

DE WADLOPER

P5
GRADUATION

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Research	Peter Koorstra
BT	Claudia van Leest

PROBLEM STATEMENT
CLIMATE CHANGE



1. https://bplusb.nl/project/tussen-water/

LOCATION
GRONINGEN, THE NETHERLANDS



RESEARCH

DEALING WITH WATER
TERPEN V.S. PUMPING STATION





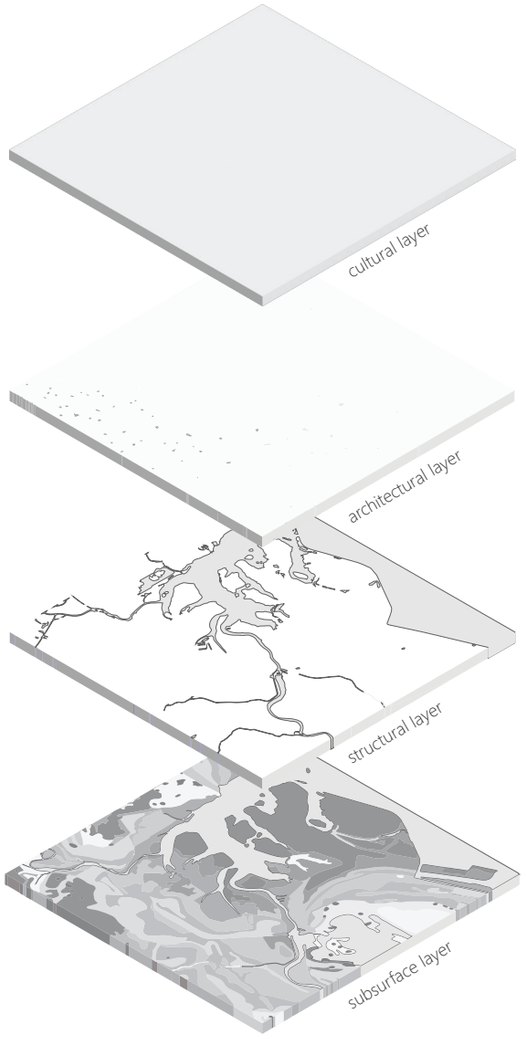
1. Own work (2023)

2. Own work (2023)

RESEARCH QUESTION

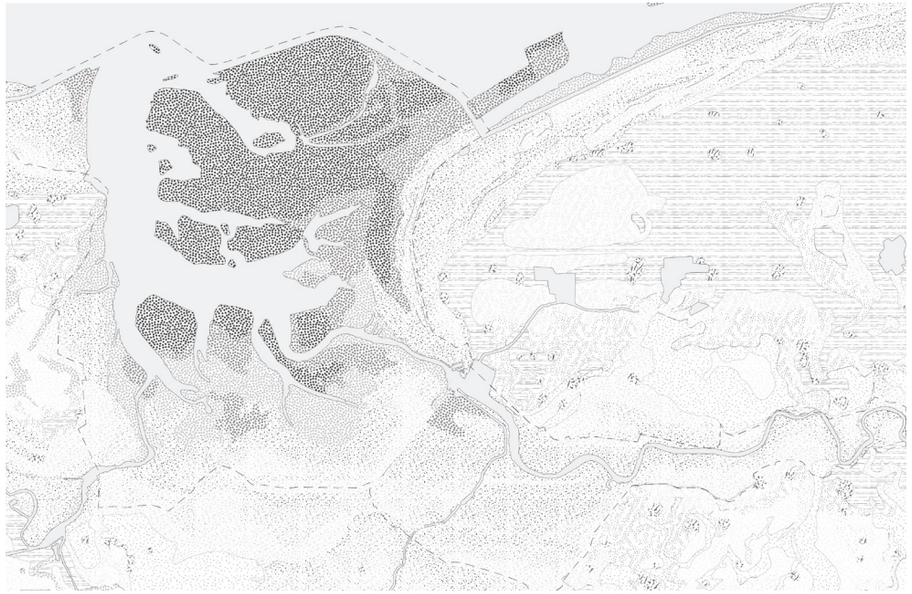
“How can an in-depth study of existing landscapes contribute valuable knowledge for designing sustainable and resilient landscapes in the future?”

METHOD
MAPING THE LANDSCAPE



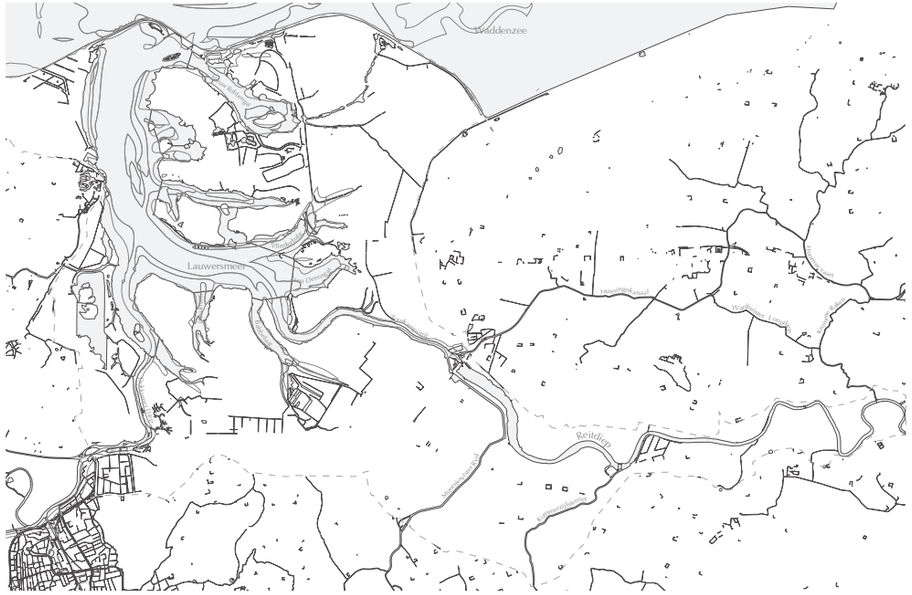
SUBSURFACE LAYER

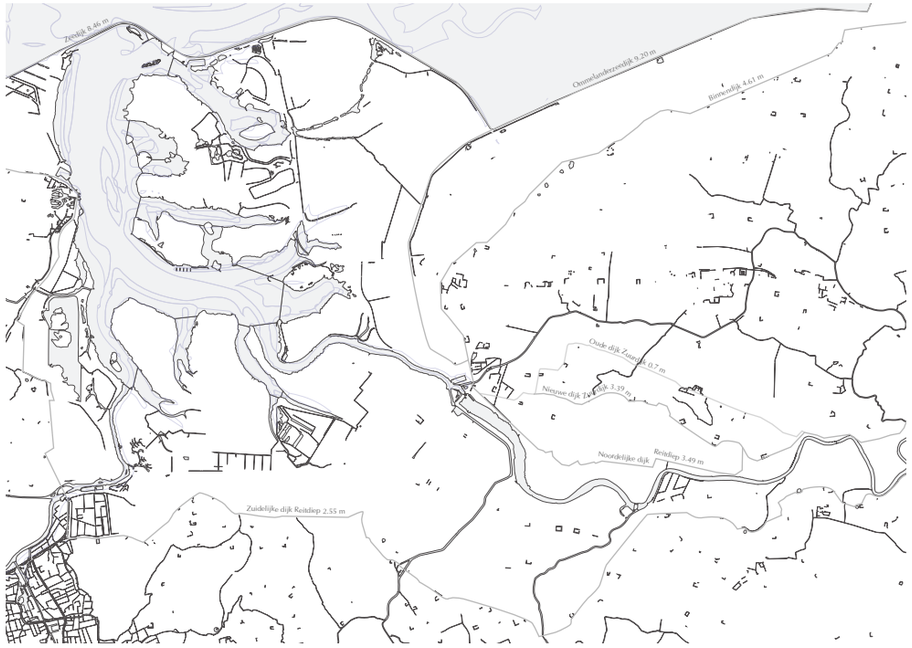
SOIL, HEIGHT





STRUCTURAL LAYER
WATER, INFRASTRUCTURE





ARCHITECTURAL LAYER
LAND USE, BUILT ENVIRONMENT





CULTURAL LAYER
EXPRESSIONISTIC V.S. SOBRIETY



om zijn zijn bij het zilte en zompige wad o v e r l o o s in de ruimte te stromen

Langzaam glijdt de rivier
door de kom van het dal
en kronkelt zich weg
in haar dromen,
om tot slot bij
het zilte en zompige wad
overloos in de ruimte te stromen.

Josephine Bartemi (2005)

Hail achter in toen,
doar kwamen wie bie mekoar,
doar was n hail mooi plekje,
n lindeboom ston doar.

Stammen van Groninger Dijken

Wiedhot steerns - veurbie
bitter eerns - veur mie,
Grode maat is mies,
Doe zegst haand - nait wies.
Blief dis hier - breed doe,
t was zo schier - zoest doe.
Oversee - mein rain
helpt gain bee - ef ais.
Mor doe best vermien,
wat ons ned is pien.
Bitter eerns - veur mie,
wiedvot steerns - veurbie.

Alles is lucht, loos en leeg, en van gain betalken, zegt Prediker,
loos en leeg en van gain betalken.

Men schrijft en knoeit aan stok deur onder de zun.
Wat komt men der wieder mit!

Gedachten gaan en brengtchten komenen

mor wereld blift **adlied** bestaan,

Stammen van Groninger Dijken

zo stroomt glijdt de rivier

Hoe, aan de regen prijsgegeven, het landschap
tot aan de horizon grijs en niemand
zichtbaar bepaalt het, lange wegen
te zijn als enige, ademend.

Schouwen, gedagen door windkracht
stroomend, het water stroomt in zijn rietzaag
en neemt, een richting is de rivier
van oudsher.

Muur rust onder dak en zich steekkend
van voorhuis tot baander de nok en het wonen,
het wonder der beeven, geboorte
beschut dan de thuiskomst.

Doch binnen vervroemding, veel blijft vezrwegen,
en omvede heerst, het bevel aan de hond.
Wachten waarop. De klank van een haad
die zijn tijd heeft, blikend. Het wachtwoord.

(...)
met jouw lichaam ons landschap
als bodem voor hemel! Ik vraag maar.
(...)
in juni, het koelende mellowe bij 't hek -
zo gedokten, een avond, ik zit in het gras
(...)

C. O. Jellema (1991)

Haar, in het dalhuis de totel, bij lacht.
Een grootmoeder lijf in haar graf
hoog op een terp. Nog klinkt de klok
als hij niet meer geluid wordt.

Waar, om te zijn, vinden mijn ogen
beelden dan hier, mijn kinderen zij.
en ik dwing hen te zien als ik vroeger
z o o p e n

Hoe, en omvattend als enkel gedachte
vermag, in het ogenblik vallen, met regen
in 't water, in landschap, in aarde -
dit als mijn lichaam te voelen,

ontijdig, ademend, enige
weg

C. O. Jellema (1991)

CURRENT SITUATION



Legend

- Water
- Grass landscape
- Agriculture
- Swamp landscape
- Nature reserve
- Dikes
- Road network
- Buildings

Current situation of the research area (own work, 2023)



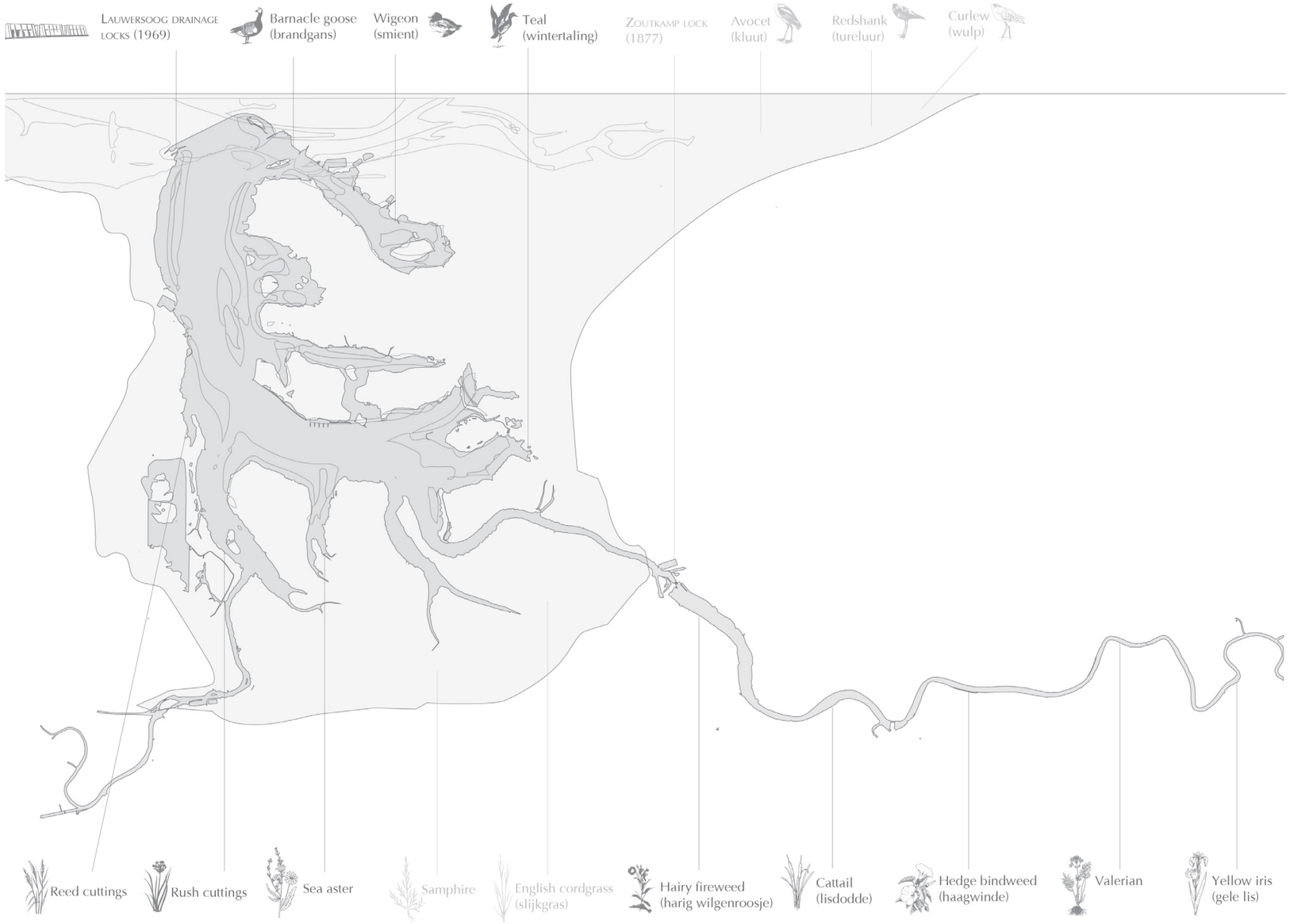
1. https://www.np-lauwersmeer.nl/het-lauwersmeer/natuur-landschap/

LAUWERSSEA
PART OF THE WADDEN SEA



1. https://whc.unesco.org/en/list/1314/

FLORA AND FAUNA

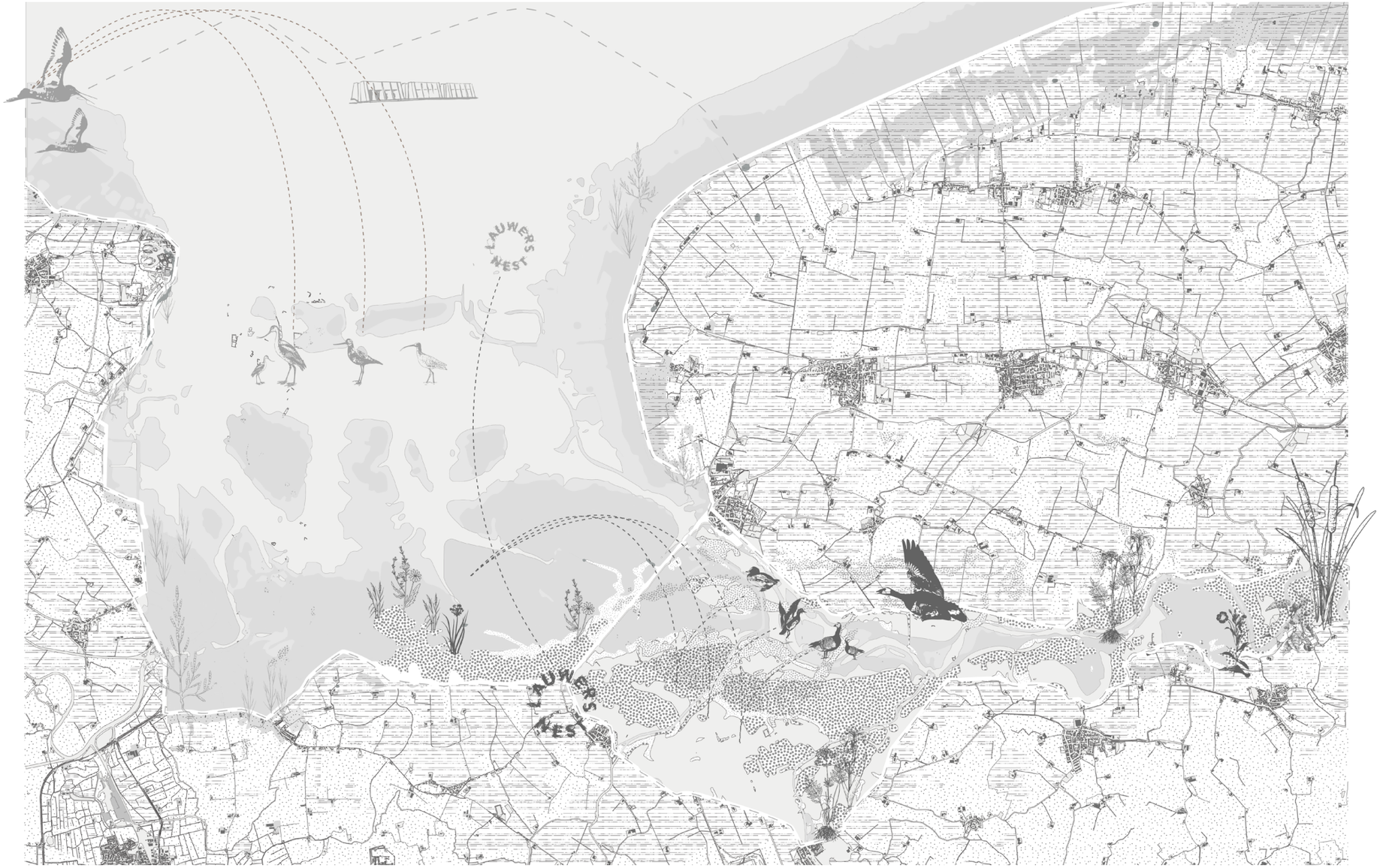


The flora and fauna of the Lauwerslake (own work, 2023)

Legend

- Lauwersea before 1969
- Lauwerslake after 1969
- Former flora and fauna
- Current flora and fauna

MASTERPLAN



Legend

- Water
- Grass landscape
- Agriculture
- Swamp landscape
- Nature reserve
- Dikes
- Road network
- Buildings

Current situation of the research area (own work, 2023)

VISION
VERDRONKEN LAND VAN SAEFTINGHE



1. David Samyn https://www.waasland.be/het-verdronken-land-van-saeftinghe

DESIGN

FUNCTION
RESEARCH & MUDFLAT HIKING





1. https://www.nioz.nl/en/news/herring-arrives-earlier-in-the-wadden-sea-due-to-climate-change-shows-extreme-long-term-research

2. https://europeupclose.com/article/dutch-wadden-sea/

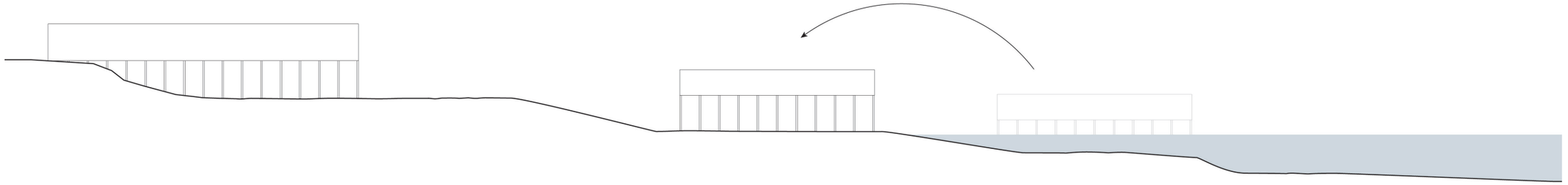
CONCEPT
STATIC VS DYNAMIC



CONCEPT
STATIC VS DYNAMIC



CONCEPT
STATIC VS DYNAMIC



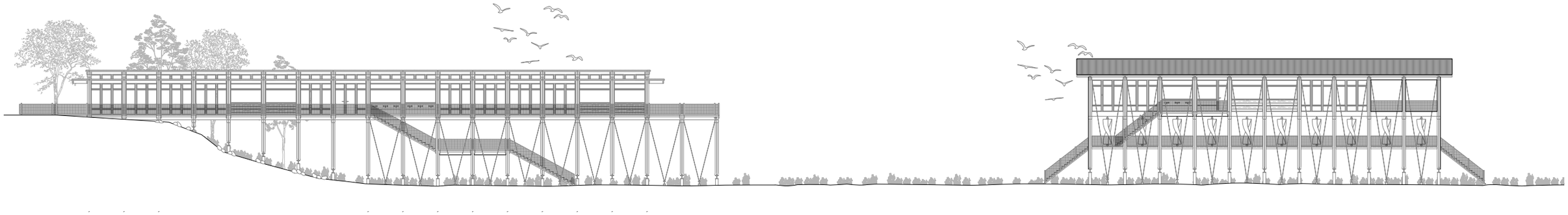
SITUATION DRAWING



Current situation of the research area (own work, 2023)

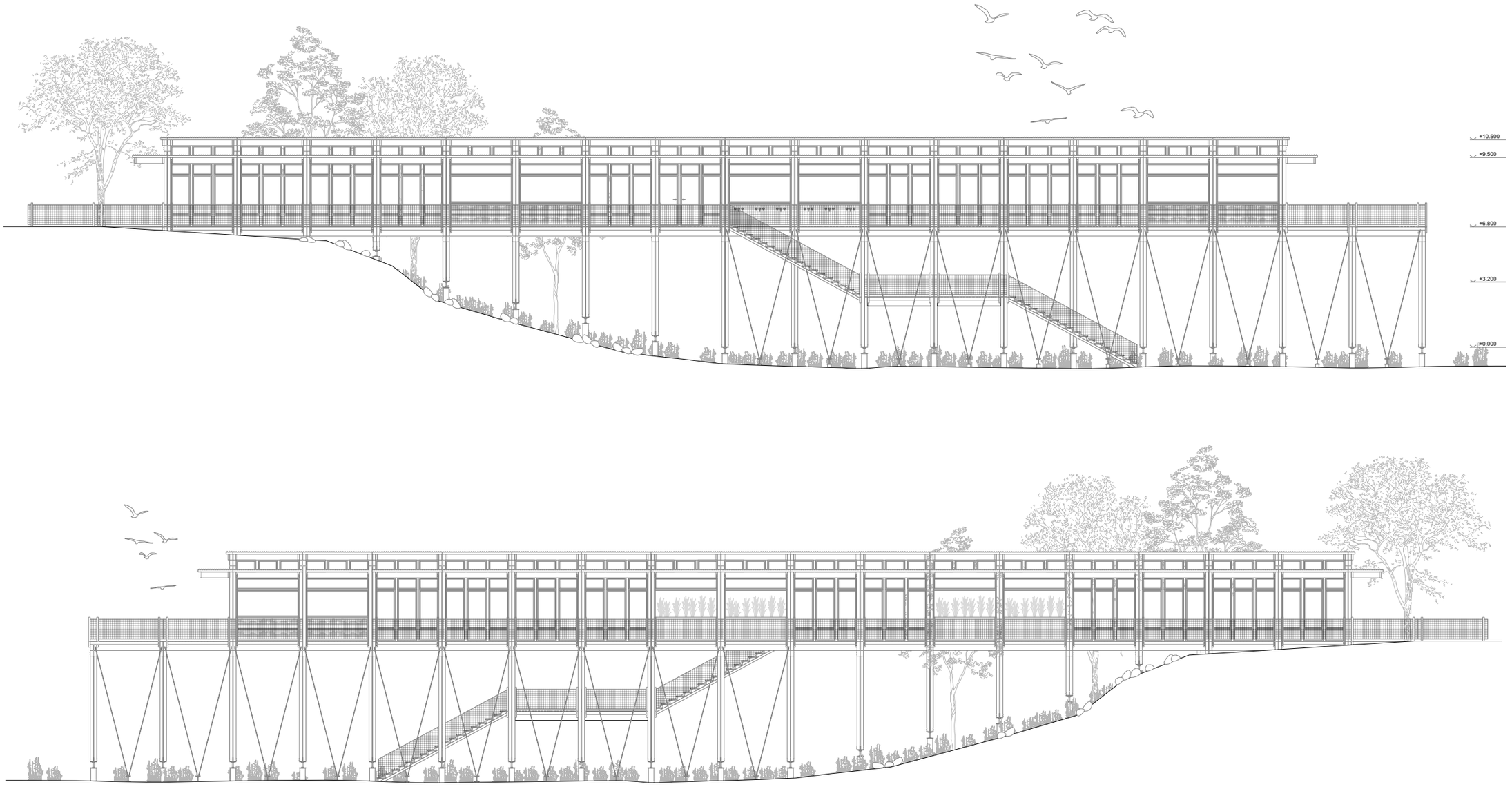
VISITORS COMPLEX ‘DE WADLOPER’

ELEVATION 1:200



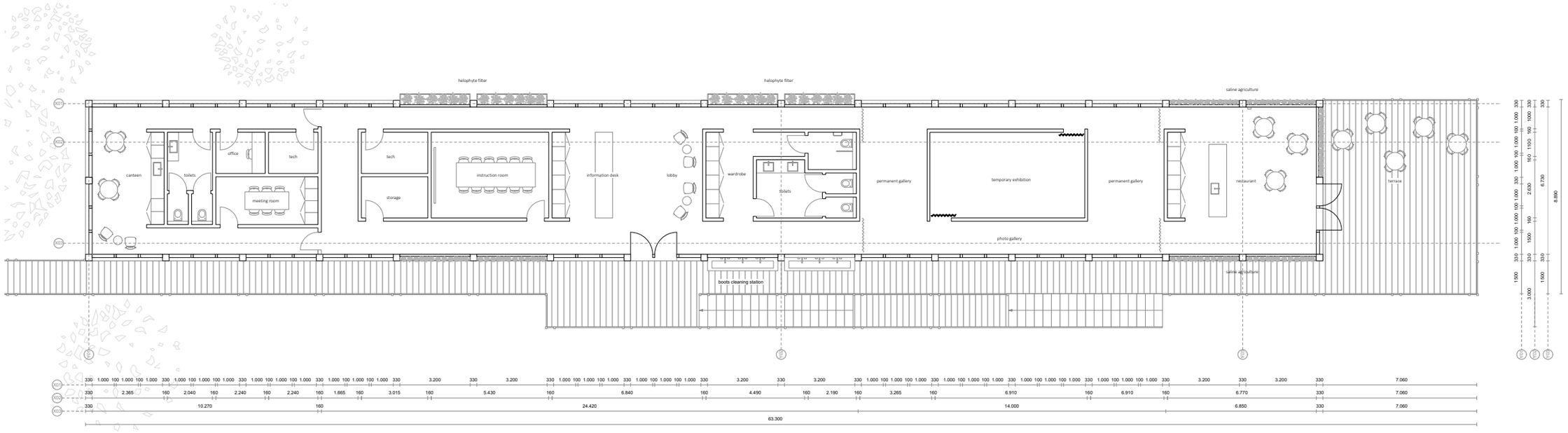
VISITORS CENTRE

ELEVATION 1:100



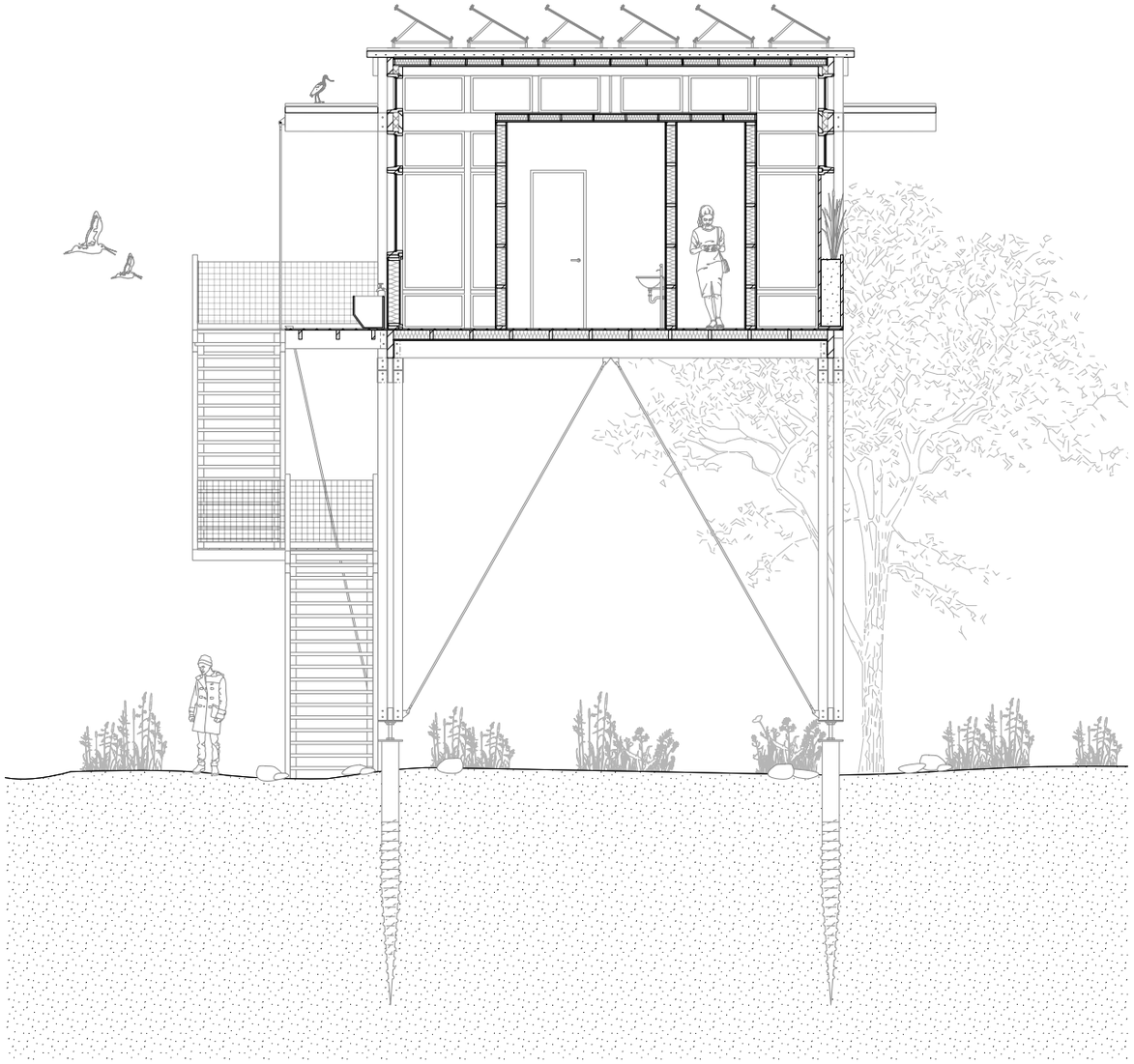
VISITORS CENTRE

FLOORPLAN 1:100



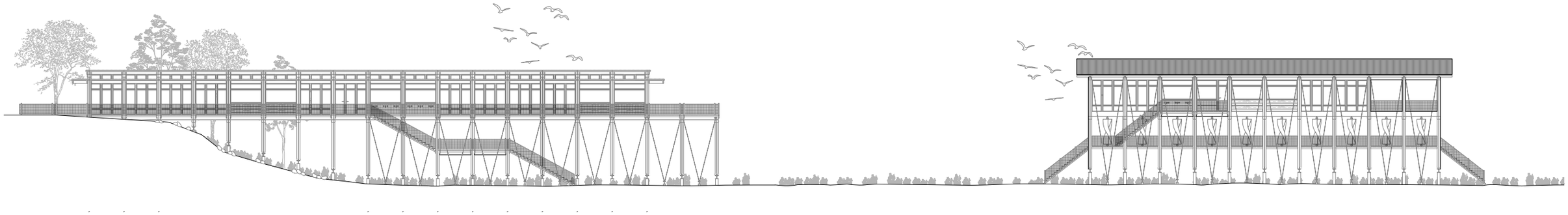
VISITORS CENTRE

SECTION 1:50

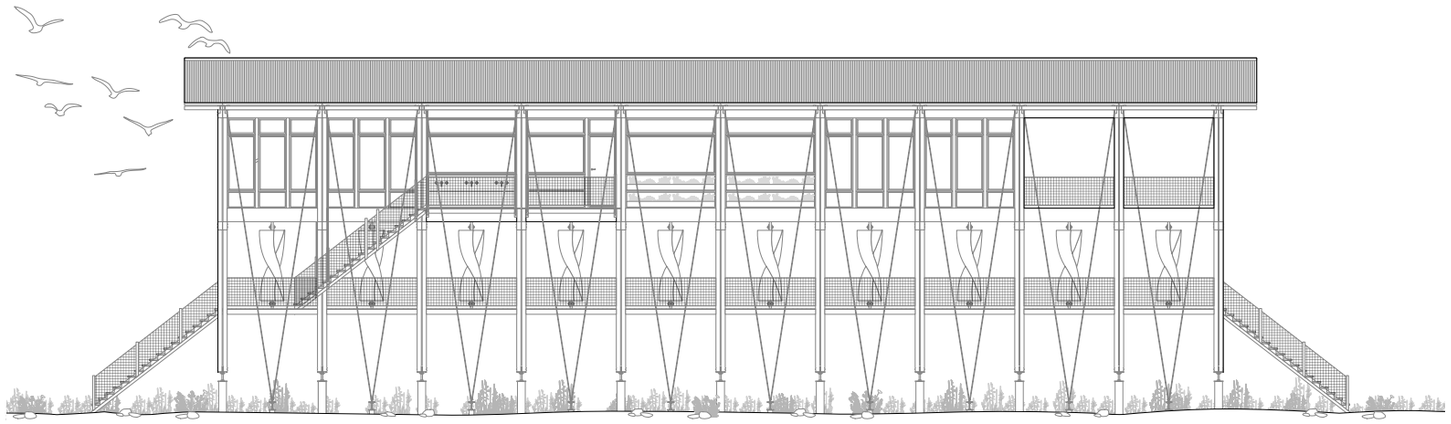


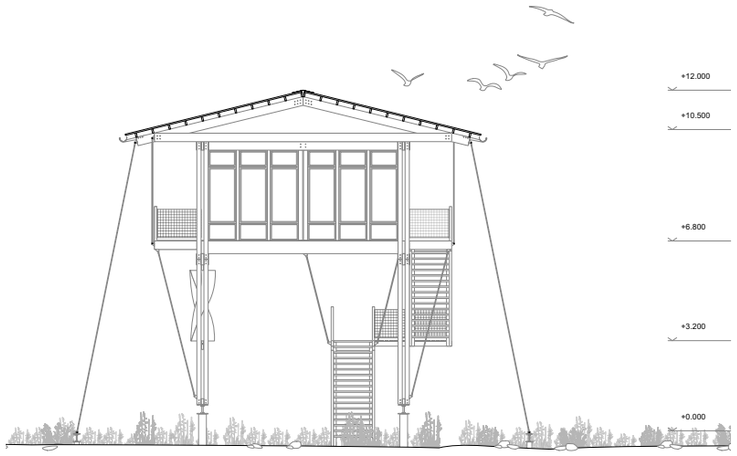
VISITORS COMPLEX ‘DE WADLOPER’

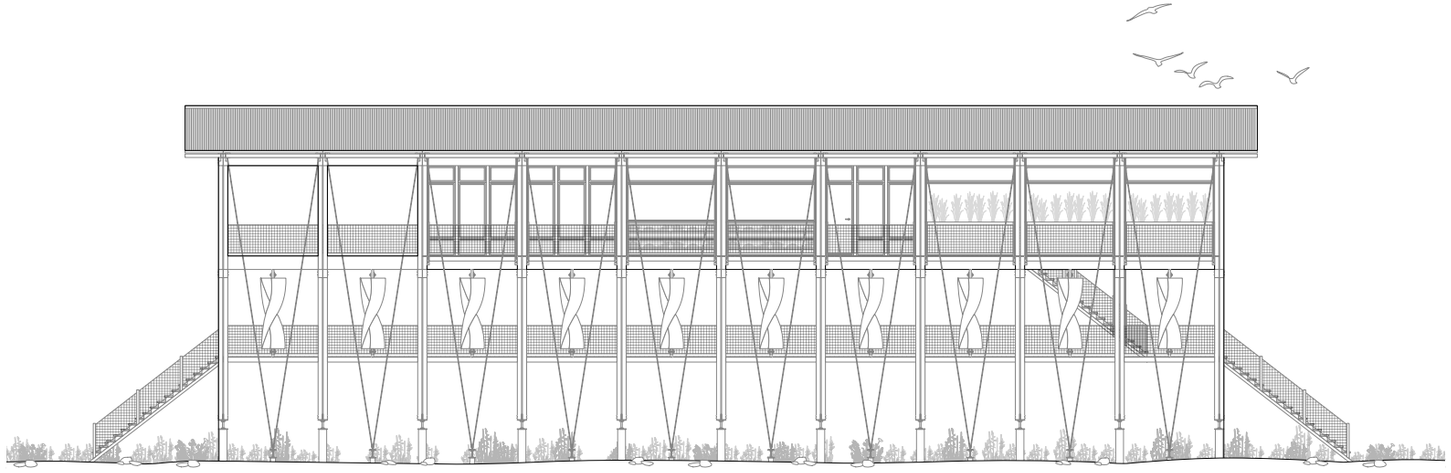
ELEVATION 1:200

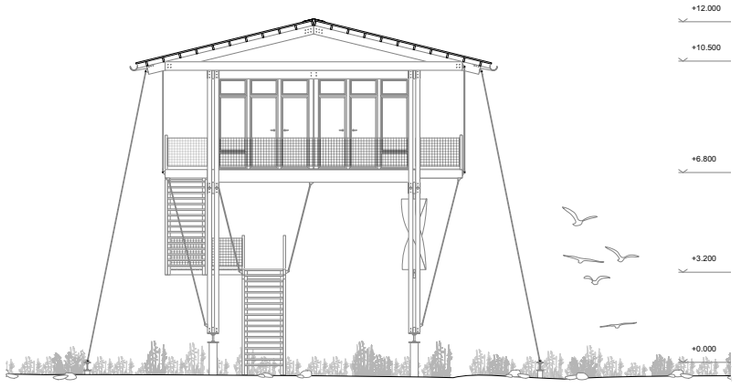


PAVILION
ELEVATION 1:100





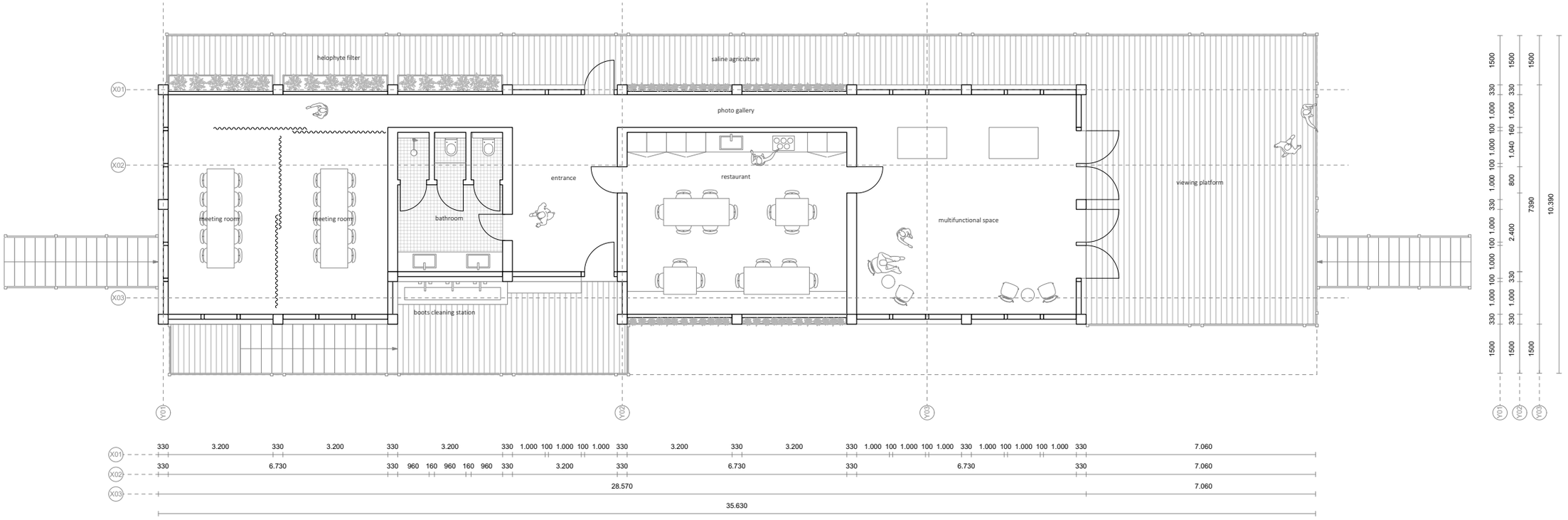




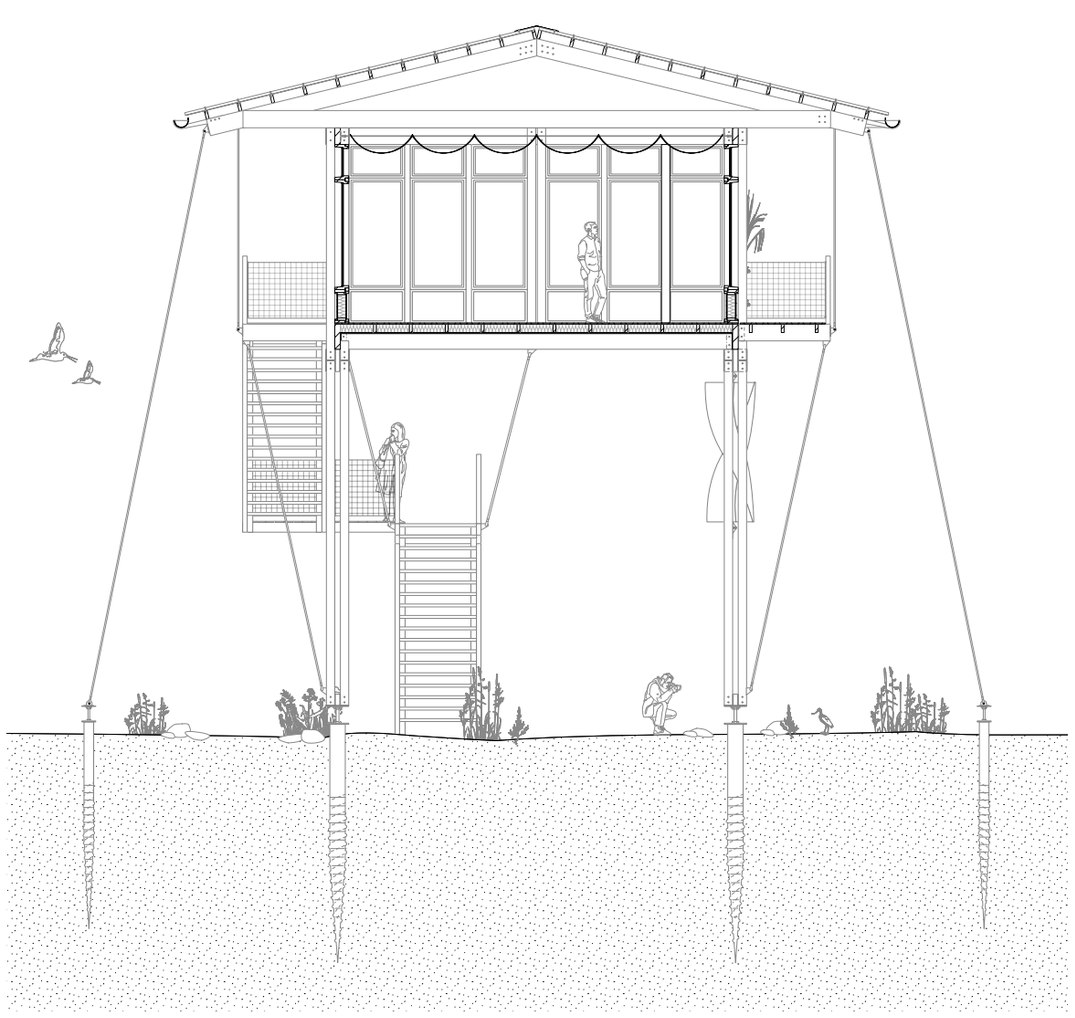
PAVILION
MODEL 1:50

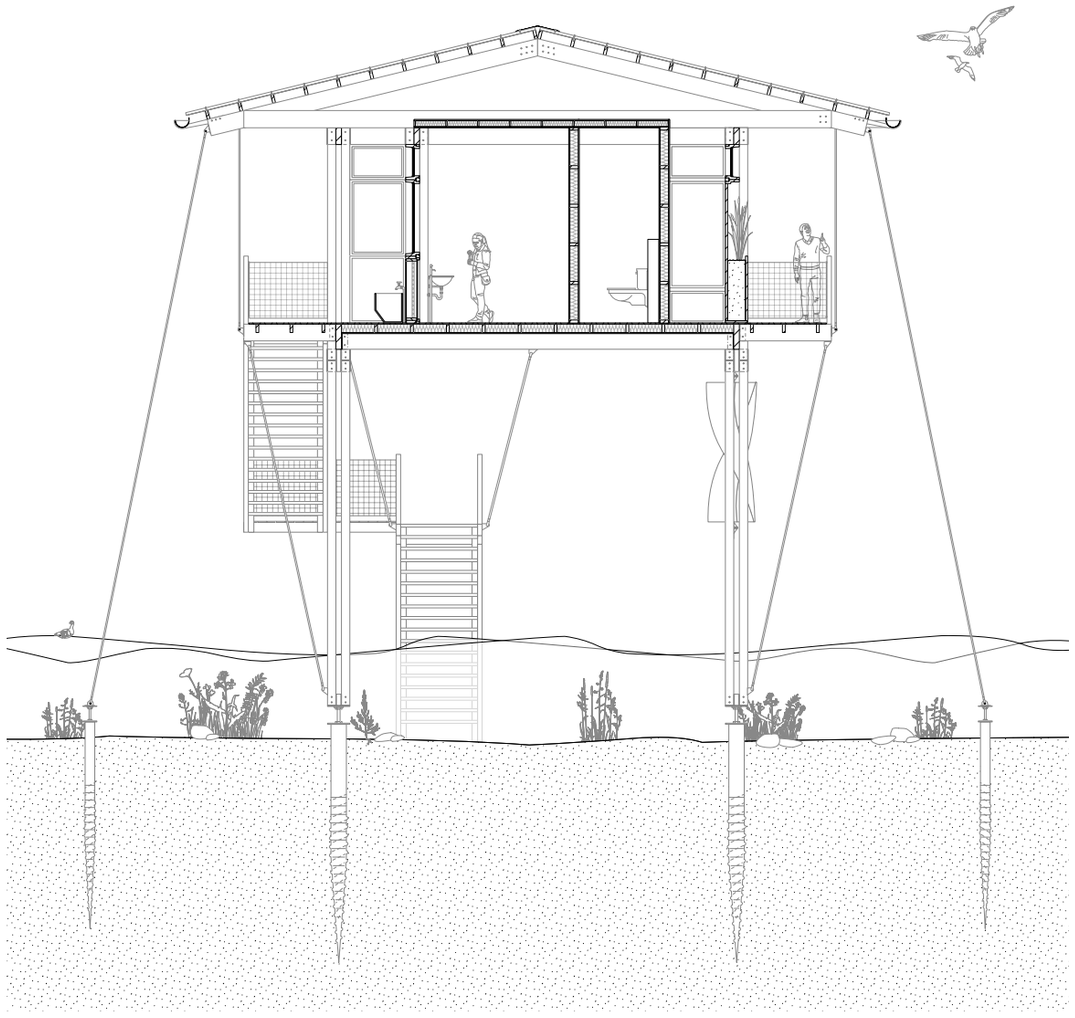


PAVILION
FLOORPLAN 1:100



PAVILION
SECTION 1:50



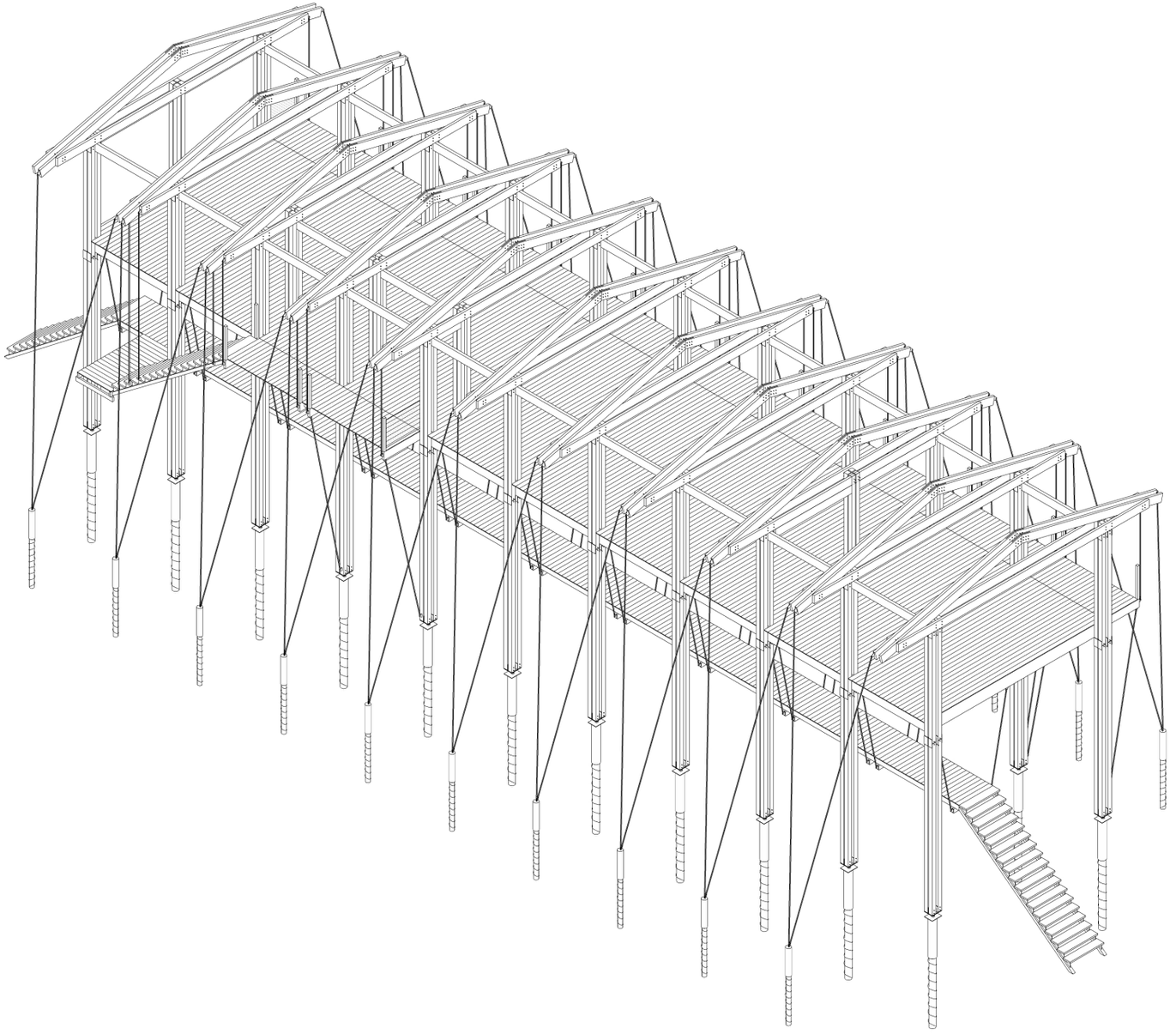


PAVILION
MODEL 1:50

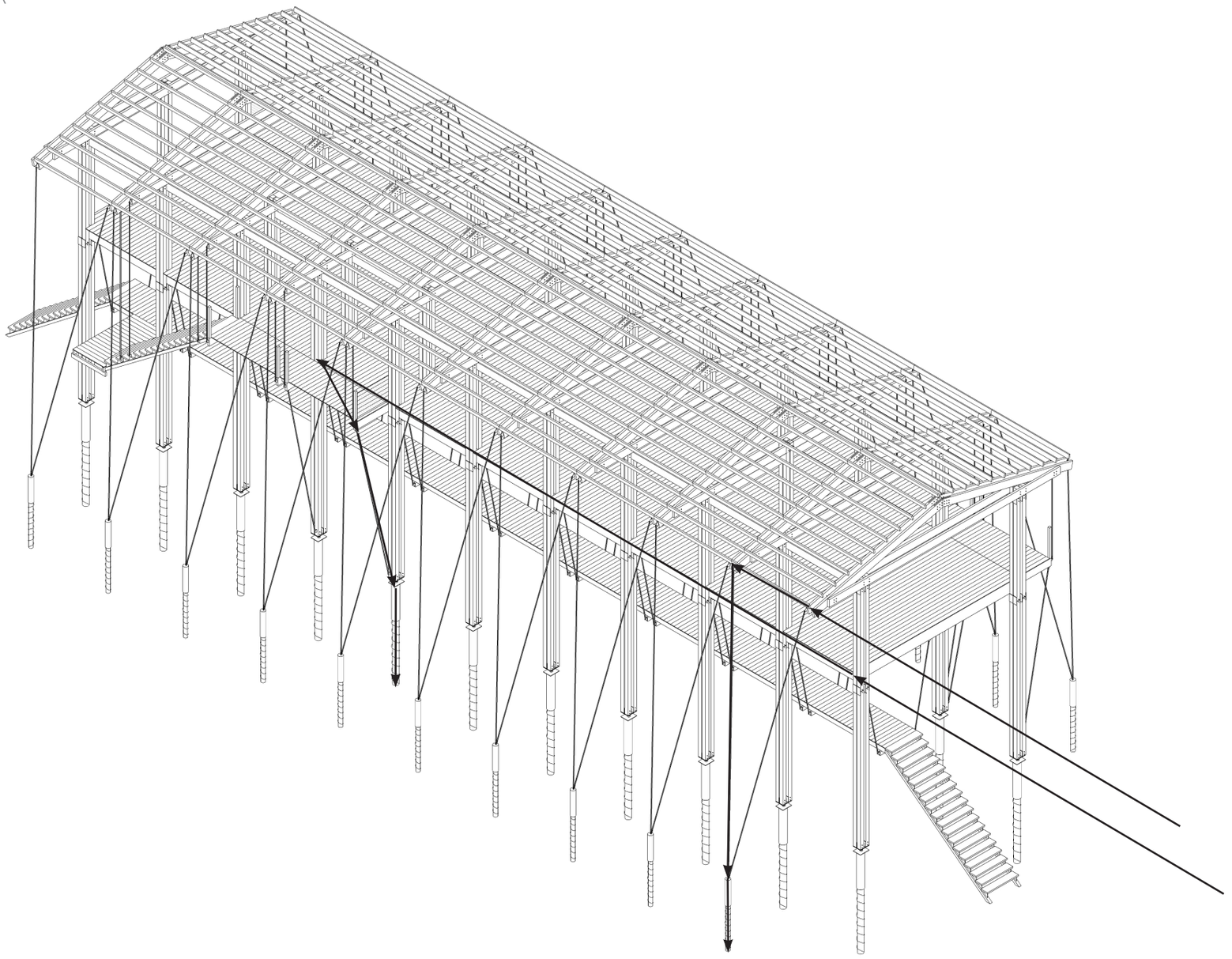


BUILDING TECHNOLOGY

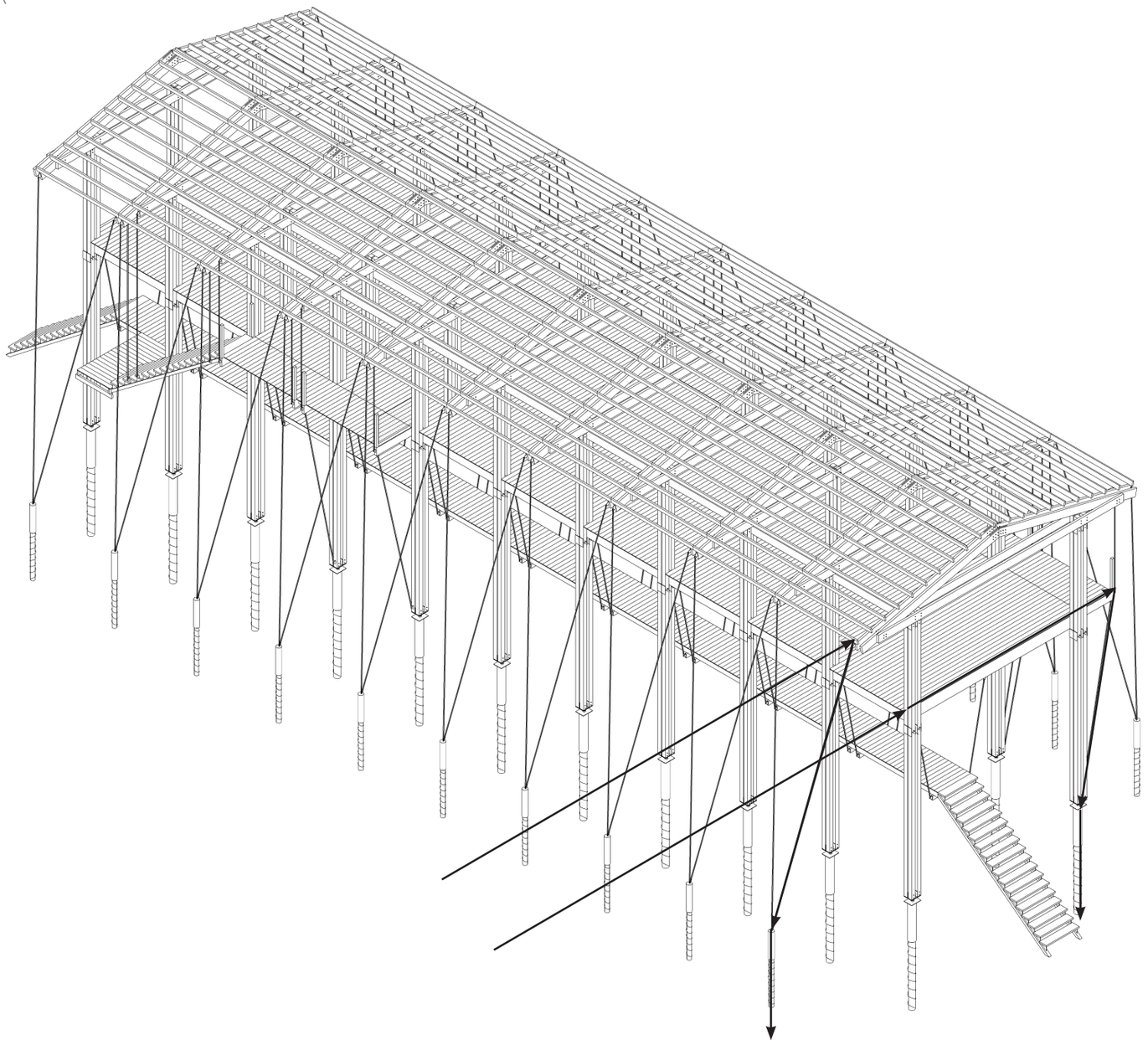
STRUCTURE
AXONOMETRY

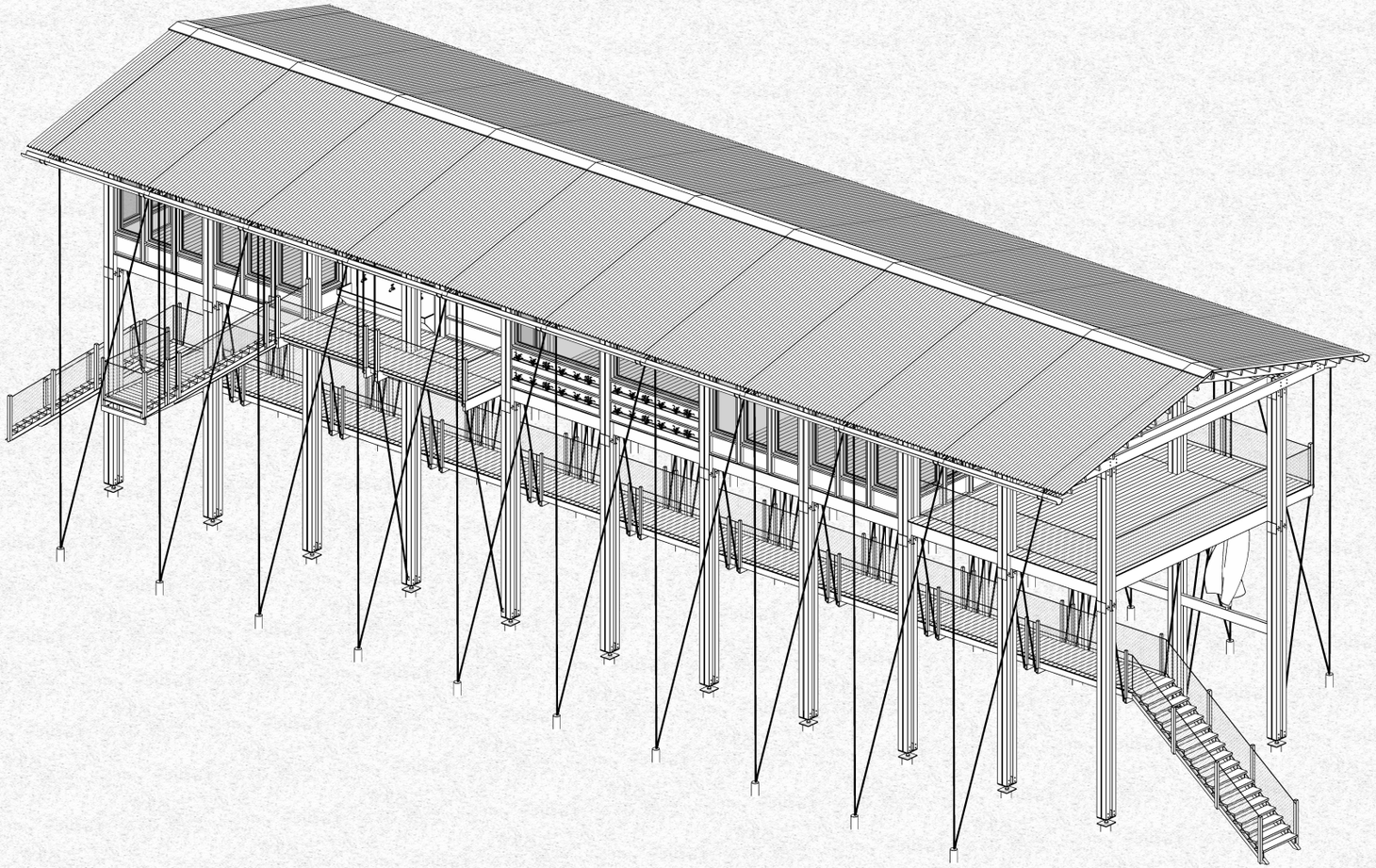


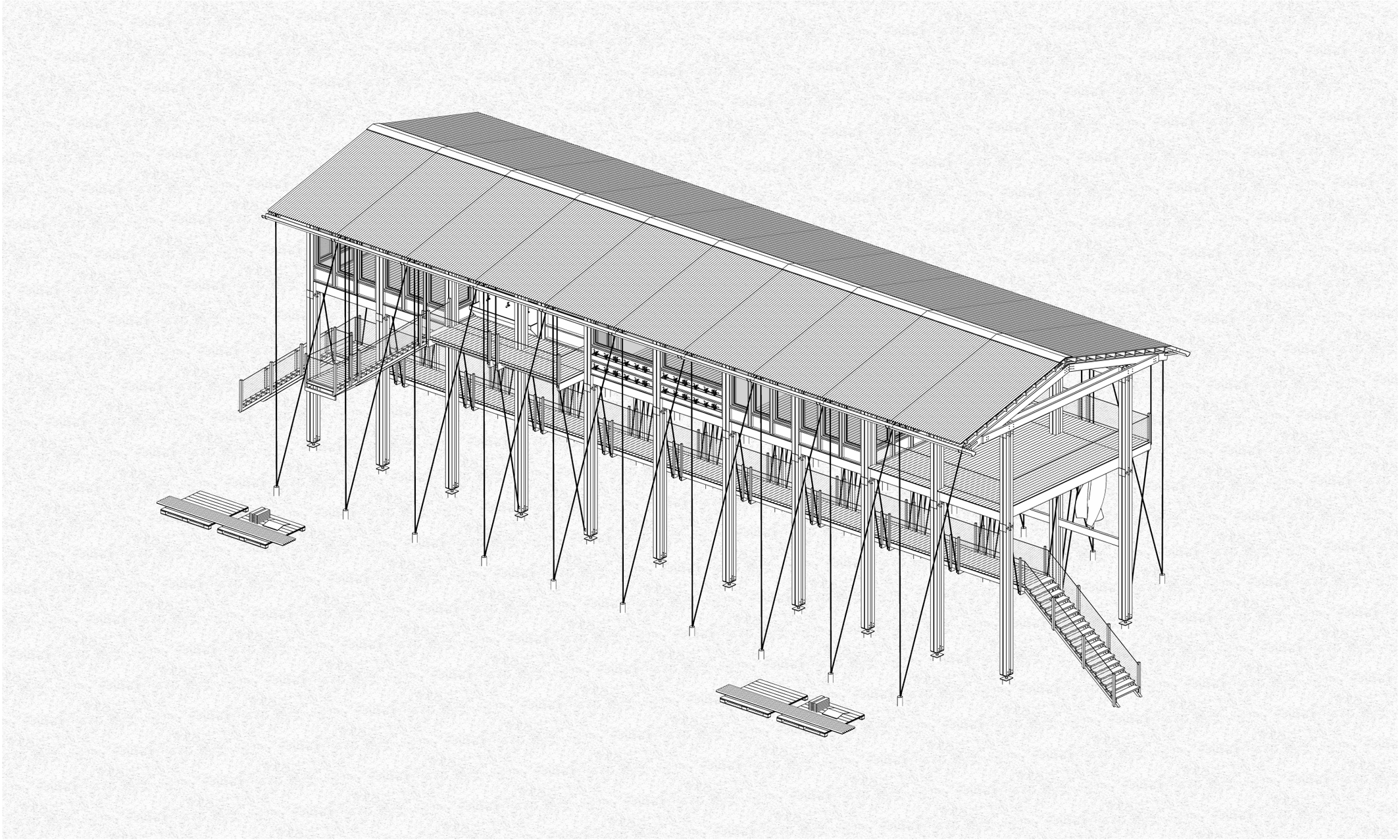
STRUCTURE
WIND LOAD TRANSFER

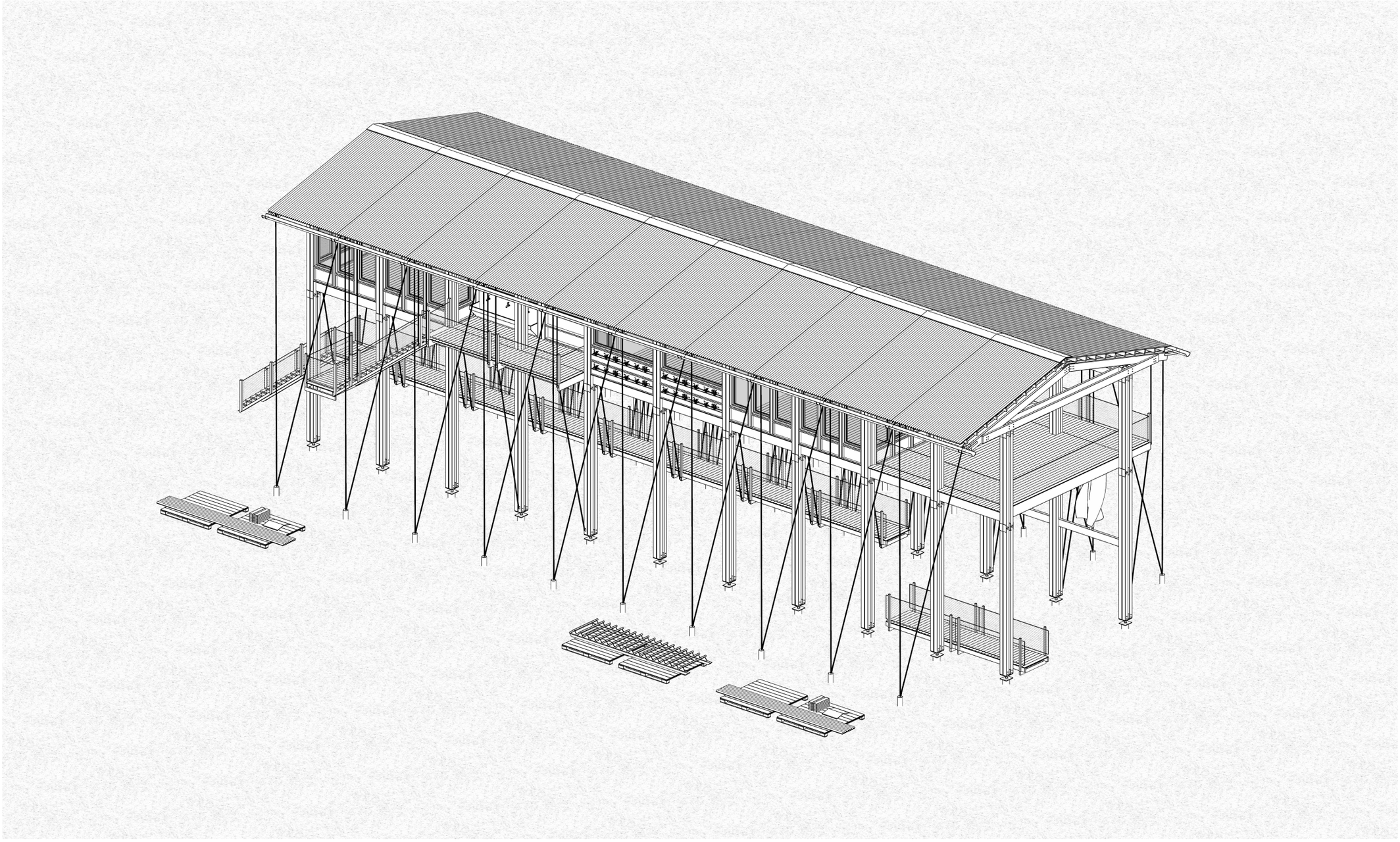


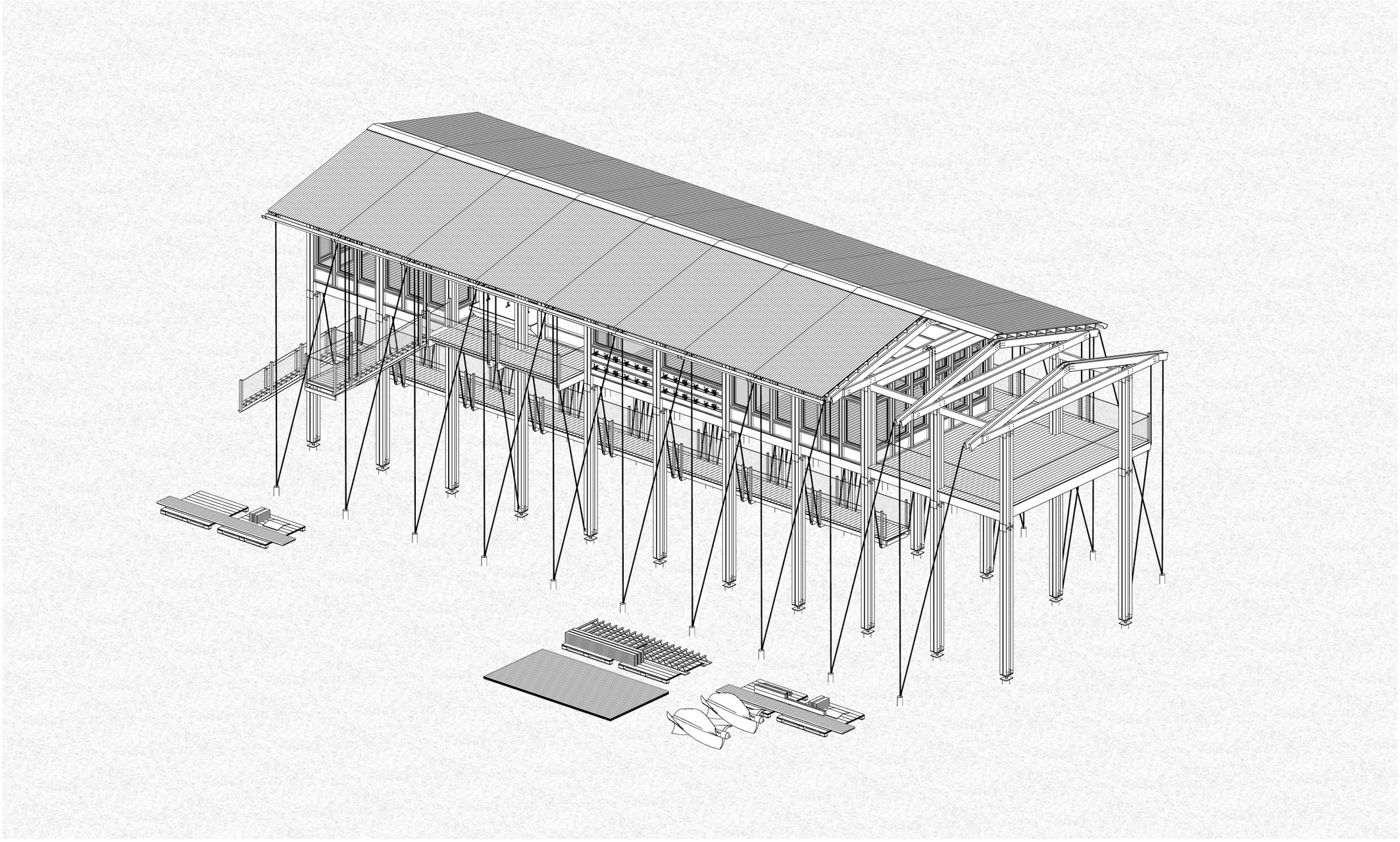
STRUCTURE
WIND LOAD TRANSFER

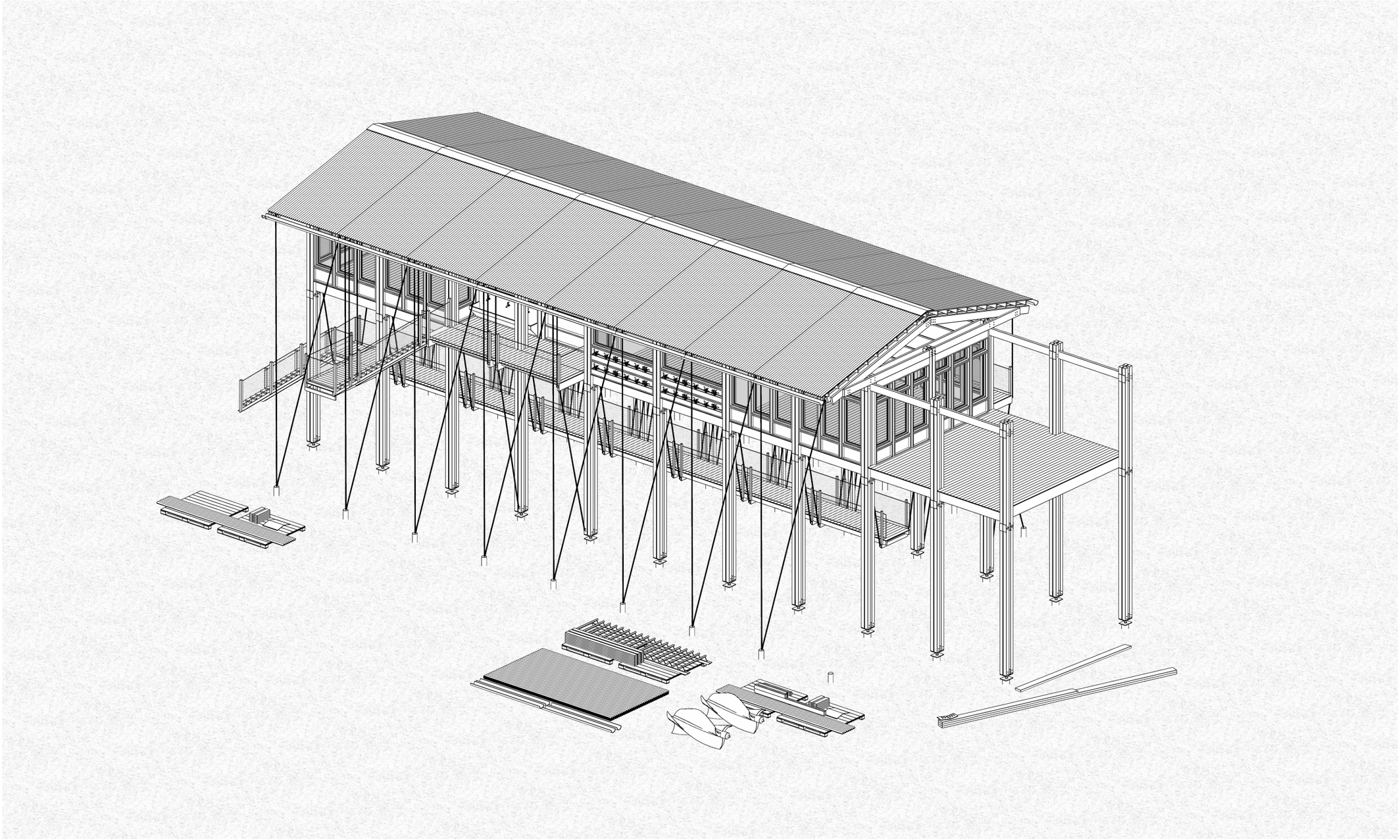


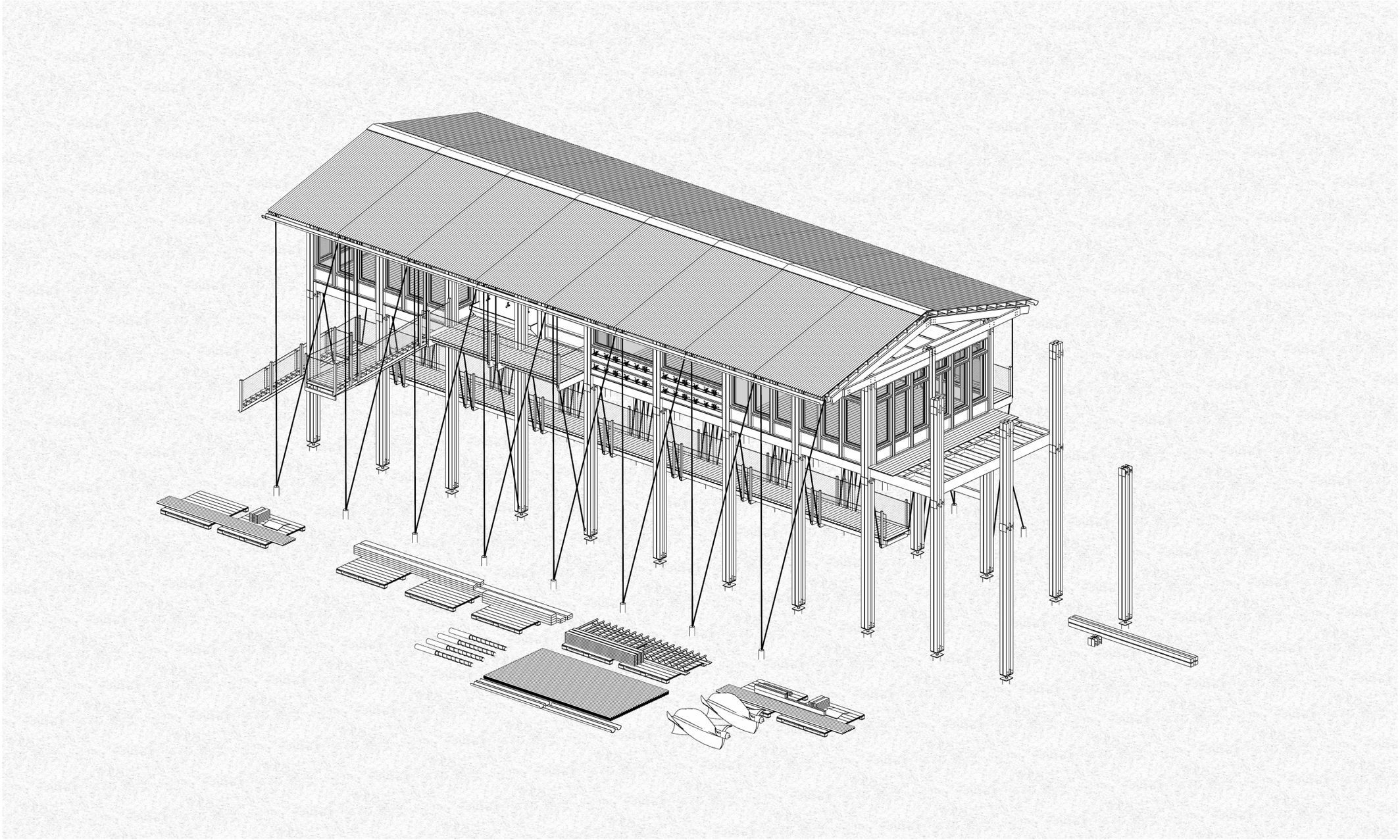


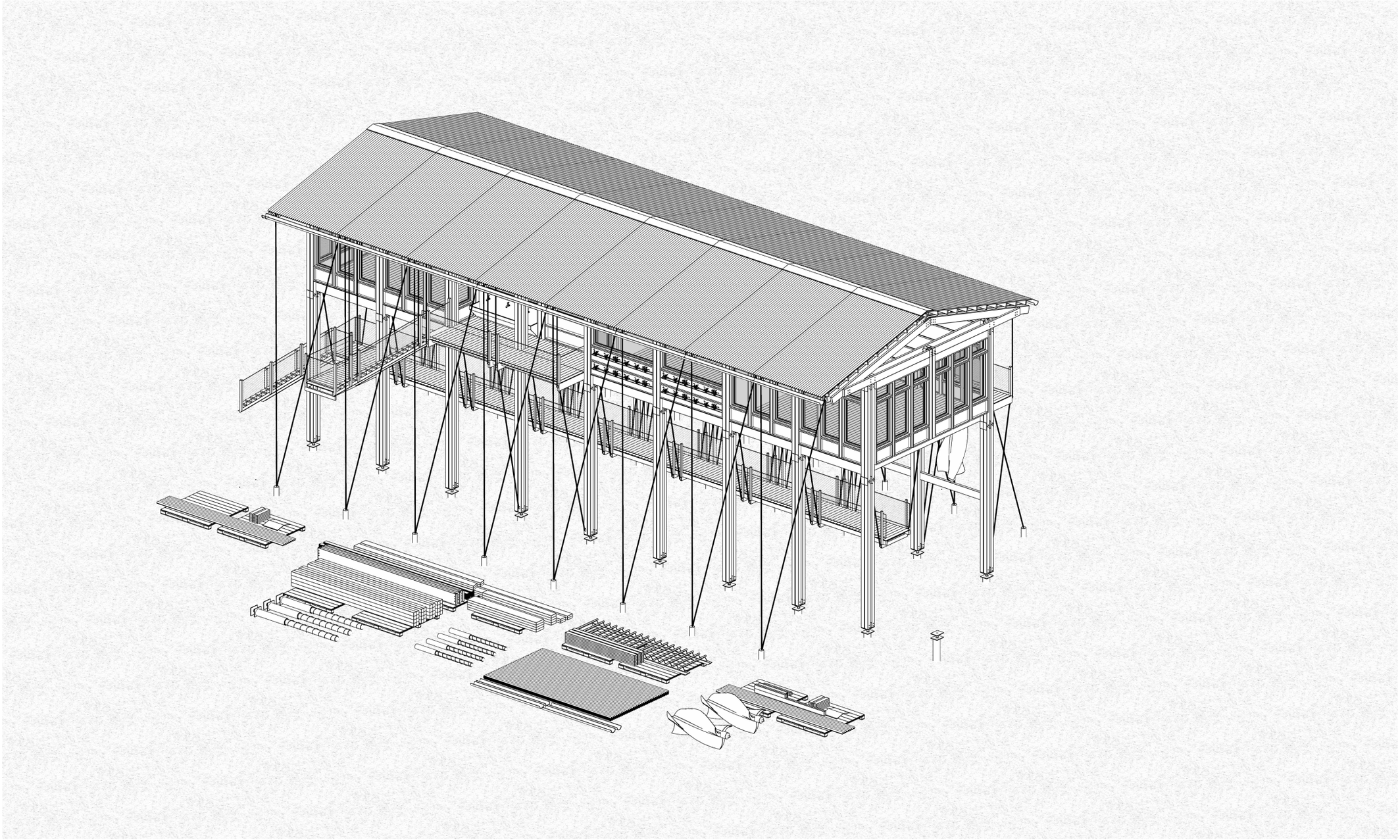


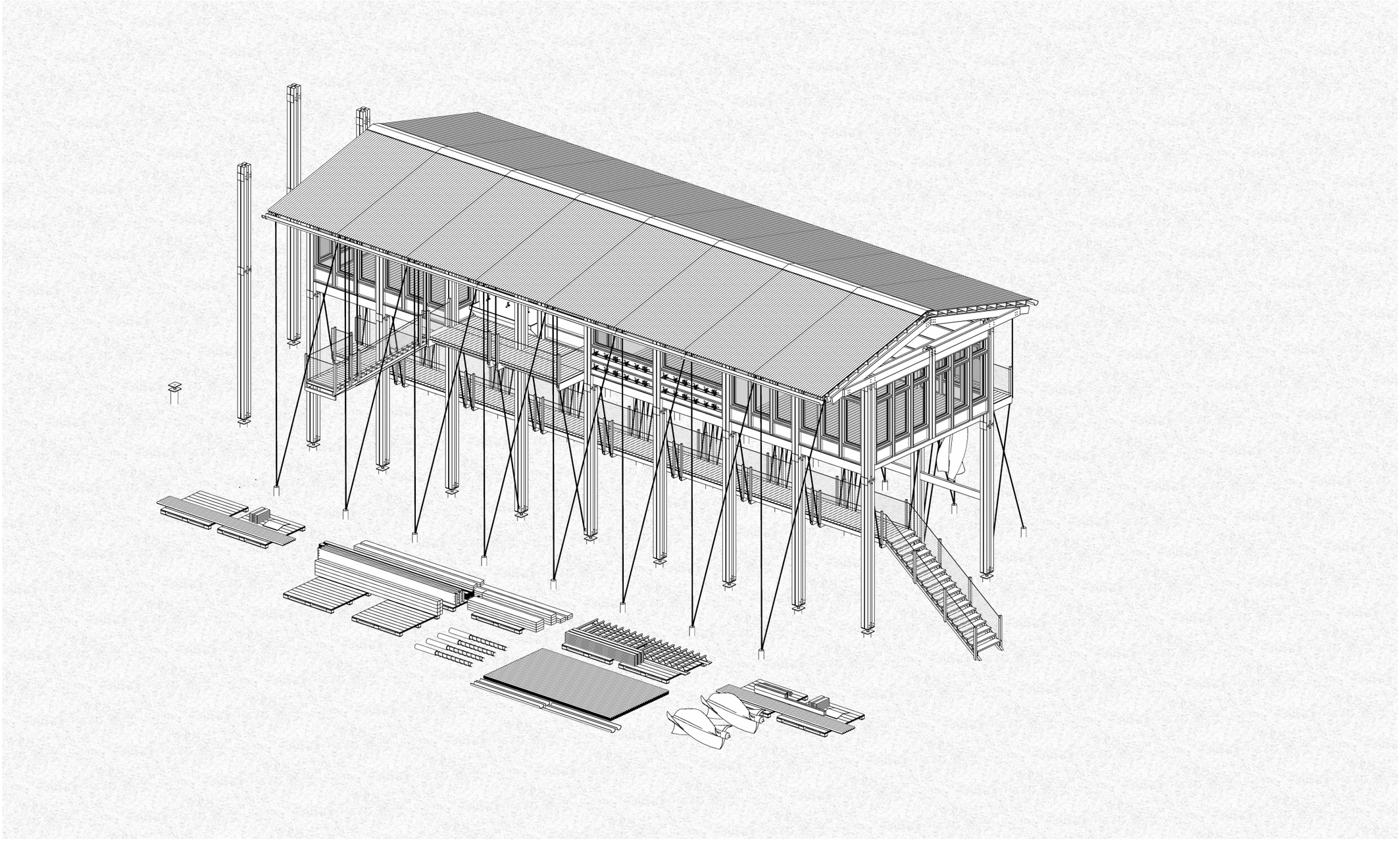


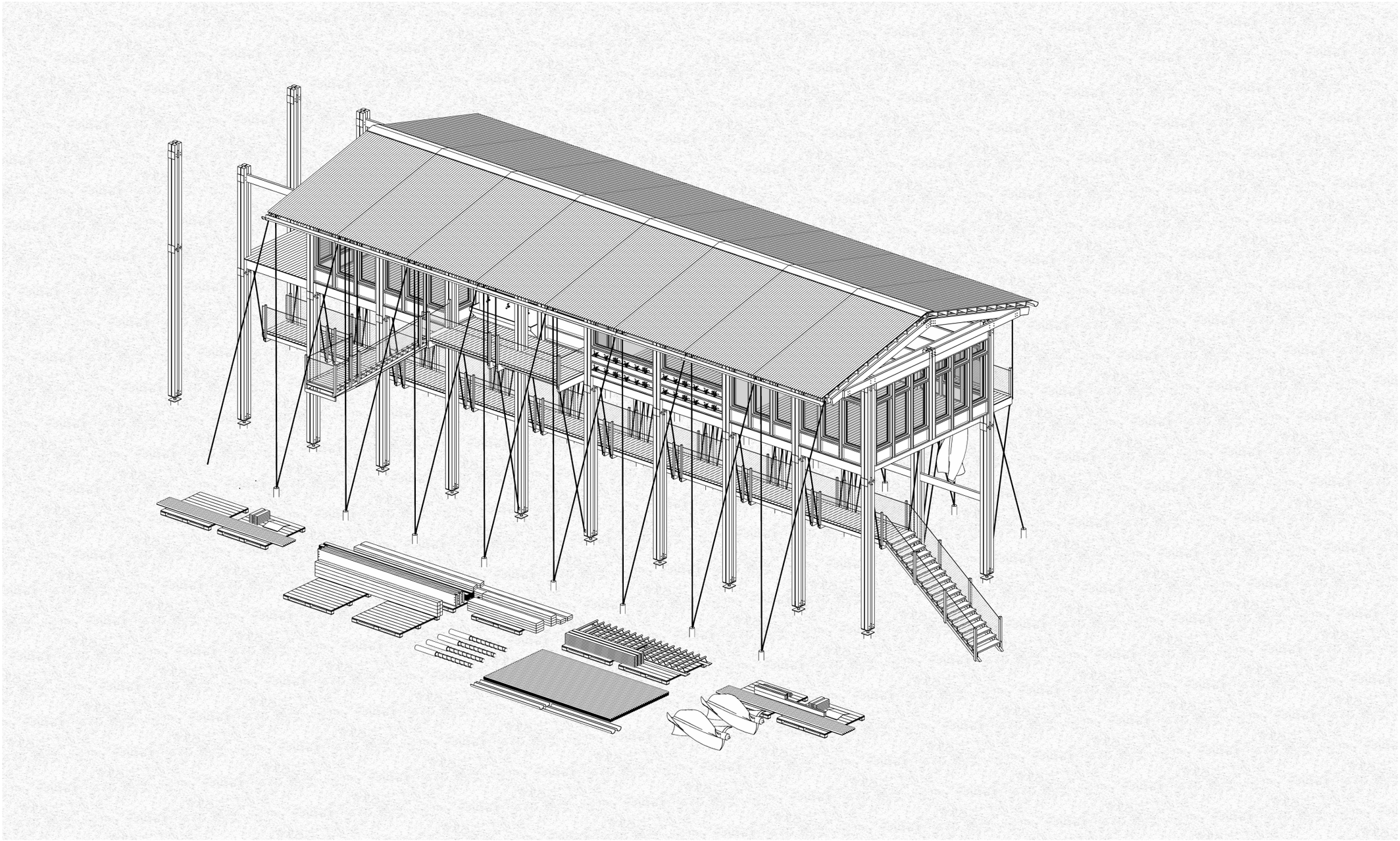


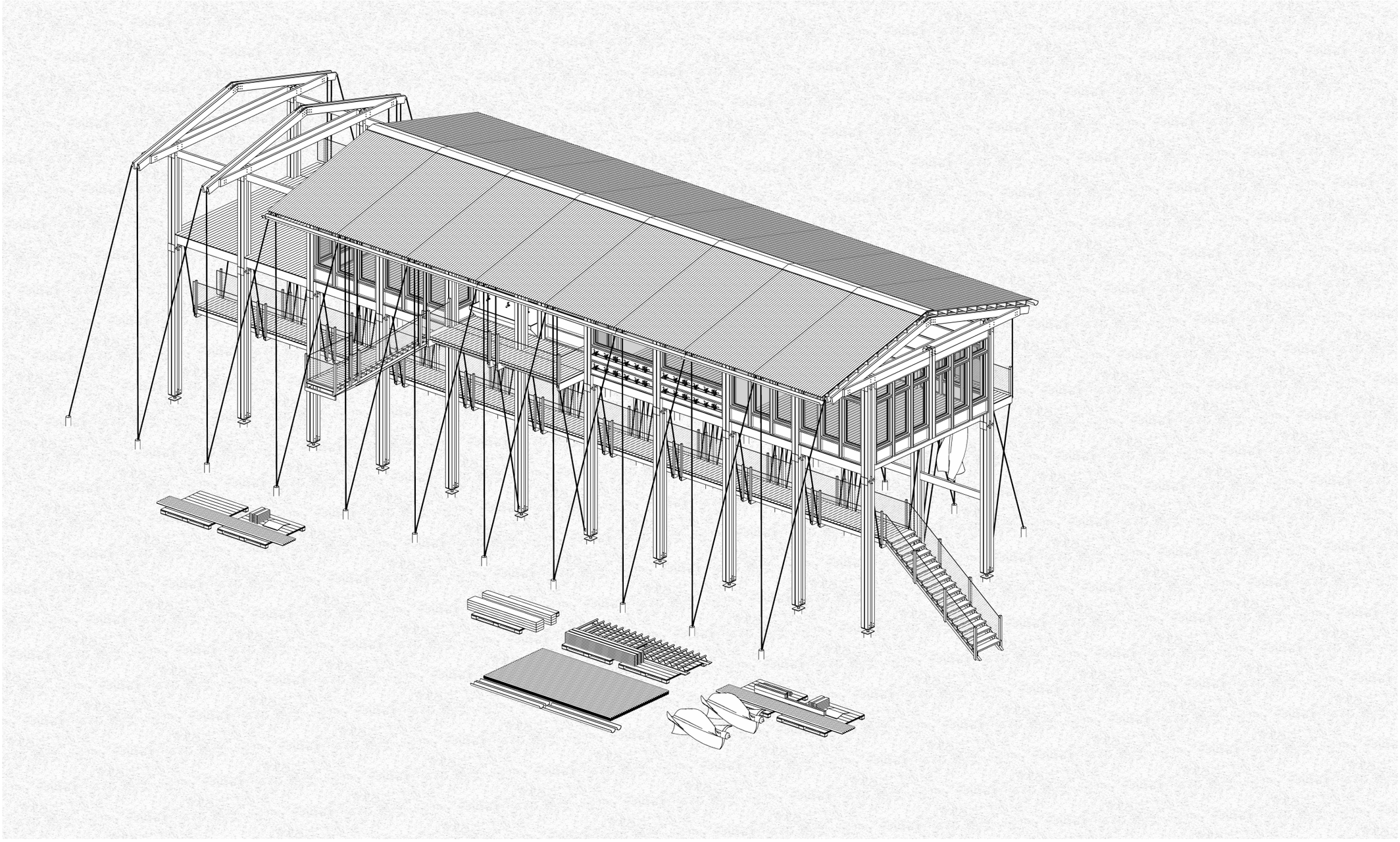


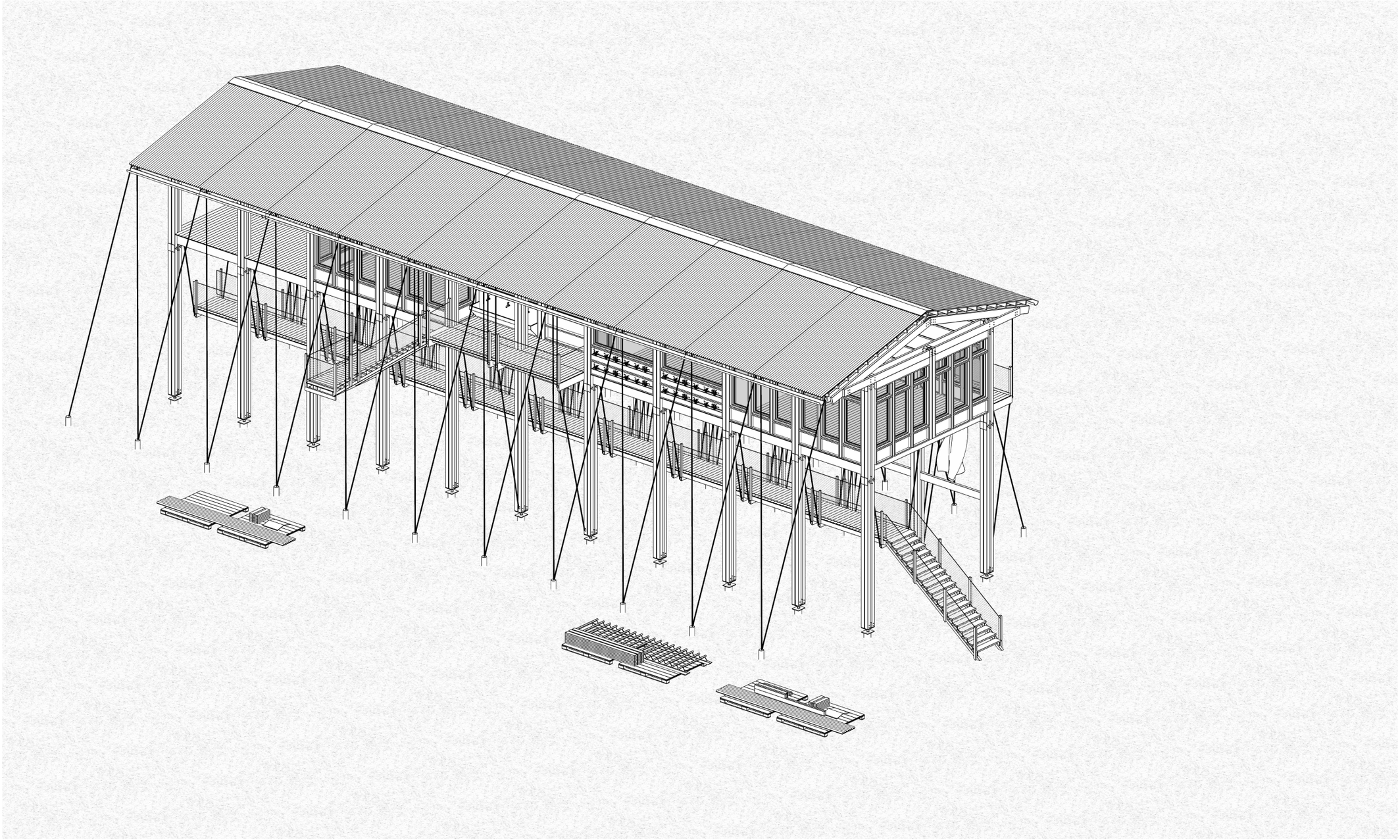


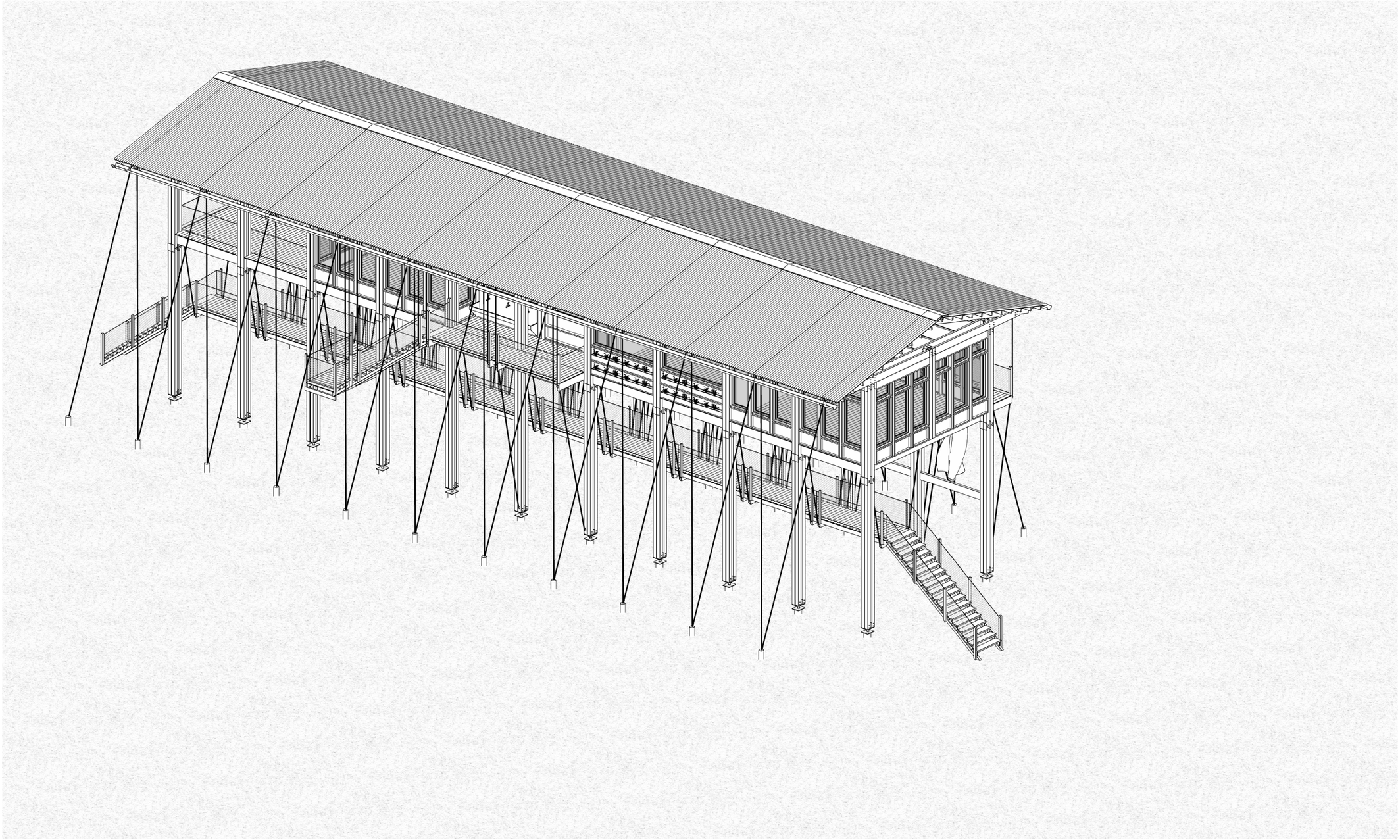




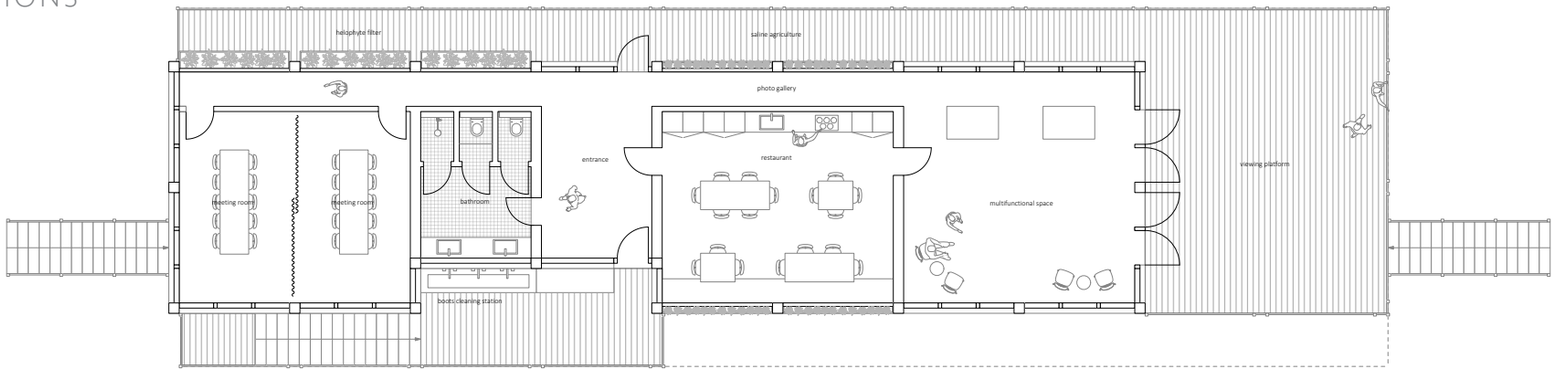


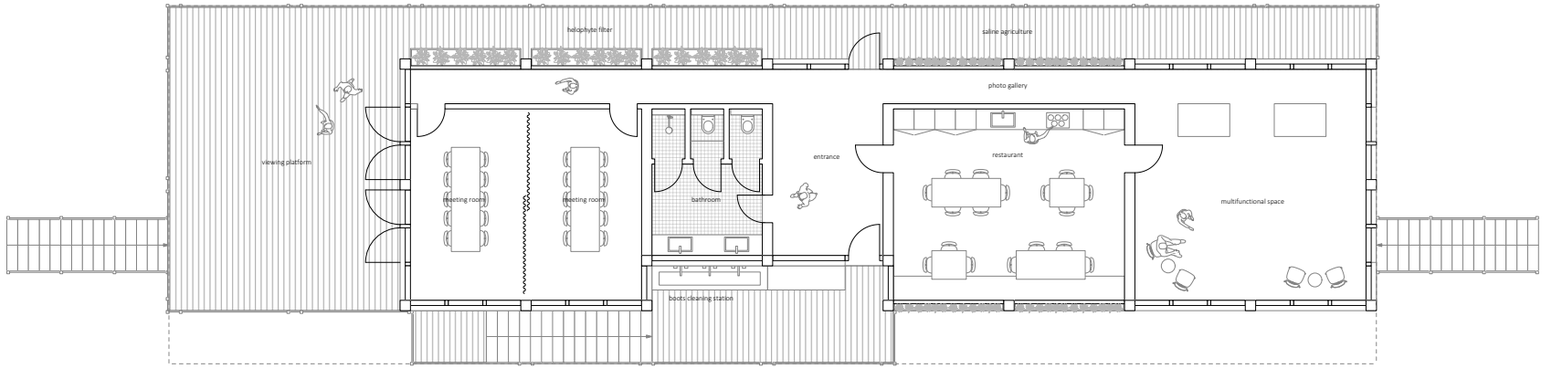


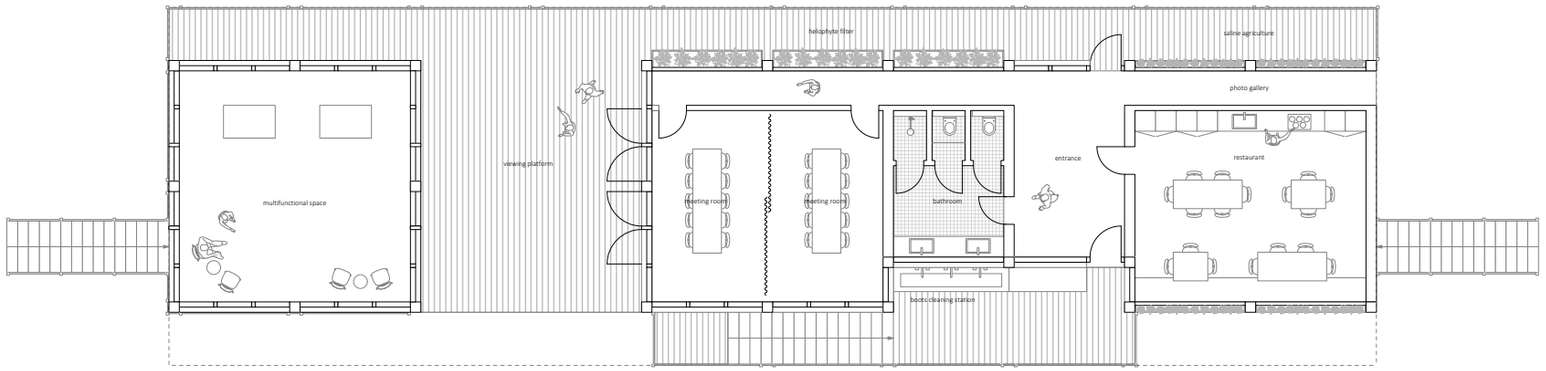




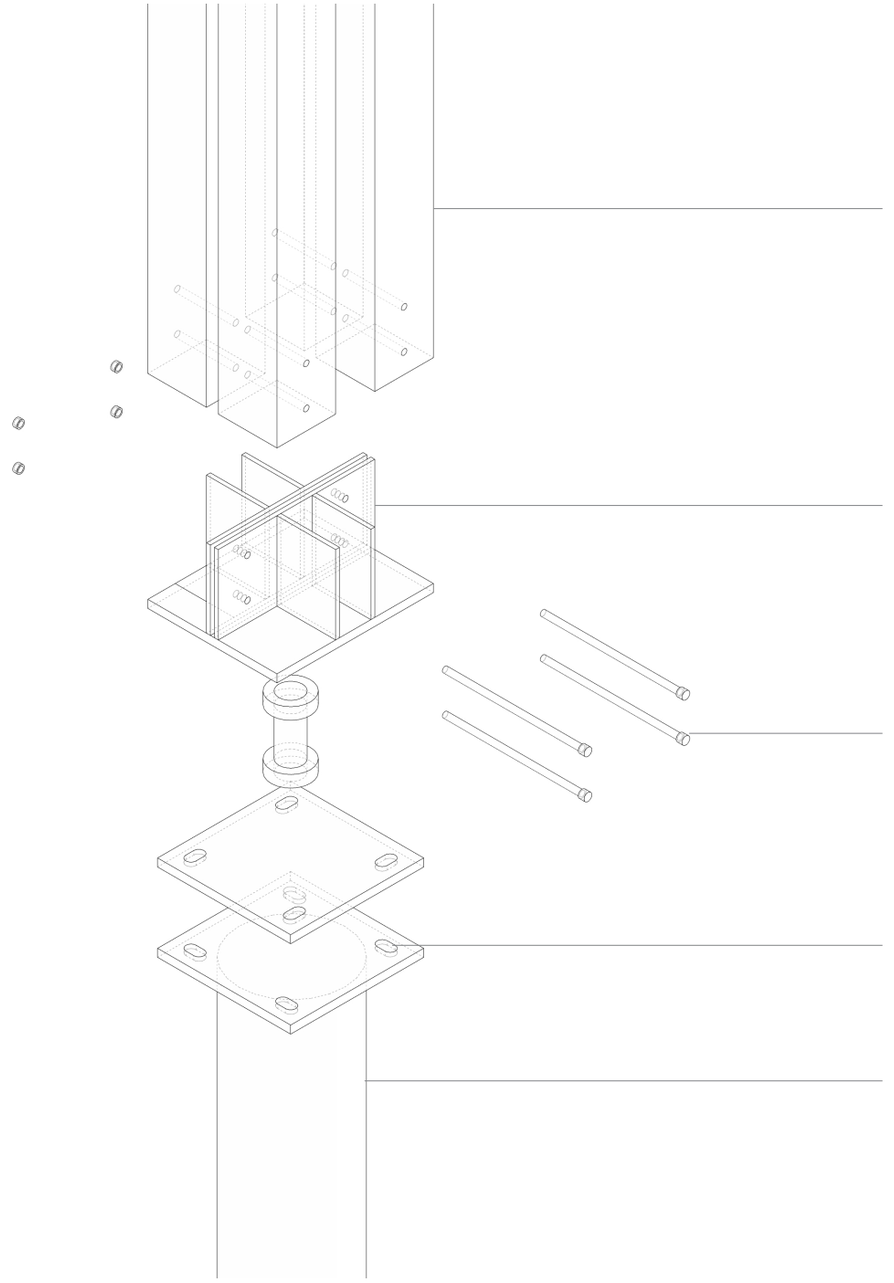
PAVILION
MORE CONFIGURATIONS



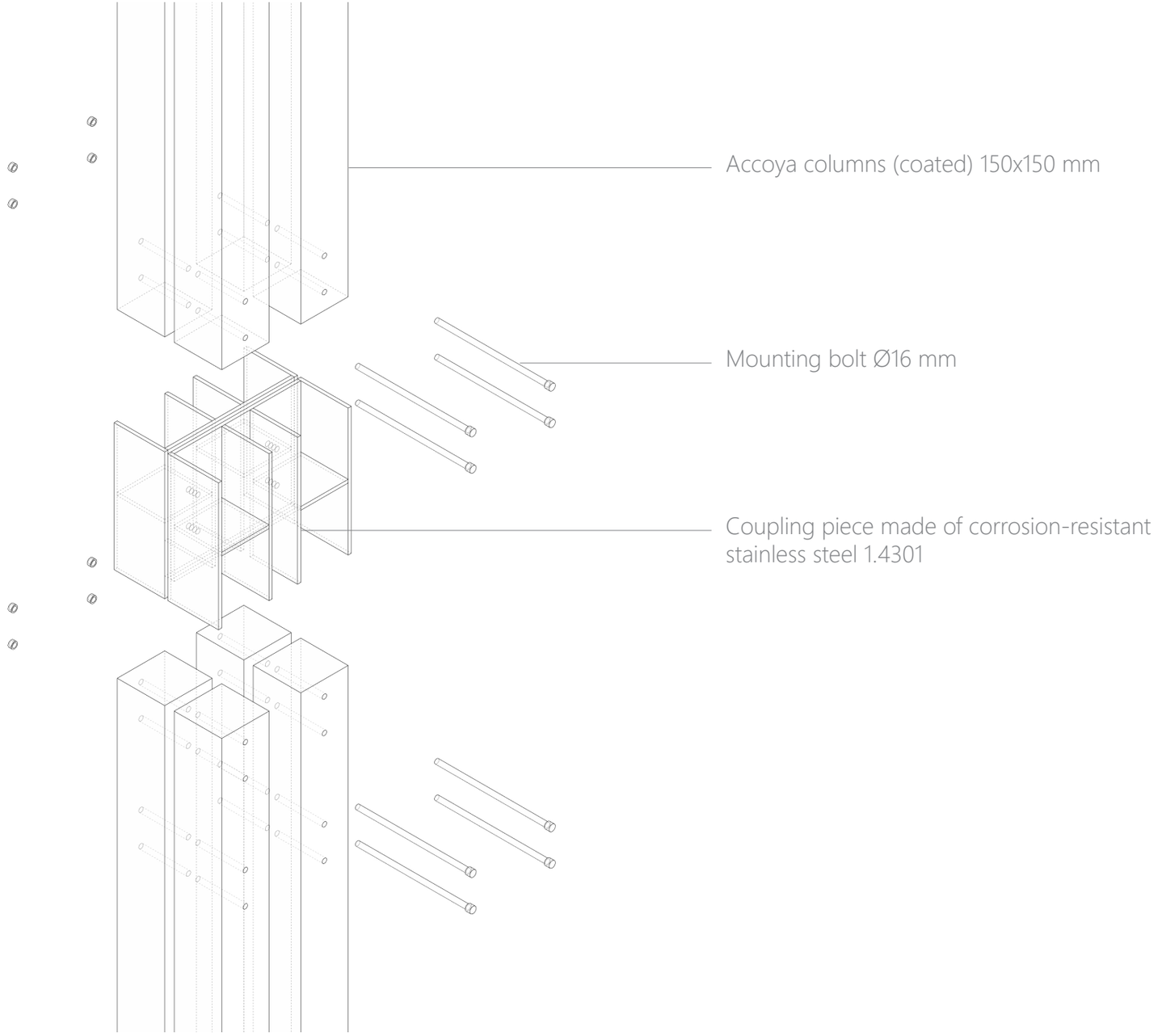




EXPLODED DETAIL
FOUNDATION



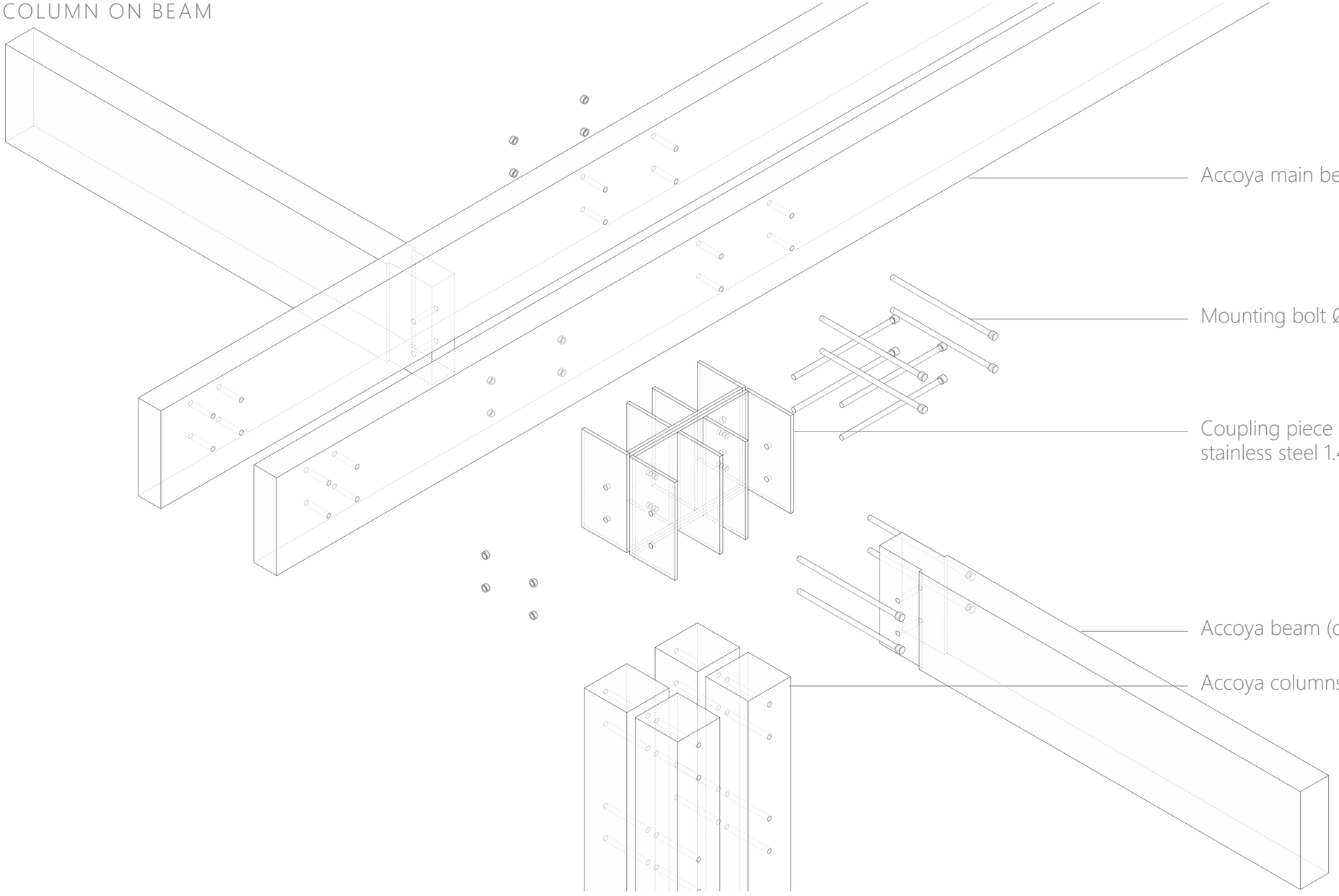
EXPLODED DETAIL
COLUMN



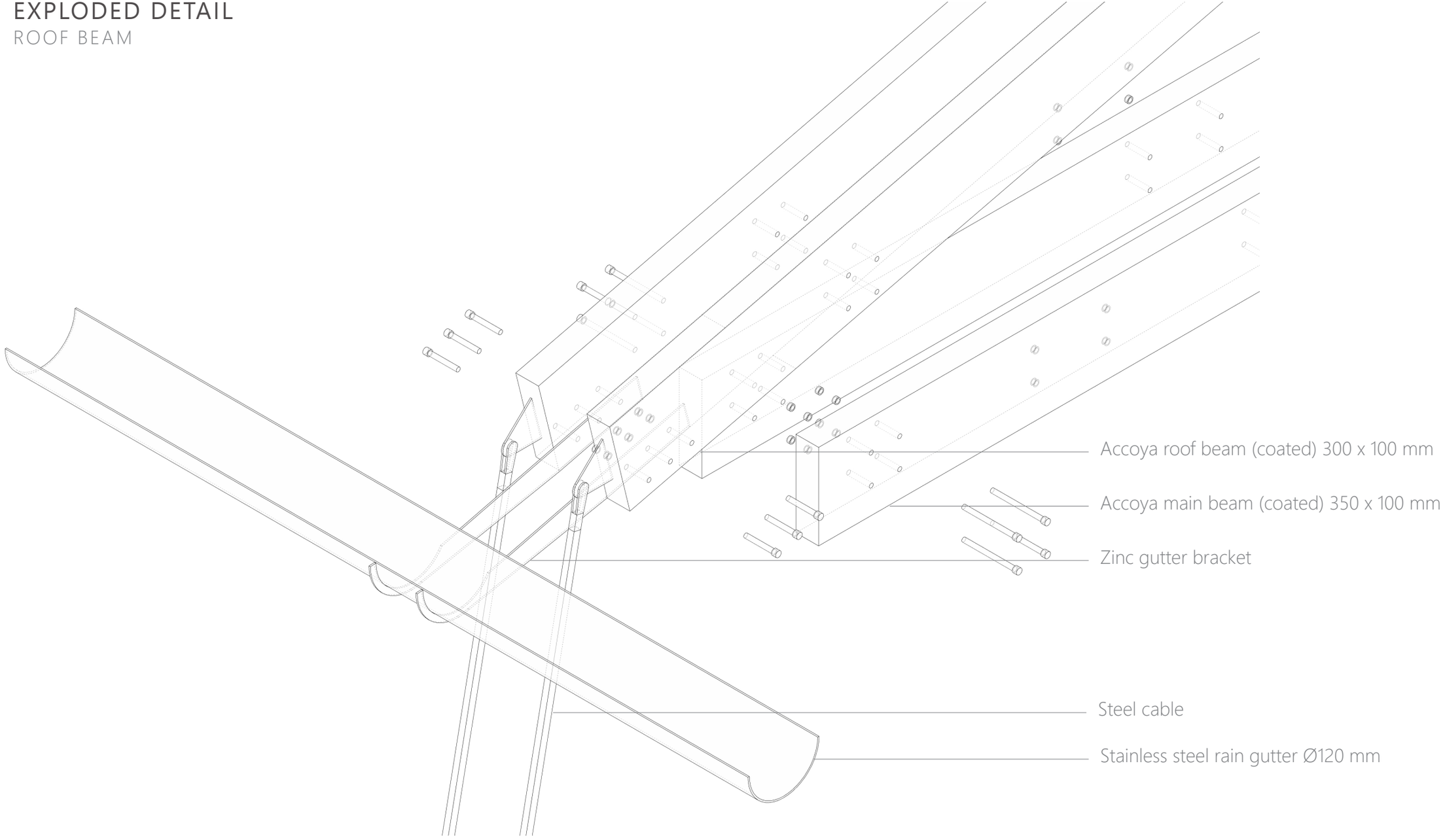


EXPLODED DETAIL

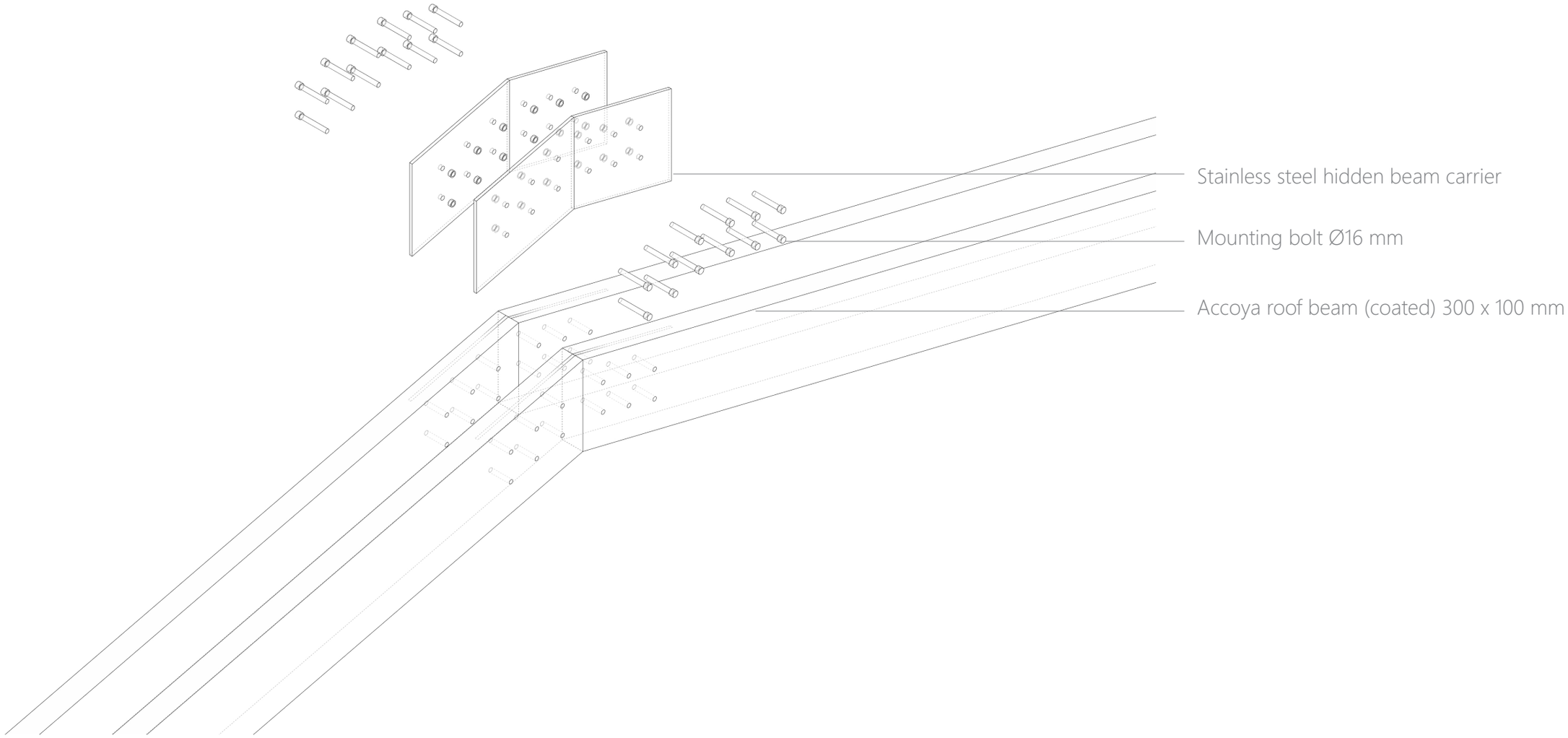
COLUMN ON BEAM



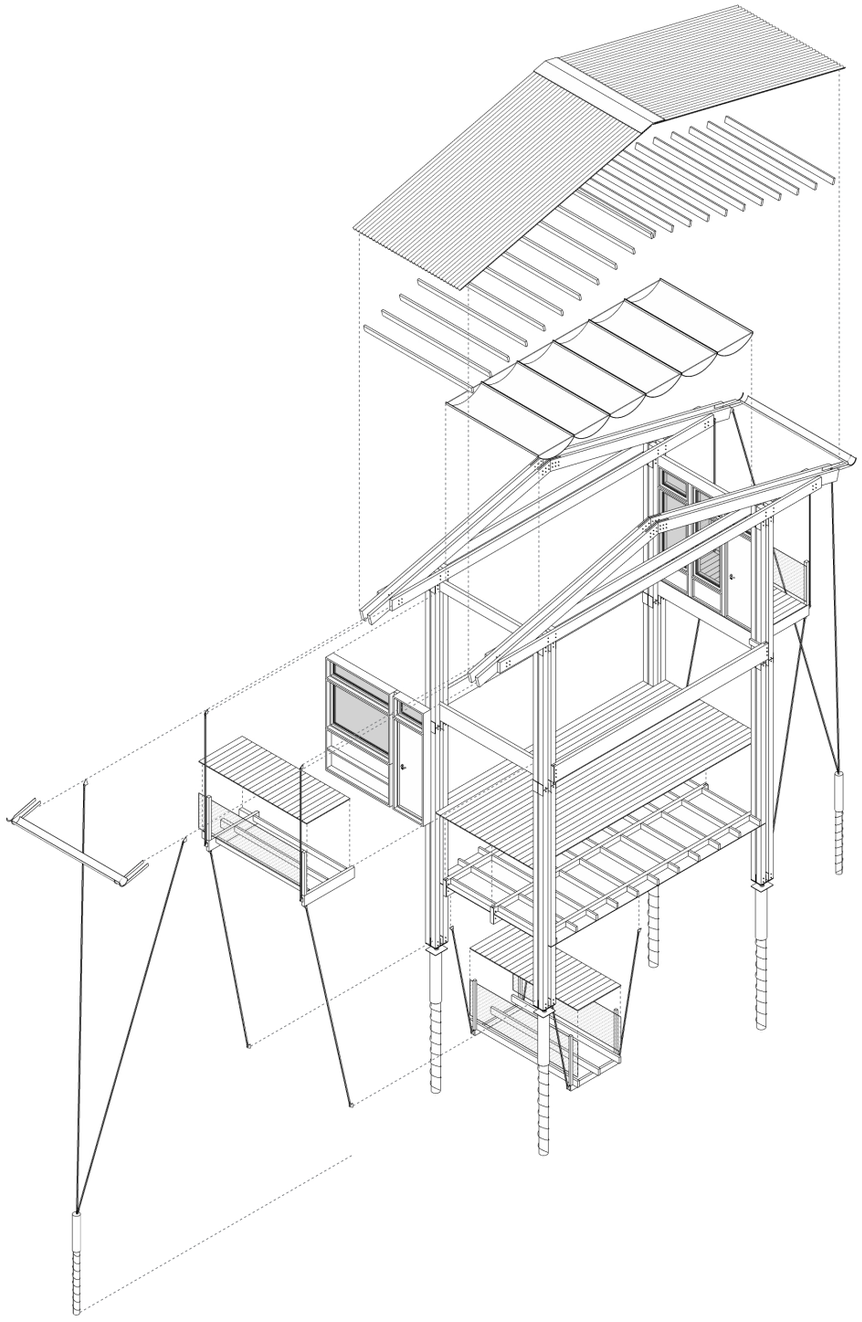
EXPLODED DETAIL
ROOF BEAM



EXPLODED DETAIL
ROOF RIDGE

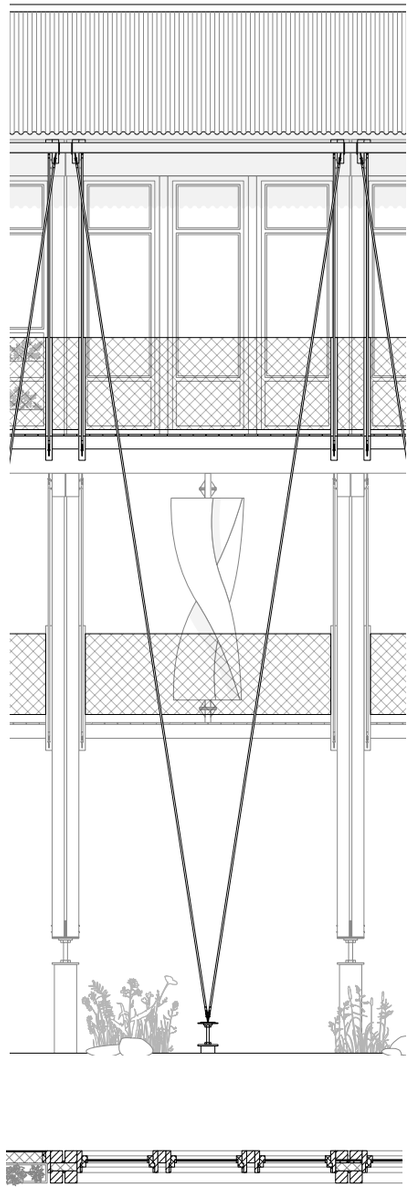


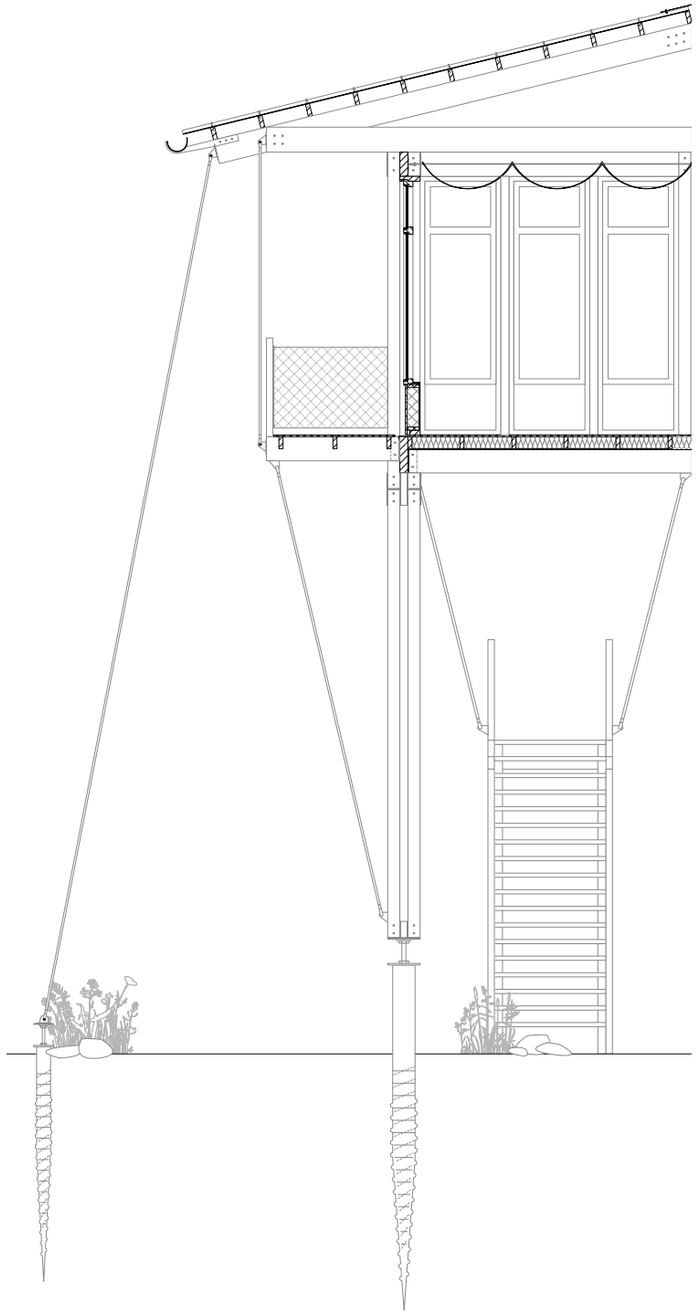
STRUCTURE
EXPLODED FRAGMENT



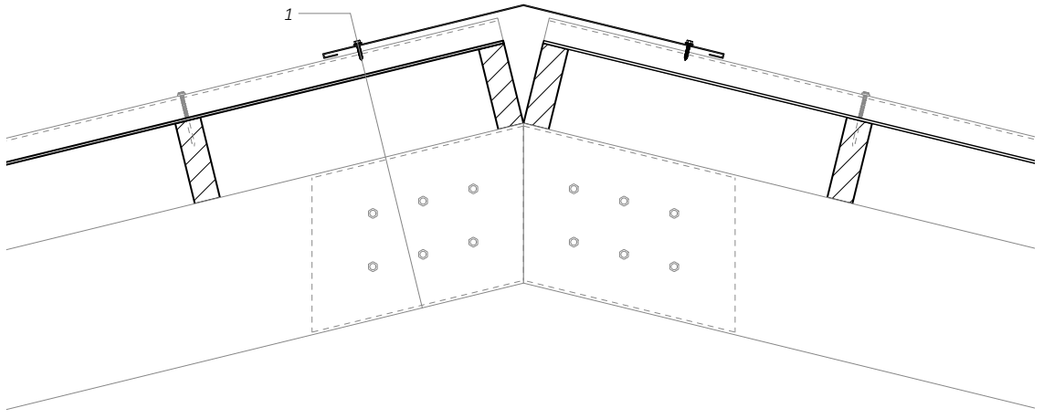
FACADE FRAGMENT

VERTICAL AND HORIZONTAL
SECTION 1:20



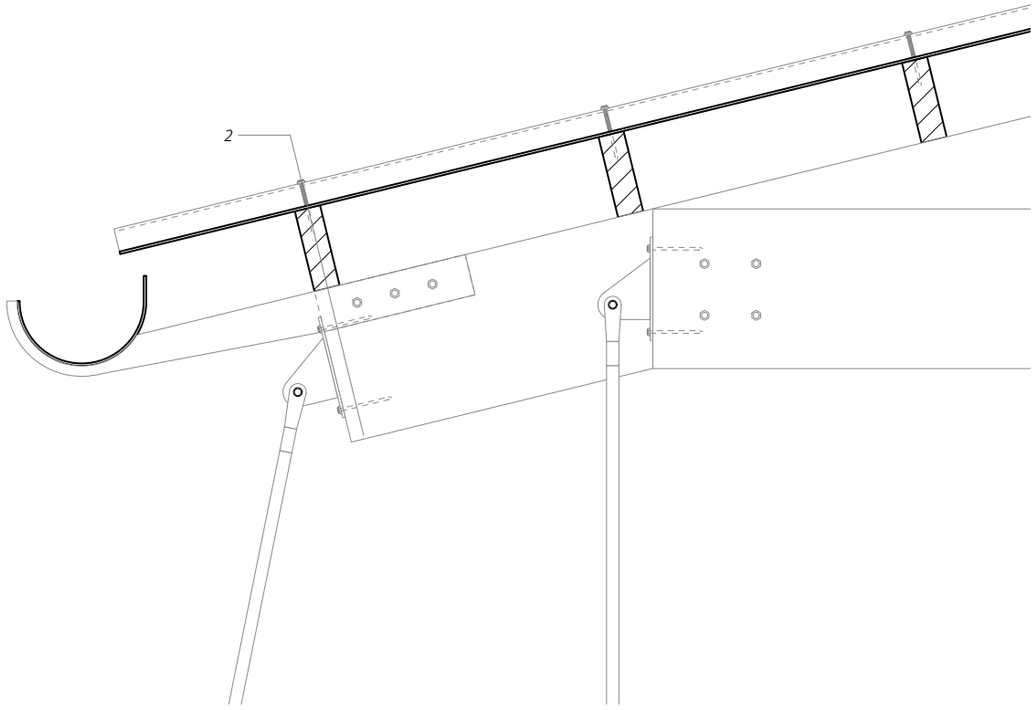


DETAIL
ROOF RIDGE 1:5



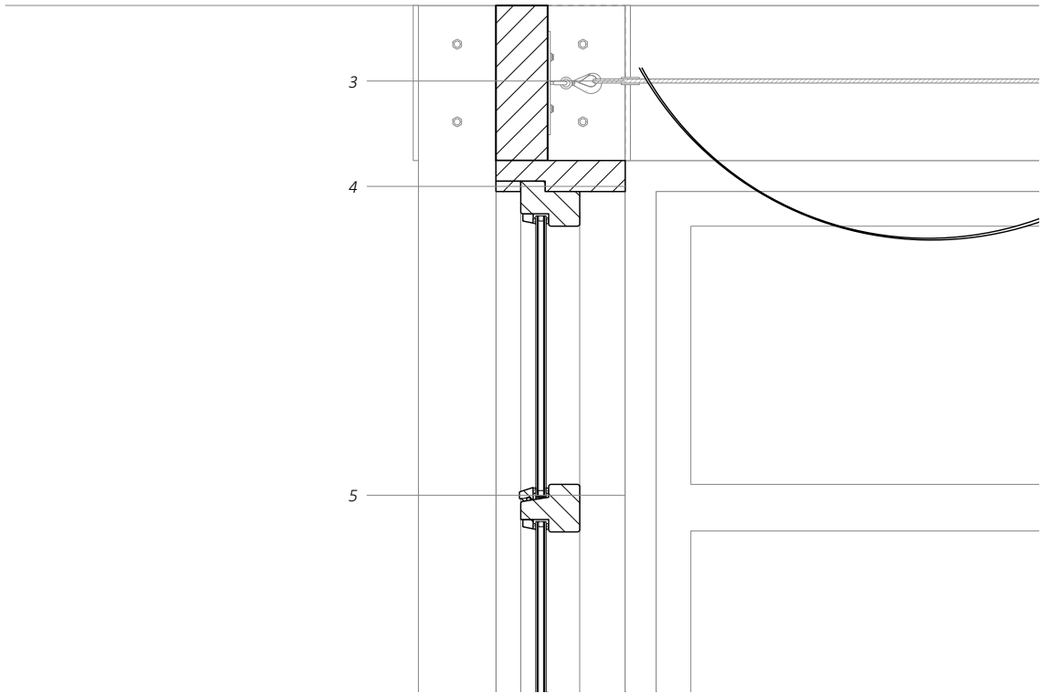
1. Ridge Capping 150° angle (3mm)
   1/4" Panel Lap Self-Drill Screw
   Outside foam closure (set in sealant)
   7/8" corrugated panel
   Wooden beam (Accoya Caïro) (160 x 50 mm)
   Wooden roof beam (300 x 100 mm)
   Invisible steel beam support in ridge

DETAIL
RAIN GUTTER 1:5



2. Wood screw hex head (100 mm)
7/8" corrugated panel
Wooden beam (160 x 50 mm)
Aluminium gutter bracket
Wooden roof beam (300 x 100 mm)

DETAIL
WINDOW FRAME 1:5

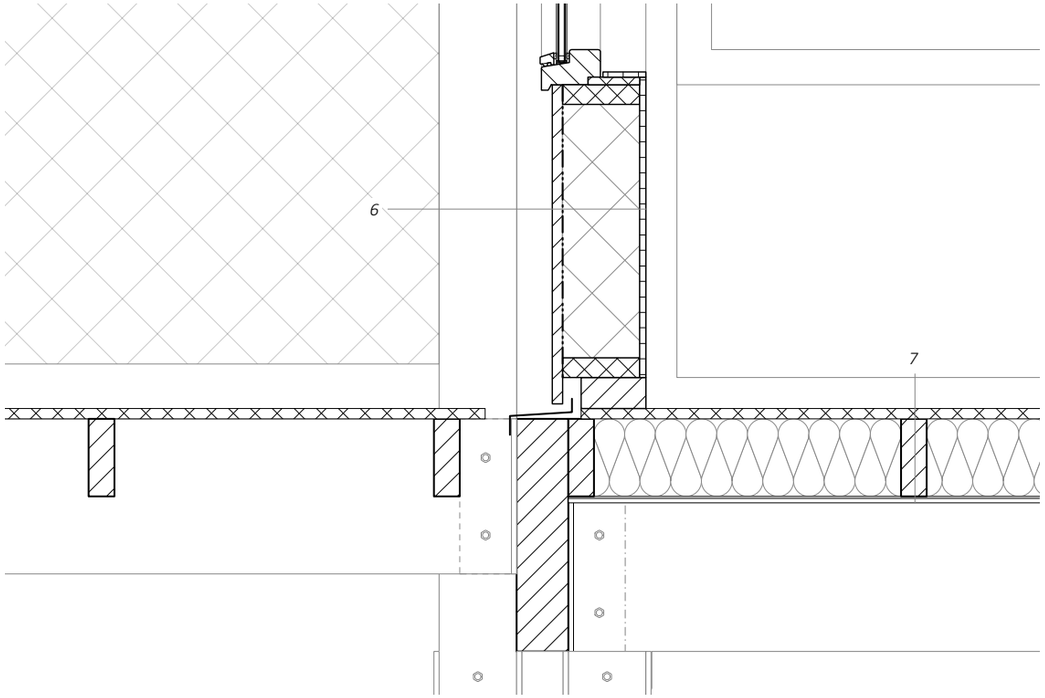


3. Steel connection for demountable construction
Wooden column (150 x 150 mm)
Wooden beam (300 x 100 mm)
Steel cable for hanging canvases

4. Wooden demountable frame (Accoya Caïro)
Wooden windowframe (67 x 114 mm)
Structure in which wooden frame is placed

5. Glazing bead
Top seal (wet)
Support and adjustment blocks
HR++ glass
Wooden window frame (90 x 114 mm)

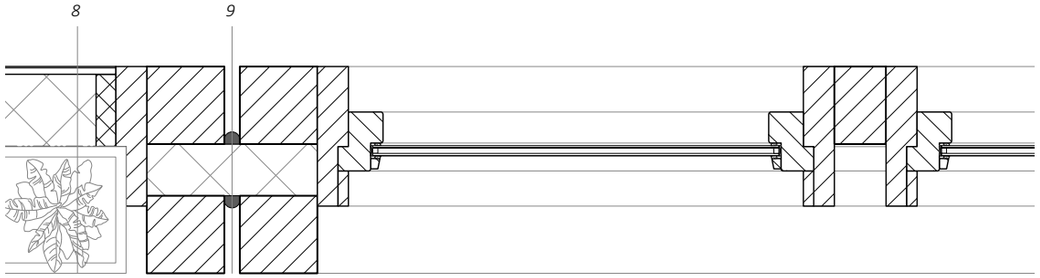
DETAIL
FLOORING 1:5



6. Wooden demountable frame (Accoya Caïro)
Wooden panel (filled with residual wood)
Natural insulation from cattail (150 mm)
Multiplex panel (12.5 mm)

7. Wooden decking board (Lourd Preto)
Natural insulation (cattail) in HSB element
Residual wood as finishing (12.5 mm)

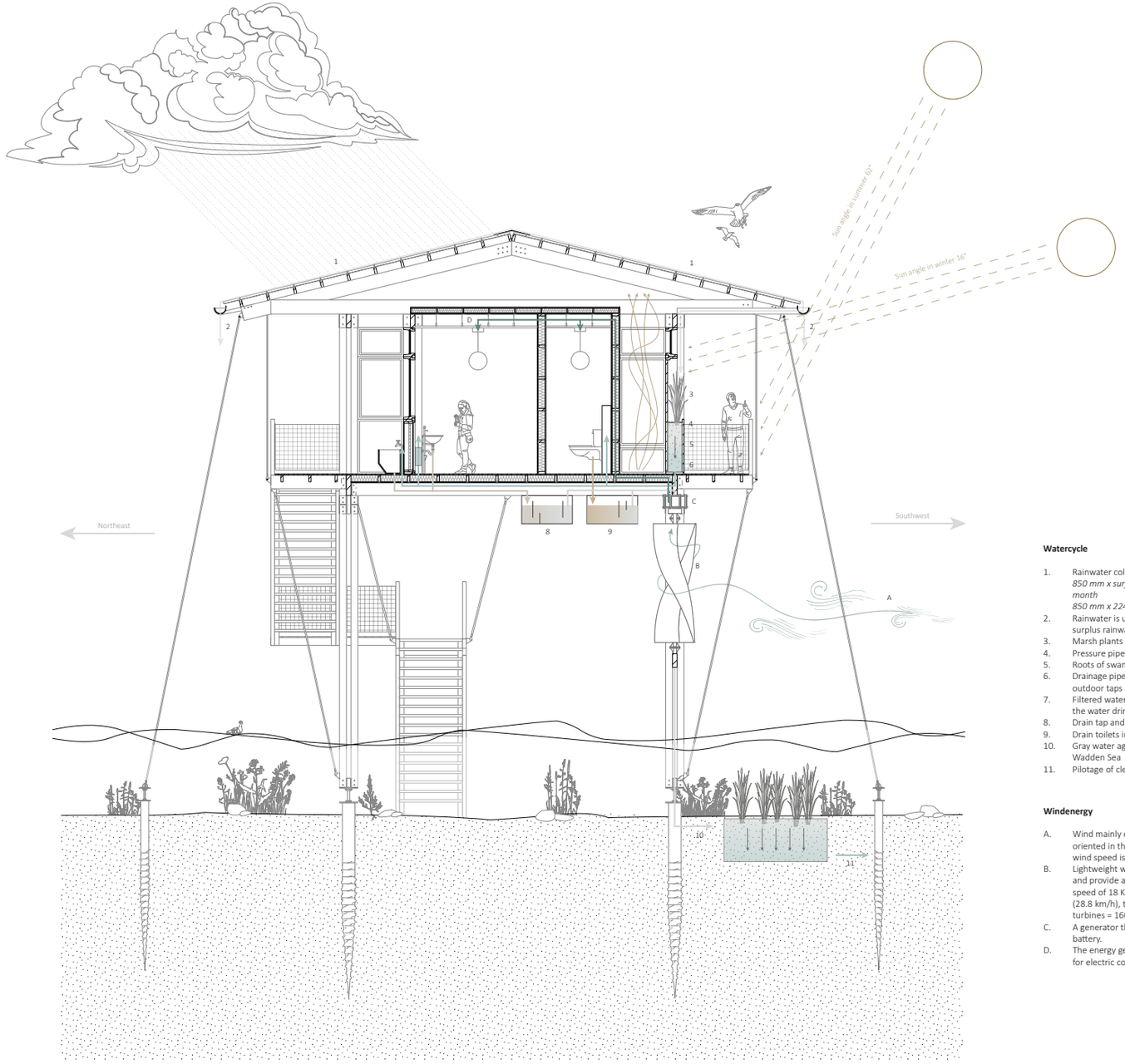
DETAIL
HORIZONTAL WINDOW 1:5



8. Planter with saline agriculture
Wooden finish from residual wood
High-quality insulation
Multiplex (12.5 mm)

9. Wooden column (150 x 150 mm)
Rubber profile for airtightness
High-quality insulation block
Rubber profile for airtightness
Wooden column (150 x 150 mm)

PAVILION
CLIMATE SECTION 1:50



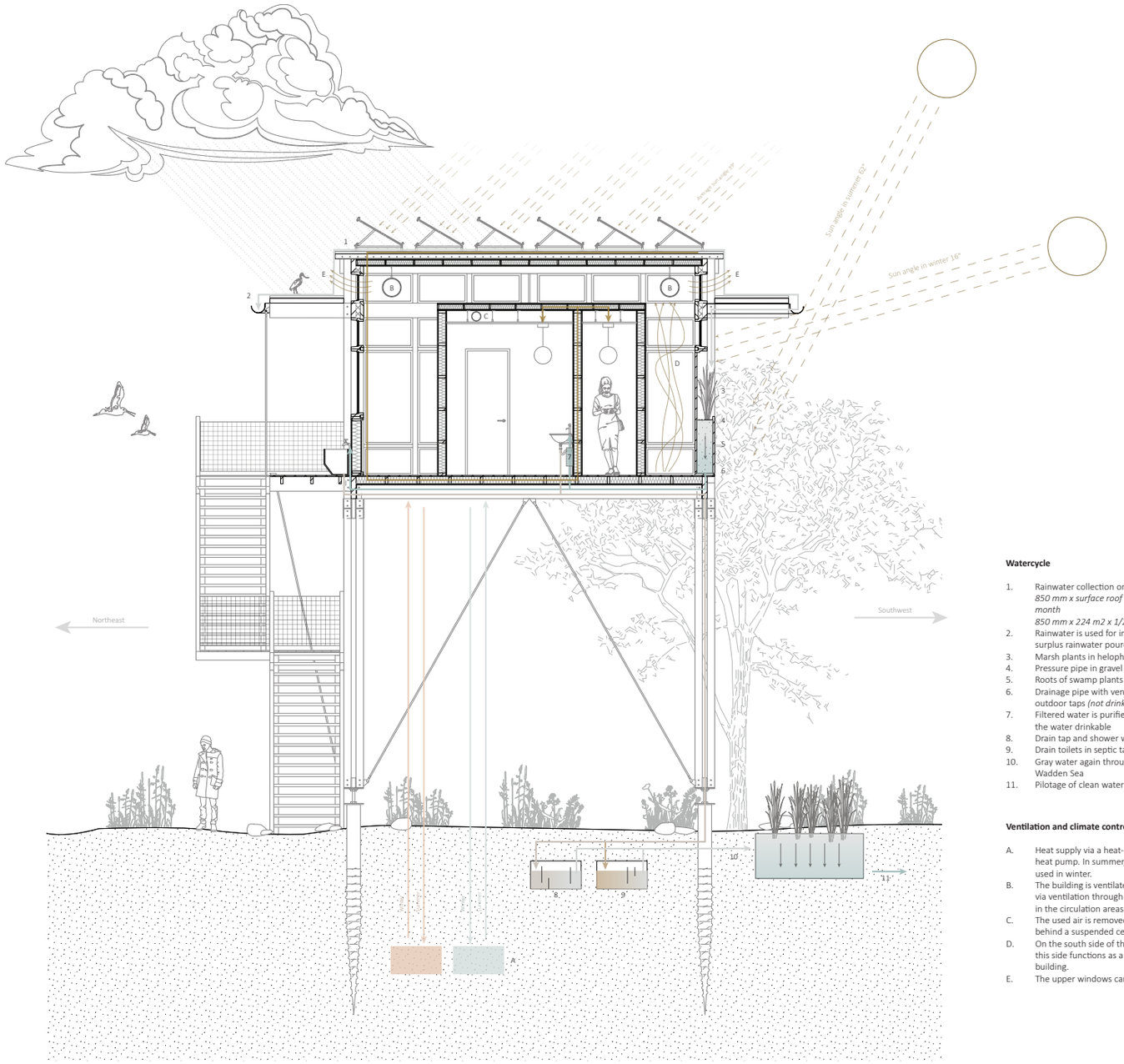
Watercycle

1. Rainwater collection on the roof
   850 mm x surface roof (m2) x downstream factor (1/2) = average yield per month
   850 mm x 224 m2 x 1/2 = 95200 L per month
2. Rainwater is used for irrigation of the saline agriculture in the facade, surplus rainwater poured into the Wadden Sea
3. Marsh plants in helophyte filter (bulrush, rush, sedge and arrowweed)
4. Pressure pipe in gravel bed
5. Roots of swamp plants in a foil container
6. Drainage pipe with venting, after which the water is used for the toilets and outdoor taps *(not drinking water)*
7. Filtered water is purified with membrane filtration using osmosis, making the water drinkable
8. Drain tap and shower water into grease separator
9. Drain toilets in septic tank
10. Gray water again through helophyte filter installed with local plants in the Wadden Sea
11. Pilotage of clean water in the area

Windenergy

A. Wind mainly comes from a south-westerly direction, so the building is oriented in the east-west direction for maximum wind yield. The average wind speed is 8.0 m/s, or 8.0 x 3,6 = 28.8 km/h.
B. Lightweight wind turbines made of cloth. The turbines are 3 meters high, and provide a constance output of 10 Watts per turbine at an average speed of 18 KM/h. Since the wind blows harder on average in this area (28.8 km/h), the output is 16 Watts. The turbines deliver 16 W x 10 wind turbines = 160 W (based on Nils Ferber's design).
C. A generator that generates energy from the wind and then stores it in the battery.
D. The energy generated is used to illuminate the building with LED lamps and for electric cooking.

VISITORS CENTRE
CLIMATE SECTION 1:50



Watercycle

1. Rainwater collection on the roof
   850 mm x surface roof (m2) x downstream factor (1/2) = average yield per month
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6. Drainage pipe with venting, after which the water is used for the toilets and outdoor taps *(not drinking water)*
7. Filtered water is purified with membrane filtration using osmosis, making the water drinkable
8. Drain tap and shower water into grease separator under the ground
9. Drain toilets in septic tank under the ground
10. Gray water again through helophyte filter installed with local plants in the Wadden Sea
11. Pilotage of clean water in the area

Ventilation and climate control

A. Heat supply via a heat-cold storage (WKO), connected to a ground source heat pump. In summer, excess heat is stored in the ground so that it can be used in winter.
B. The building is ventilated with ventilation type D, and is heated and cooled via ventilation through an air handling unit (LBK). The air supply takes place in the circulation areas.
C. The used air is removed in the toilets. The supply is visible, the discharge is behind a suspended ceiling.
D. On the south side of the building, the corridor is heated in winter because this side functions as a climate facade. This extra heat is used to heat the building.
E. The upper windows can be opened to remove excess heat in summer.

IMPRESSIONS

IMPRESSION

MUD FLAT HIKING TO THE PAVILION



1. https://www.reisroutes.be/blog/zeeland-nederland/verdronk-en-land-van-saeftinghe-bezoeken/

IMPRESSION
ARRIVAL AT PAVILION



IMPRESSION
GOING TO THE WALKWAY



IMPRESSION
ENTRANCE OF THE PAVILION



IMPRESSION
INTERIOR OF THE PAVILION







THANK YOU

ANY QUESTIONS?

