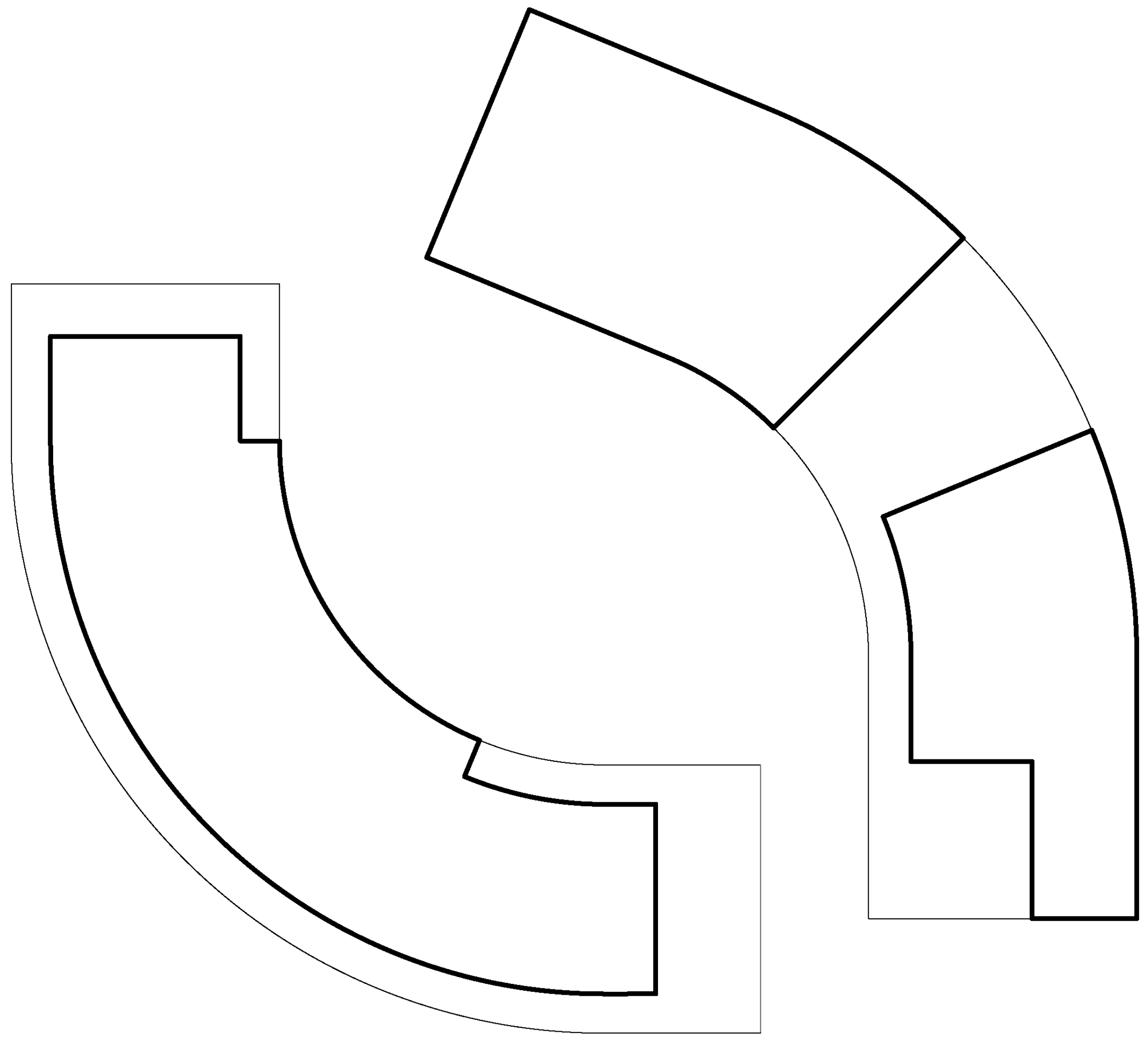


Aesthetics of Change: Timber Design for Dynamic Environments

Ornithology Research & Visitors Centre

P5 // Lada Leidmane

Studio Assignment

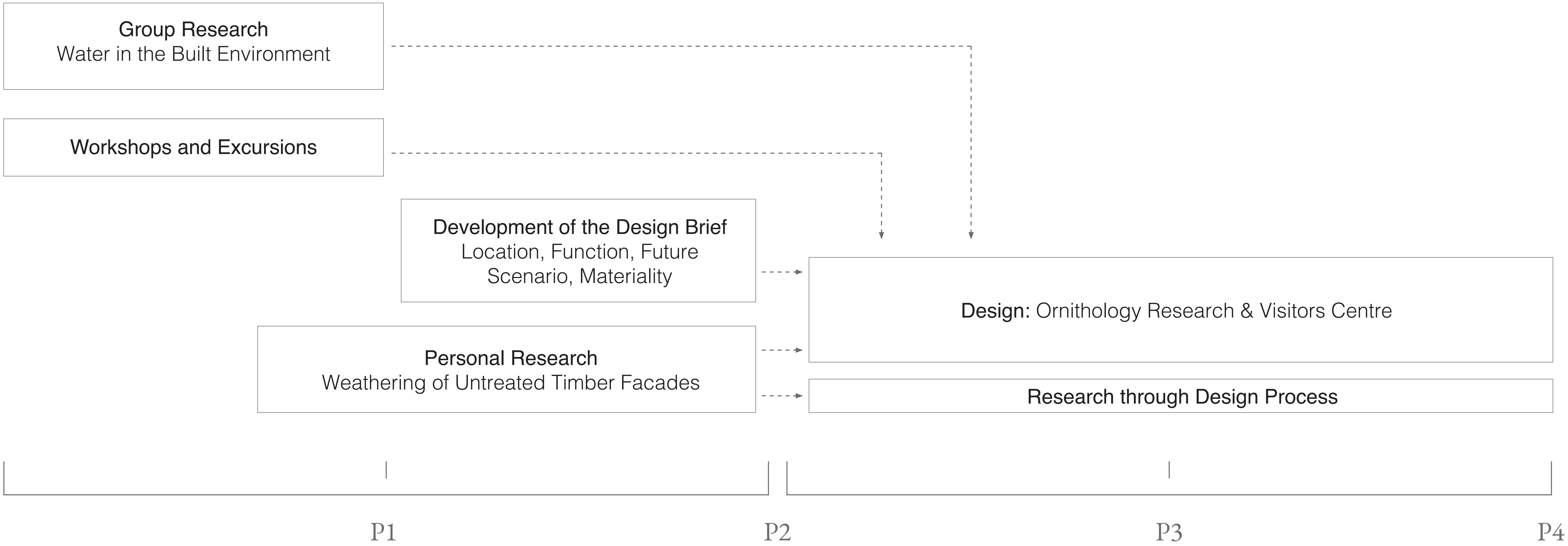
Studio Assignment

ENERGY

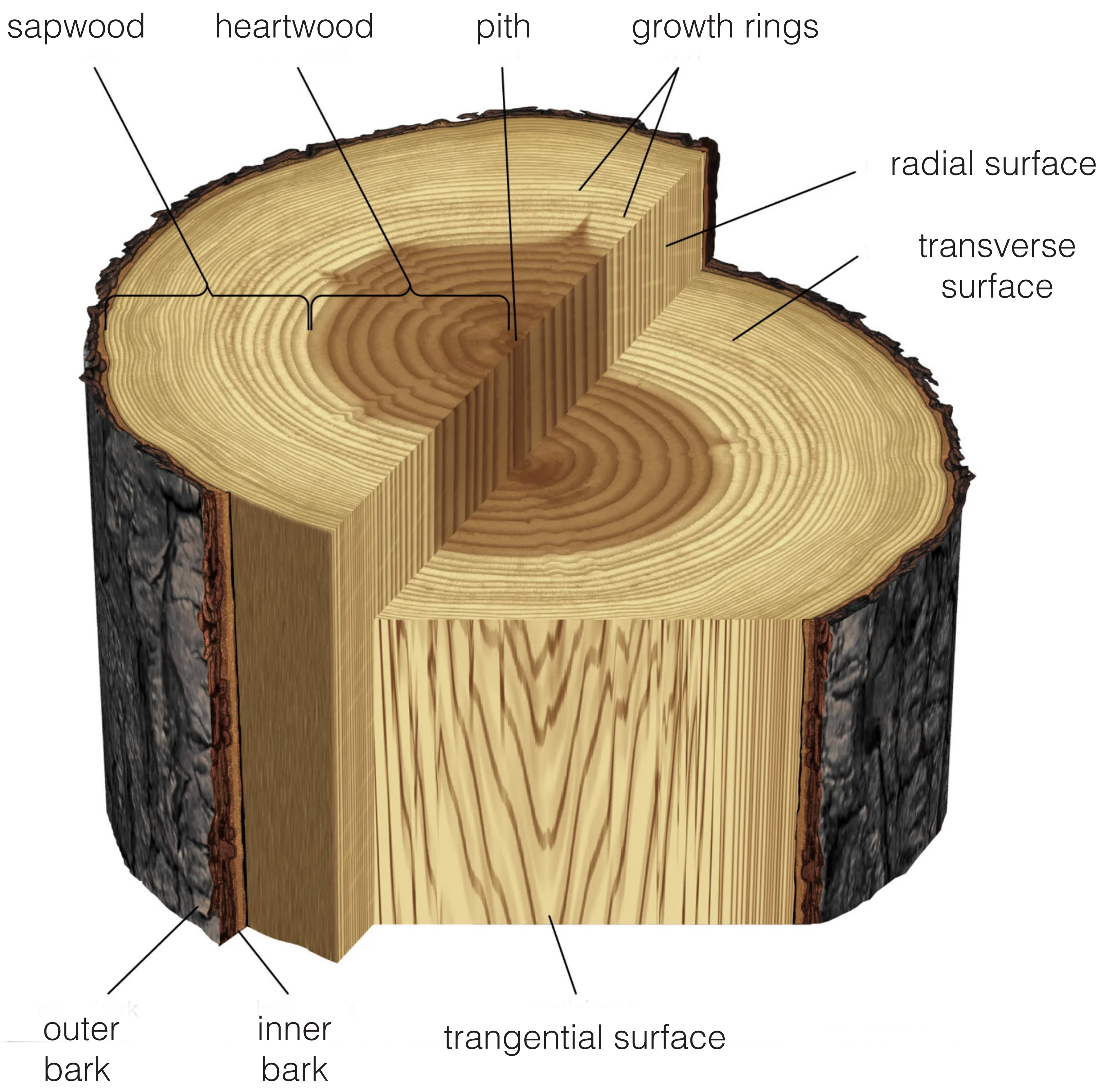
MATERIAL

WATER

Graduation Timeline



Wood



Anatomy of a tree trunk. From “Britannica“, by G. T. Tsoumis, n.d.

WOOD + DESIGN + WEATHER + TIME = **WEATHERING**

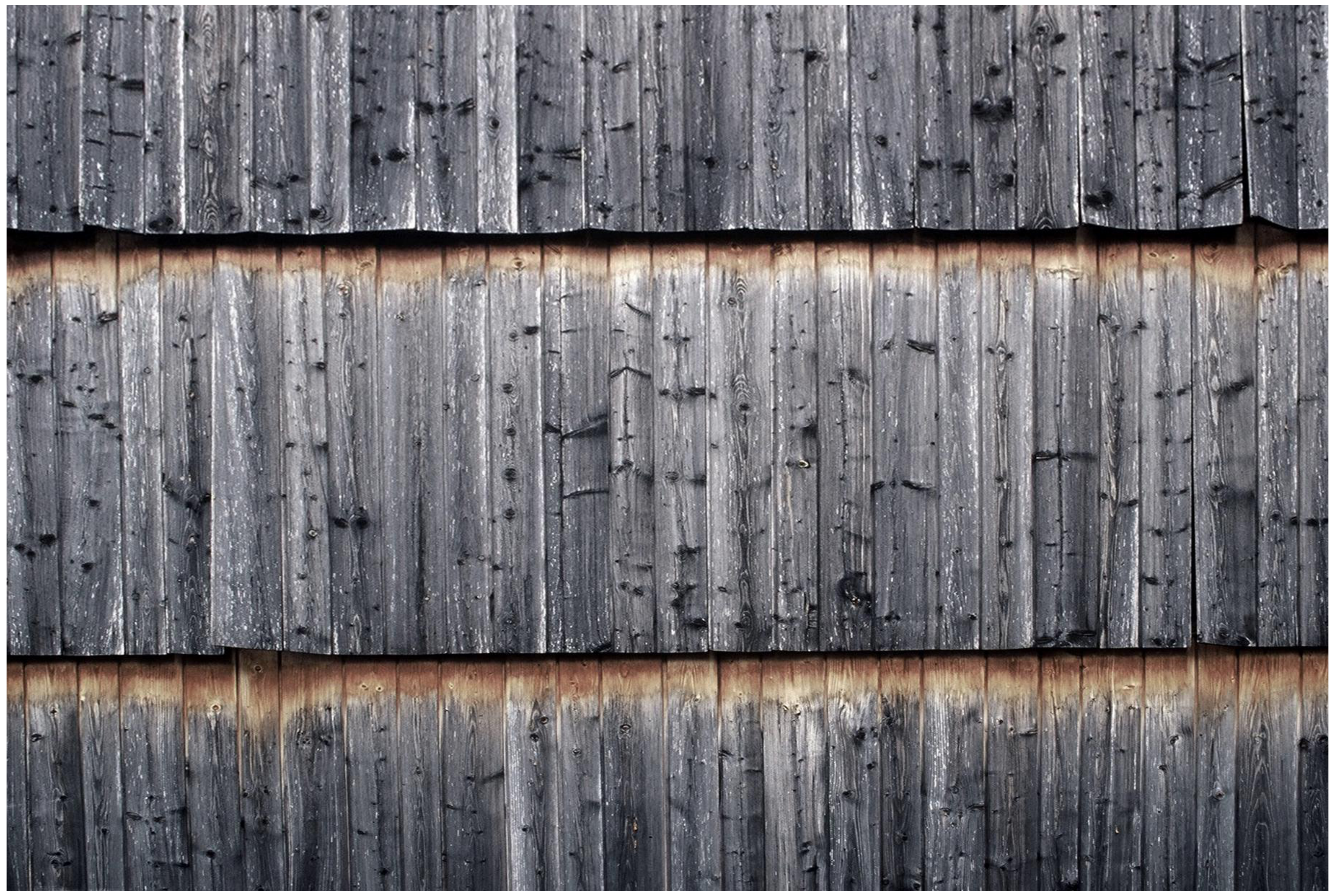
(Hirche, 2014, p. 37)

Weathering of Untreated Timber Facades

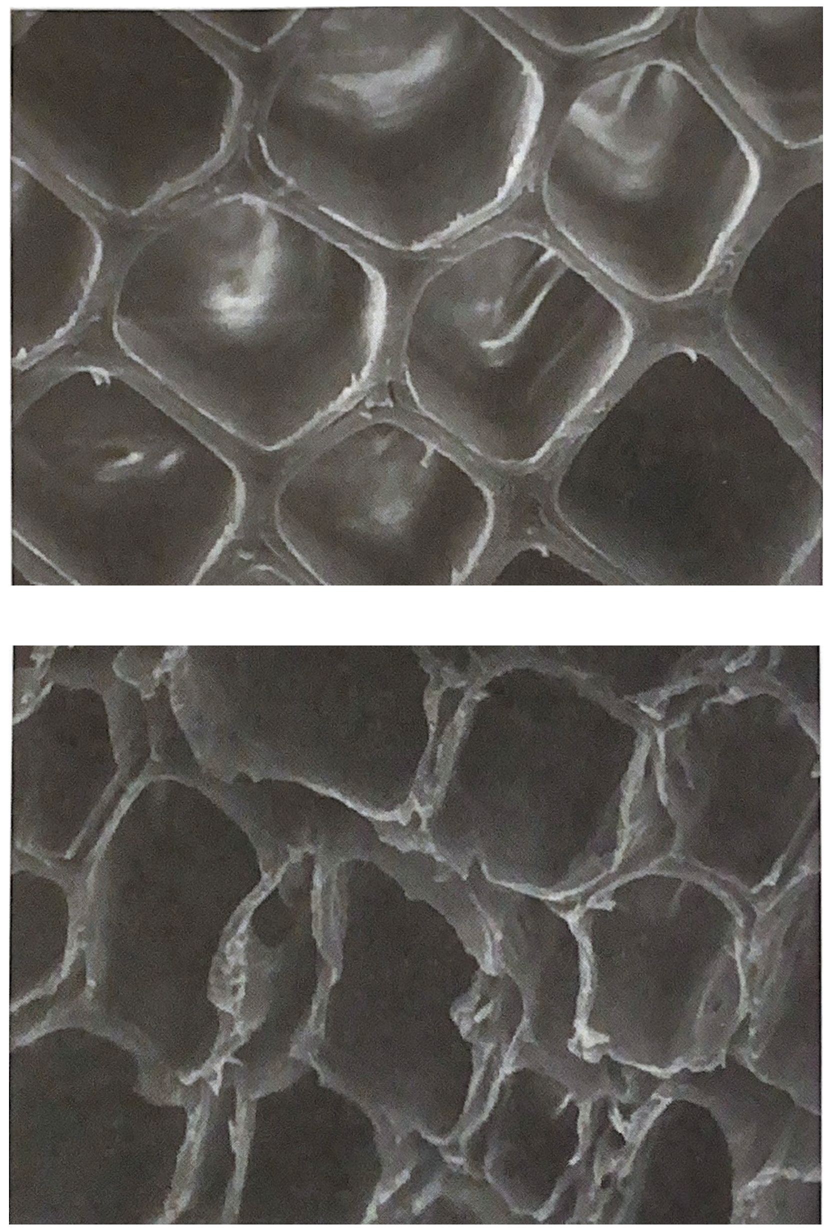
Falegnameria by Ruinelli Architetti, Switzerland. From “*Divisare*”, by Tina Mott, n.d.

Saint Benedict Chapel by Peter Zumthor, Switzerland. From “*Twitter*”, by @ArcDog, 2018.

Wood Weathering



Weathered cladding detail, project by Ruinelli Architetti. From "*Divisare*", by Tina Mott, n.d.



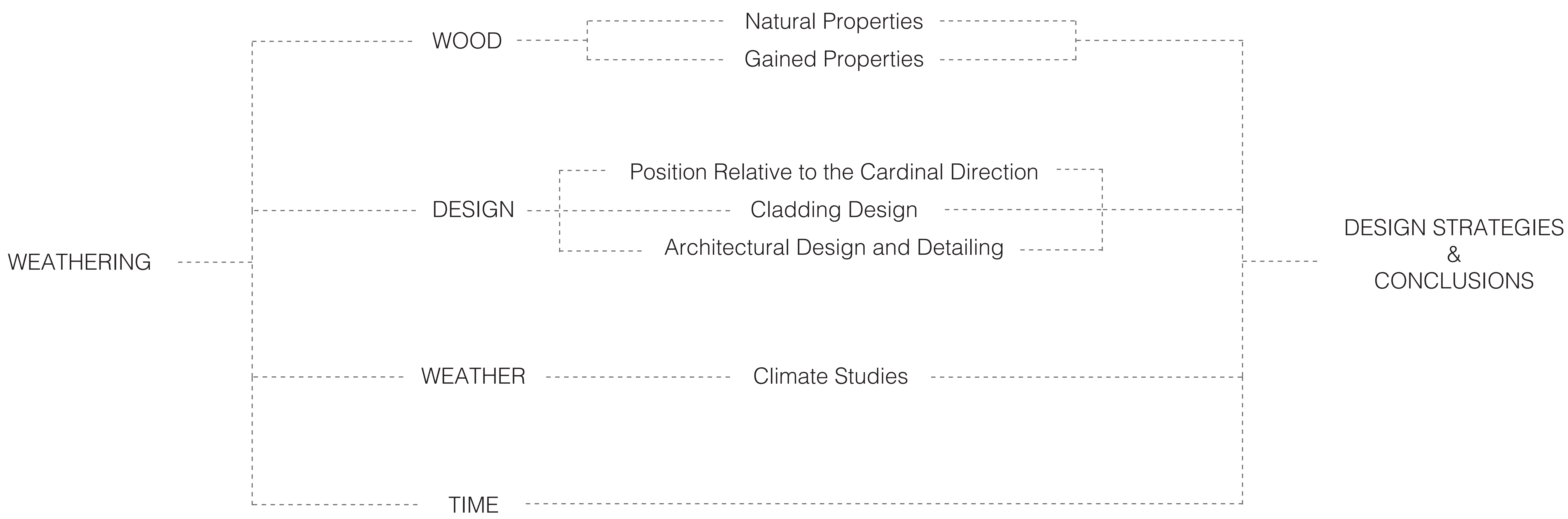
(top) Southern pine cross-section (1000x). (bottom) Southern pine cross-section following 1000h of UV radiation (λ>220 nm, 1000x). From *"Handbook of Wood Chemistry and Wood Composites"*, by CRC Press, 2005.

Research Question

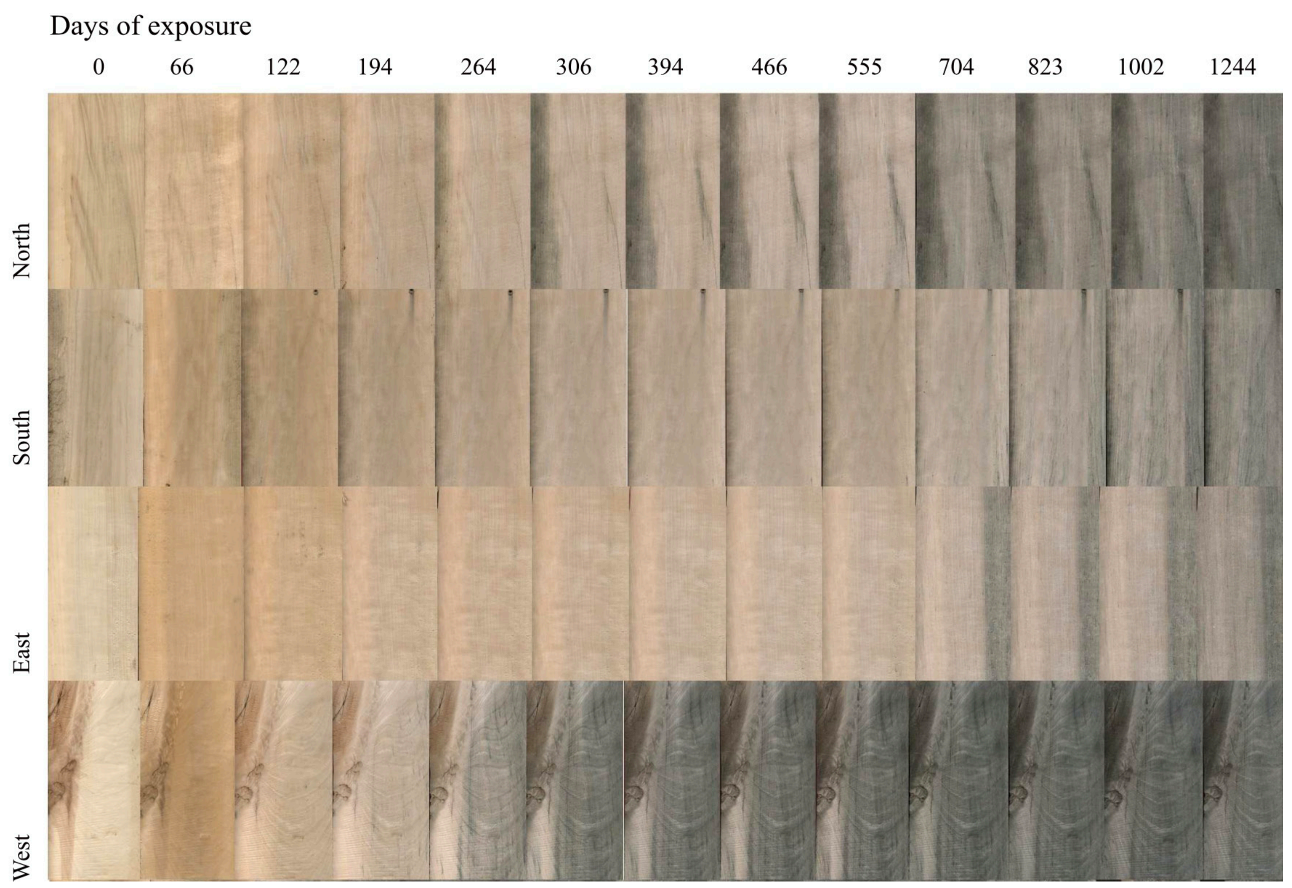
How do different design aspects influence the weathering of untreated timber facades in the distinct climate and environmental conditions of the North Netherlands, and what are its effects on building appearance?

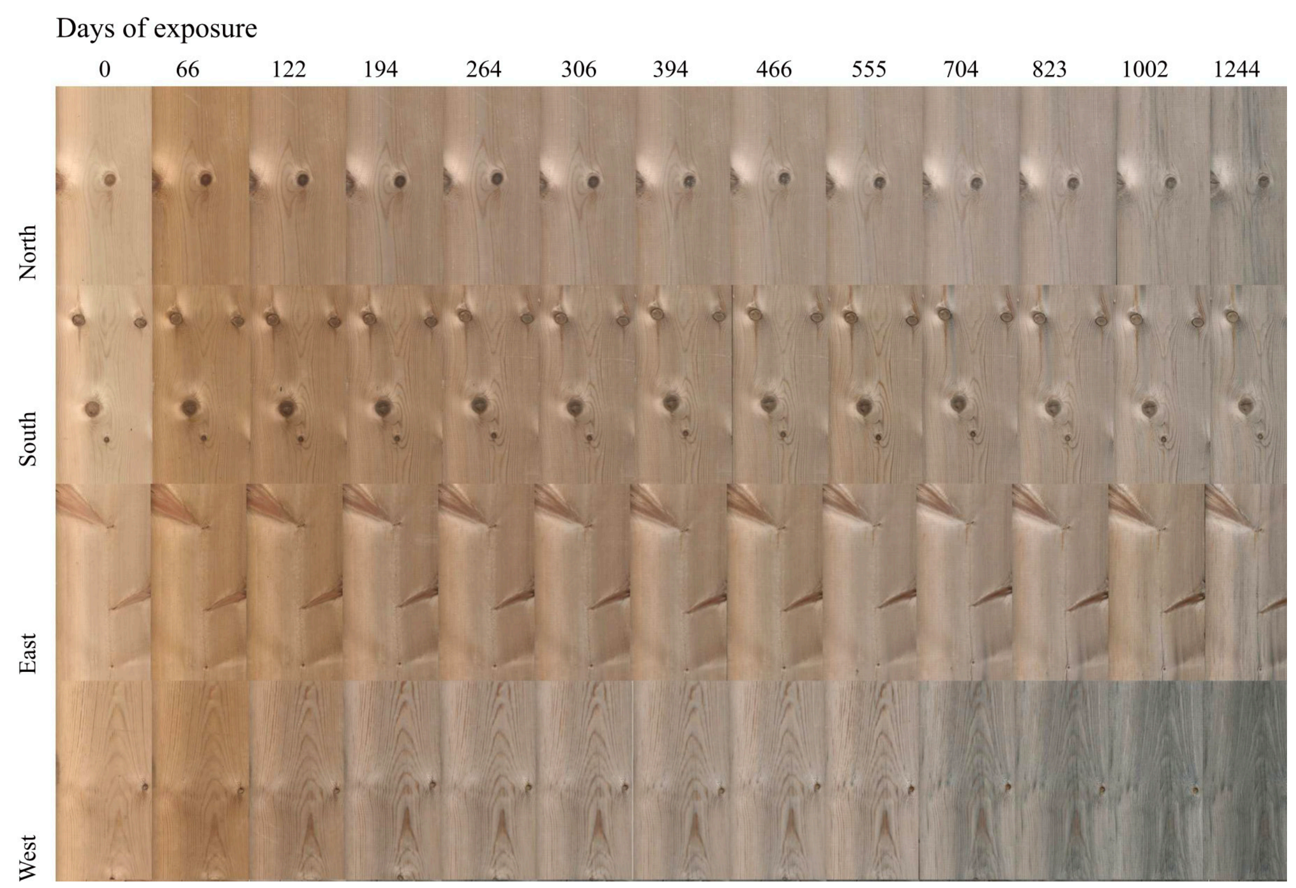
Methodology

Weathering of Untreated Timber Facades in the North Netherlands



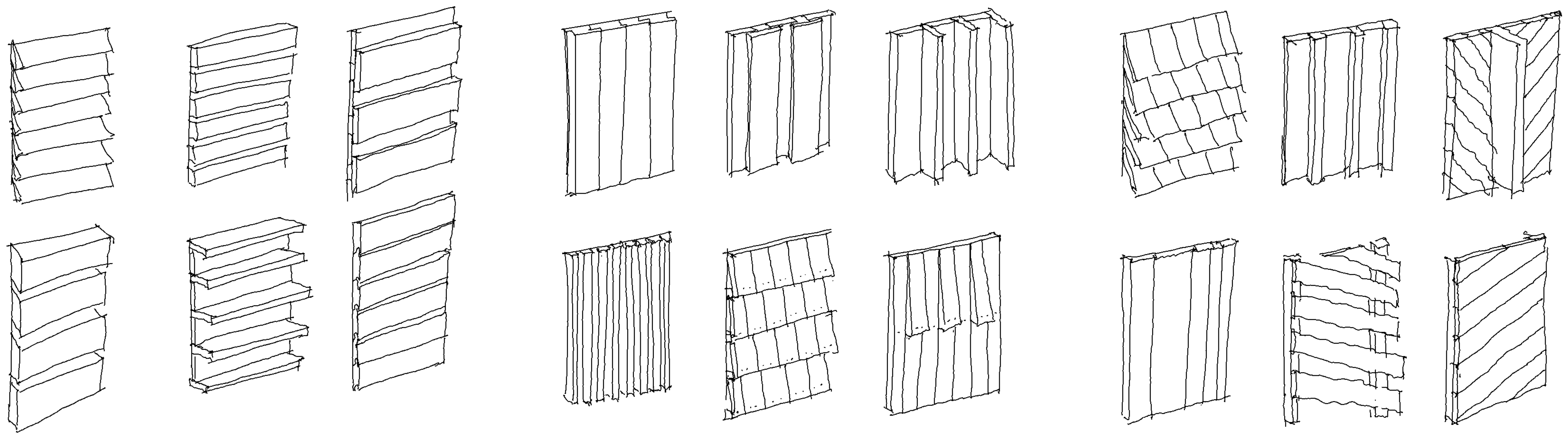
Position Relative to the Cardinal Direction





Aspen (top), Scots Pine (middle), Larch (bottom) heartwood sample scanned images from the outdoor weathering experiment. The number on top indicates exposure time in days. From *Wood Weathering from a Service Life Perspective* (Rüther, pp. 125-127), Norwegian University of Science and Technology, 2011.

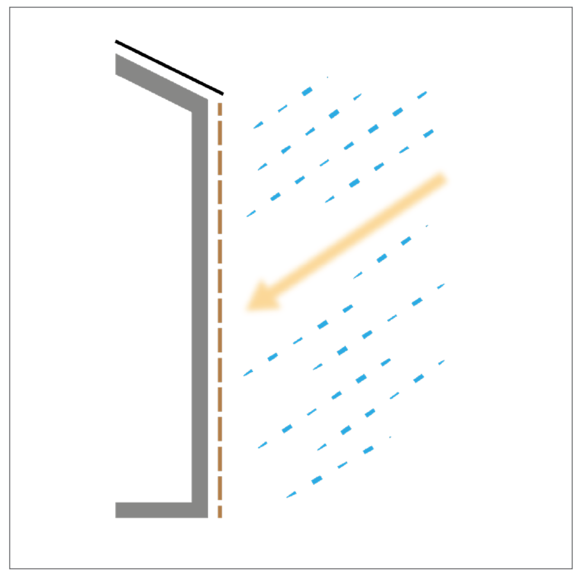
Cladding Design



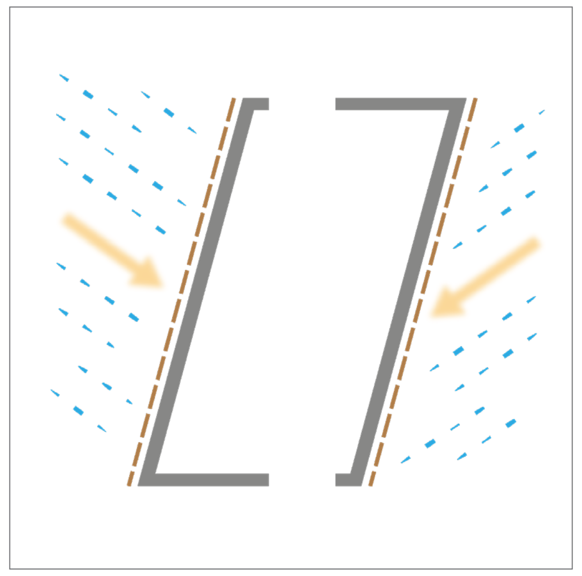
Timber cladding variations. Sketch by the author.

Photo showing the south facing structural frame at Voll, Trondheim used for Hirche's experimental research. From *Wood Weathering as Design Option* (Hirche, p. 76), by M. Hirche, 2014, Norwegian University of Science and Technology. Copyright [2014 by Majbrid Hirche.

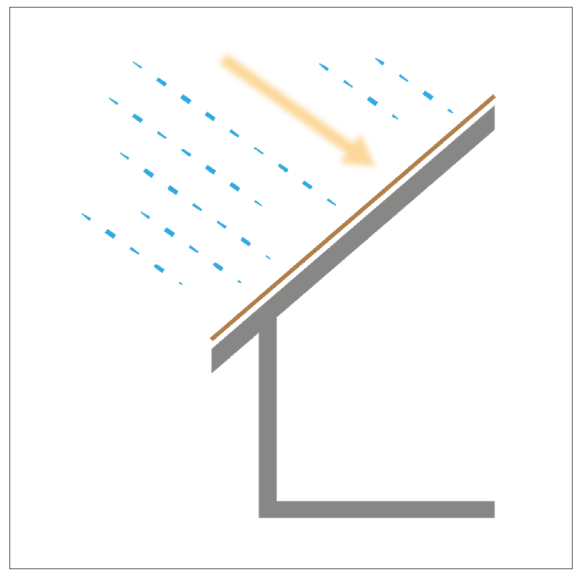
Architectural Design and Detailing



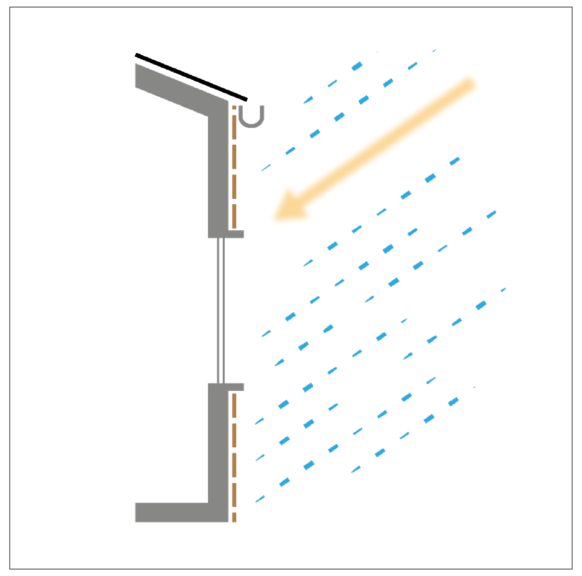
Vertical surfaces



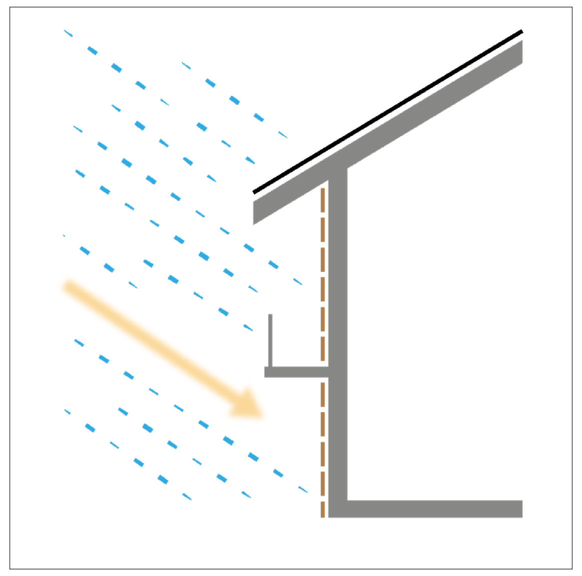
Tilted surfaces



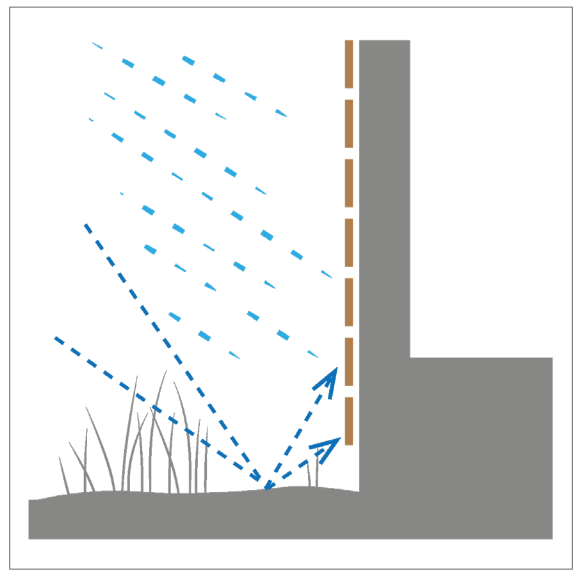
Roof cladding



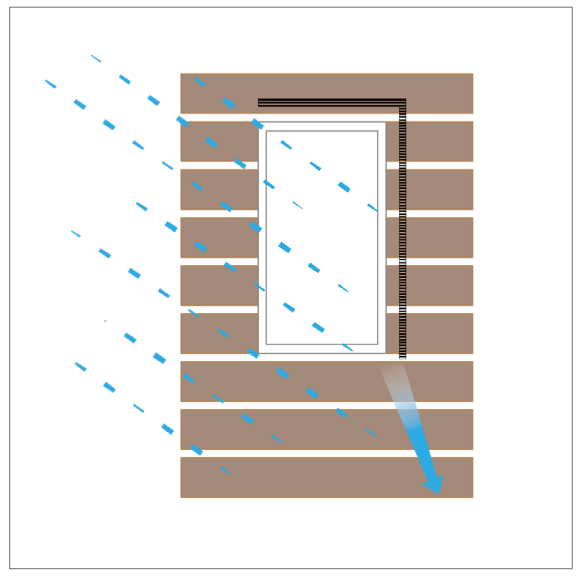
Moulding and windows



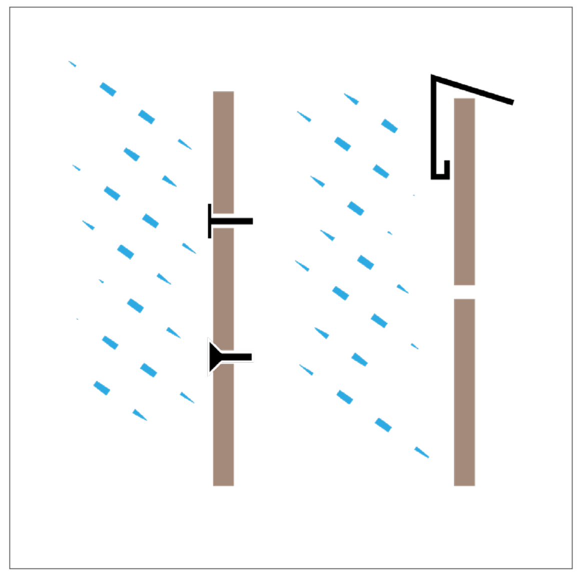
Cantilevered components



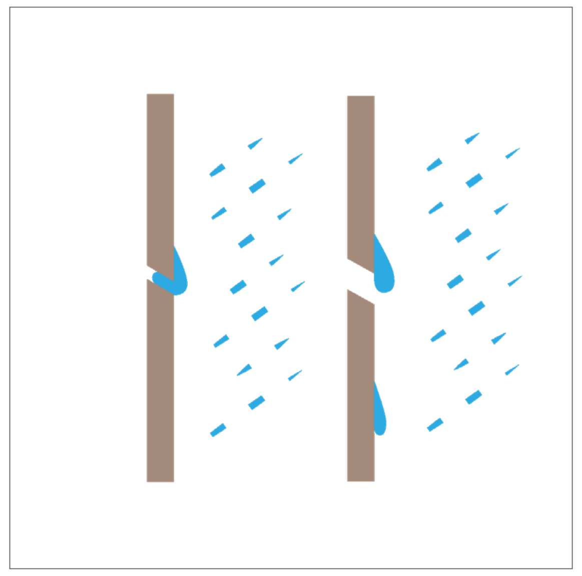
Ground-level cladding



Water run-off



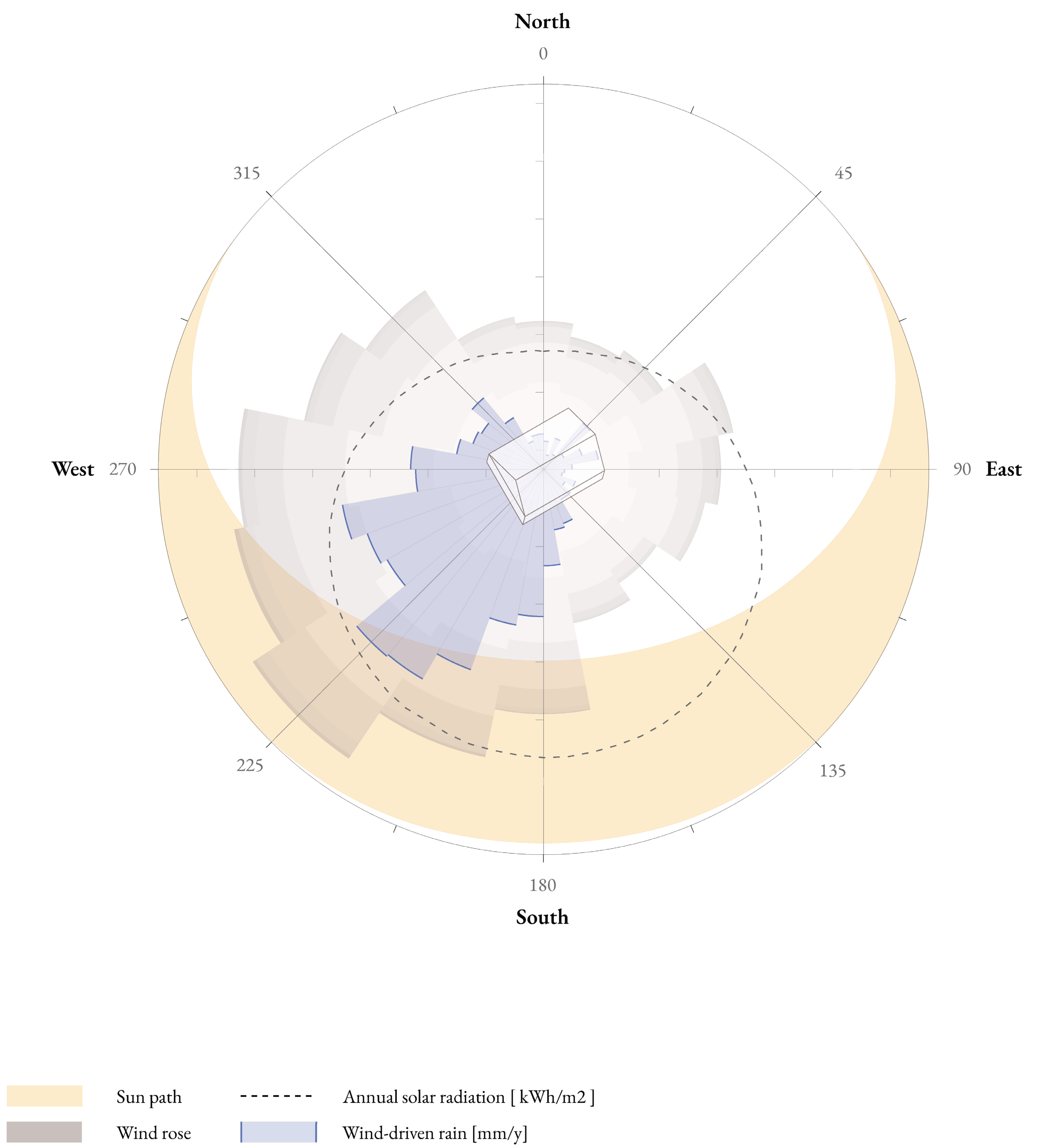
Fixings, fasteners and hardware



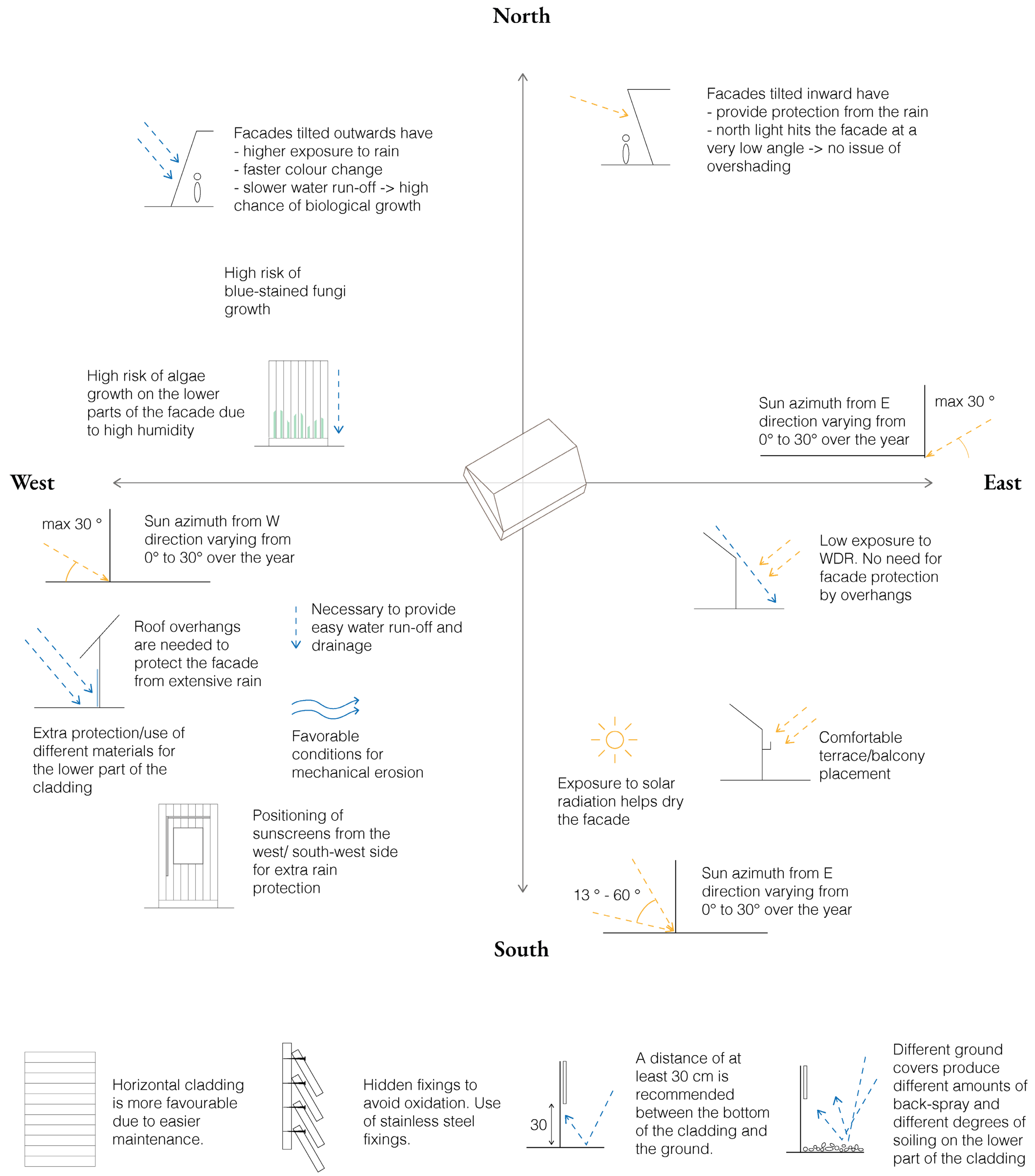
Joints

Based on *Weathering of unpainted wooden façades - Experience and examples* (Zimmer et.al., 2022).

Design Strategies



Climate map for Lauwermeer National Park. Combined diagram of wind-driven rain (WDR), wind rose, solar radiation and sun path.

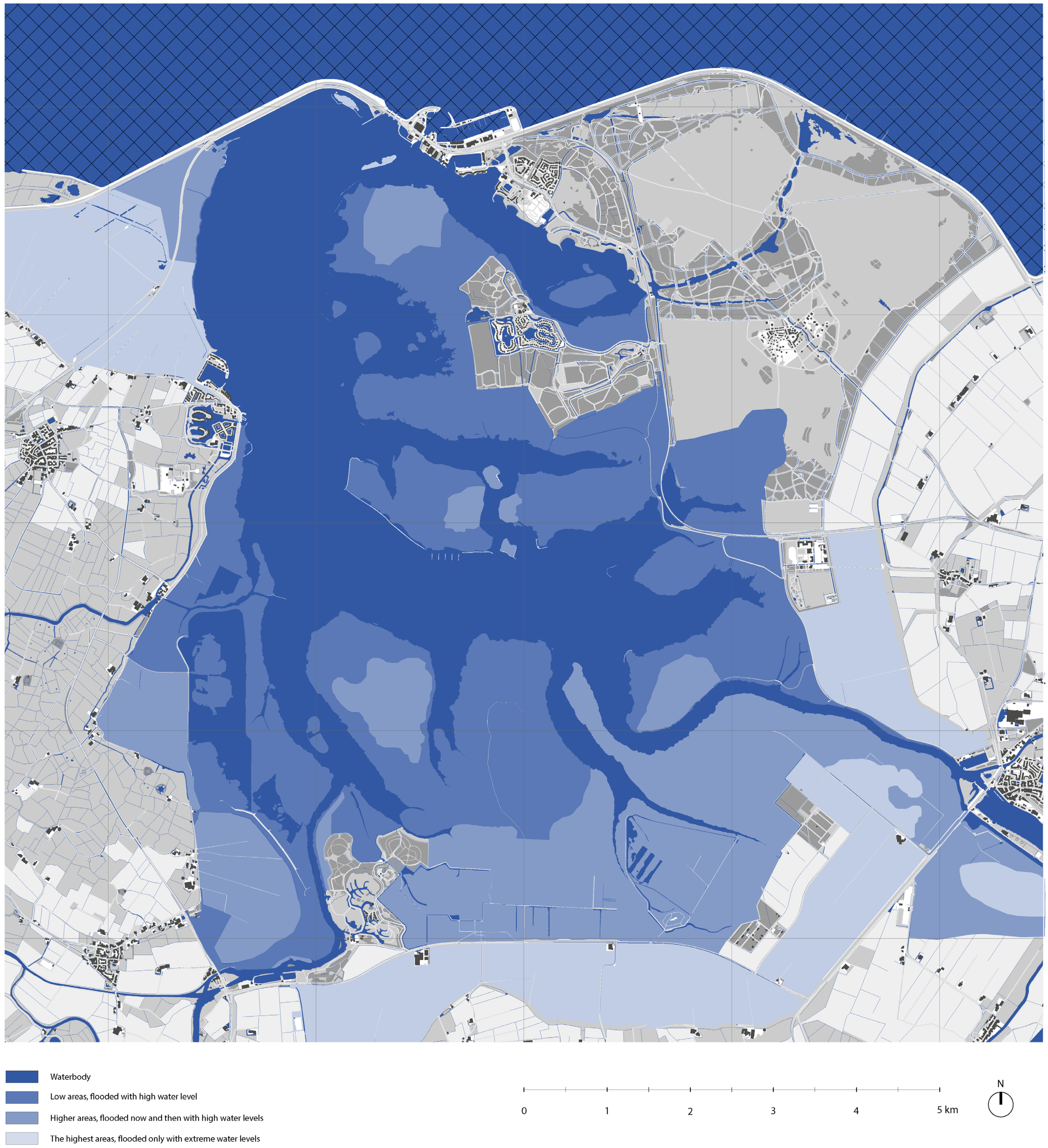


Designing with Weather: Design Strategies.

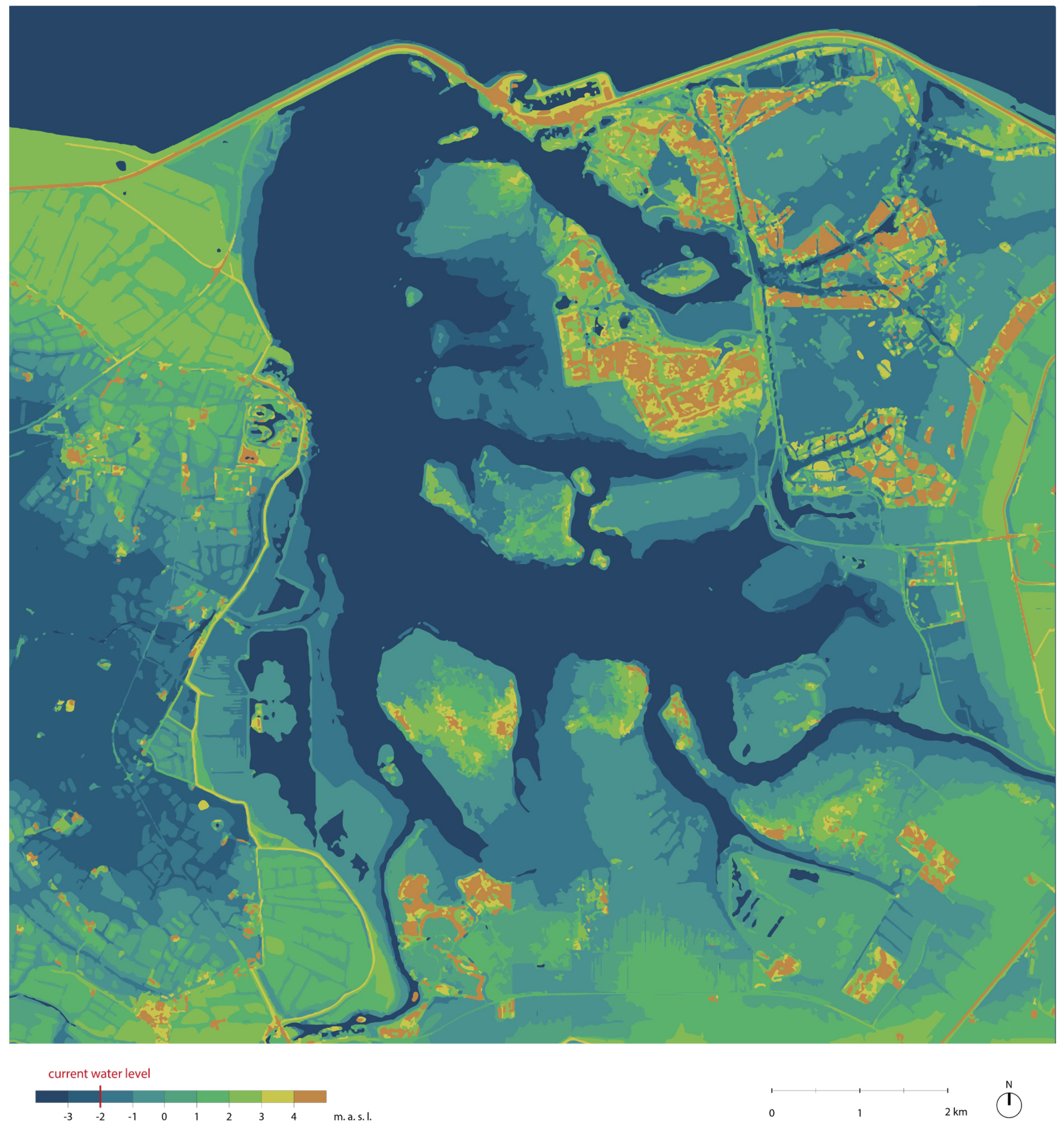
Lauwersmeer National Park

Groningen

Future Vision



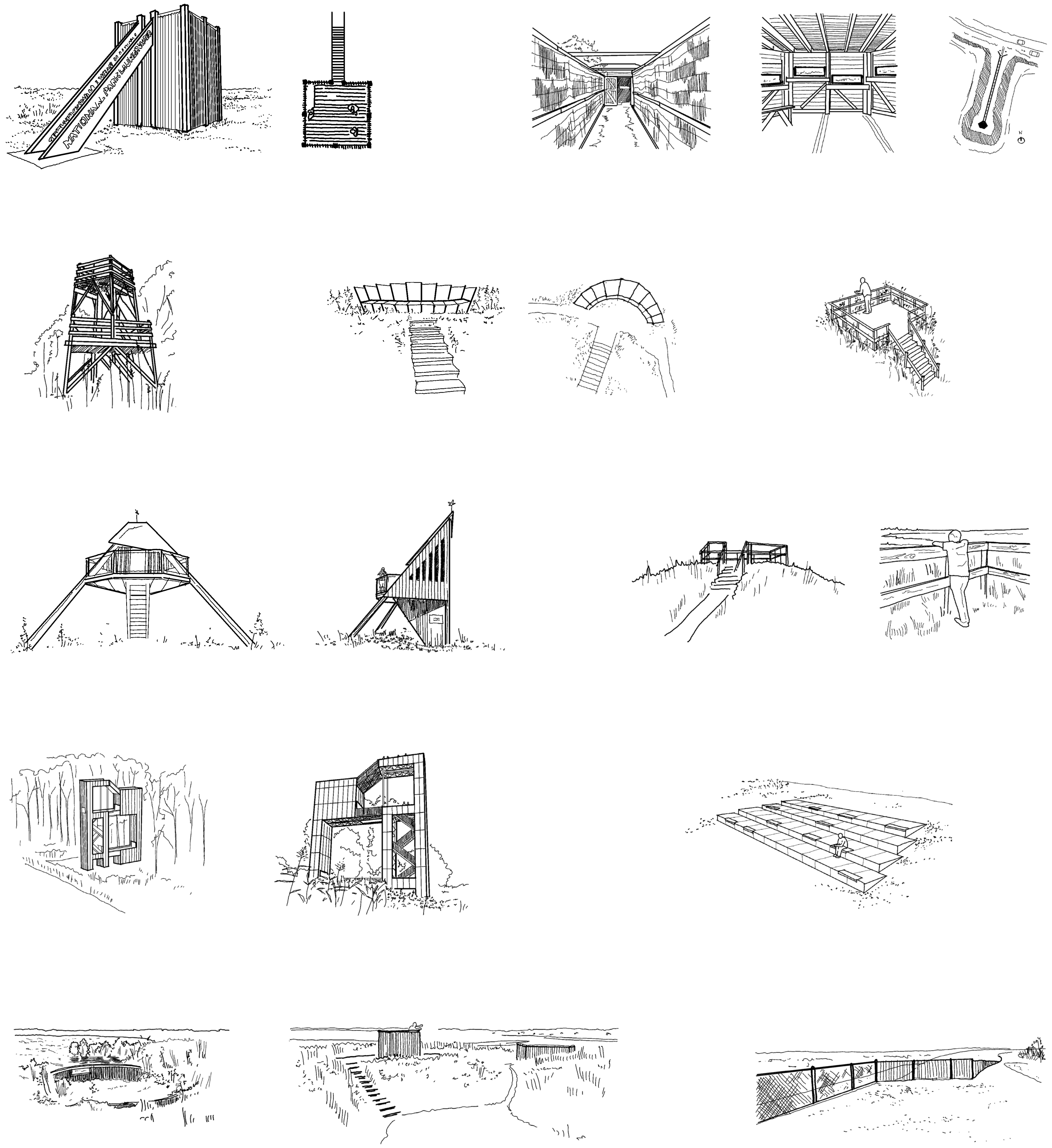
Lauwers Lake seasonal flooding map



Elevation map of Lauwersmeer National Park

Natural Habitats and Vegetation

Bird Watching in Lauwersmeer National Park



Location: Current State

Location: Seasonal Flooding

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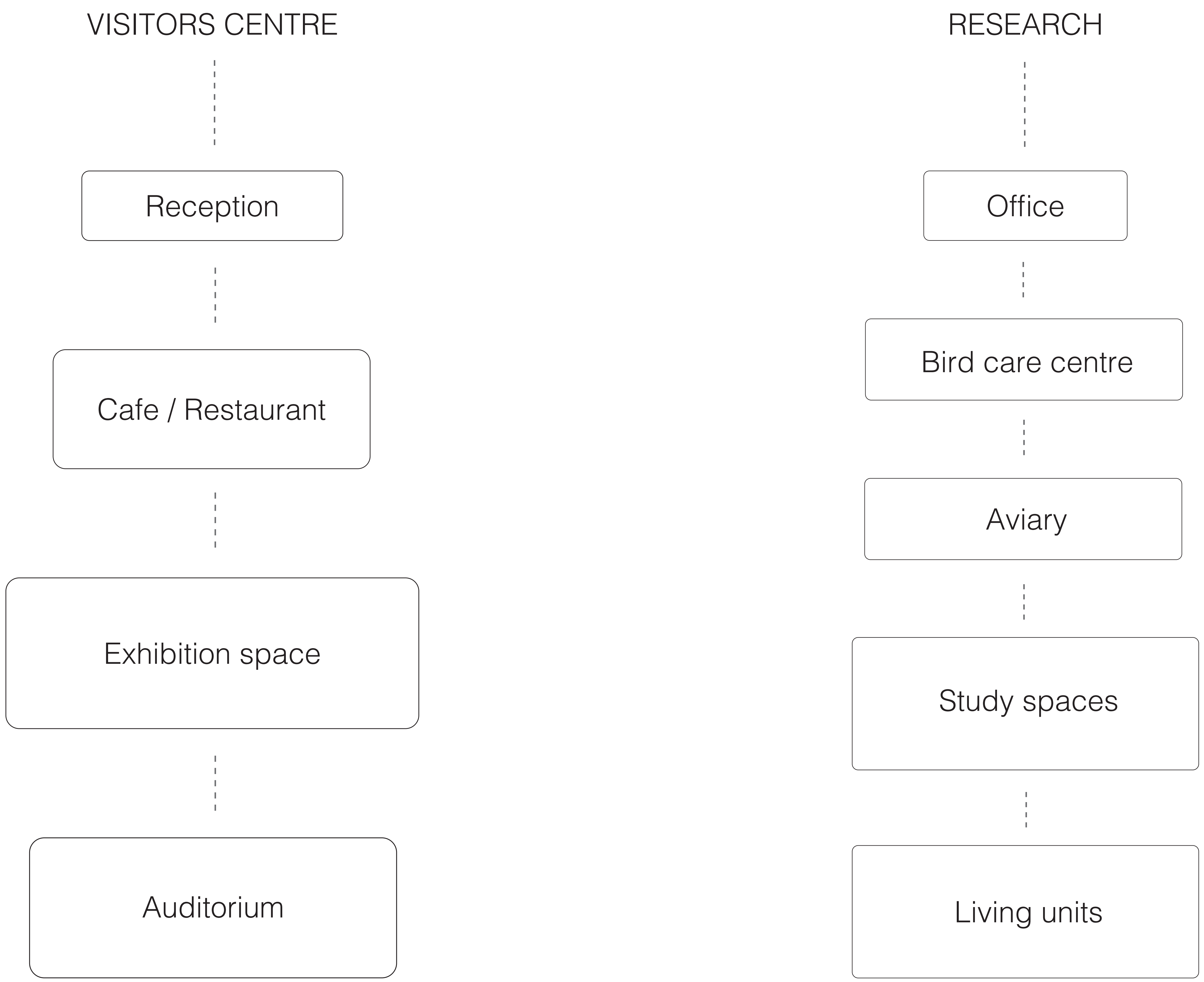

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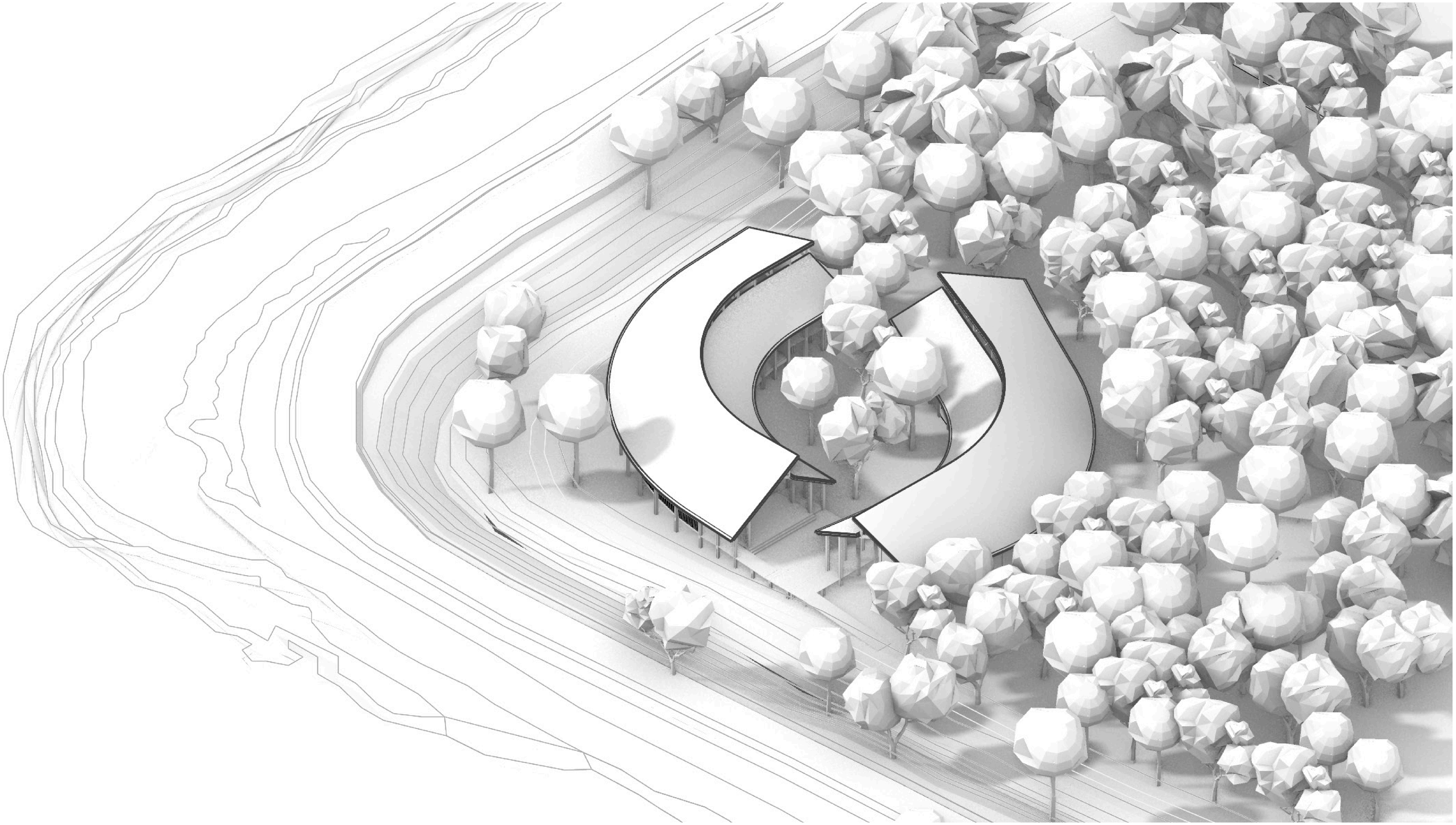
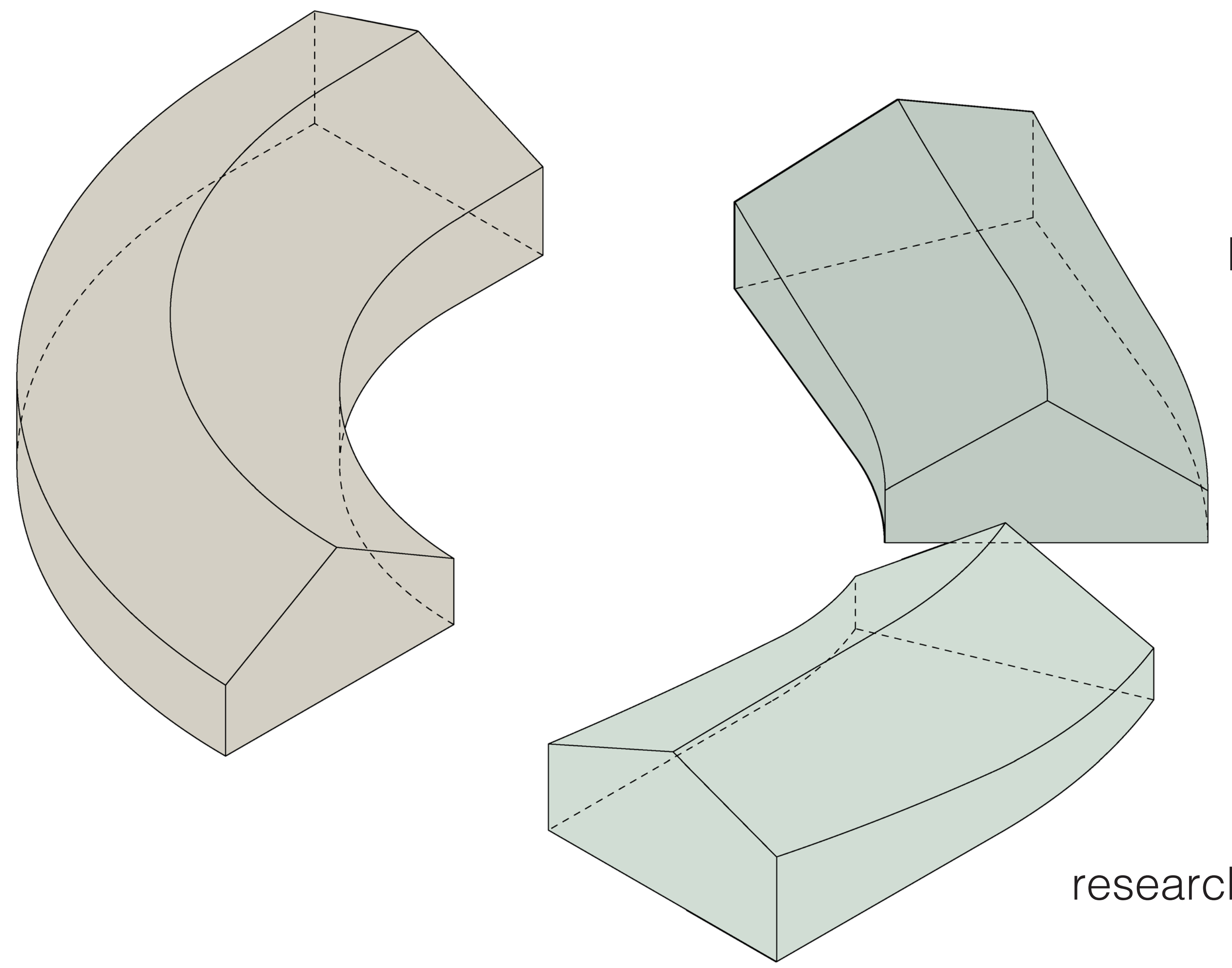
Design Proposal

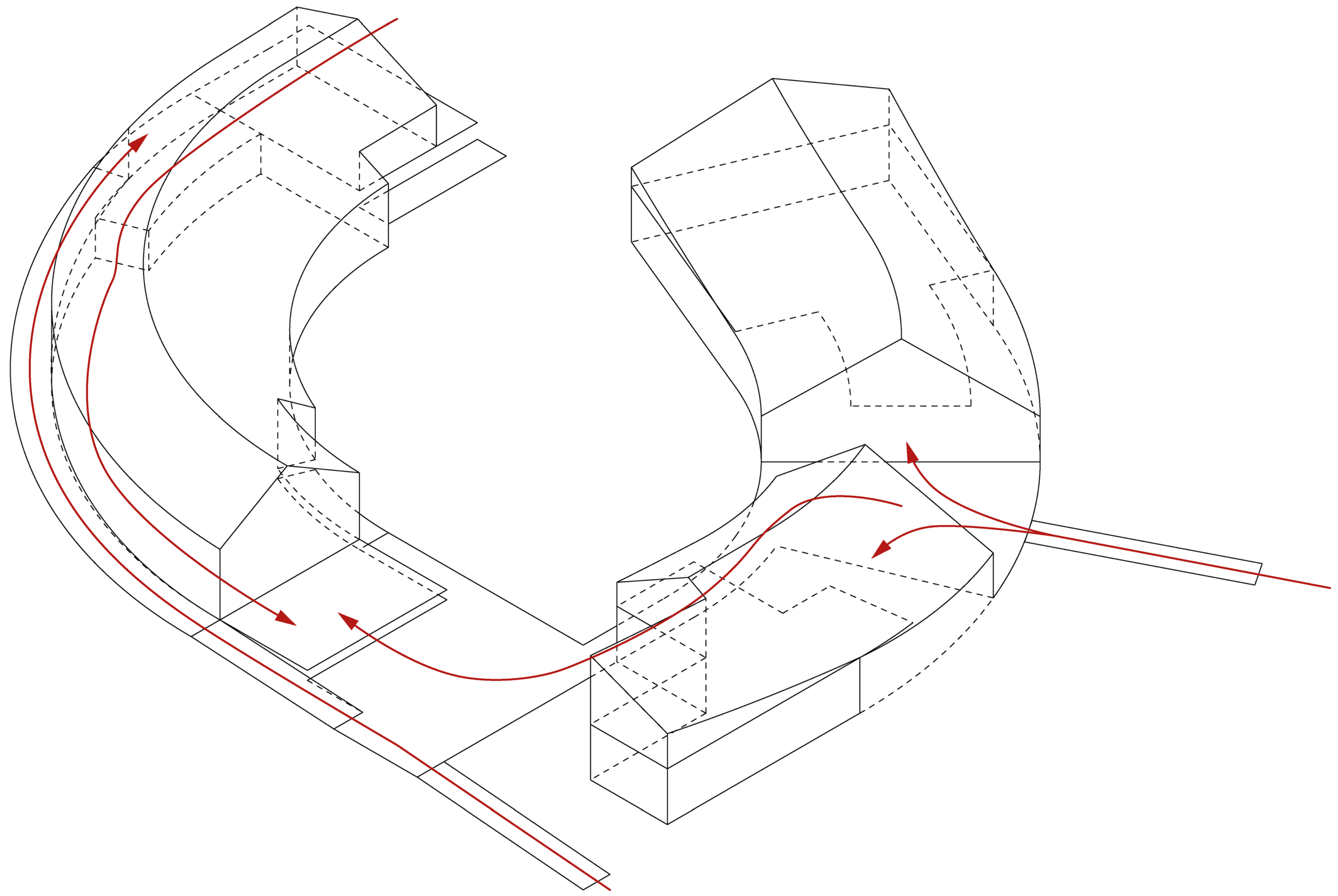
Positioning



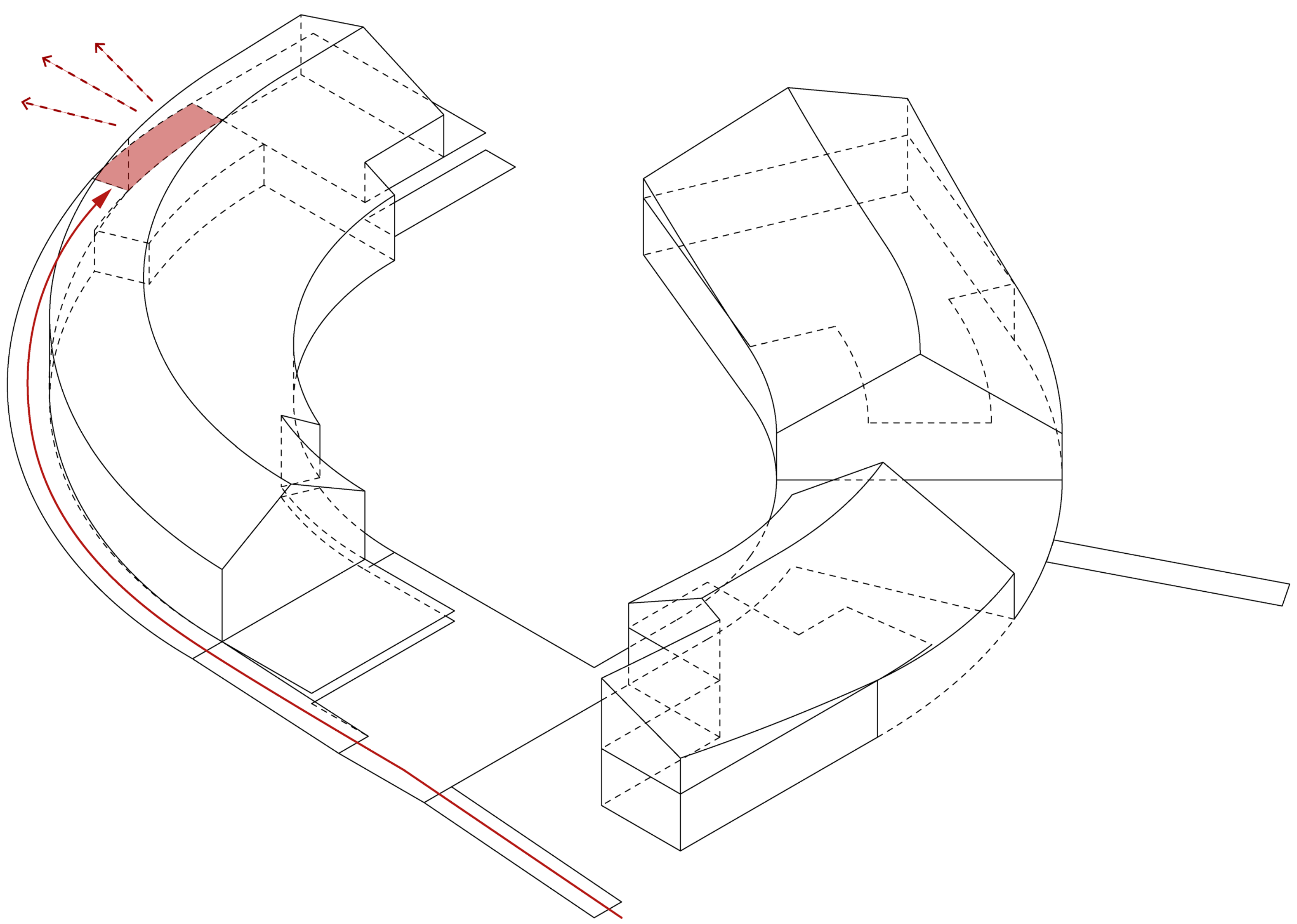
Programme



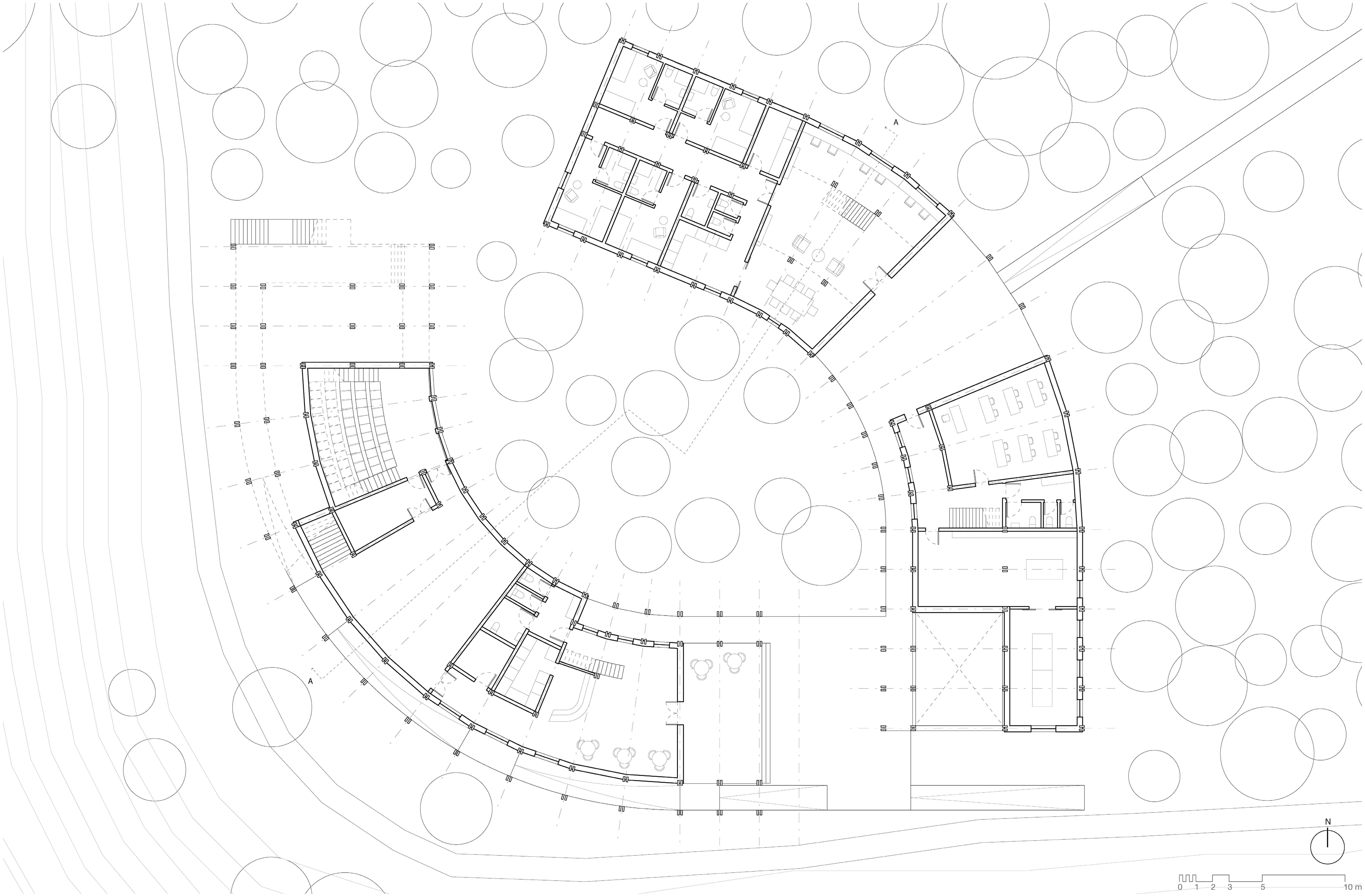
Access and Circulation



Viewing Platform



Viewing Platform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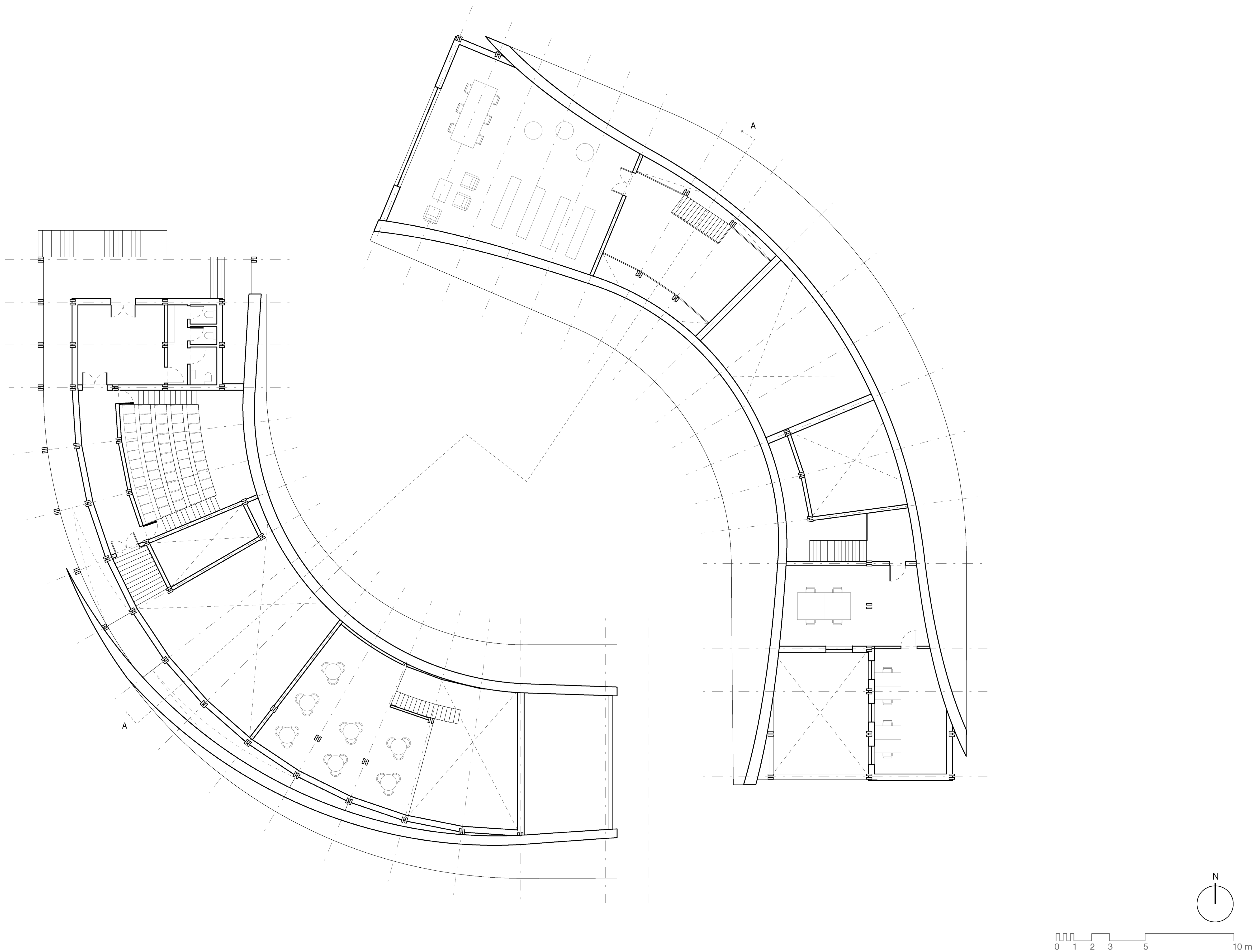
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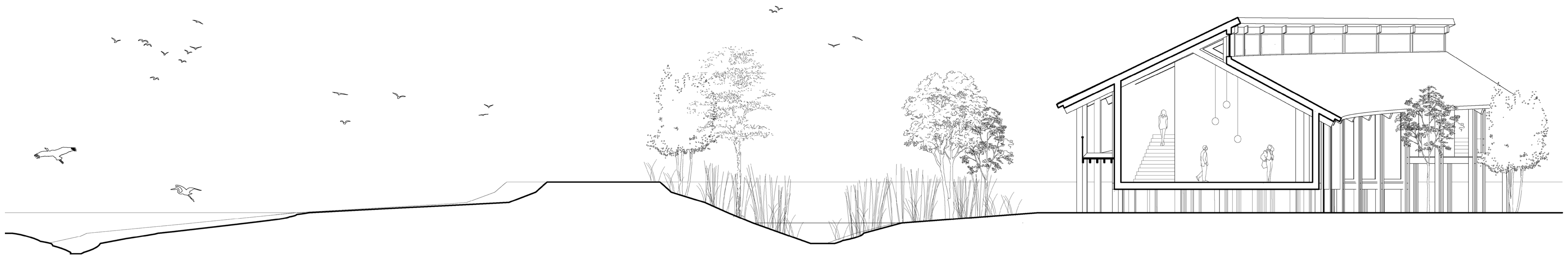

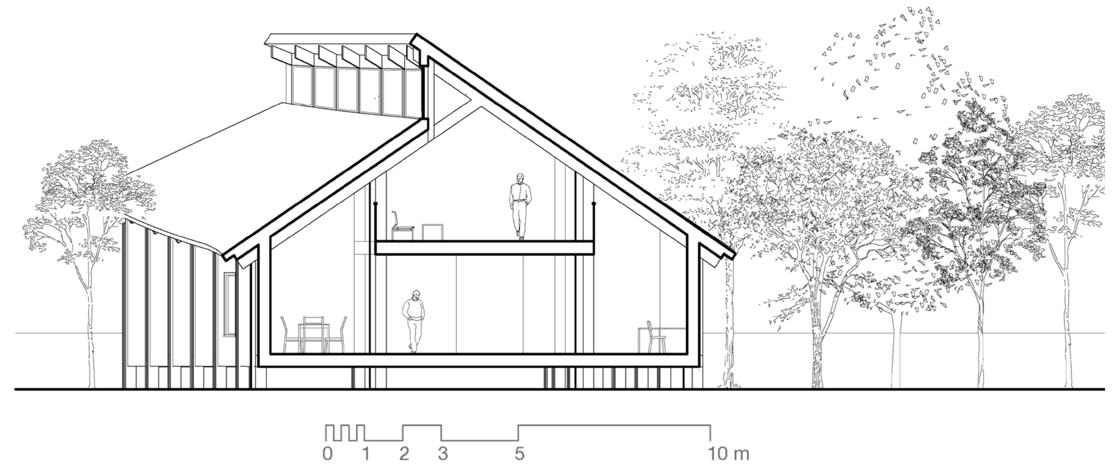
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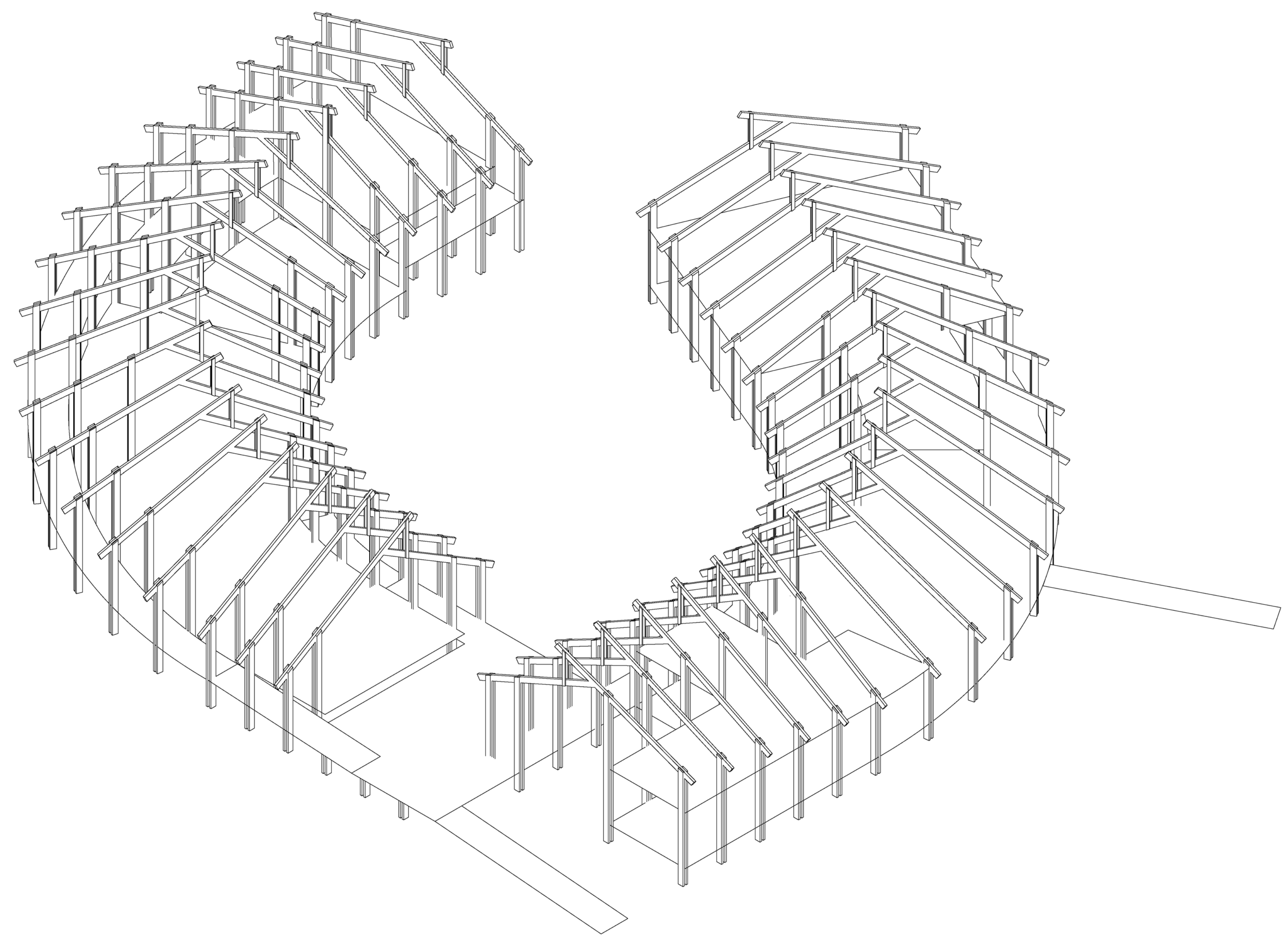
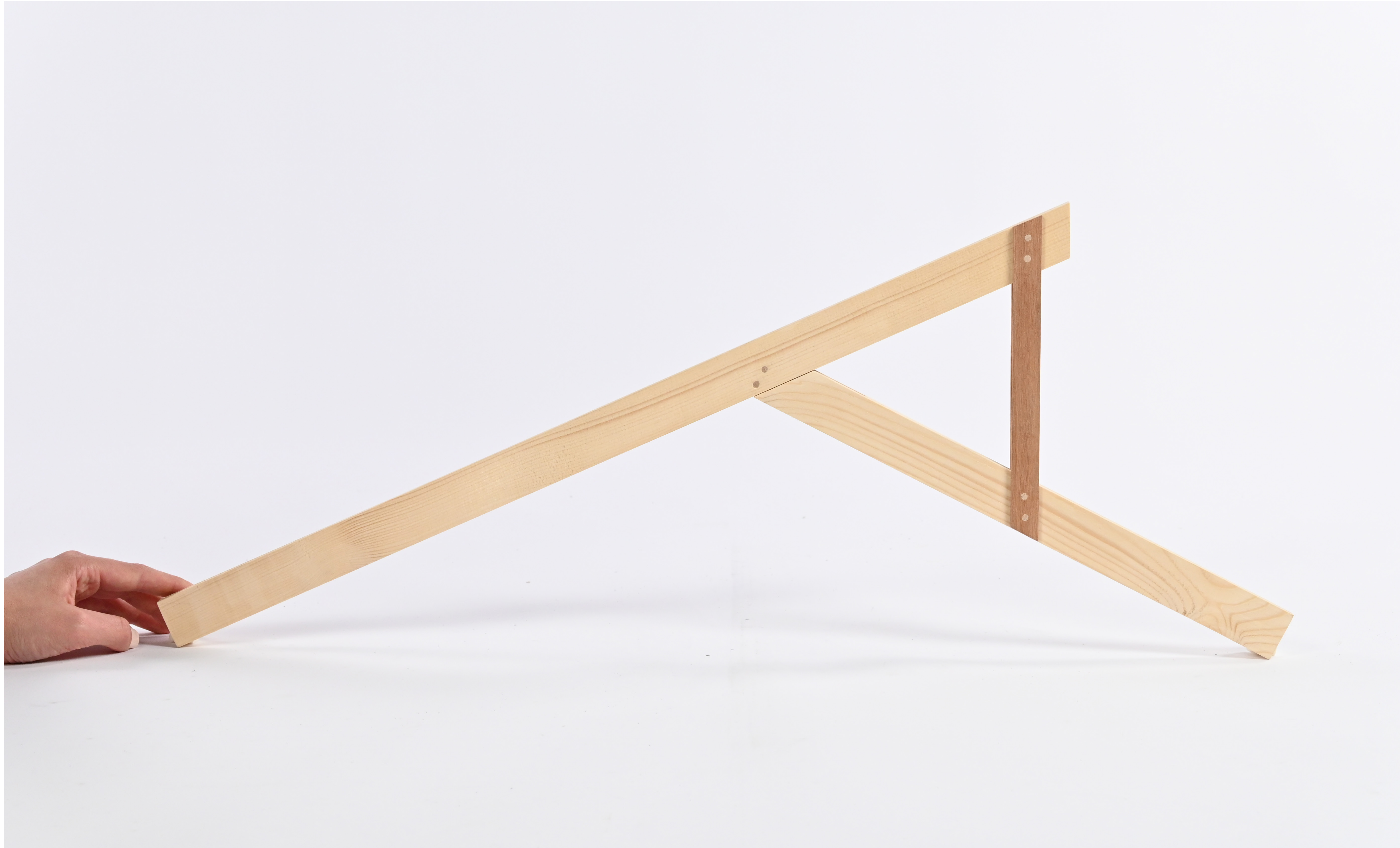
Structure

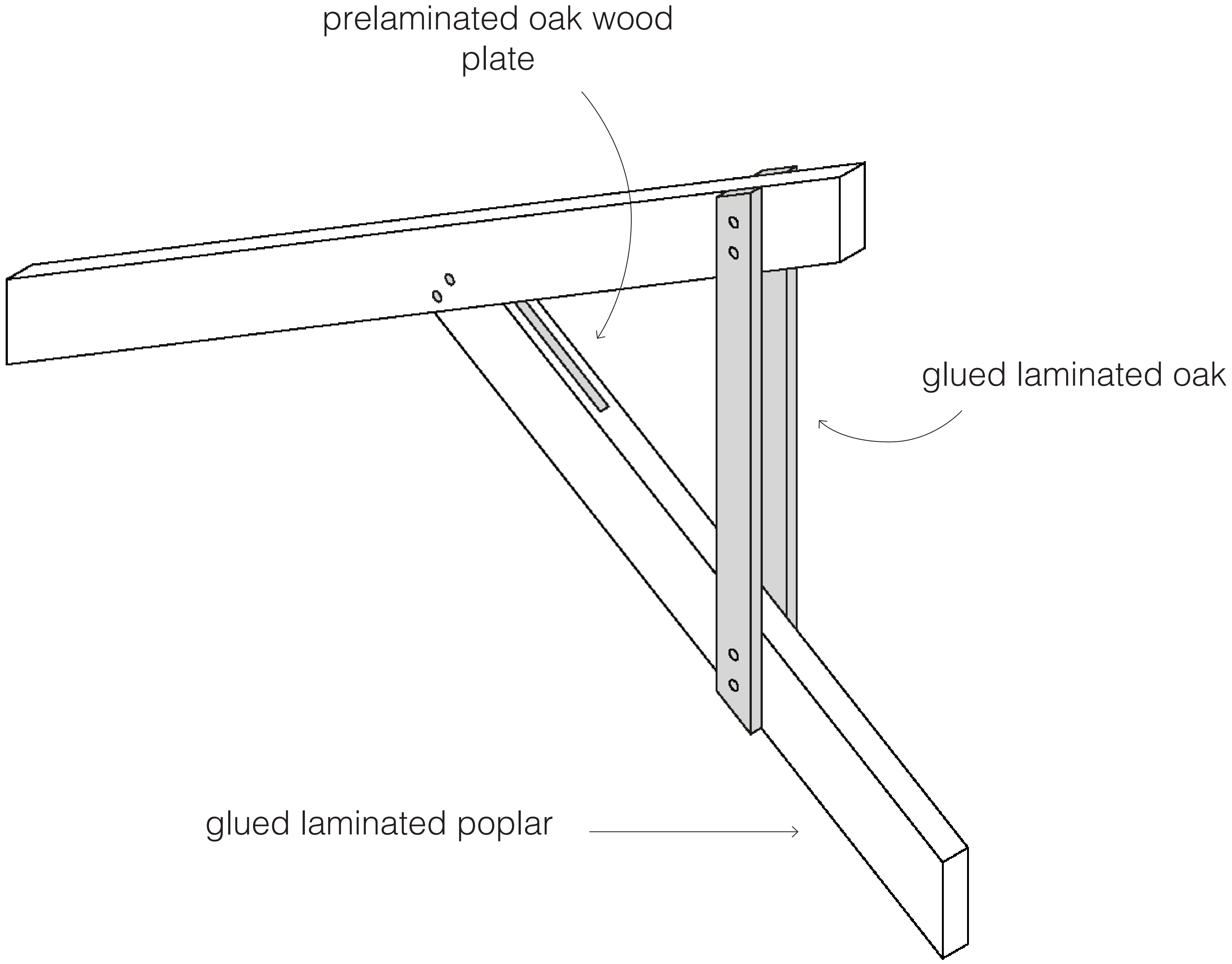


Structure Concept

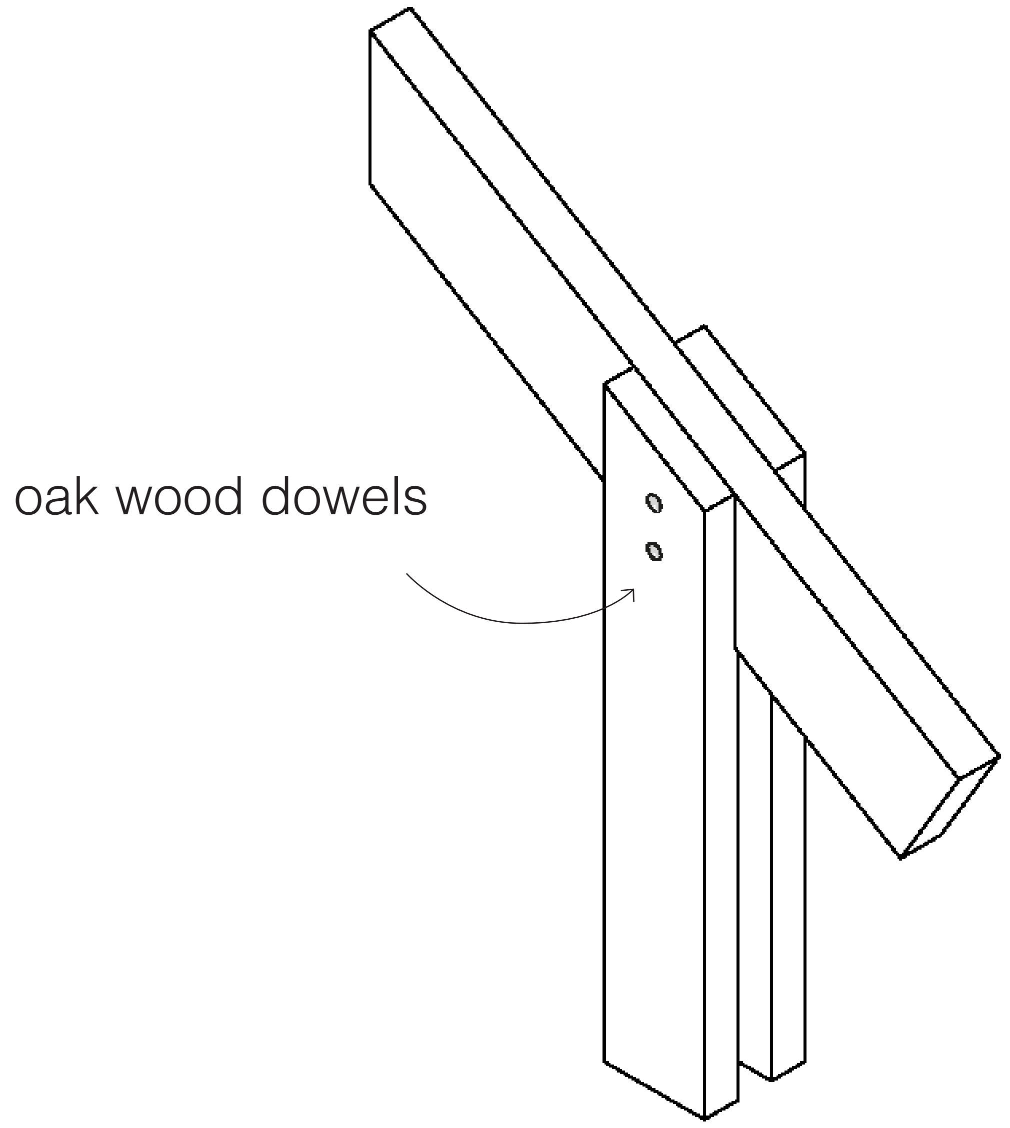
Wood Joints



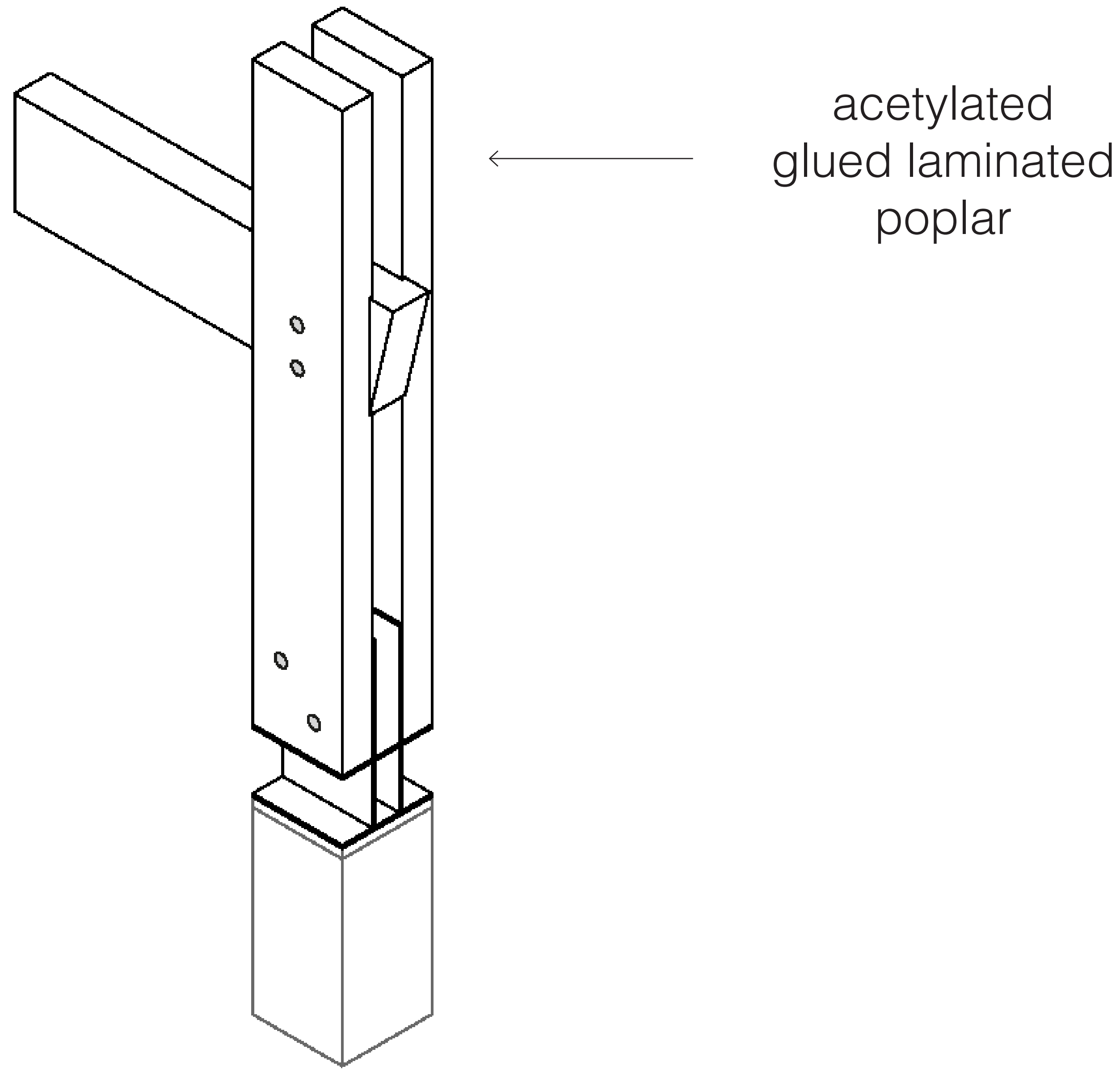
Wood Joints



prelaminated oak wood plate
glued laminated oak
glued laminated poplar



oak wood dowels



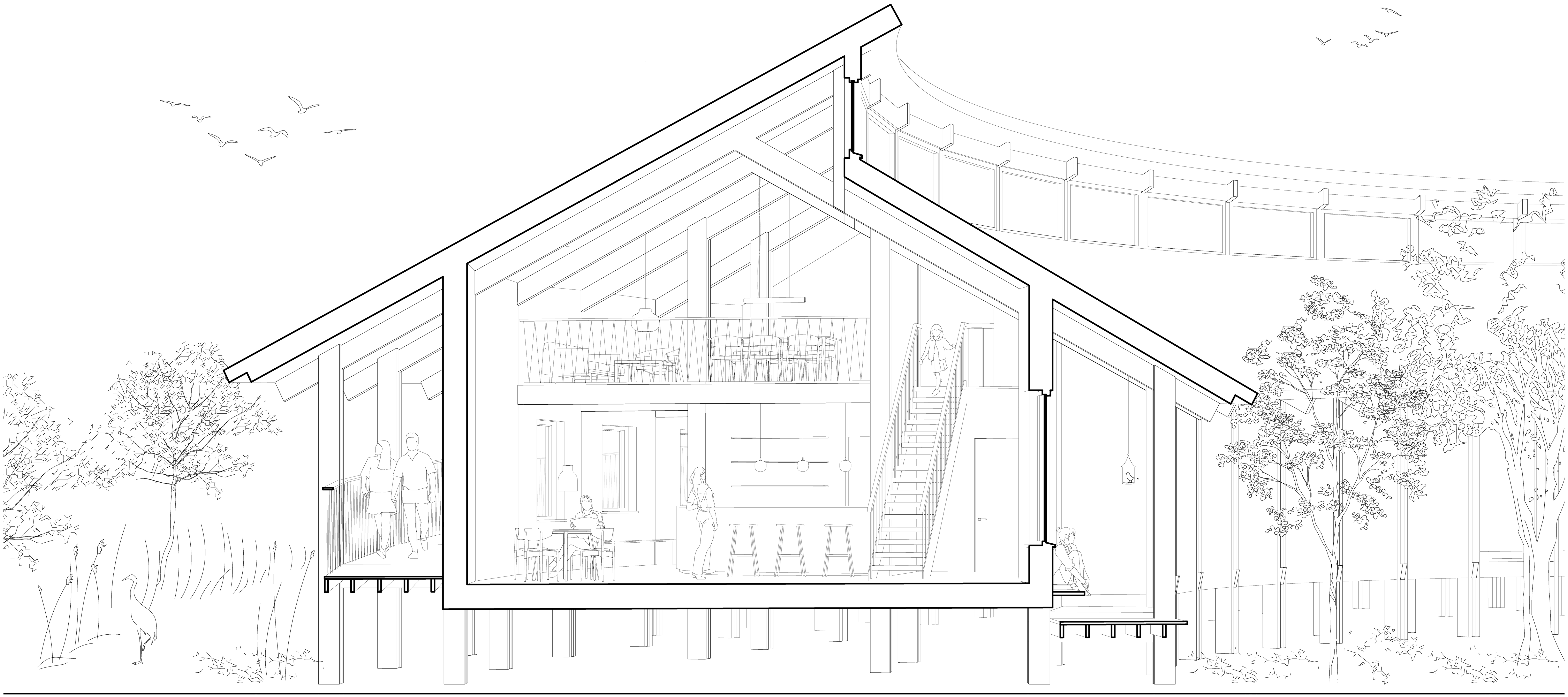
acetylated glued laminated poplar

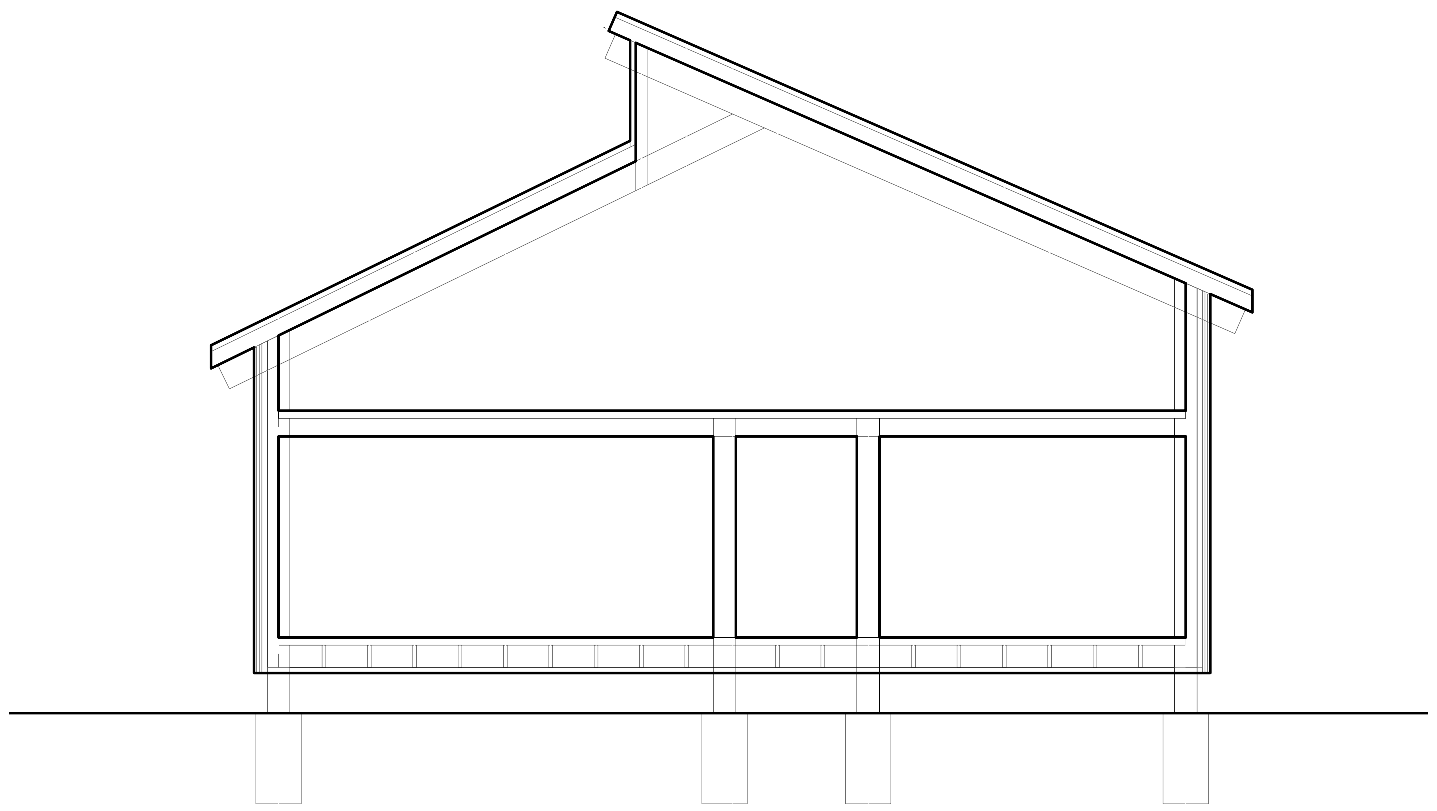
Structure and Space

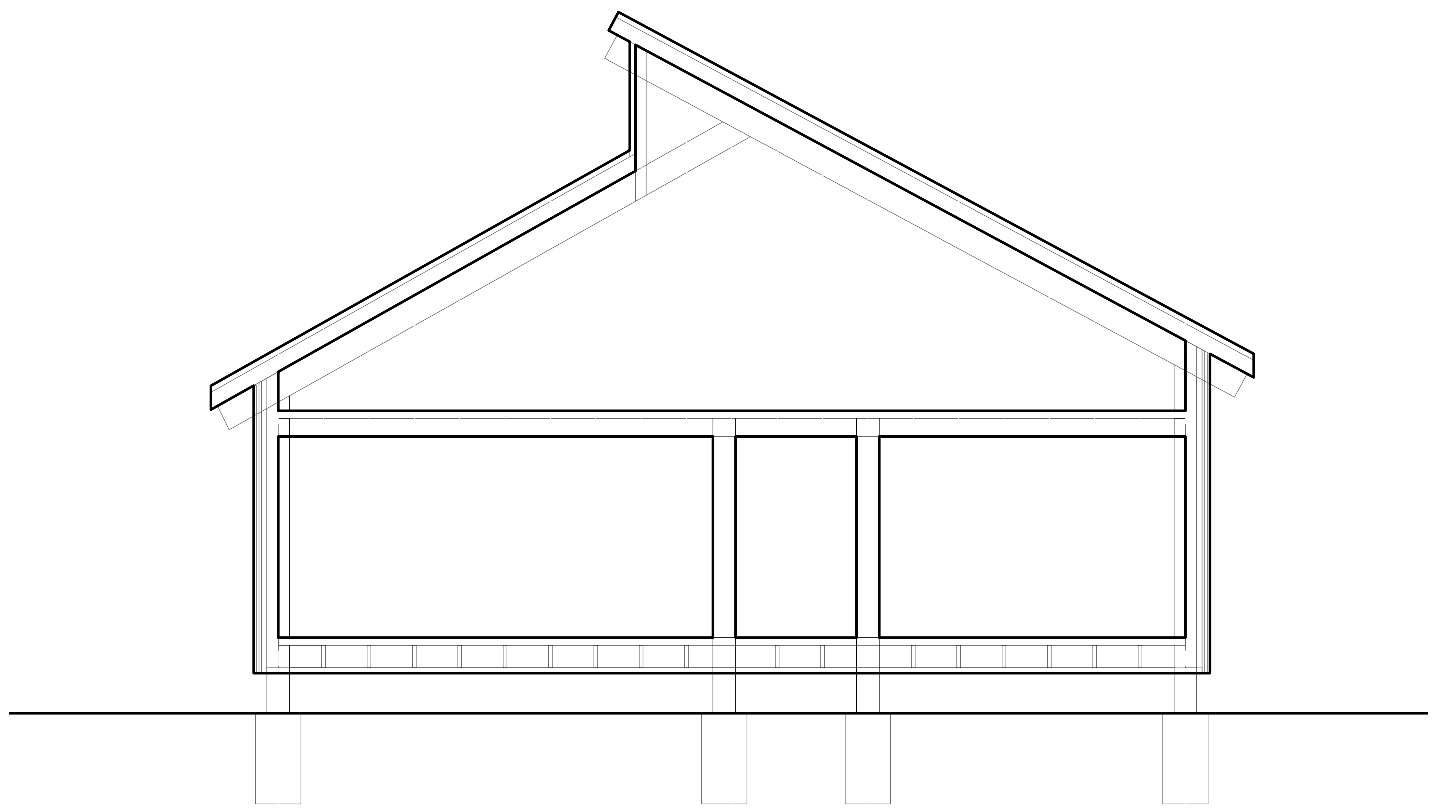
Structure and Space

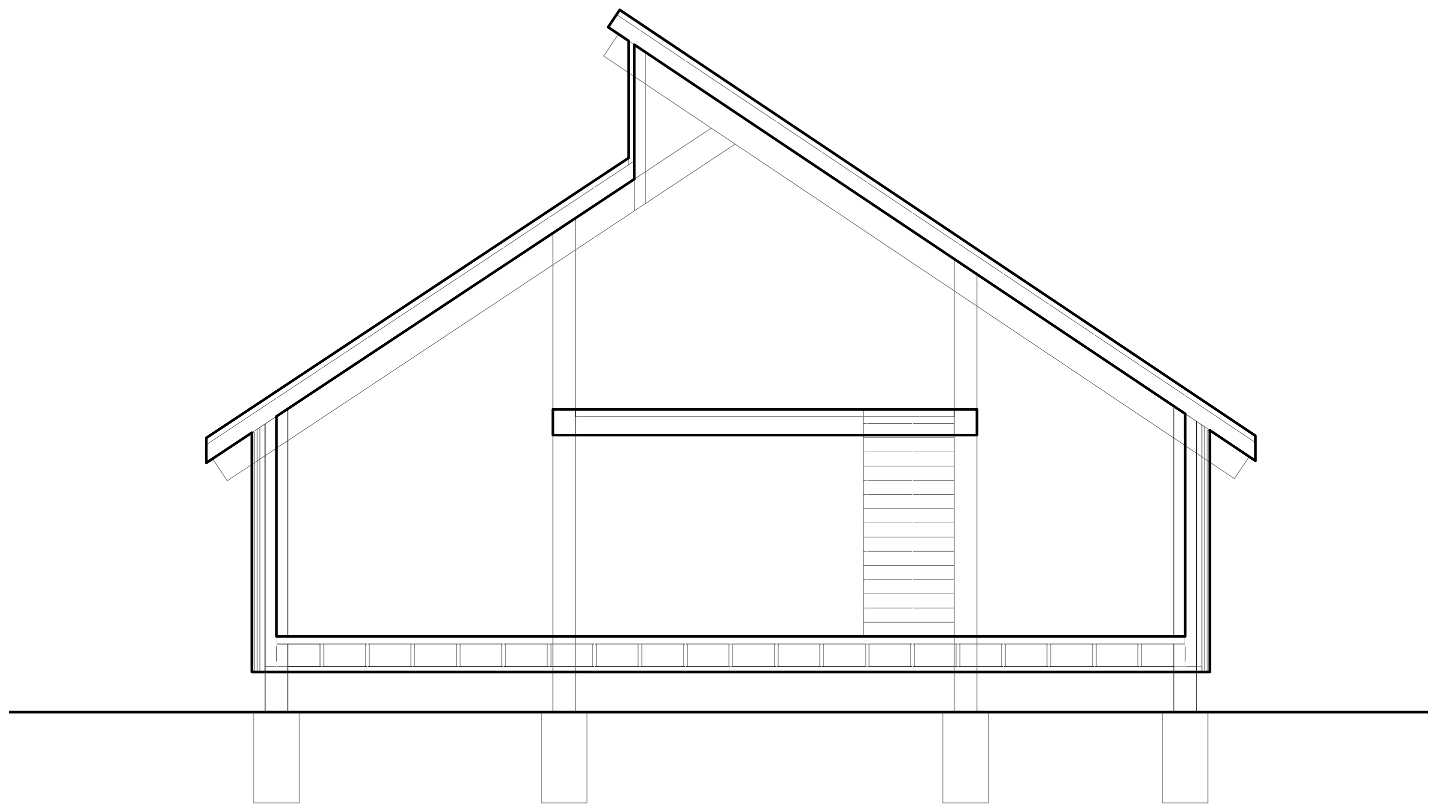
Light and Space

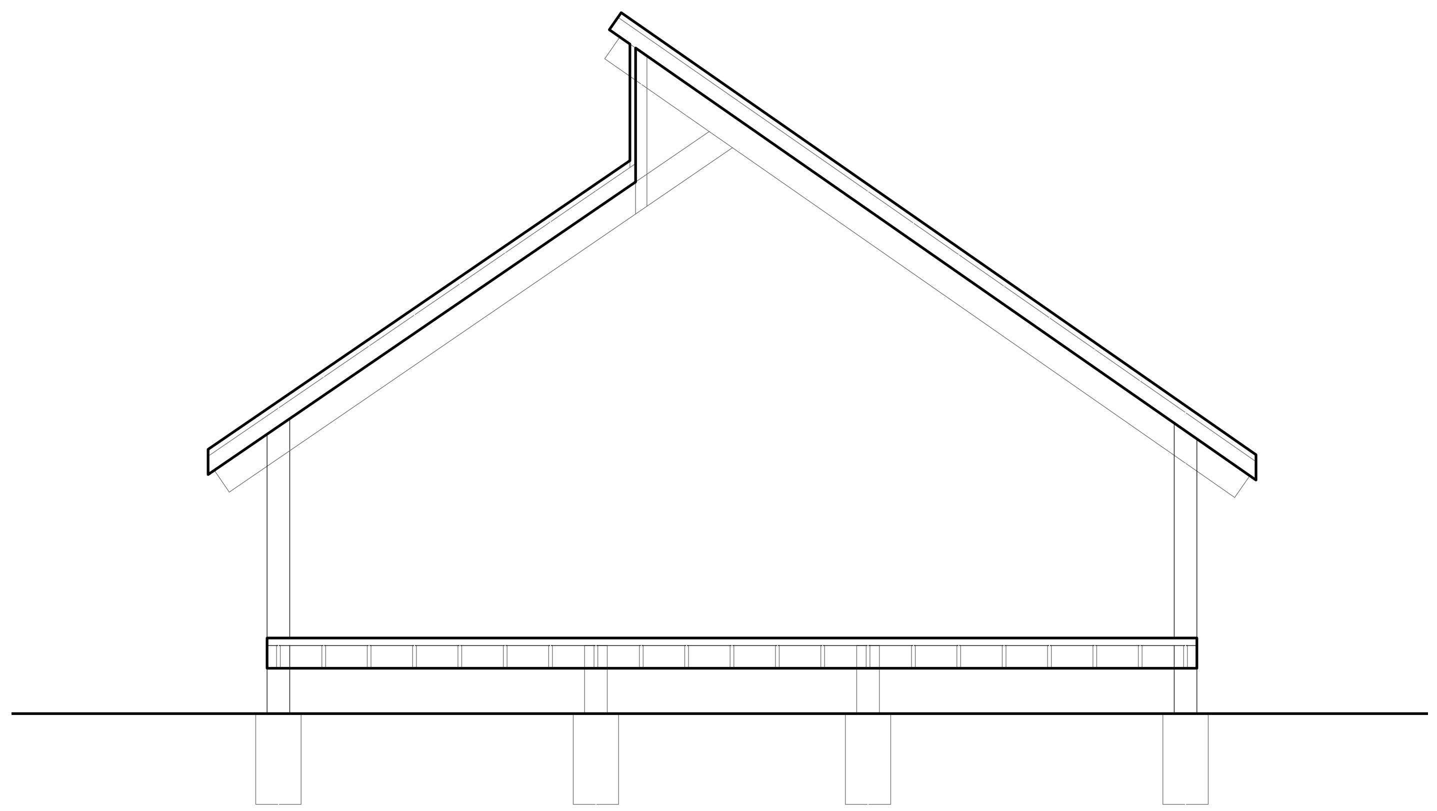
Light and Space

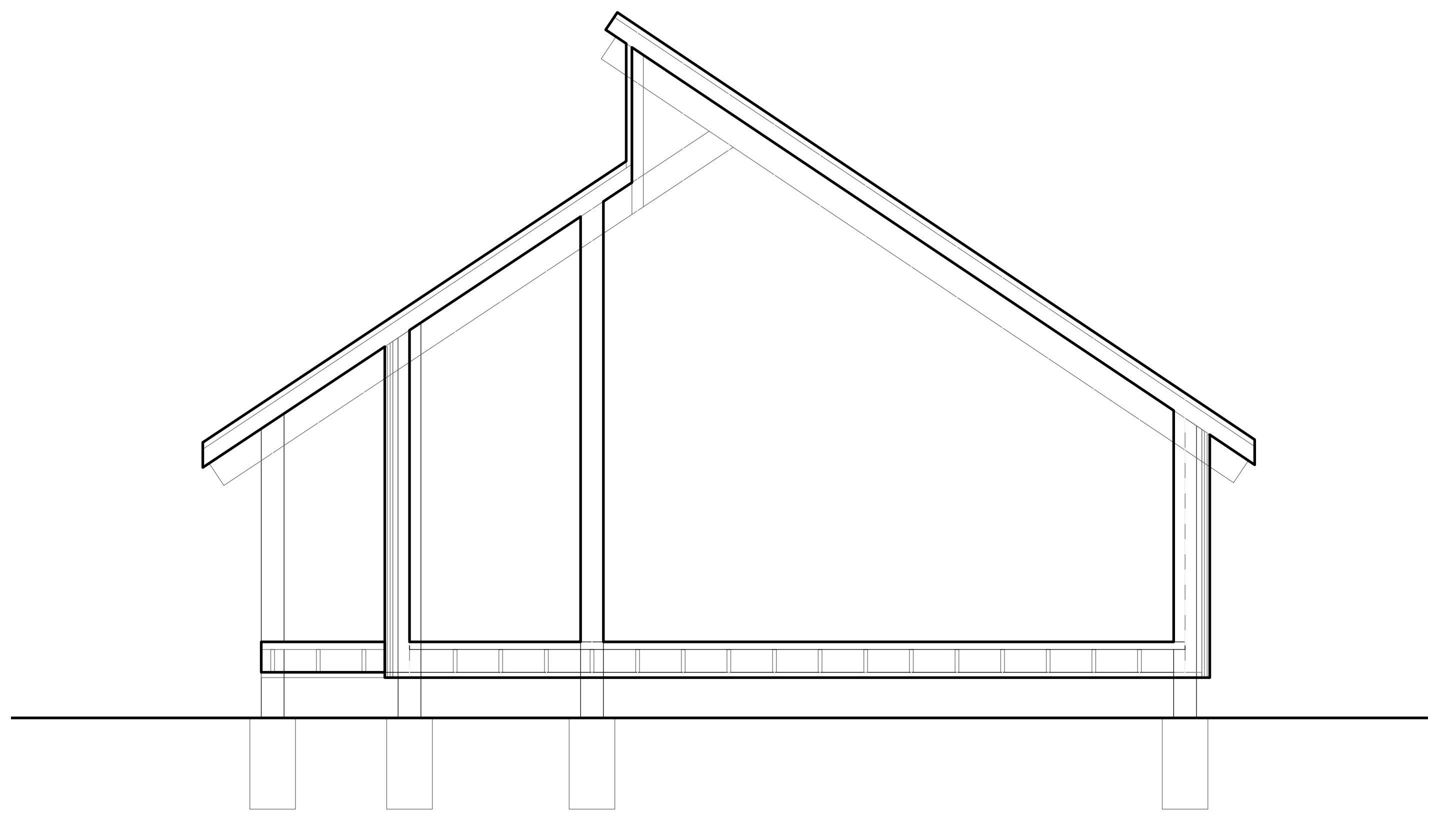


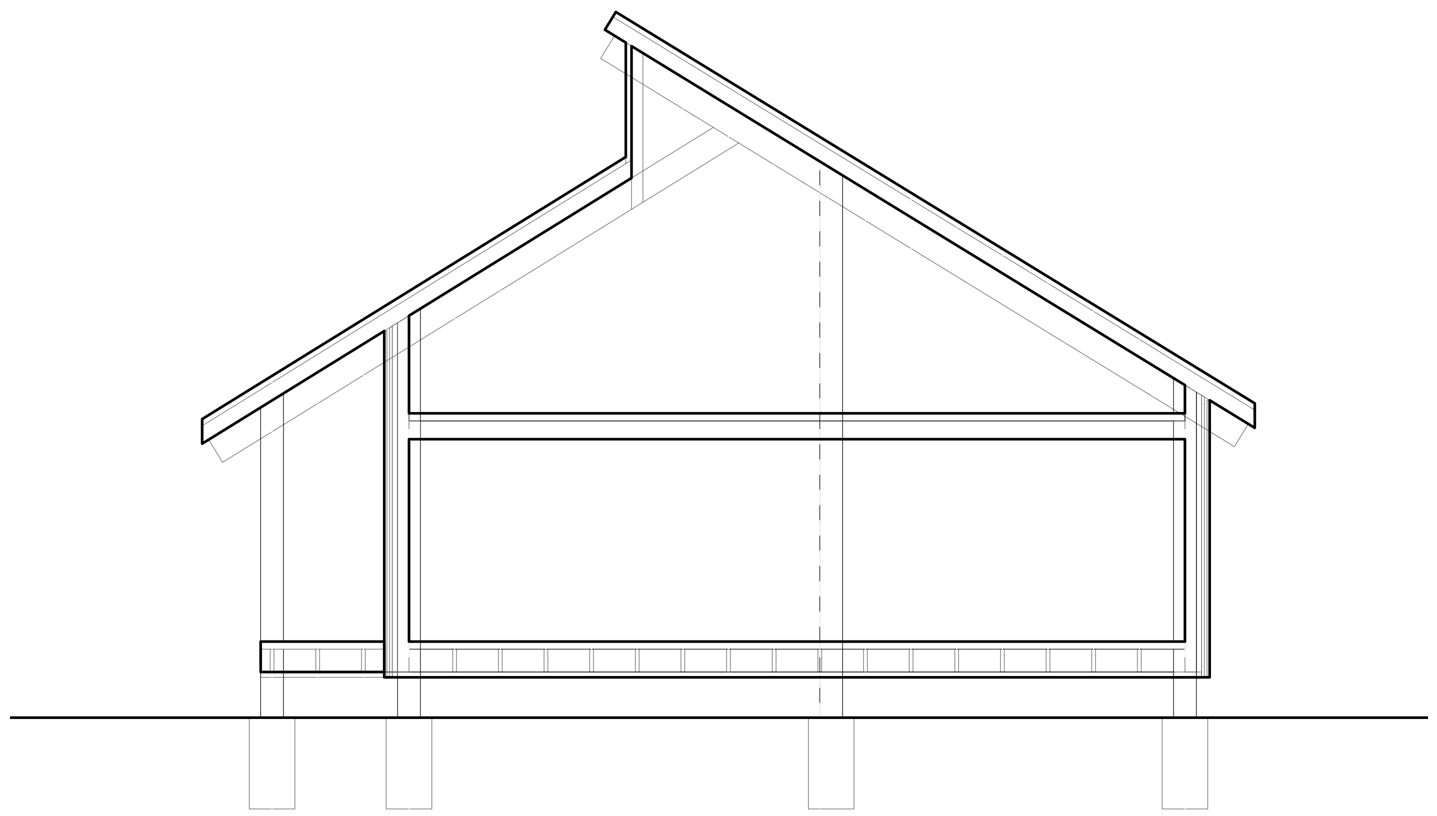


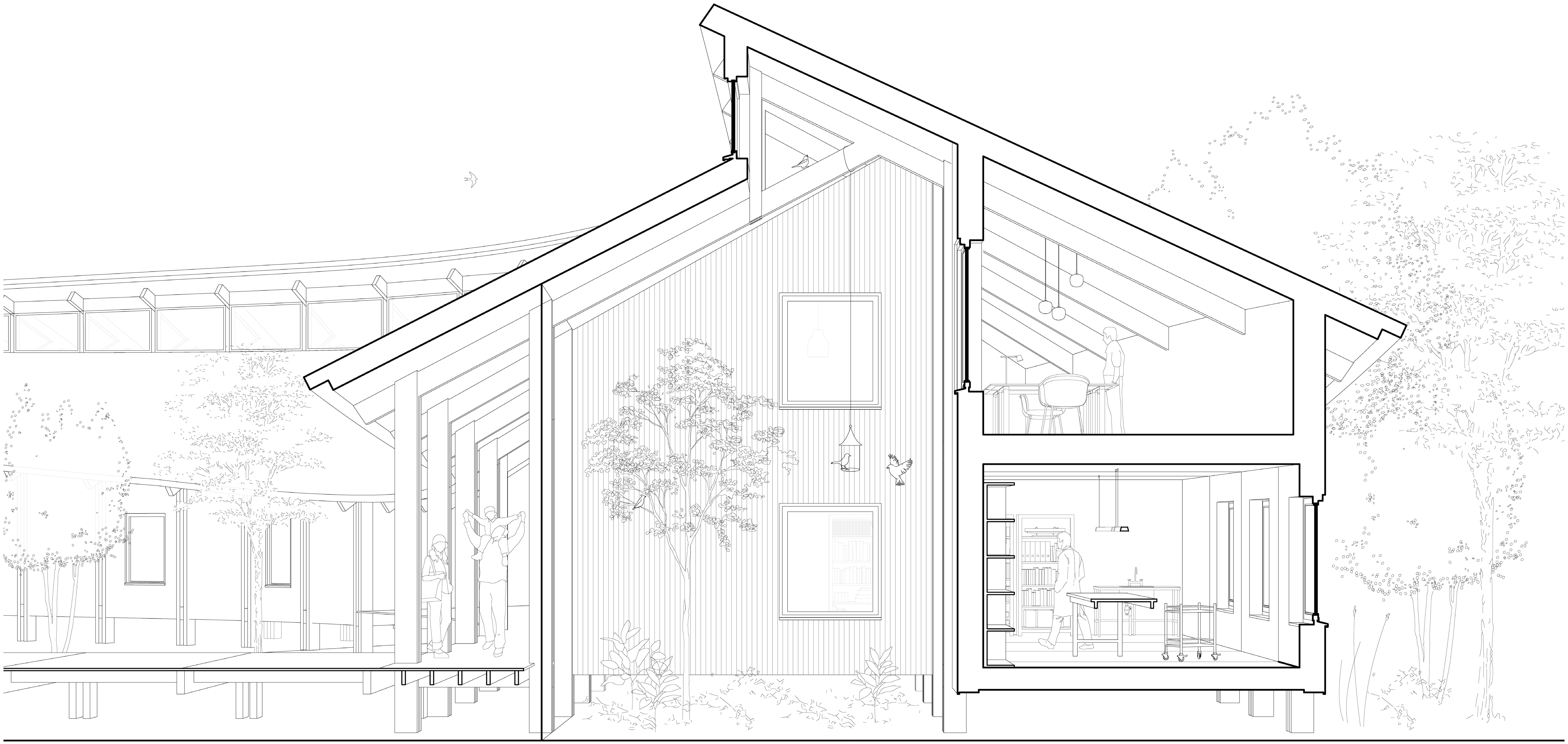




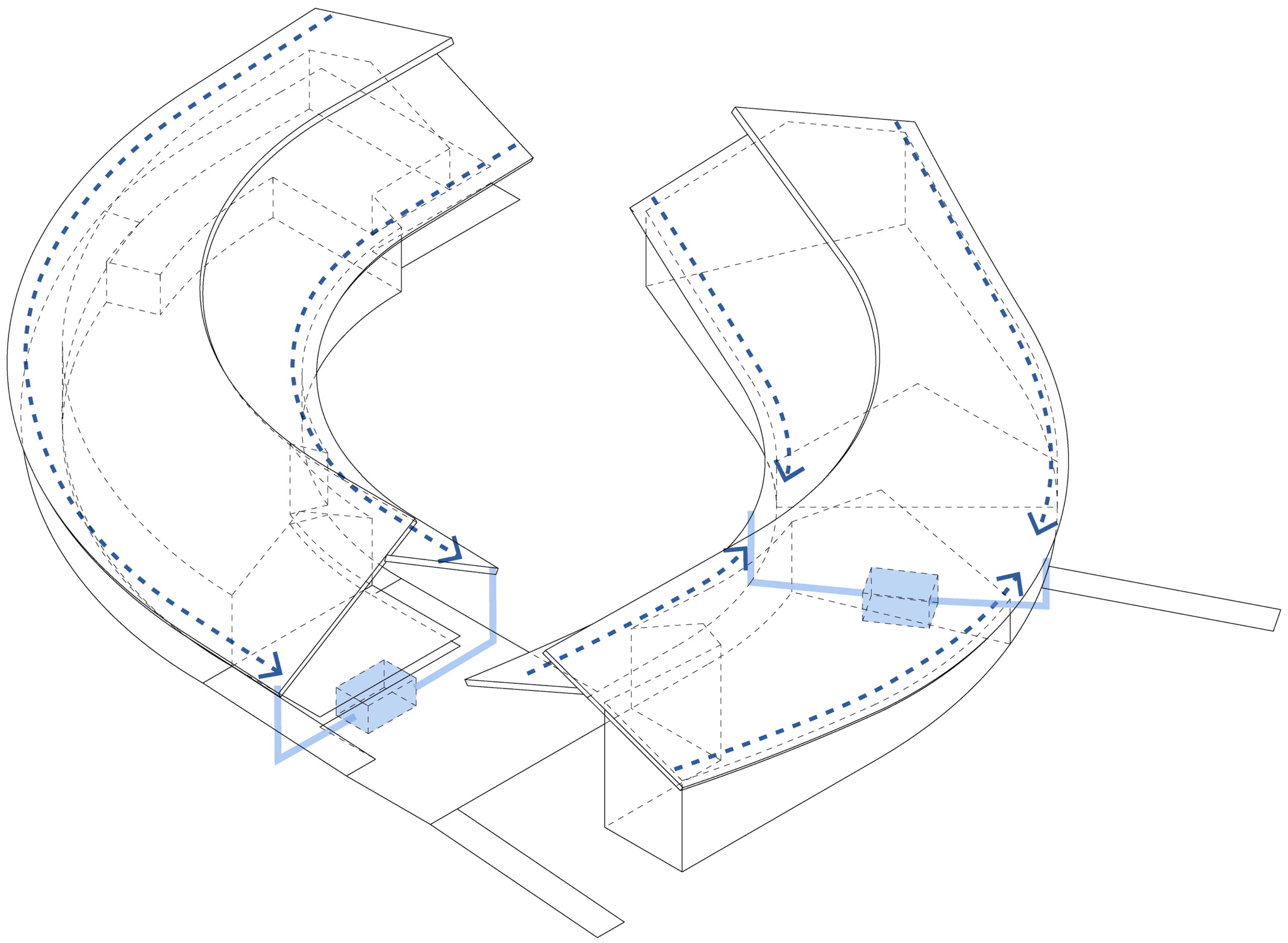




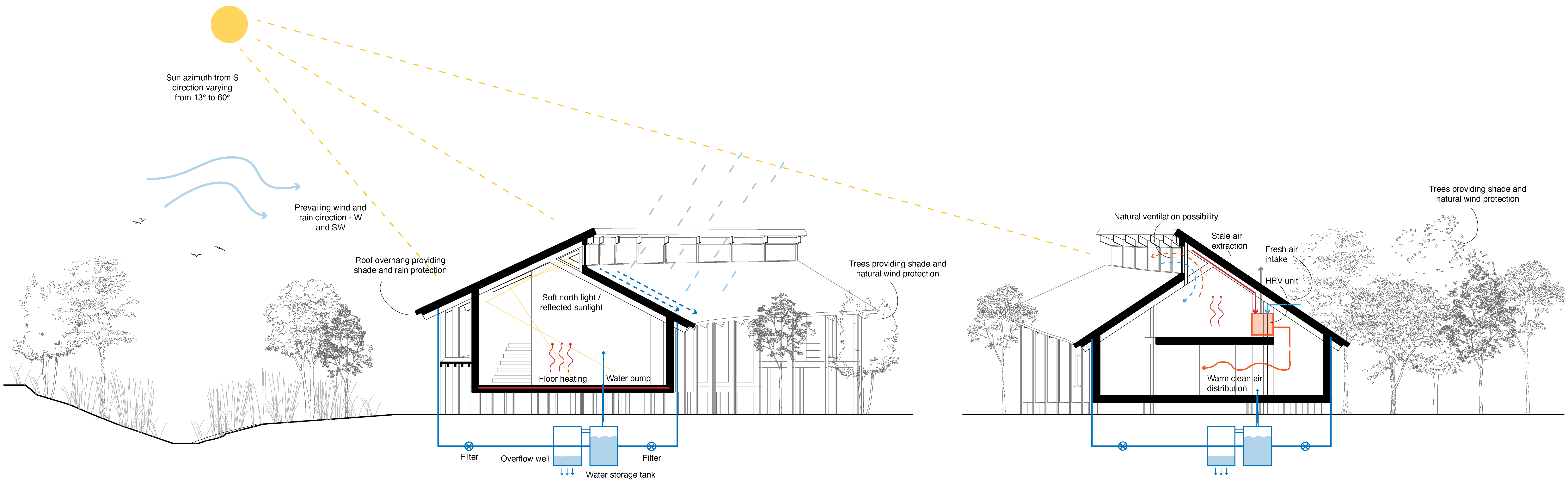




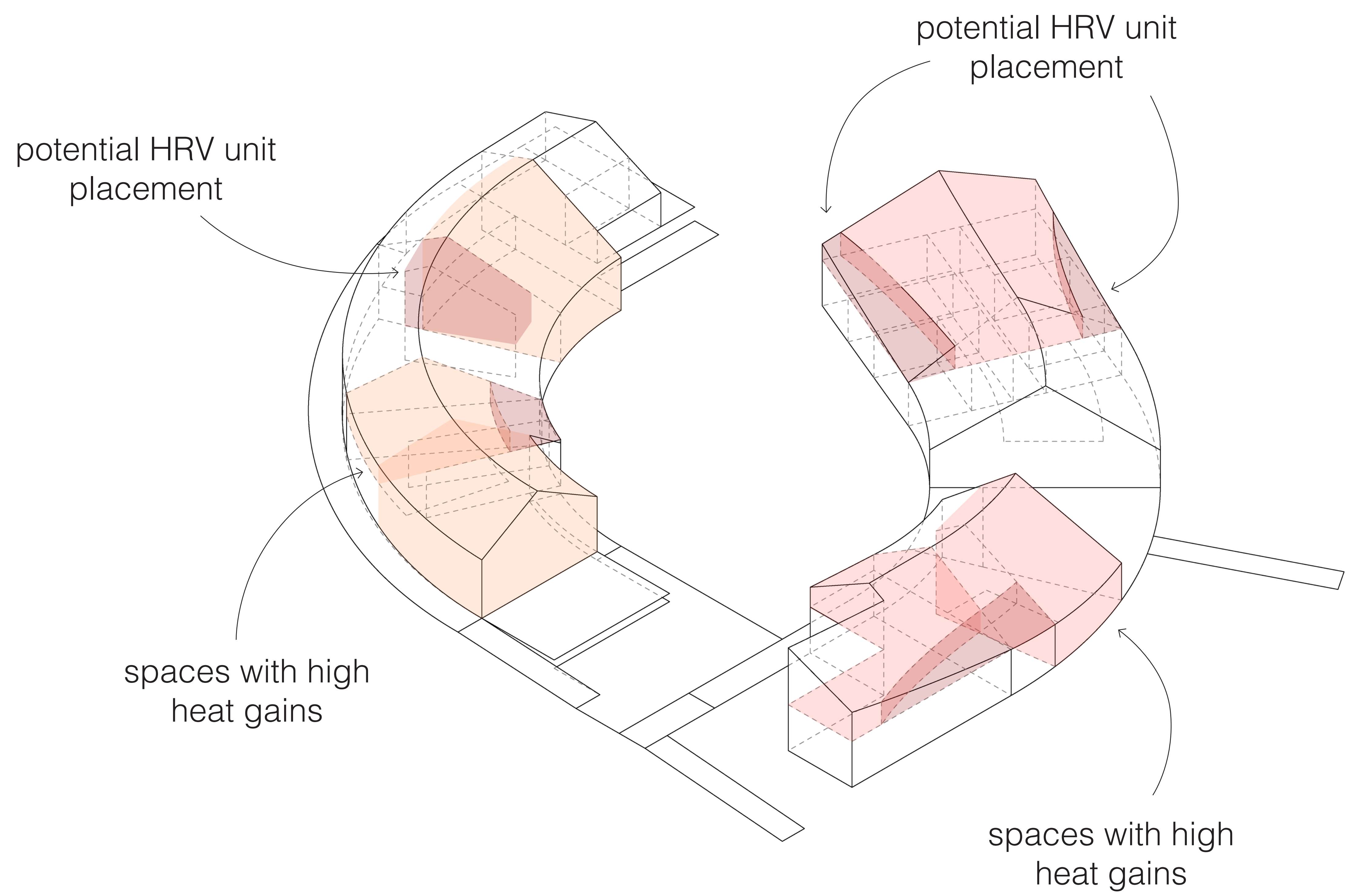
Water Collection & Reuse



Climate Control



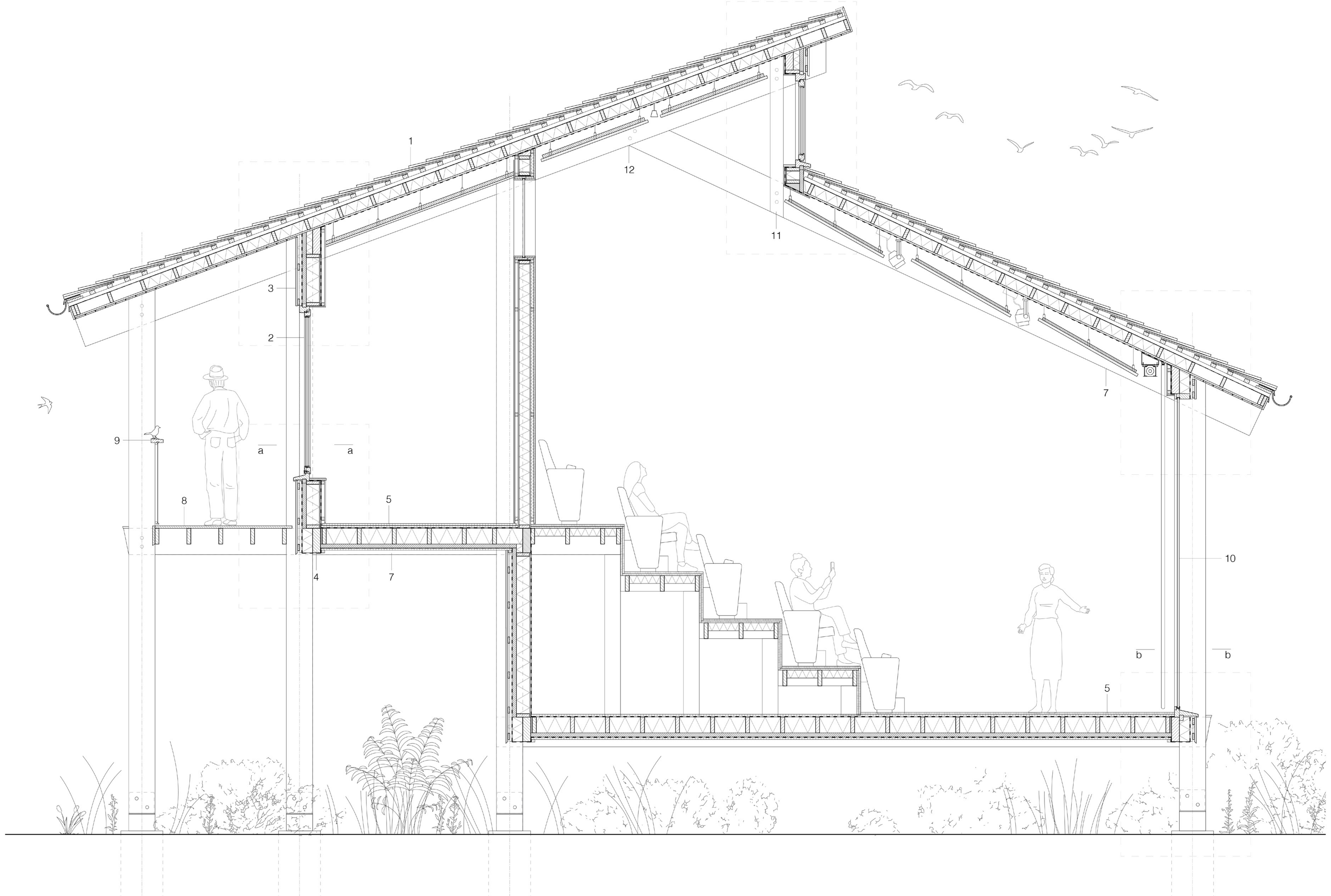
Heat Recovery Ventilation



Fragment Model

Fragment Model

Fragment Model



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