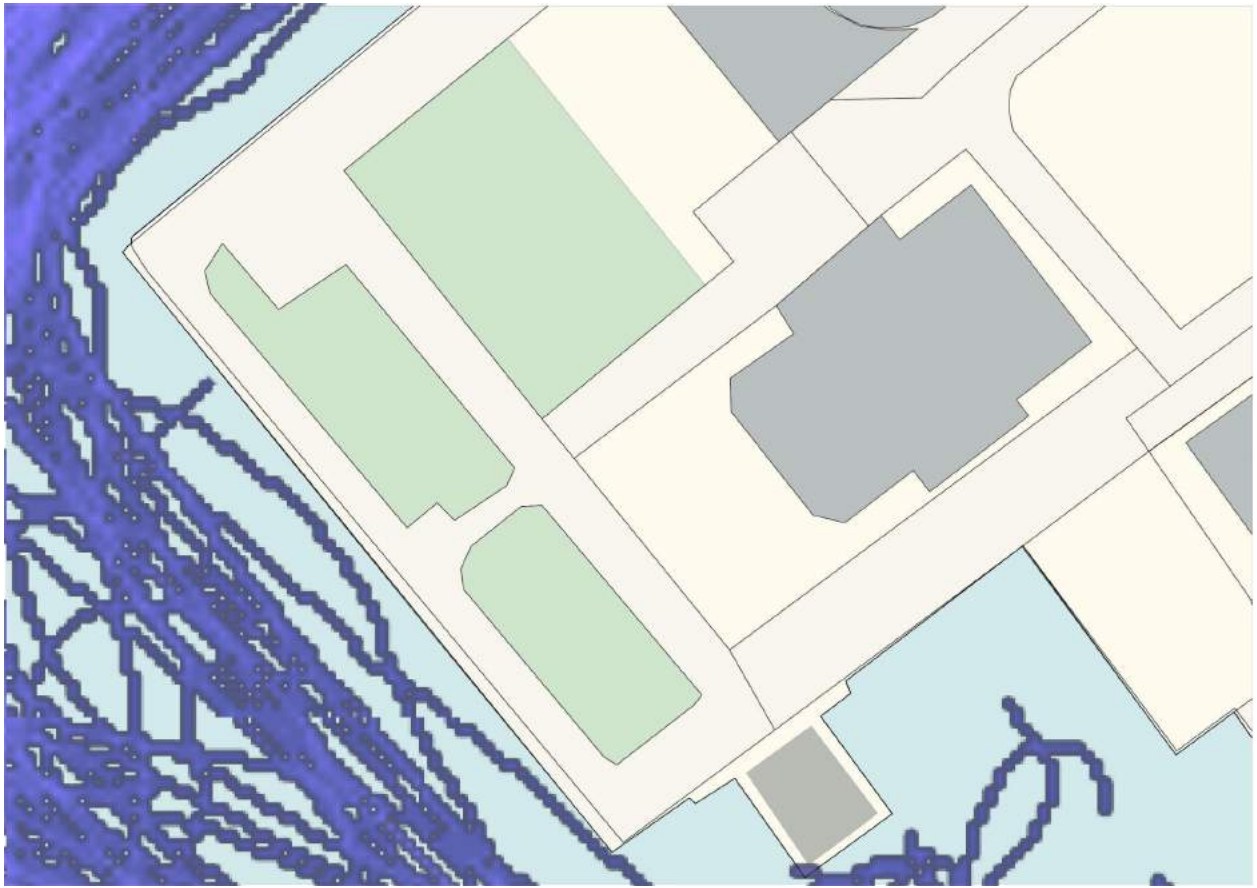
Workout density - Based on Strava Data

Walking Density



Workout density - Based on Strava Data

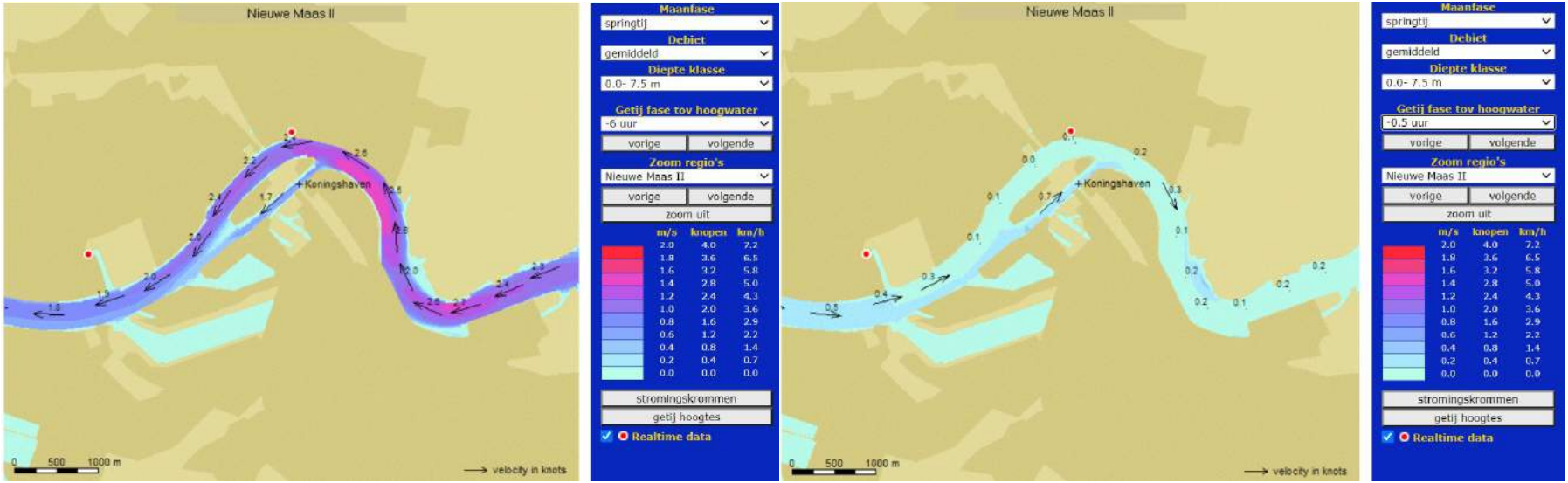
Swimming Density



Workout density - Based on Strava Data

Swimming Density

Current


Nieuwe Maas II
+Koningshaven
0 500 1000 m
velocity in knots
Maanfase
springtij
Debiet
gemiddeld
Diepte klasse
0.0- 7.5 m
Getij fase tov hoogwater
-6 uur
vorige
volgende
Zoom regio's
Nieuwe Maas II
vorige
volgende
zoom uit
m/s knopen km/h
2.0 4.0 7.2
1.8 3.6 6.5
1.6 3.2 5.8
1.4 2.8 5.0
1.2 2.4 4.3
1.0 2.0 3.6
0.8 1.6 2.9
0.6 1.2 2.2
0.4 0.8 1.4
0.2 0.4 0.7
0.0 0.0 0.0
stromingskrommen
getij hoogtes
Realtime data
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velocity in knots
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stromingskrommen
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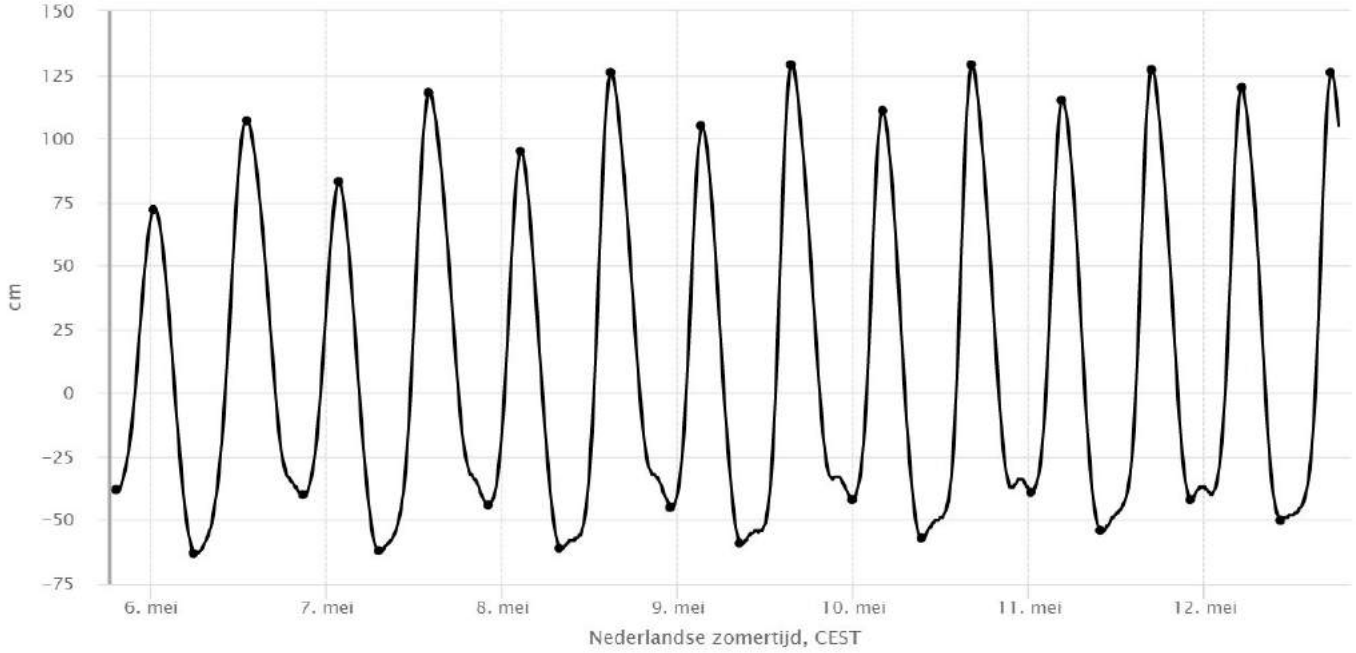
Water level


150
125
100
75
50
25
0
−25
−50
−75
cm
6. mei
7. mei
8. mei
9. mei
10. mei
11. mei
12. mei
Nederlandse zomertijd, CEST

Functional analysis

Activities at Site

groups sitting in the grass

looking out over the water

people walking their dog

people sporting

wind, when present, forms major obstacle

the openness of the space allows for many types of uses

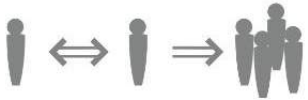
Interaction Analysis

Activities at Site

people looking at the ships

people enjoying being near the river

people enjoying the sunshine



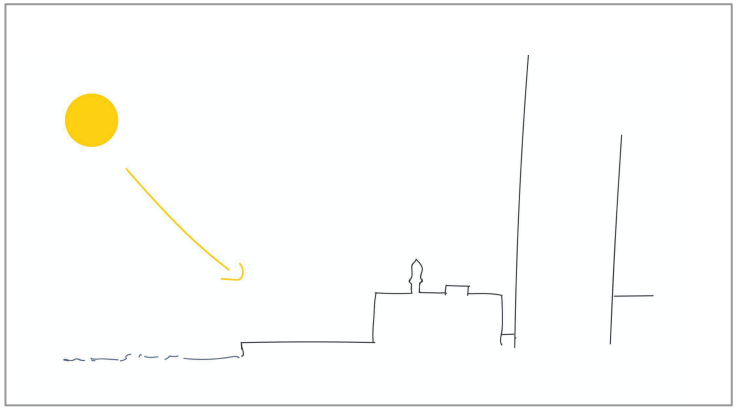
people interacting with eachother, forming groups

different groups are not interacting

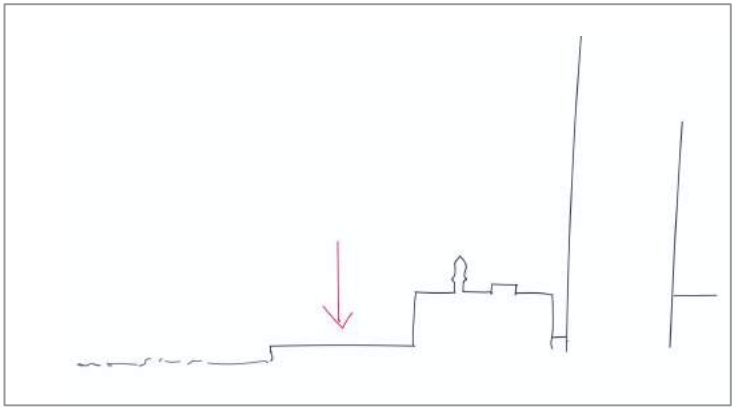
interaction with the river is superficial

Site observations

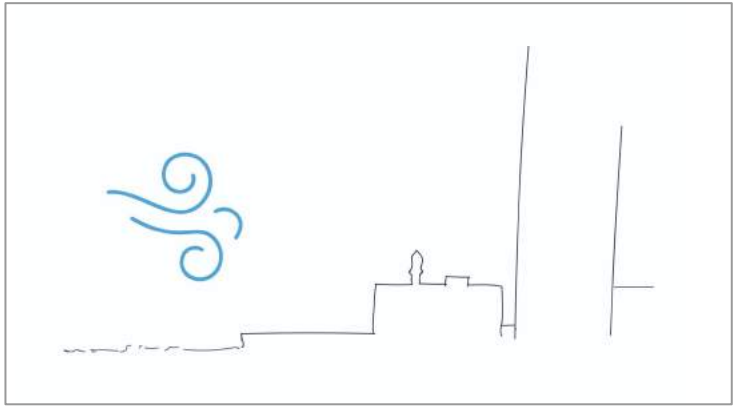
Site observations



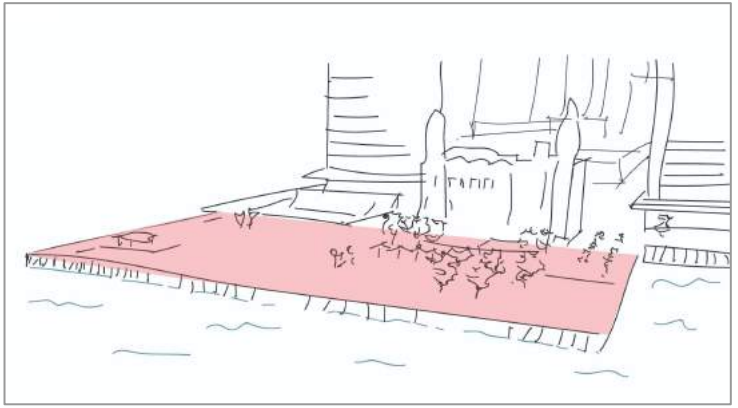
Sun Exposure



Low Height Buildings



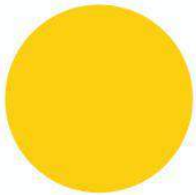
Wind Exposure



Emptiness + Openness

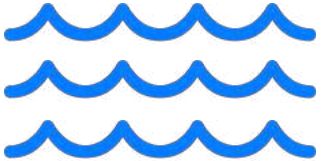
Site observations

Main Objectives



Sun

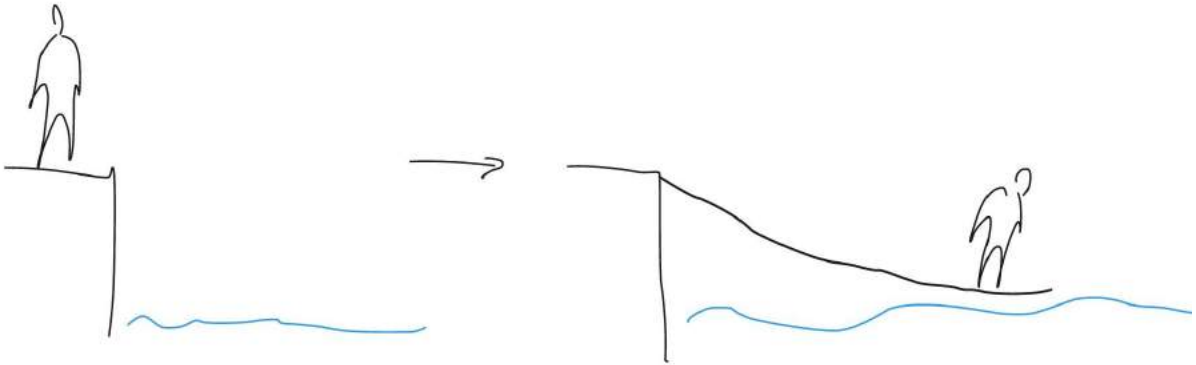
Wind



Water

Design Idea

How?



Design as a link between water- human- land

Interaction and movement

How can a building and a person interact?

Interaction and movement

Compliant Mechanisms
Pneumatic Movement
Origami Folding
Projection of Visuals
Thermochromic change
Augmented Reality
Responsive Lights
Changing Translucency
Moving Curtains
Movement behind flexible material
Movement of the anchors of a flexible material
Distortion by wind
Mechanical Movement
Distortion of Live footage

Sound responding to presence
Sound made by interactor
Playing with Mirrors
Physically moving light sources
Turn surfaces into (touch) screens
Fill the Space, make your own path
Warp Perception
Erosion as a design feature
Wind powered Movement
Water powered Movement
Heat based transformation
Soft Floors / Walk on Water
Taken by the Tide / Planned Obsolescence
Water-like structures

Analog Interaction

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Digital Interaction

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Touchable Interaction

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Perceivable Interaction

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Energy Neutral Interaction

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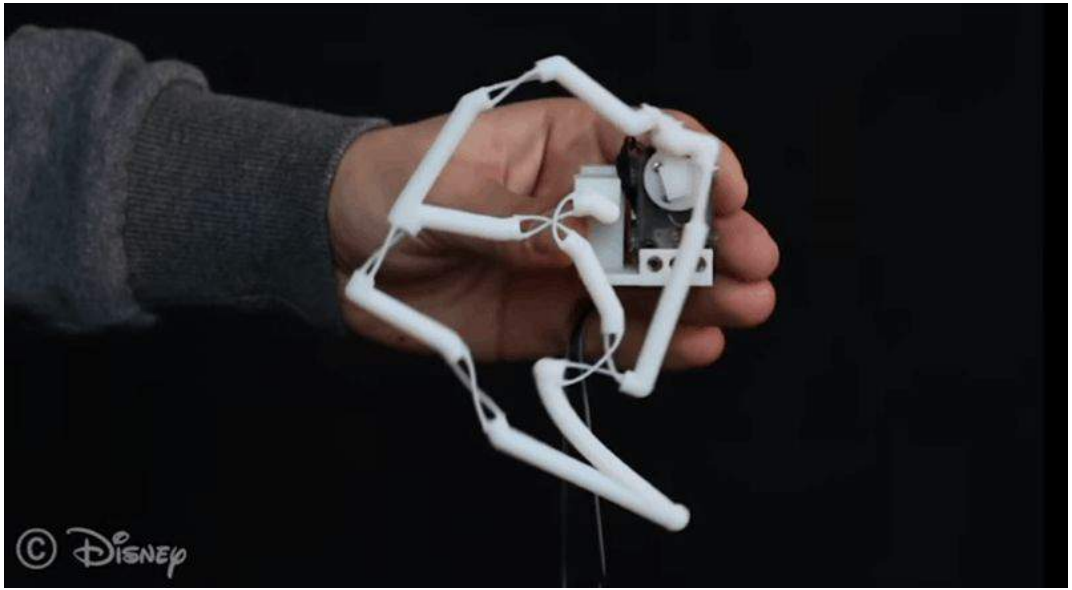
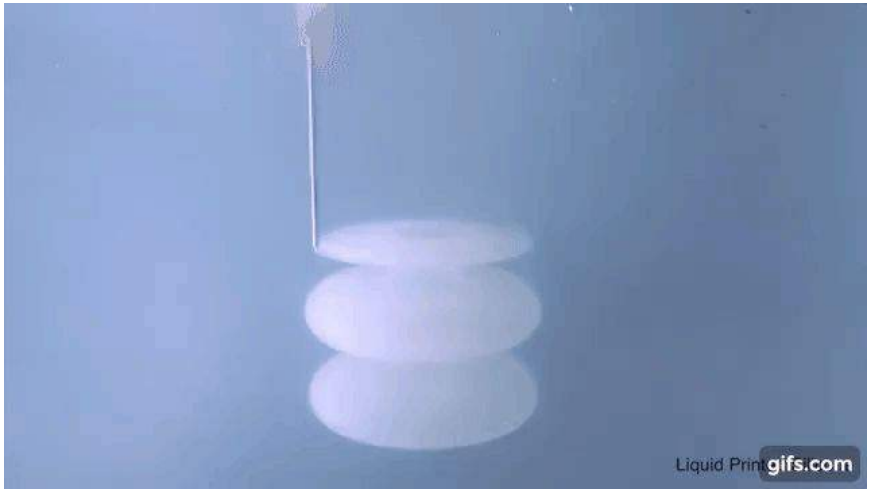
Compliant Mechanisms

Compliant Mechanisms rely on bending and twisting properties to allow movement without complex mechanical connections.



Pneumatic Movement

MIT has designed some 3D printable inflatables that use air pressure to move and change shape.



Origami Folding

By creating creases in surfaces we could potentially fold them by pushing in and out, transforming both their shape and aesthetic.

Projection of visuals

With the use of body trackers and projectors we could create surfaces that can interact with those that are near them.

Responsive lights

When combined with sensors or motion tracking devices lights can react to the inhabitants of a space, to selectively give or take light where wanted.

Thermochromic change

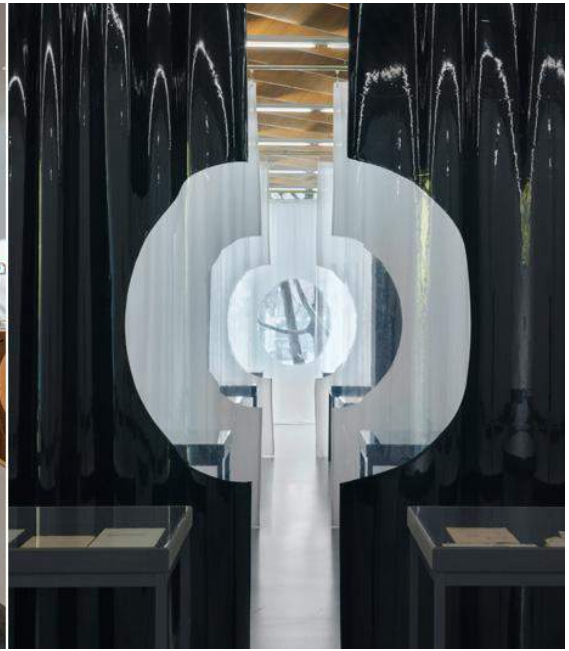
Thermochromic paints change colour when heated or cooled down. This way they can either react to weather conditions or human heat.

Changing Translucency

By choosing when and where people can look through apertures one could shape the way inhabitants experience a space.

Moving Curtains

Curtains could be used as a moveable wall to temporarily open or close space where needed.

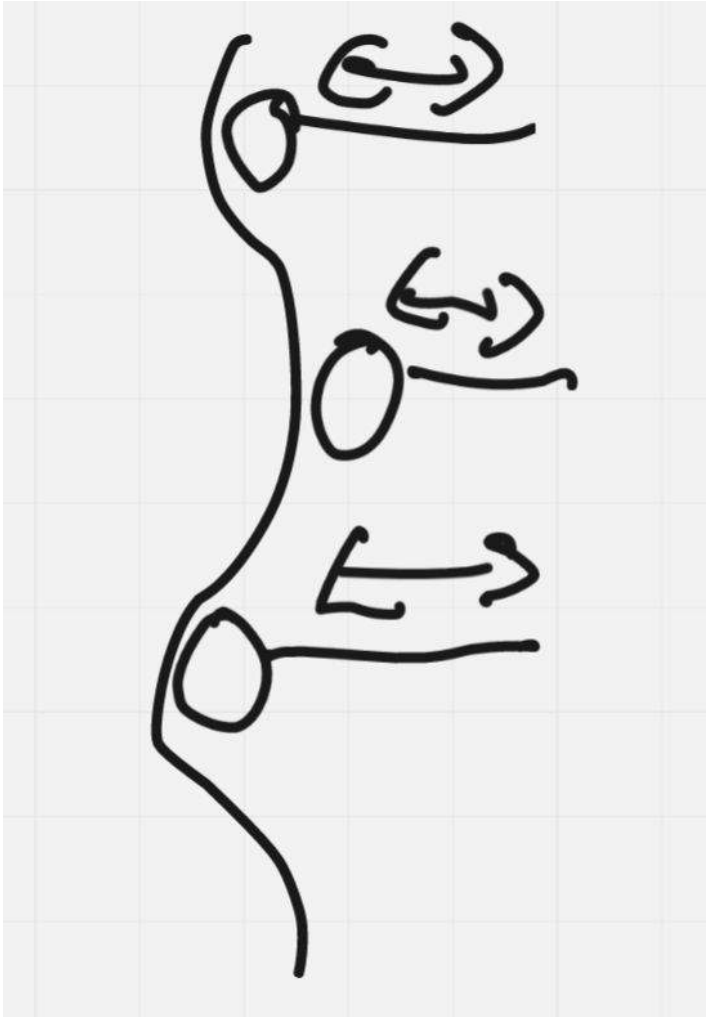


Augmented Reality

Augmented reality allows people to use their own devices to add a layer of interaction to a space that can be programmed and changed later.

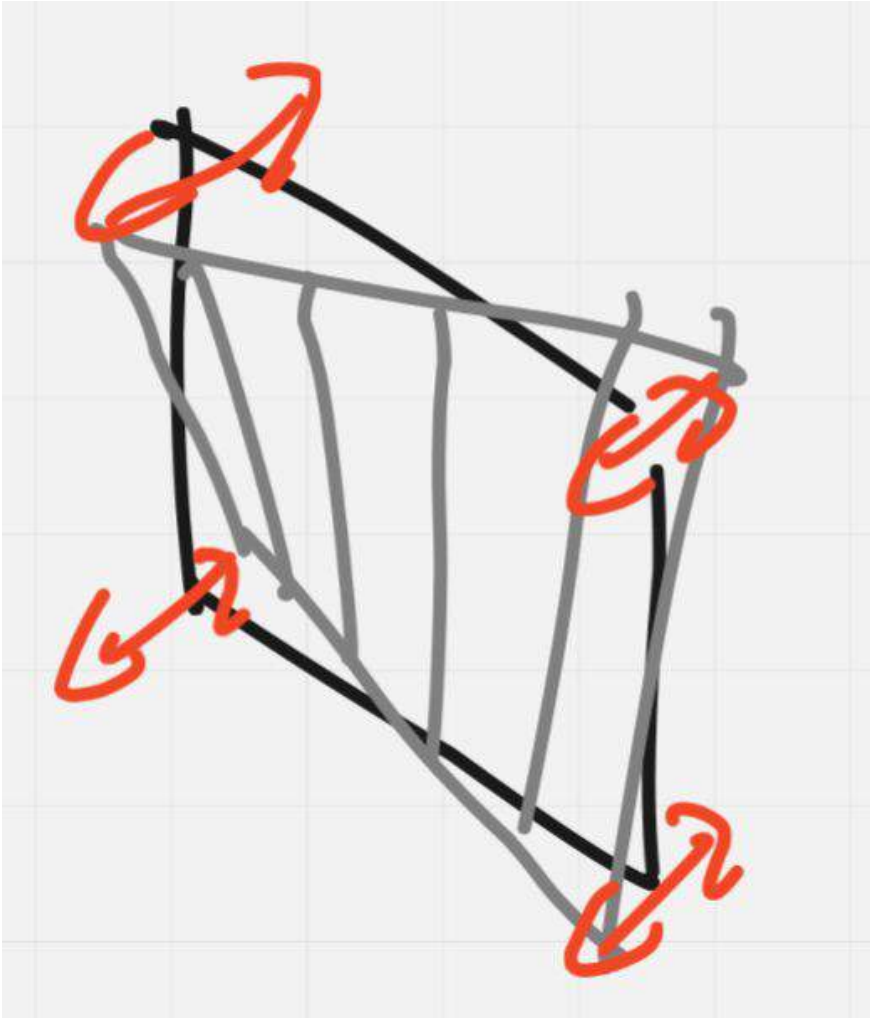
Movement behind a flexible surface

By pulling on or pressing into a flexible surface from behind the surface could become a dynamic canvas of movement.



Movement of the anchors of flexible surfaces

By moving the connections of a flexible surface forward and backward the surface could bend and twist, turning orthogonal to curved.



Distortion by Wind

If you allow wind to blow past the back of a textile or otherwise soft wall it will start to ripple, making the invisible wind visible.

Mechanical Movement

By using sensors, motors, actuators and other mechanical parts, the building could move and shift to respond to the presence of people.

Distortion of Live Footage

By filming in the building and using filters, collage techniques and other digital post production effects people could interact with themselves and others.

Sound responding to presence

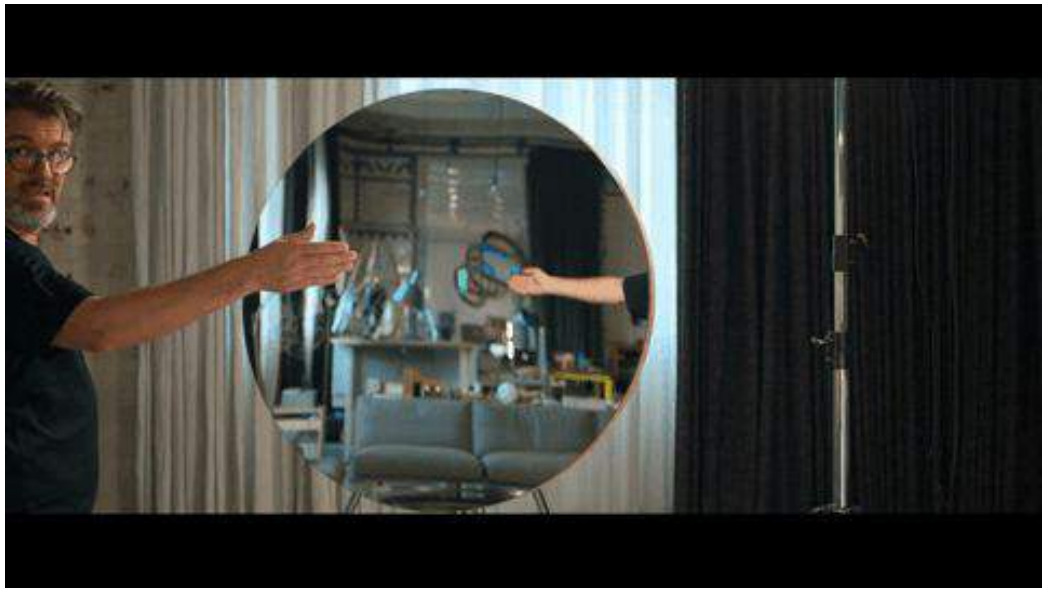
By sensing when people are present in certain areas of space the building could project sounds that correspond to them.

Sound made by Interactor

Space could act as any instrument by allowing people to for example hit it like drums or a gong, or play it like a piano or guitar or any.

Playing with mirrors

Laughing mirrors somehow always invite people to interact with them, they are however fairly tacky. Maybe having an odd interaction with mirrors moving or displaying other things than expected could pull people in.



Physically moving light sources

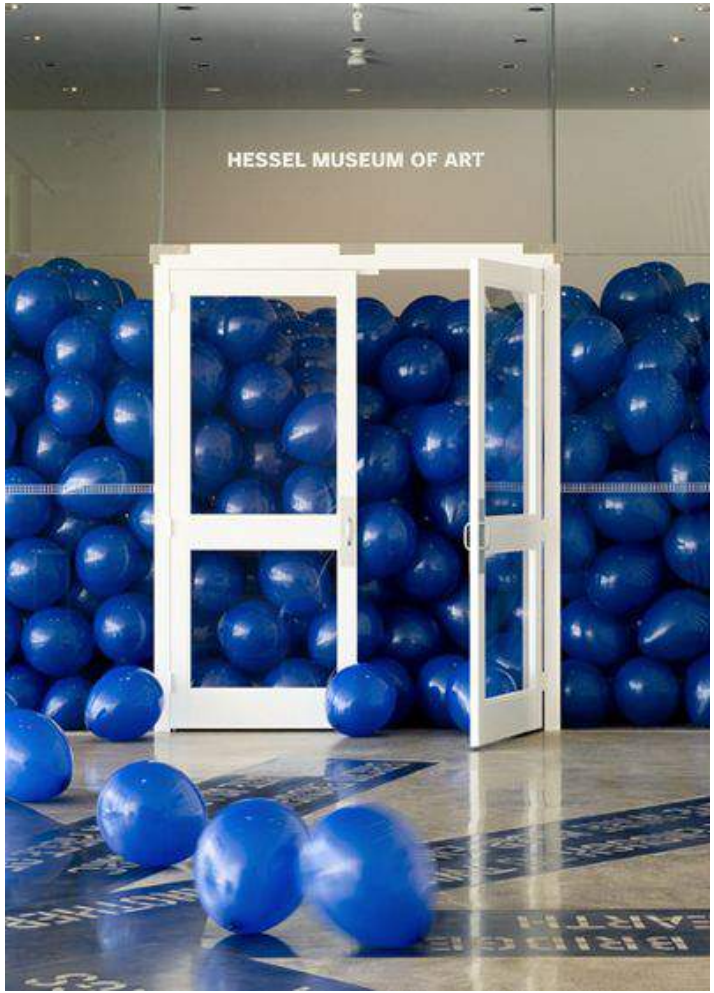
By allowing people to interact with the light sources around a structure that displays strong shadows and light lines we could invite them to have a more physical understanding of light in space.

Turn surfaces into (touch)screens

An easy way to interact these days is by turning every surface into a screen that displays what yo want and can be interacted with simply by touch. Just like we are all used to with our phones.

Fill the space / create your own space

Instead of creating empty space, one could create full space that people have to interact with to create their own way forward.



Warp perception

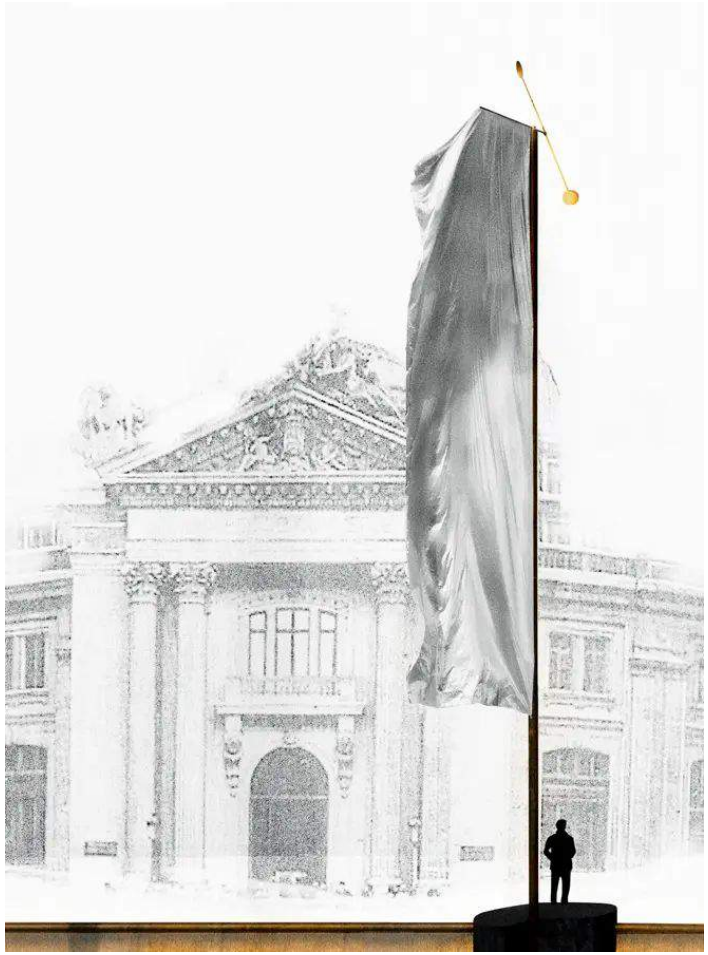
Rather than physically changing space into complex geometric forms, sometimes just the idea is needed and the participants mind does the rest.

Erosion as a design feature

By allowing people to interact with the light sources around a structure that displays strong shadows and light lines we could invite them to have a more physical understanding of light in space.

Wind Powered movement

Wind is something we feel every time we go outside, yet it is only visible in the breaking waves and waving trees. What if we create similar effects, but architectural.



Water Powered movement

By making the building move along with the tides and the passing boats it could create a more involved interaction with the water than otherwise. Could not find good pictures for it, so here is a waterwheel.

Heat based transformation

BIf we take advantage of material properties in regards to heat expansion we can create structures that open or close when the sun shines. Imagine a building that closes on its own when it starts to rain.

Soft Floors / Walk on Water

By allowing people to interact with the light sources around a structure that displays strong shadows and light lines we could invite them to have a more physical understanding of light in space.

Taken by the tide / planned obsolescence

By Anchoring something down instead of letting it float like most quayside structures a dialogue about impermanence and the force of nature can be started.

Water-like structures

By exploring different ways of experiencing water we can form structures that feel like it. By investigating characteristics of water the structure could unify itself with the water in some sense.

Preferred Interaction

Compliant Mechanisms
Pneumatic Movement
Origami Folding
Projection of Visuals
Thermochromic change
Augmented Reality
Responsive Lights
Changing Translucency
Moving Curtains
Movement behind flexible material
Movement of the anchors of a flexible material
Distortion by wind
Mechanical Movement
Distortion of Live footage

Sound responding to presence
Sound made by interactor
Playing with Mirrors
Physically moving light sources
Turn surfaces into (touch) screens
Fill the Space, make your own path
Warp Perception
Erosion as a design feature
Wind powered Movement
Water powered Movement
Heat based transformation
Soft Floors / Walk on Water
Taken by the Tide / Planned Obsolescence
Water-like structures

MAB

Guido 2021, Netherlands, Delft

The Idea

The installation is designed to simultaneously guide its visitors at a safe distance, while providing a short moment of escapism and relaxation. Composed of a large-scale, yet intricate, hanging canopy which reacts to the presence of visitors, Guido transforms any mundane day-to-day transitional space into an engaging, unique experience.

Technical concept

The current prototype of Guido currently consists of nearly 1000 wooden nodes, 21 stepper motors and 8 Arduinos to interactively move the node structure. Facilitated by the triangular shape and notches at each anchor-point, the nodes are easily clicked into each other and can be extrapolated into a large-scale, blanket-like structure. Due to the alternating normals of the designed nodes, the mesh gains both depth and flexibility. Users of Guido are detected using Time of Flight sensors which, upon triggering, send the data to central control unit which computes an optimal path generation via a sophisticated and dynamic algorithm and forwards its output to the corresponding motors that eventually raise and lower the mesh at the corresponding points.

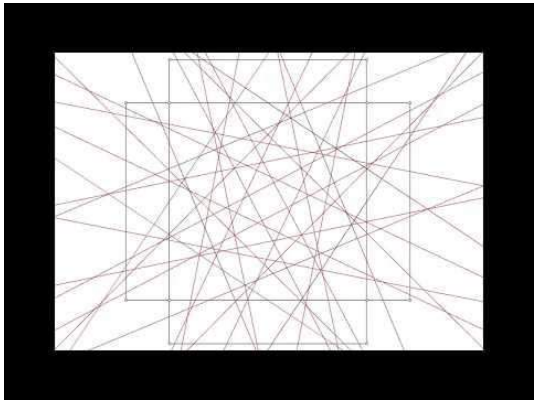
Design to production

Tectonics in the age of the computer:

Tectonics: the science or art of construction

1. Algorithmic tectonics:

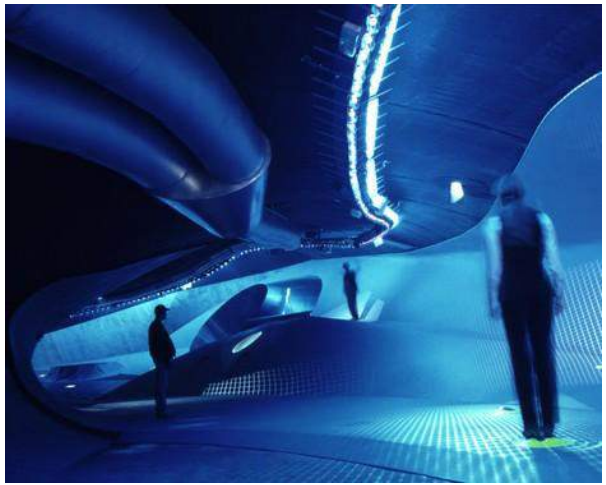
Through the use of algorithms complex shapes and structures become manageable. It offers a form of randomness that's more controllable. An important example is the Serpentine Pavilion of 2002 by Ito and Belmond.



Tectonics in the age of the computer:

2. Fluid form-finding tectonics:

NOX's Lars Spuybroek has a different way of looking at tectonics. He sees great value in the abstract movement of structures. For movement is a fundamental aspect of the human condition. Because of it's movement with a human body a car can become a part of feel as if it's a part of the users body. A building should strive to do the same with an ever changing structure.



Tectonics in the age of the computer:

3. Technological swarm tectonics

ONL conceives a building as a swarm of intelligent elements, constantly sensing, calculating and reacting to their environment. Oosterhuis sees potential in bringing something unforeseen to a place, something never experienced before, that are forcing us to think differently and put us in another state of consciousness. Other arguments for a swarm building is that the elements can respond to changes in atmosphere possible making them stronger and more efficient. Pneumatics can play a big role in enabling this movement.

source: https://publications.lib.chalmers.se/records/fulltext/165235/local_165235.pdf

ONL file to factory principles

Construction Principles for File 2 Factory

- Structural Skin: In opposition to modernist concept of separated skin and structure.
- Polygonal Tessellation: Transforming a curved surface into a faceted one, creates modules.
- Generic Detail: Attaching all the unique facets/modules by one generic detail.
- Composite Material: To improve the performance of the used material.

source: https://repository.tudelft.nl/islandora/object/uuid:01f55888-8034-42ec-b8e5-c9b4afeaaae7/datastream/OBJ/download

Production methods

Mass customized: (for non standard)
3d printing
Binder jet 3d printing
CNC cutting

Mass produced (for repeating complex elements i.e. for movement.)
Injection mold (for 1000+)
Rotation mold (for around 100)
Vacuum casting

Proposals

Types of interaction

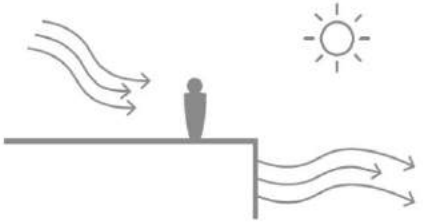
Emphasizing passing ships

creating interaction between people and ships.

Making people aware of eachother

creating interaction between people and ships.

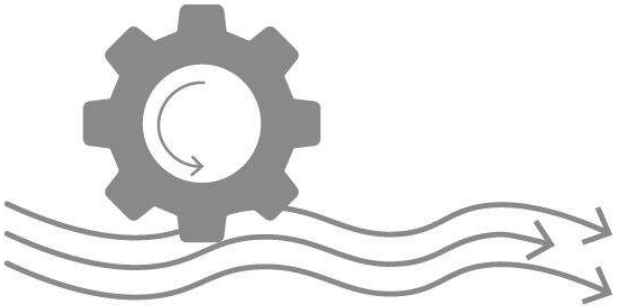
Responding to and emphizing the elements



creating interaction between people and ships.

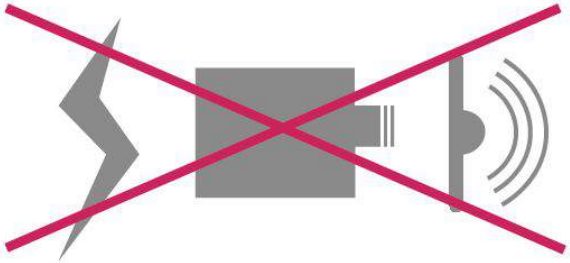
1. A kinetic structure responding to the environment

A kinetic art structure driven by water



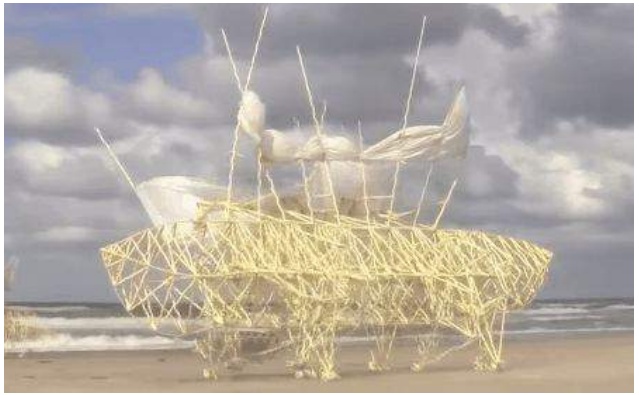
emphasizing the ever present motion of the river. (1.3-2.8 kts). making everyting mechanical.

Rejecting the use of electricity, camera and sensors



avoiding creating participating in a built environment that is always watching.
not wasting energy.

1. A kinetic structure responding to the environment



Proposed function: