FROM WATER TO STRUCTURE

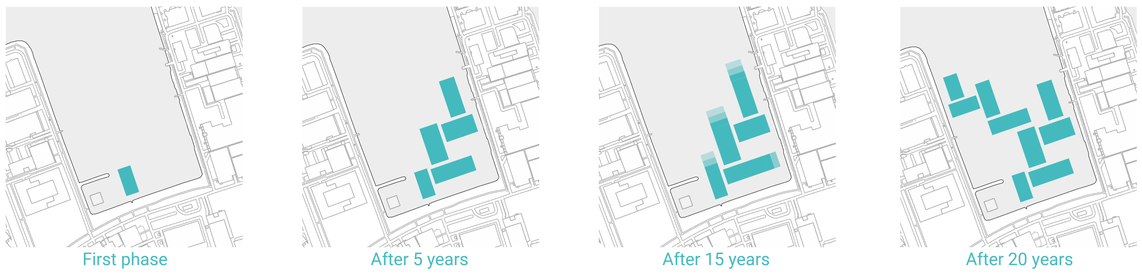
Reconnecting floating architecture and aquatic ecosystems through regenerative design

Floating ecosystem view

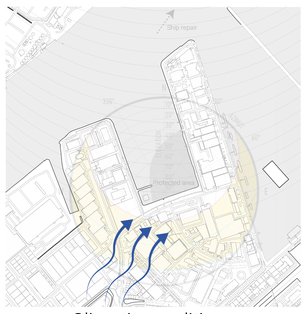
The project investigates the possibilities of using **bio-based materials** sourced from **local aquatic environments** for all parts of a **floating building**. The design of a culture hub for the future community of Amsterdam Haven Stad addresses the pollution and lack of biodiversity in the industrial port of Amsterdam by producing the building materials in a **regenerative process**.

The materials' **life-cycle** is rethought by linking the plants' cultivation cycle and the materials' lifespan in a new **double-loop** system. It considers the floating building as a constantly evolving and maintained entity. A **computational analysis** framework allows to evaluate the appropriate area for each material to grow on, in order to supply the needs of the building for the **construction and replacements**.

Modularity is at the centre of the structural concept, for all building elements, from the floating platform to the roof skeleton and floating ecosystems. This allows the building parts to be **maintained and replaced** at the end of their use. **Community building** is made possible through the **prefabrication** of the different pieces and ease of assembly of the structural elements.



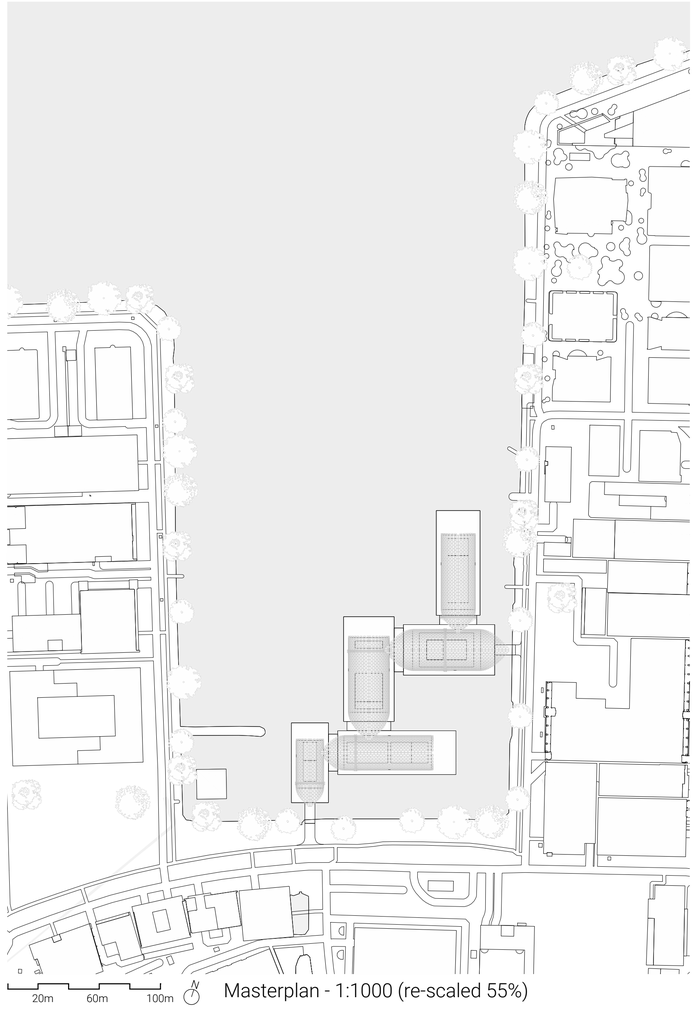
Adaptability & expandability



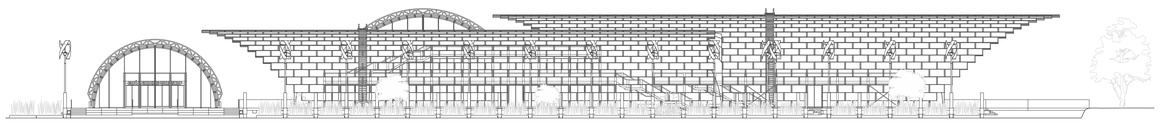
Climatic conditions

Planned transports

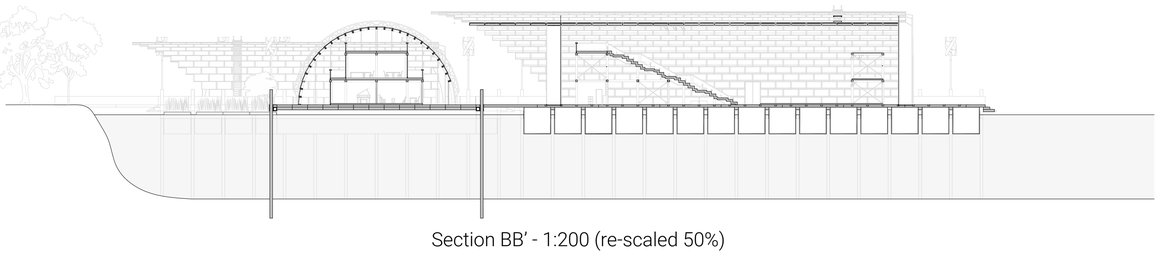
Massing - 1:5000 (re-scaled 50%)



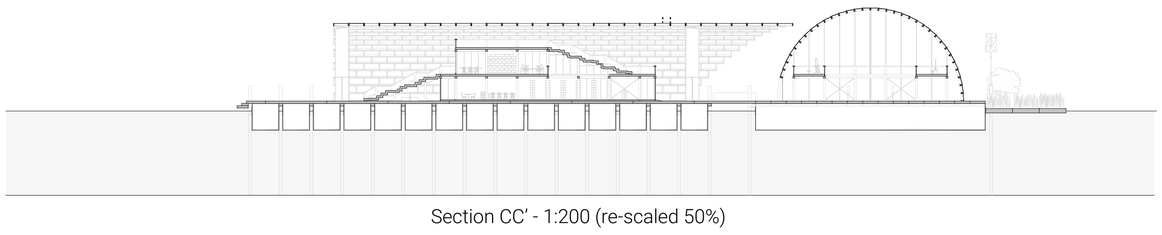
Masterplan - 1:1000 (re-scaled 55%)



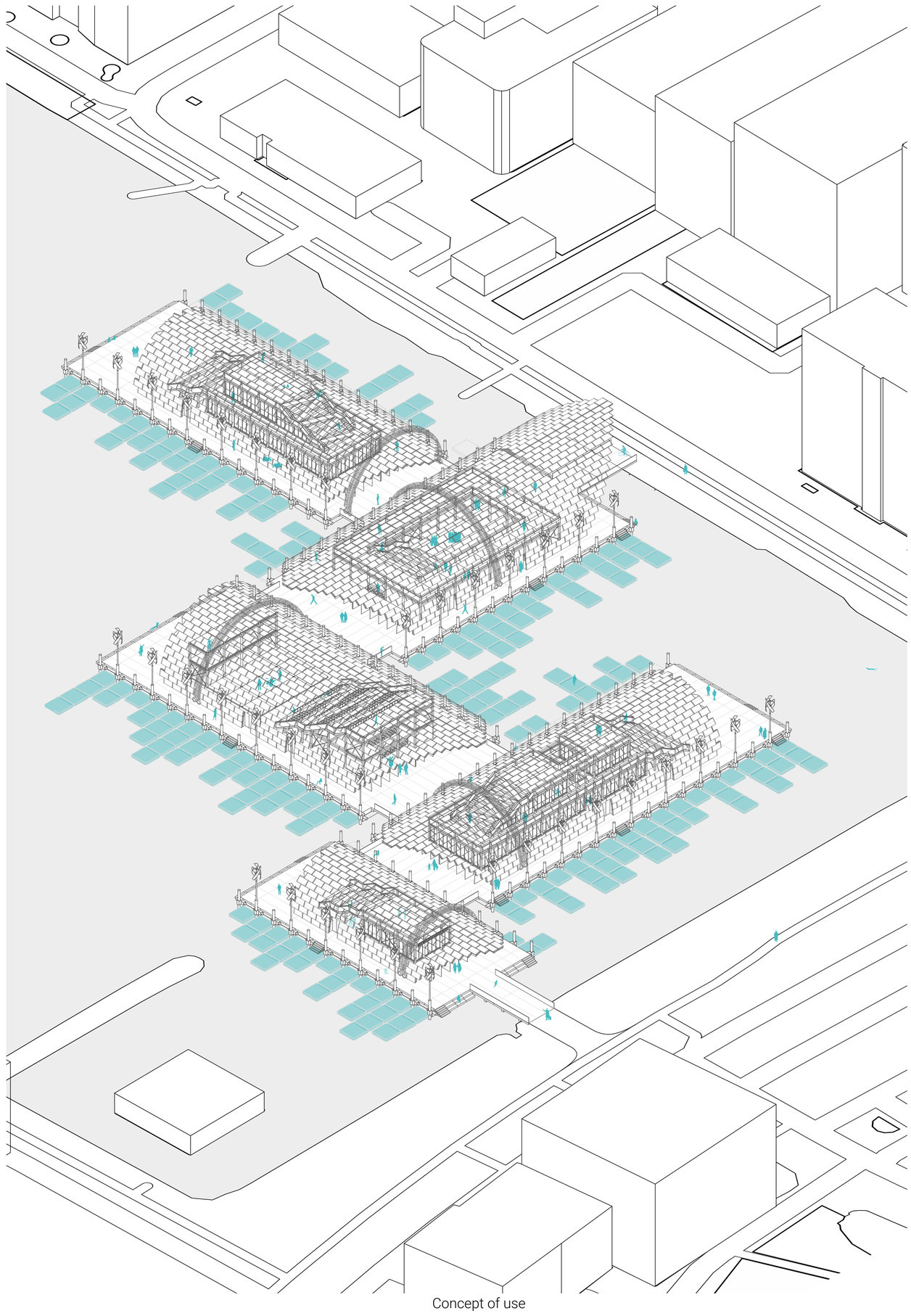
Elevation AA' - 1:200 (re-scaled 50%)



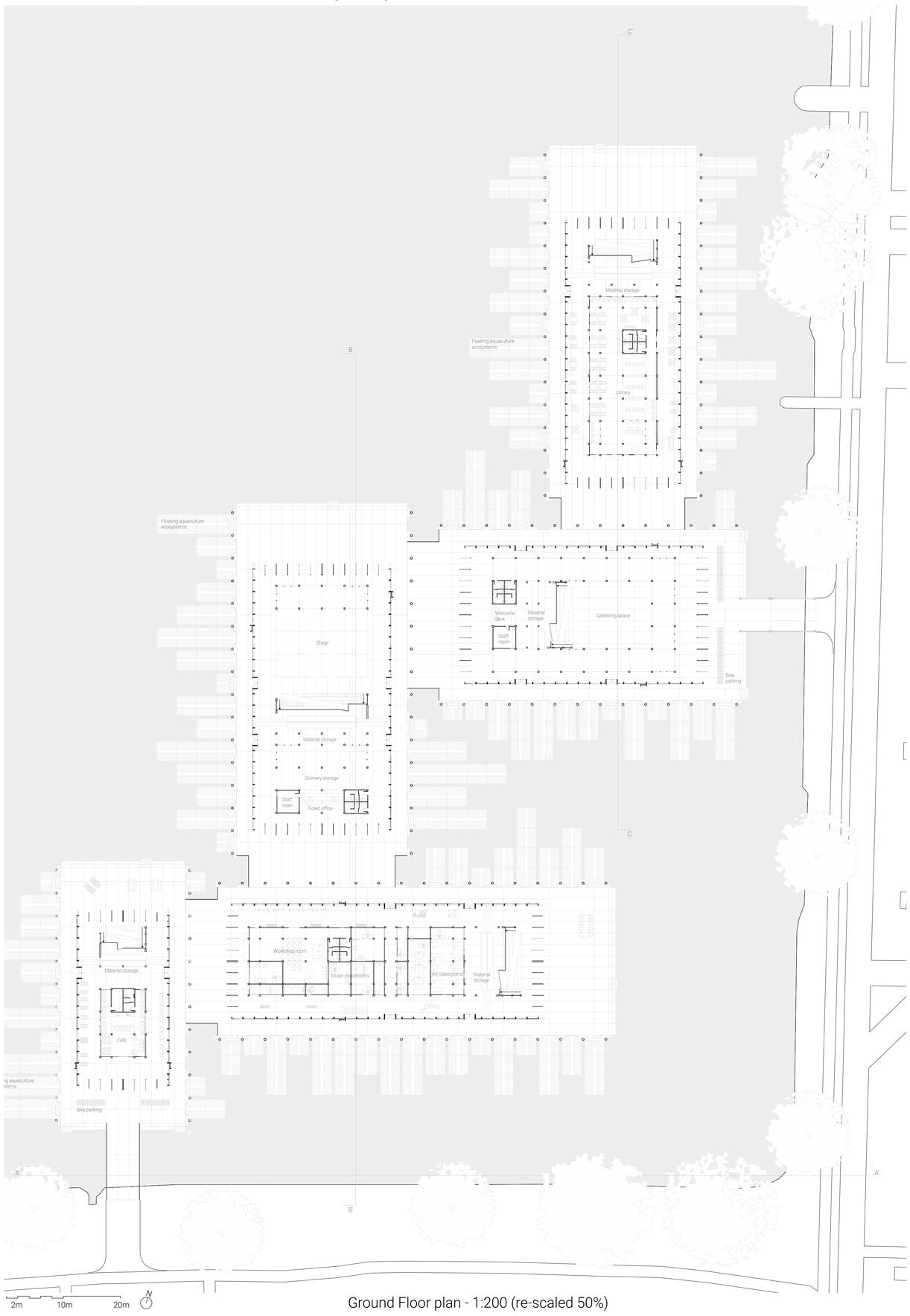
Section BB' - 1:200 (re-scaled 50%)



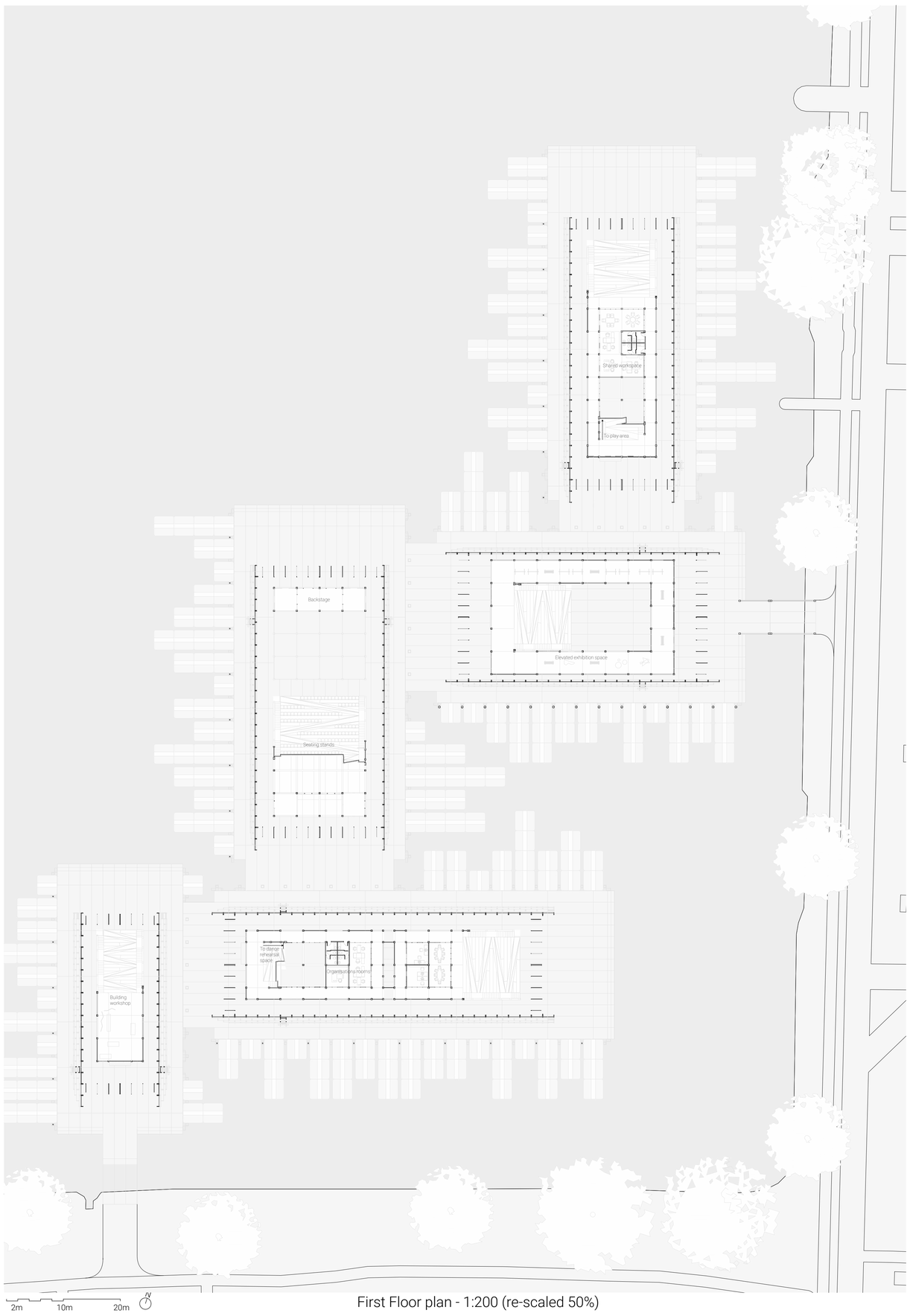
Section CC' - 1:200 (re-scaled 50%)



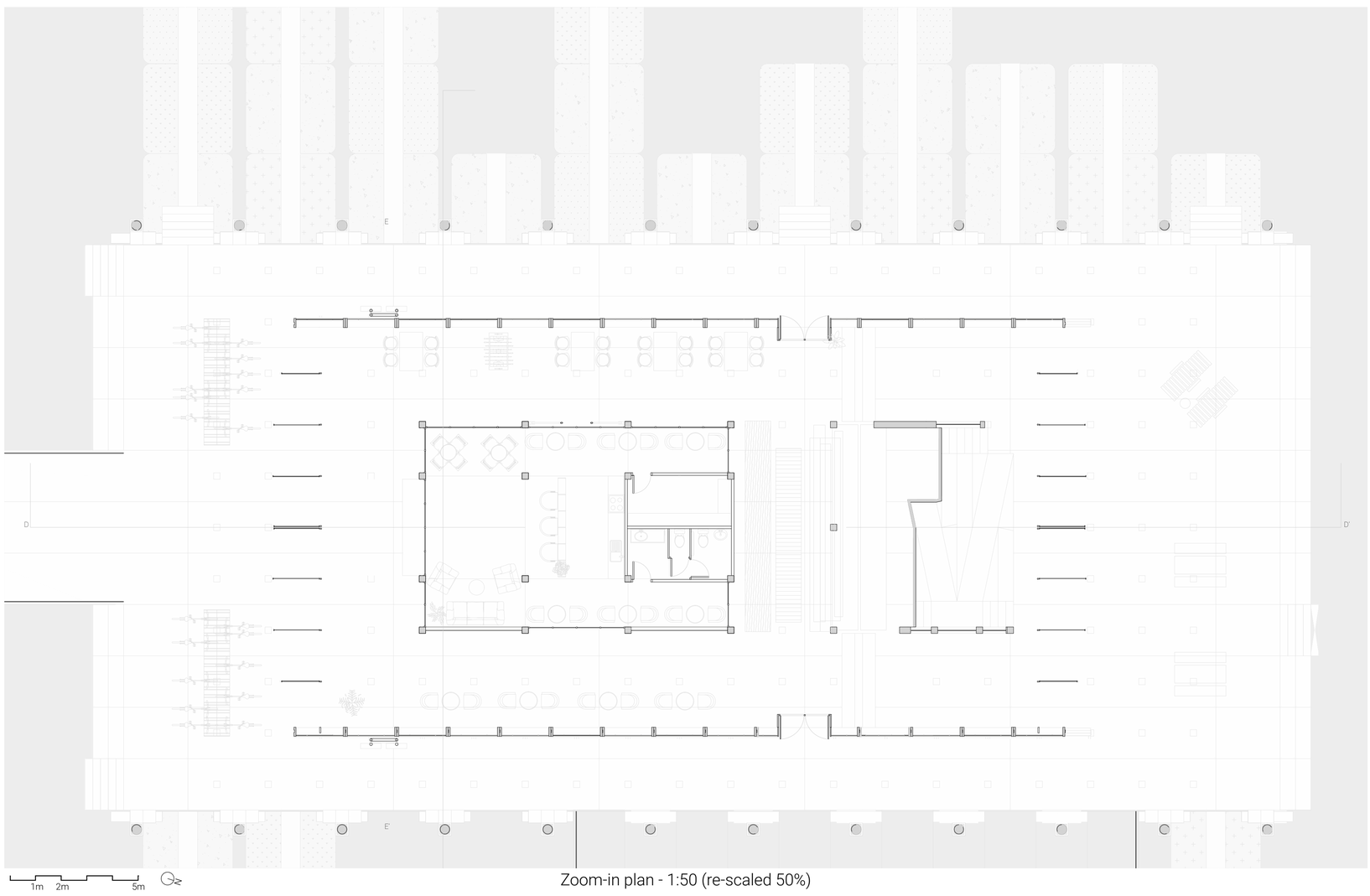
Concept of use



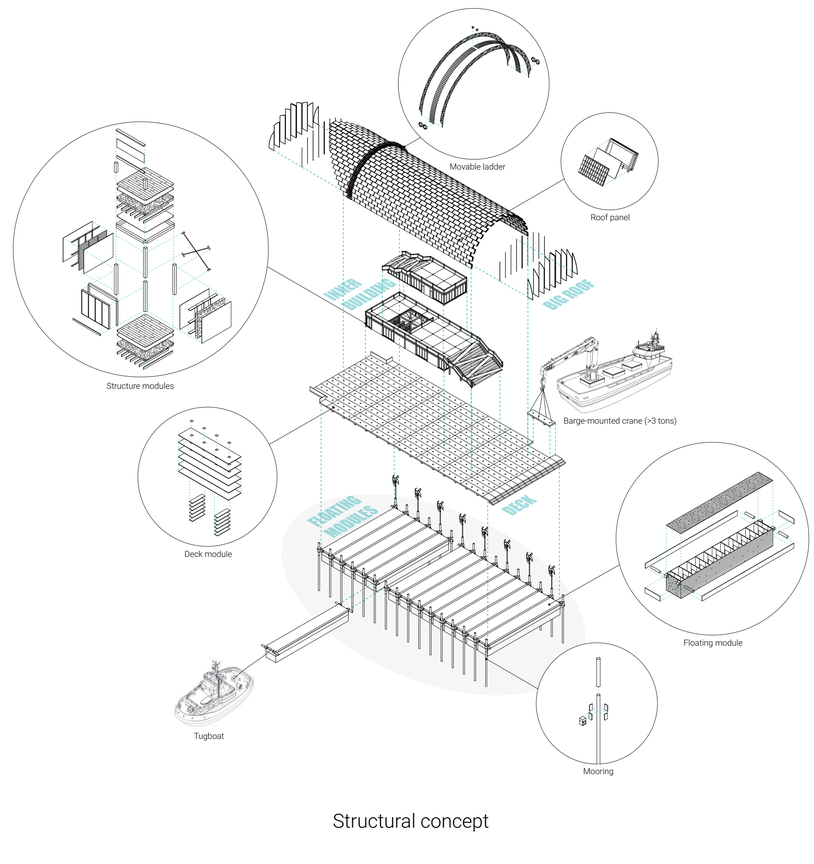
Ground Floor plan - 1:200 (re-scaled 50%)



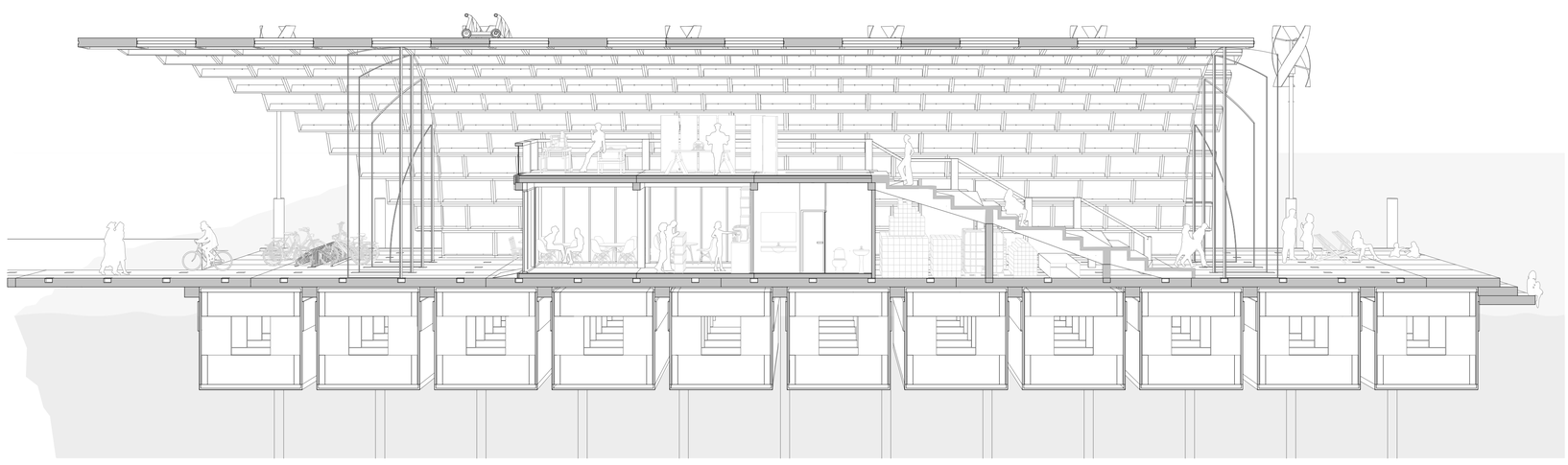
First Floor plan - 1:200 (re-scaled 50%)



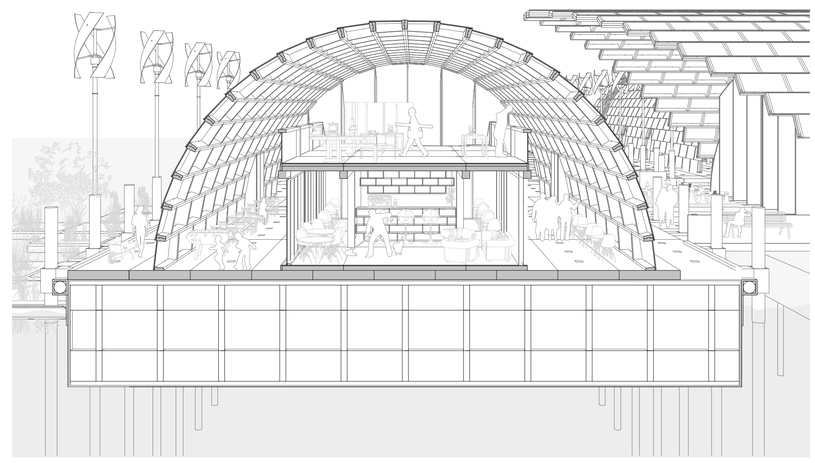
Zoom-in plan - 1:50 (re-scaled 50%)



Structural concept



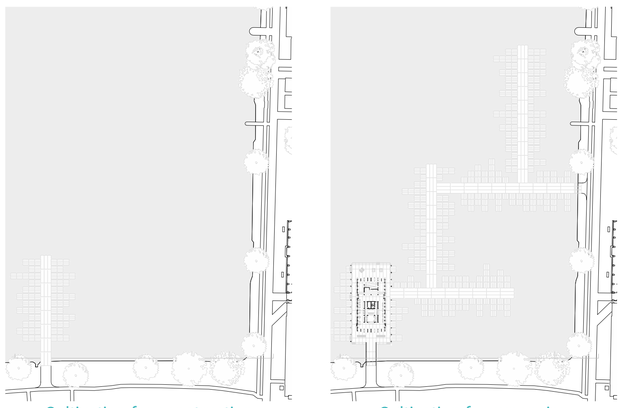
Section DD'- 1:50 (re-scaled 50%)



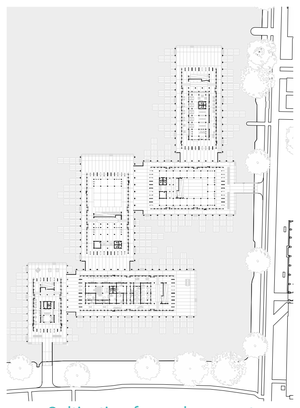
Section EE'- 1:50 (re-scaled 50%)

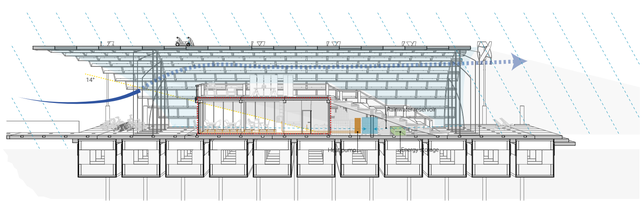

Main entrance view

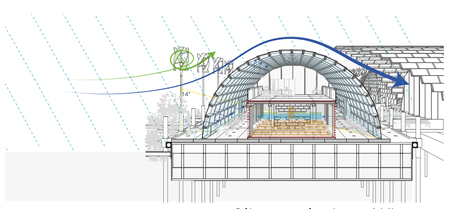

Café view

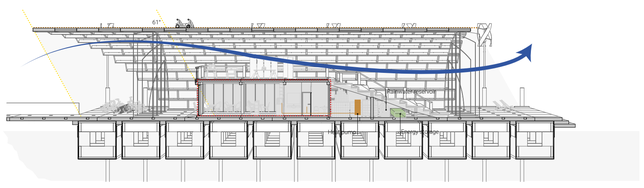

Cultivation for construction

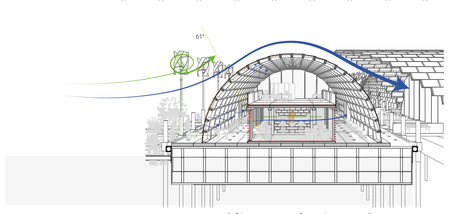
Cultivation for expansion

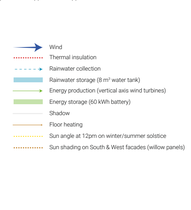

Cultivation for replacement



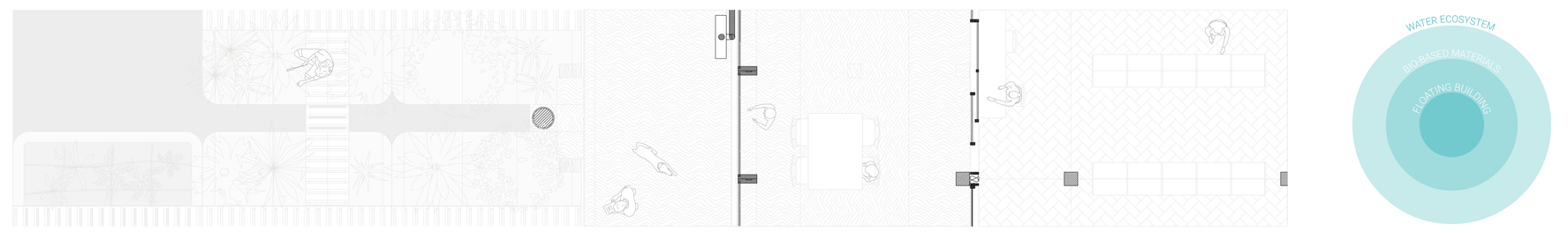

Climate design - Winter






Wind
Thermal insulation
Rainwater collection
Rainwater storage (8 m³ water tank)
Energy production (vertical axis wind turbines)
Energy storage (60 kWh battery)
Shadow
Floor heating
Sun angle at 12pm on winter/summer solstice
Sun shading on South & West facades (willow panels)

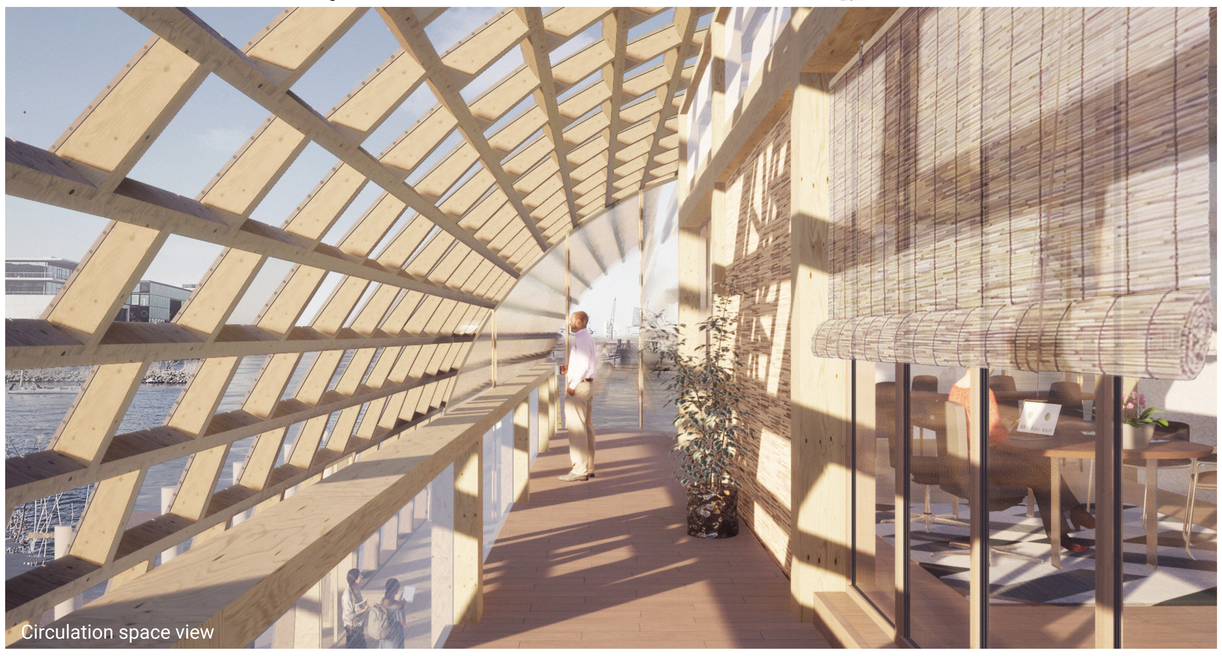
Climate design - Summer



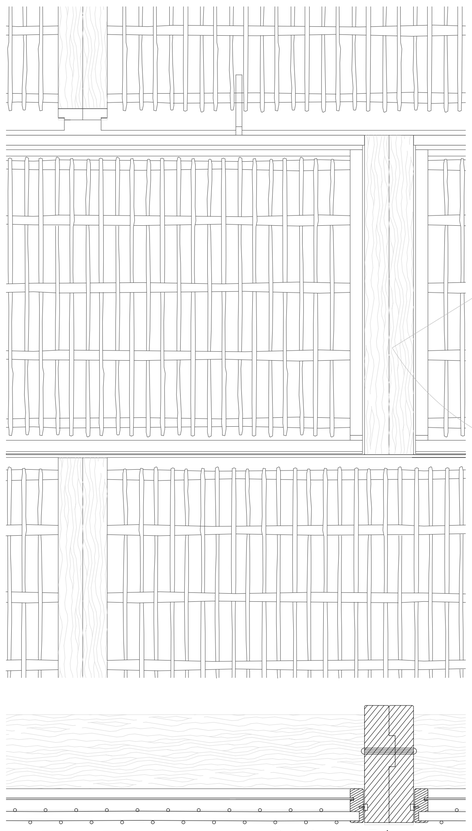
1m 2.5m

Fragment - 1:20 (re-scaled 70%)

New approach


Circulation space view

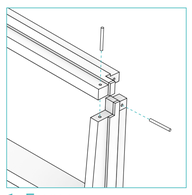

Performance hall view

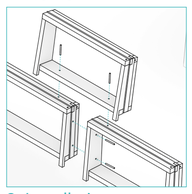


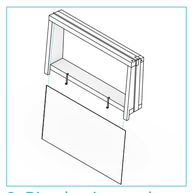
10cm 30cm 50cm

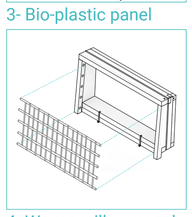
01 Seaweed-based bio-plastic clip
02 Alder horizontal structure
03 Pivoting window handle
04 Woven willow shading panel
05 Seaweed-based transparent bio-plastic sheet
06 Alder dowel
07 Alder pivoting panel frame
08 Sealing gasket

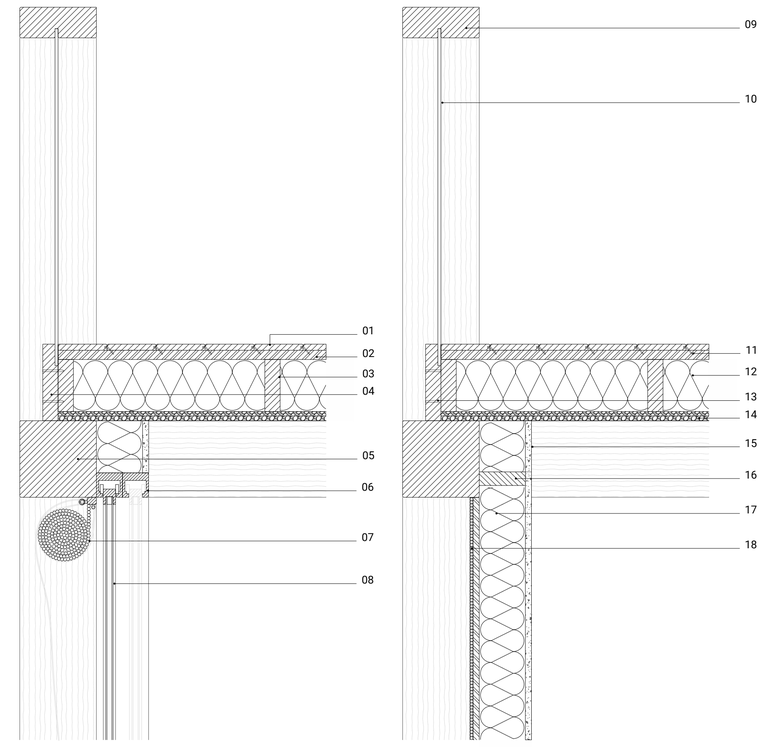
Detail A - 1:5 (re-scaled 50%)


1- Frame


2- Installation


3- Bio-plastic panel

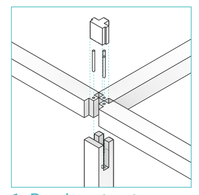

4- Woven willow panel

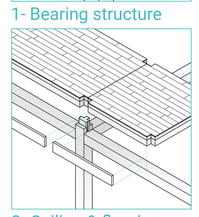


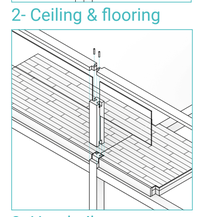
01 Birch wood flooring 20 mm
02 Birch plywood panel 30 mm
03 Ash timber joist
04 Ash timber covering beam
05 Ash timber primary beam 250 mm
06 Birch wood sliding window frame
07 Reed shading blind
08 Double glazing window
09 Ash timber handrail
10 Seaweed-based bio-plastic panel 10 mm
11 Wooden nail
12 Eelgrass insulation 170 mm
13 Wooden nail
14 Compressed reed ceiling 30 mm
15 Clay plaster with cattail seedwool 20 mm
16 Ash frame structure
17 Eelgrass insulation 150 mm
18 Reed cladding

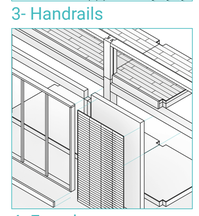
10cm 30cm 50cm

Detail B - 1:5 (re-scaled 50%)


1- Bearing structure


2- Ceiling & flooring


3- Handrails


4- Facade