P5 Maximilian Loeschke
explore lab graduation studio
27.06.2025

The Fragile Mountain

dynamics

e ▸ Ausland ▸ Europa ▸ Bröckelnder Berg in der Schweiz löst Gletschersturz aus



Schweizer Kanton Wallis

Bröckelnder Berg löst Gletschersturz aus

dynamics

Huge rockfall in Tyrol near the Zugspitze

Nachrichten | 04.08.2024 15:19



The massive rockfall occurred on Saturday evening. (Bild: Bergrettung Ehrwald)

dynamics

08.11.2024 | 11:17 | BAUBRANCHE

NEWS

Mehr Nassschneelawinen wegen Klimawandel

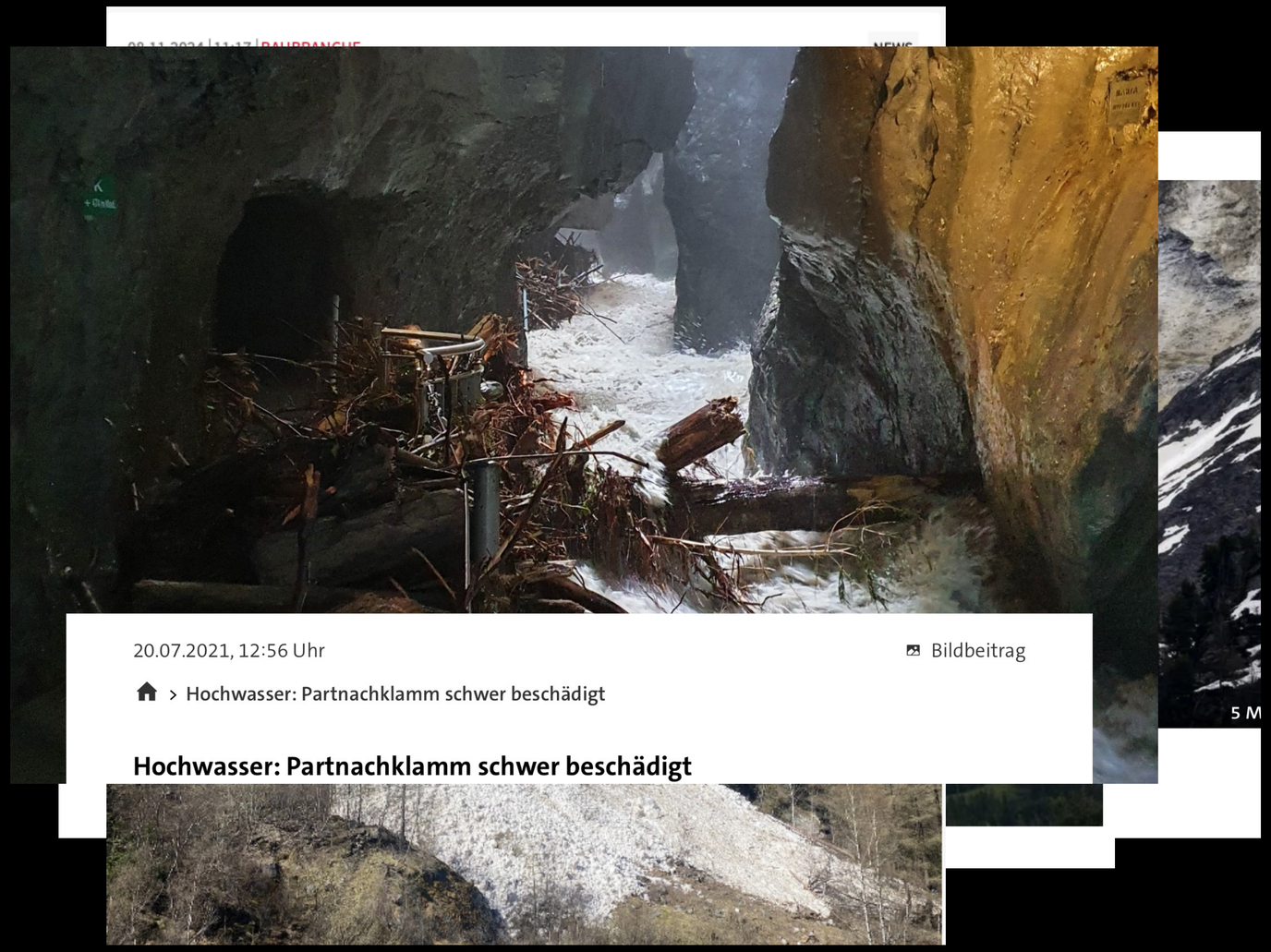
Teaserbild-Quelle: U. Andermatten

Zwar sinkt die Zahl trockener Lawinen im Zuge des Klimawandels. Aber jene der Nassschneelawinen wird zunehmen - und damit stellen sich für Skigebiete und Lawinendienste neue Herausforderungen. Das zeigt eine Untersuchung des WSL-Instistuts für Schnee- und Lawinenforschung.





dynamics



20.07.2021, 12:56 Uhr

Bildbeitrag

> Hochwasser: Partnachklamm schwer beschädigt

Hochwasser: Partnachklamm schwer beschädigt

dynamics

Kleiner Bach wird zu reißendem Strom: Alm massiv von Hochwasser betroffen – riesiger Sachschaden

22.07.2021, 05:17 Uhr
Von: Tanja Brinkmann

Kommentare Drucken Teilen



Die Gebäude zu sichern, darauf hat zunächst der Fokus der Helfer gelegen. © privat

The Fragile Mountain

nature vs. human



nature vs. human



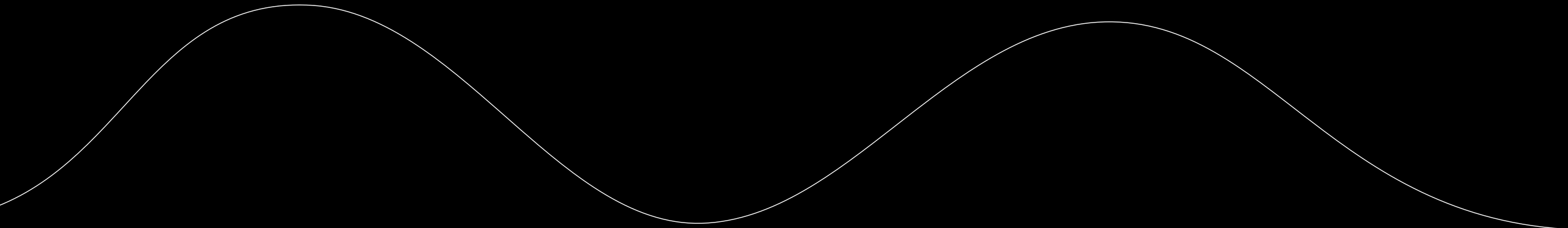
nature vs. human



research question

*How can design reveal the **fragility** of a mountain to support a deeper understanding of the **relationship** between human and natural **dynamics**?*


Munich
Vienna
Zurich
Ljubljana
Lyon
Milan
Venice


erosion in the anthropocene
embracing decay
fragility in deep time
designing sedimentation
experiencing erosion

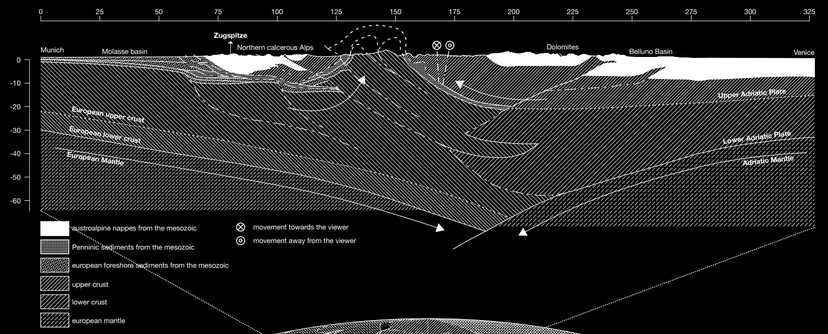
fragility

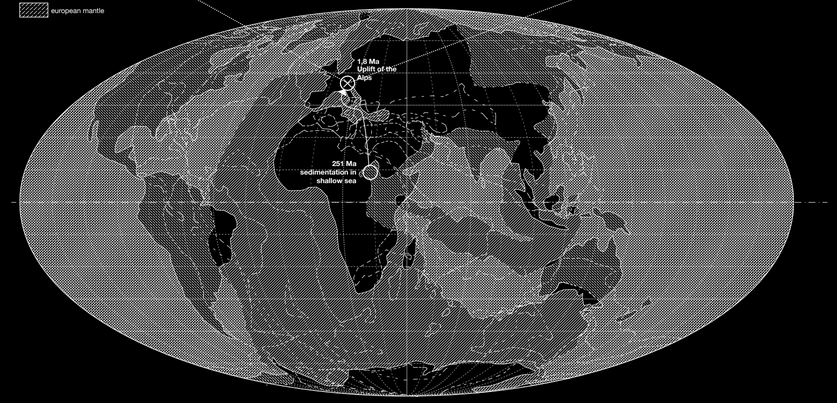
in deep time

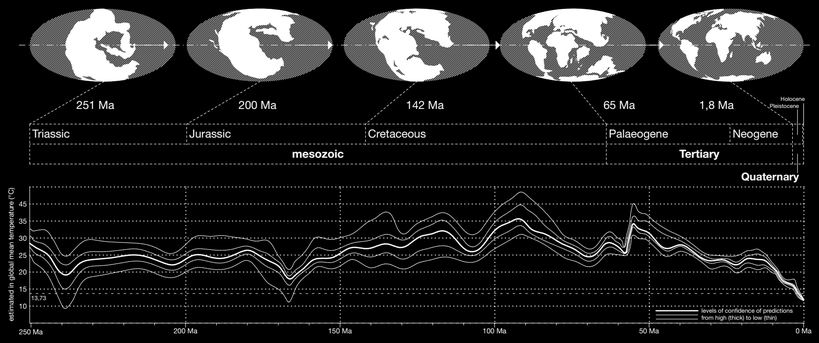
Seen in deep time, things come alive that seemed inert.
New responsibilities declare themselves.
Ice breathes. Rock has tides. Mountains rise and fall.

- Robert Macfarlane

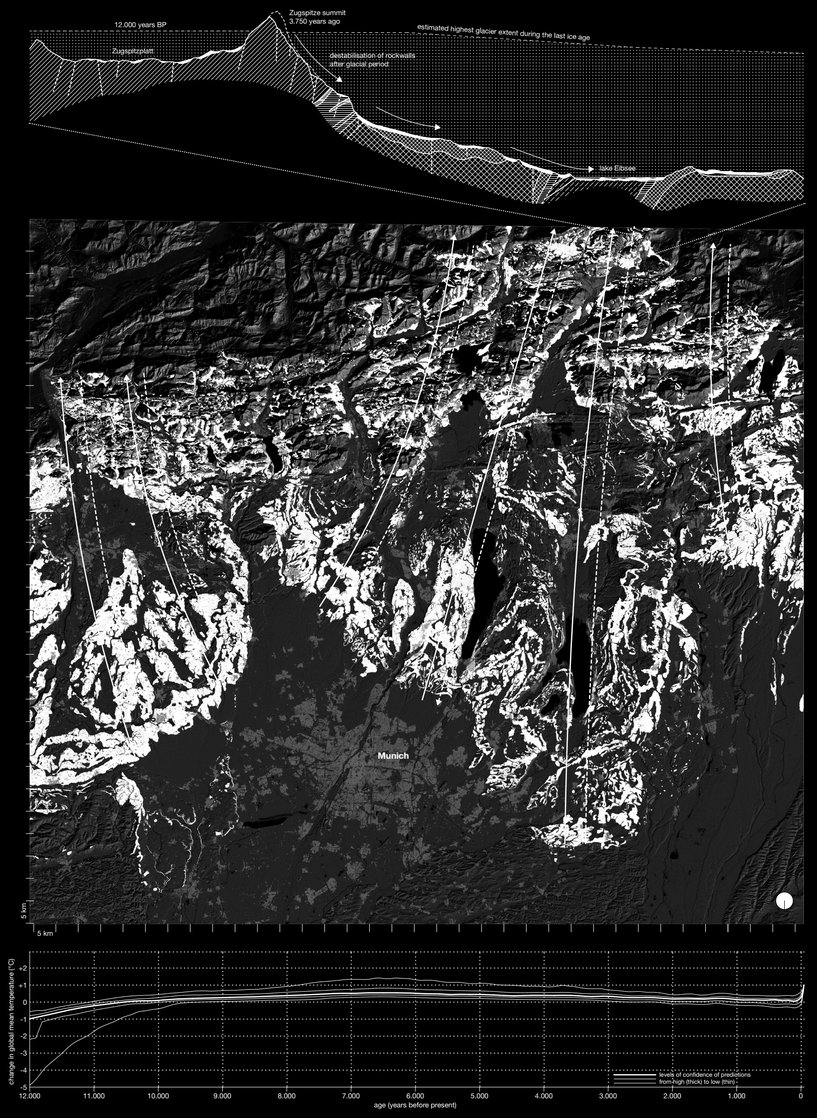
sediments of the orogeny



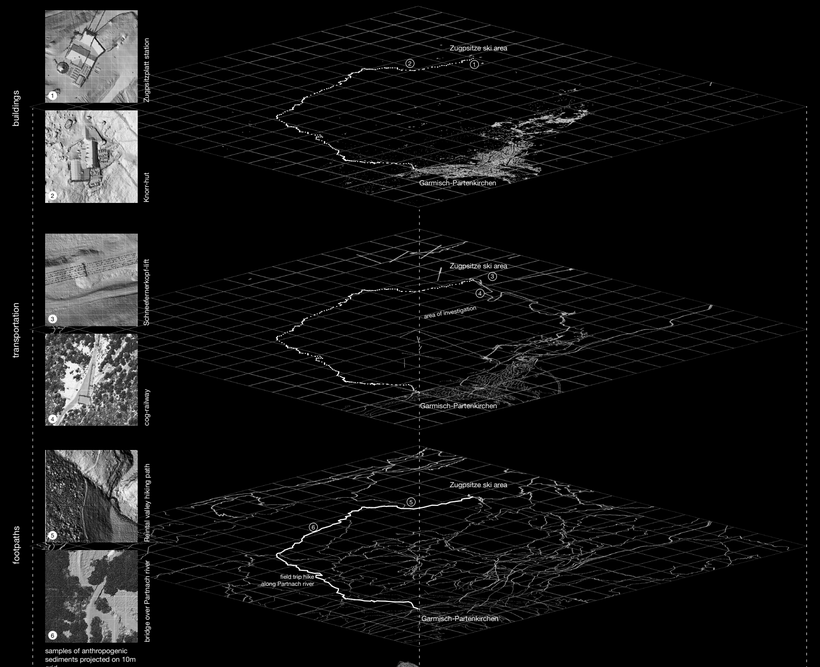


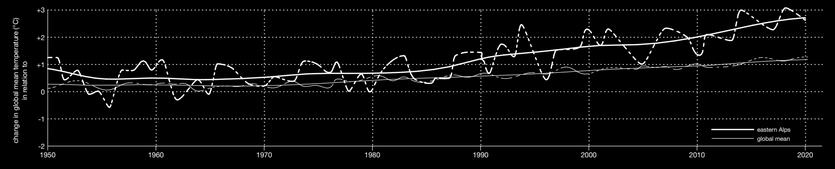


erosion in the holocene

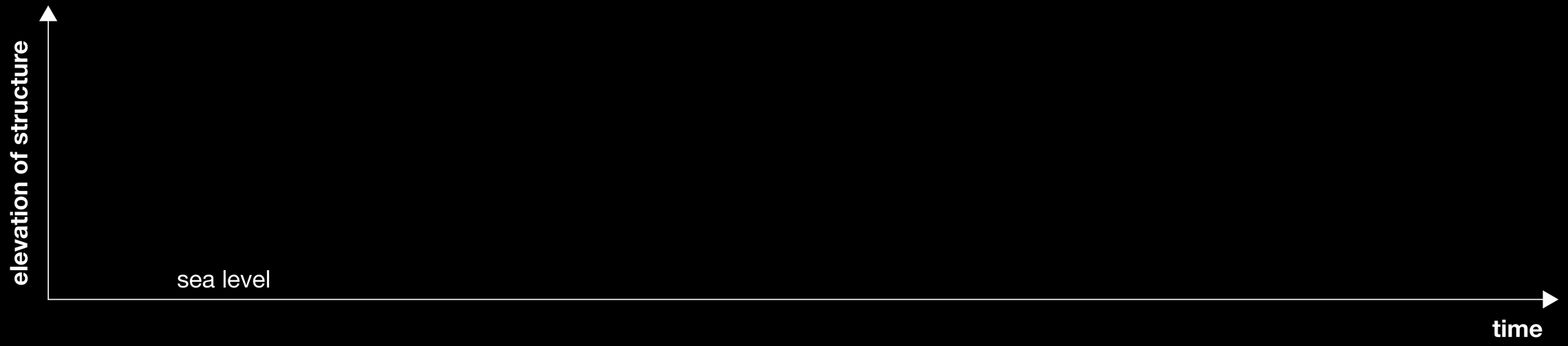


sediments of the anthropocene





cycle of erosion



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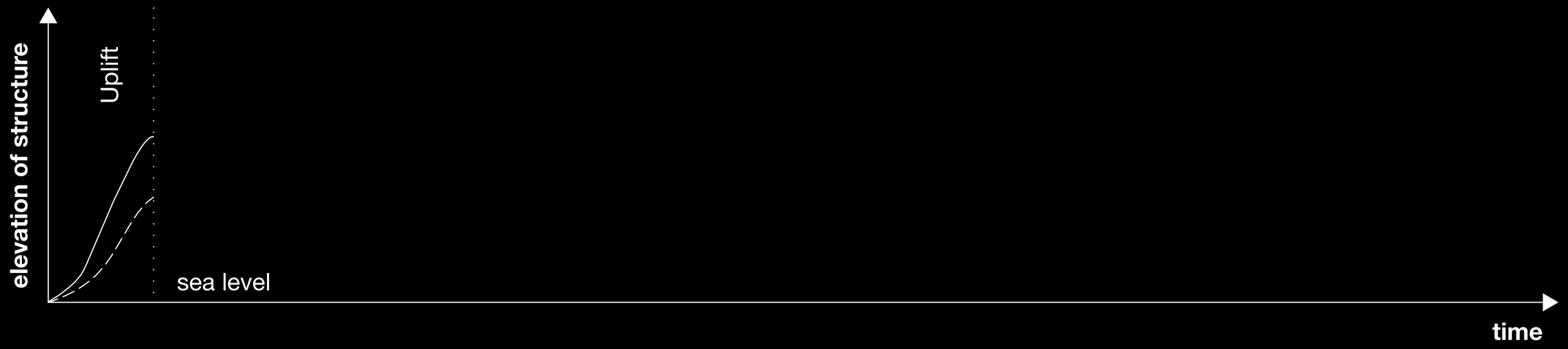
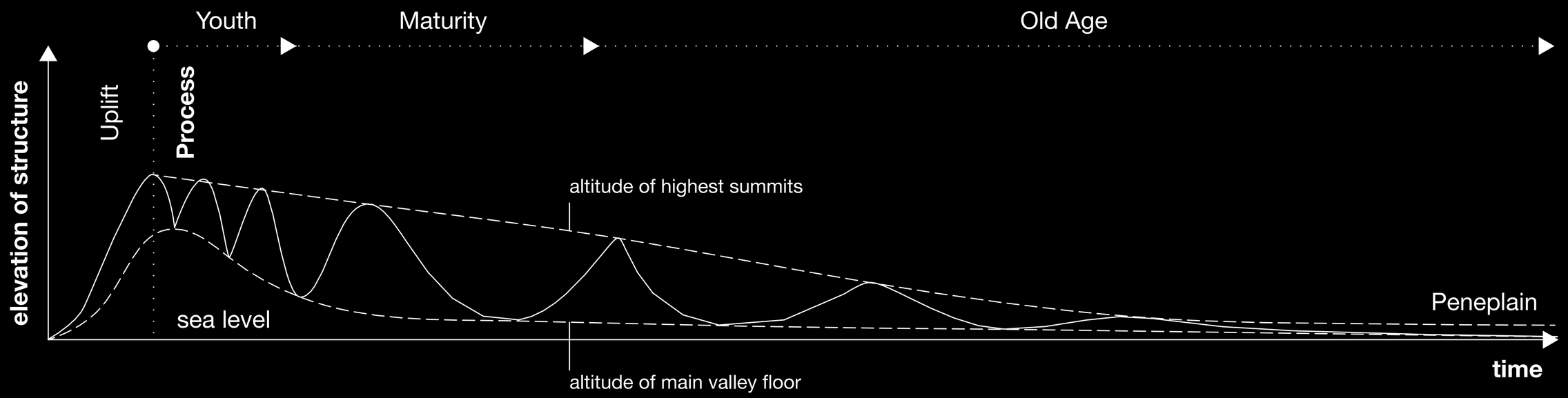
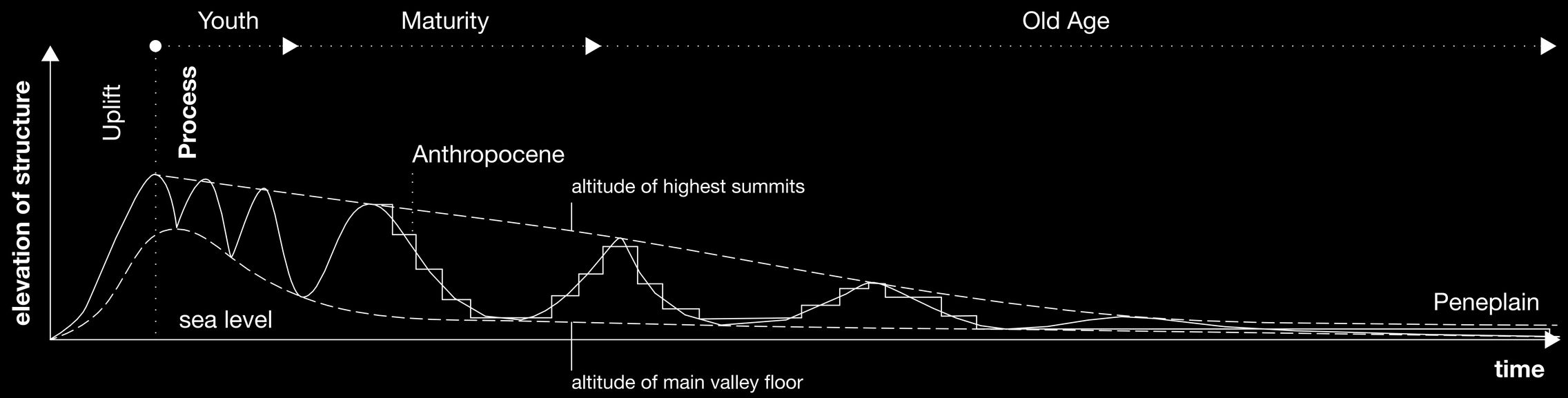


cycle of erosion



cycle of erosion

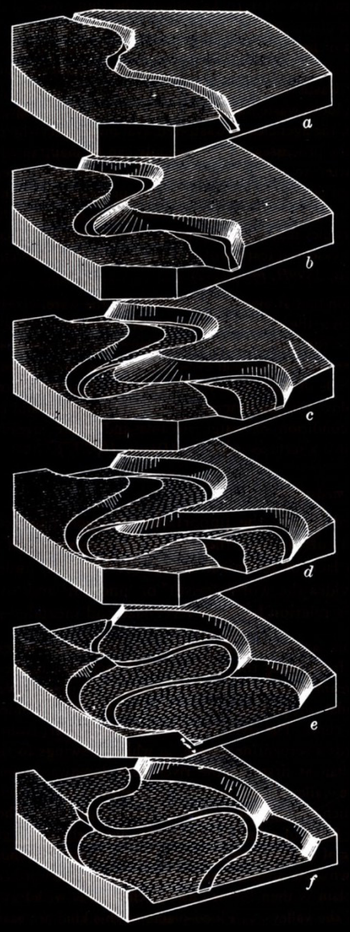


erosion in
the anthropocene



fieldtrip



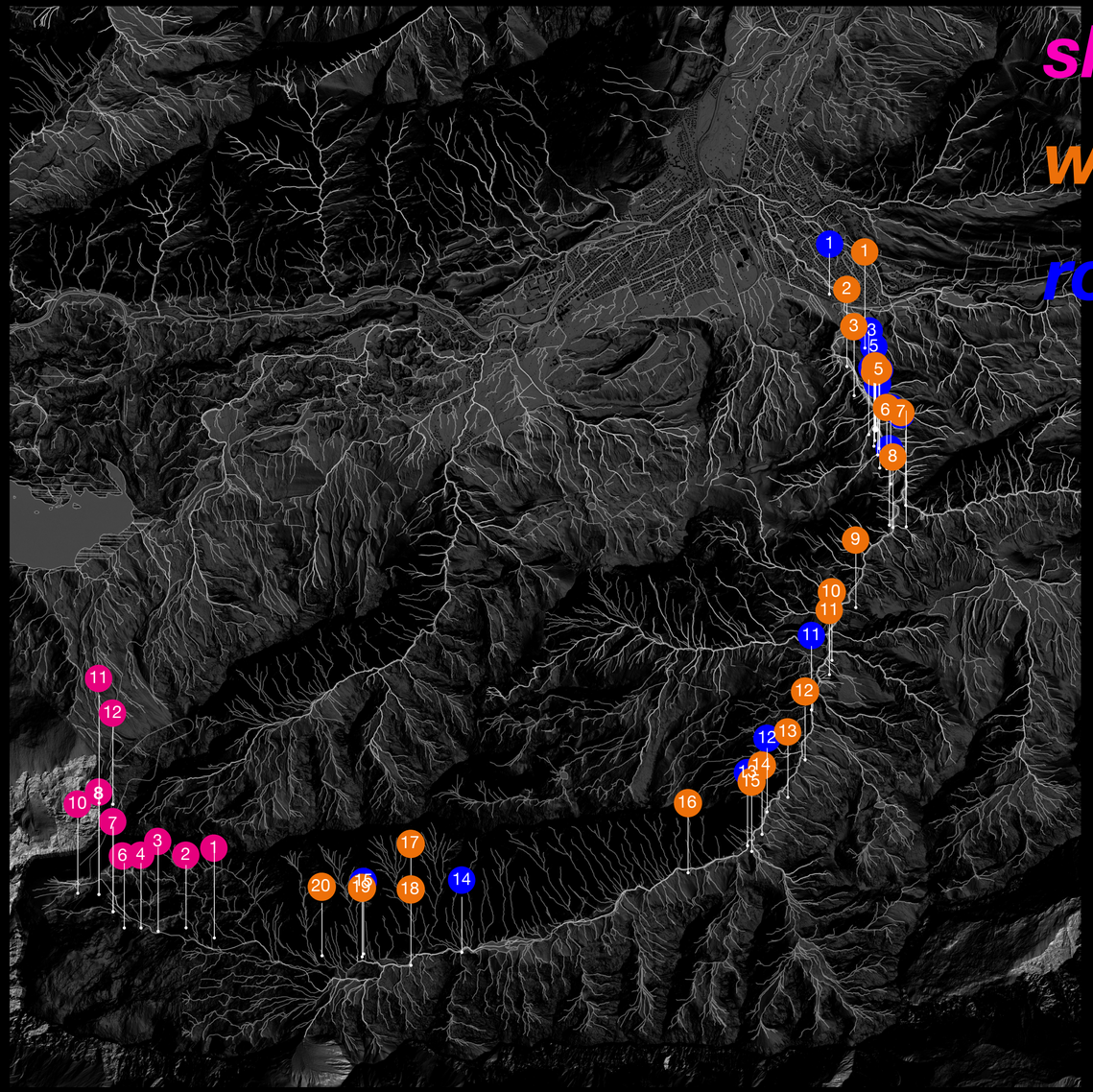


cycle of erosion
by W. M. Davis



torrents during heavy rainfall

fieldtrip

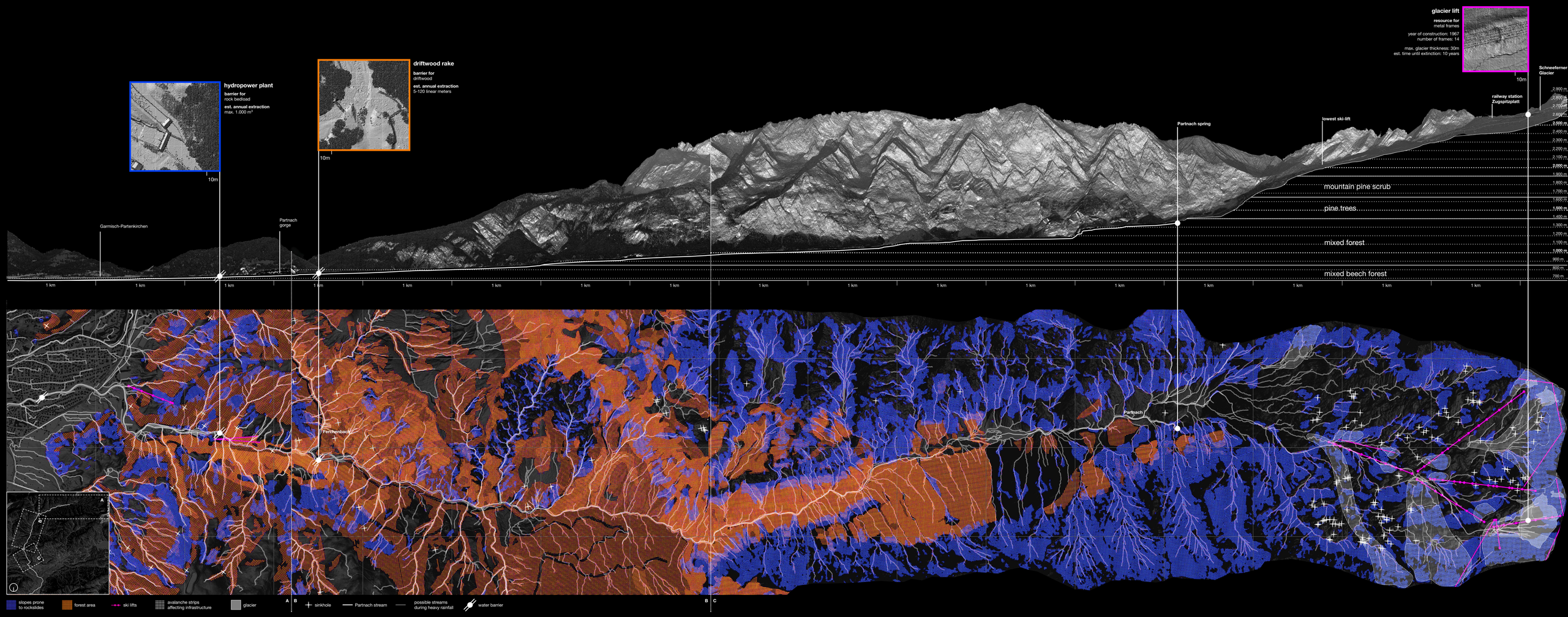


ski infrastructure

wood

rock

erosion in the anthropocene



observations

ski infrastructure



uncertain climate future

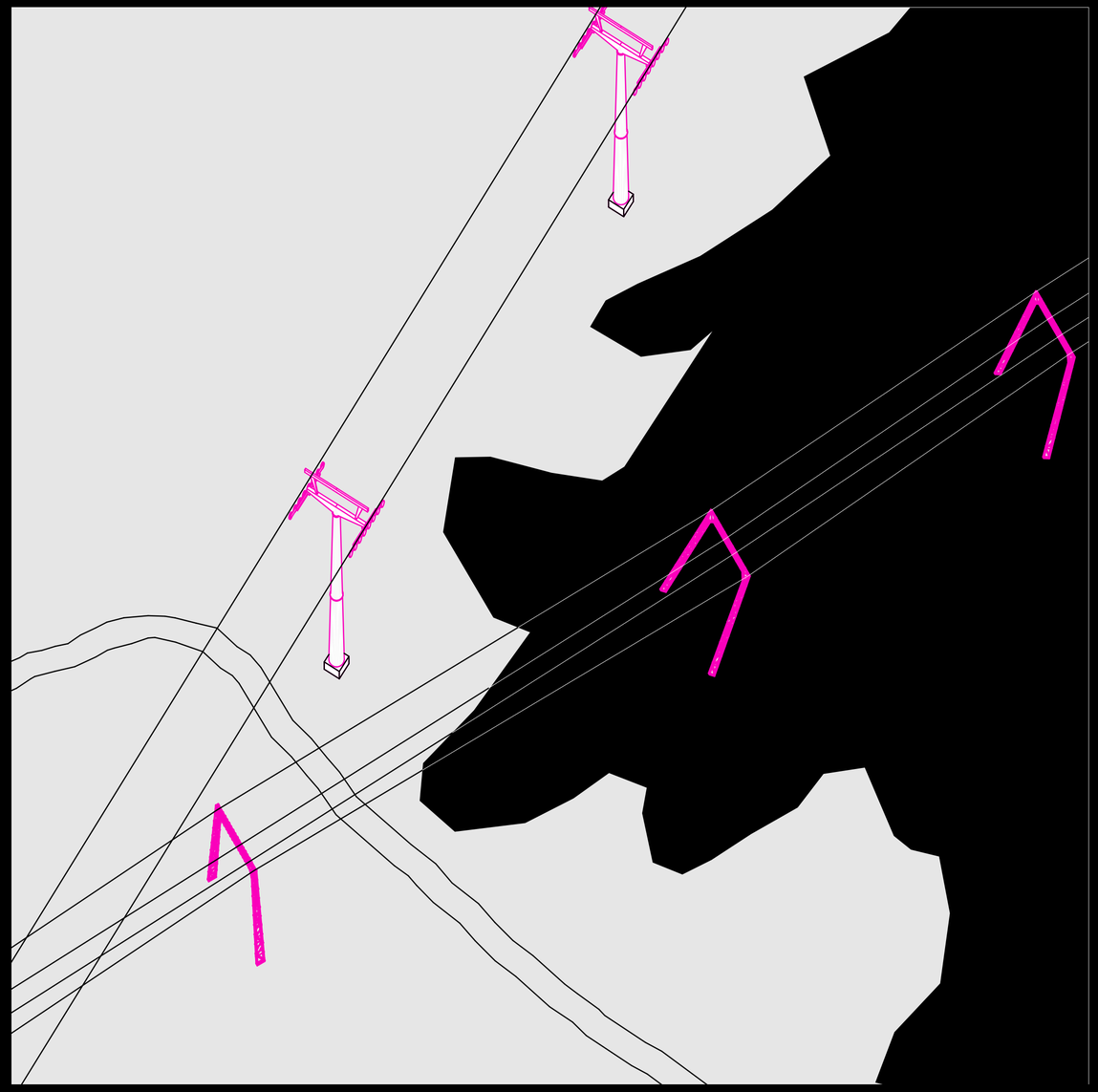


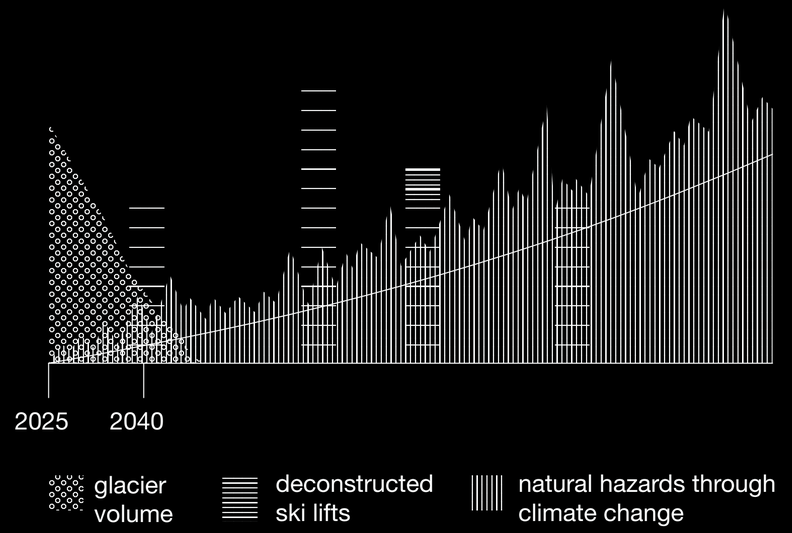
glacier extinction by 2040



collection of steel waste

observations





observations

driftwood



landslides

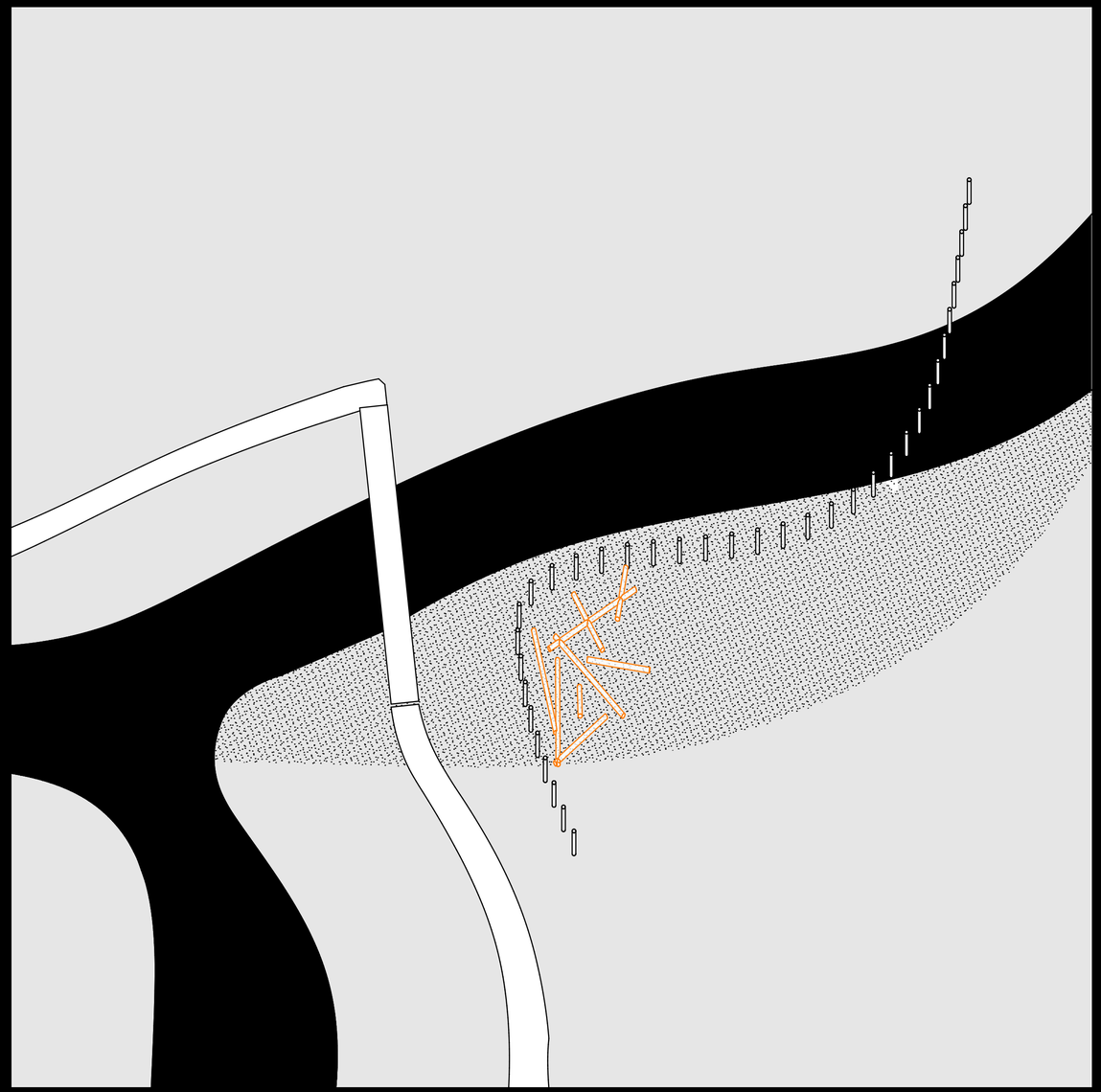


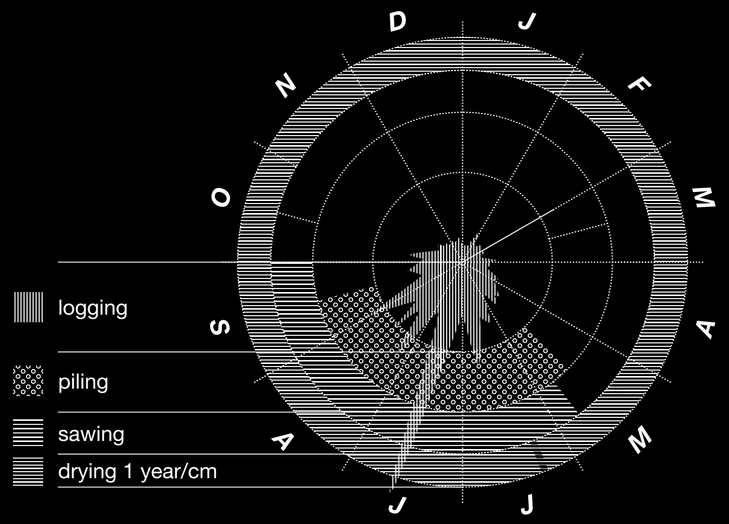
root erosion



maintenance of riverbed

observations





observations

bedload rock



erosion of rockface, melting permafrost

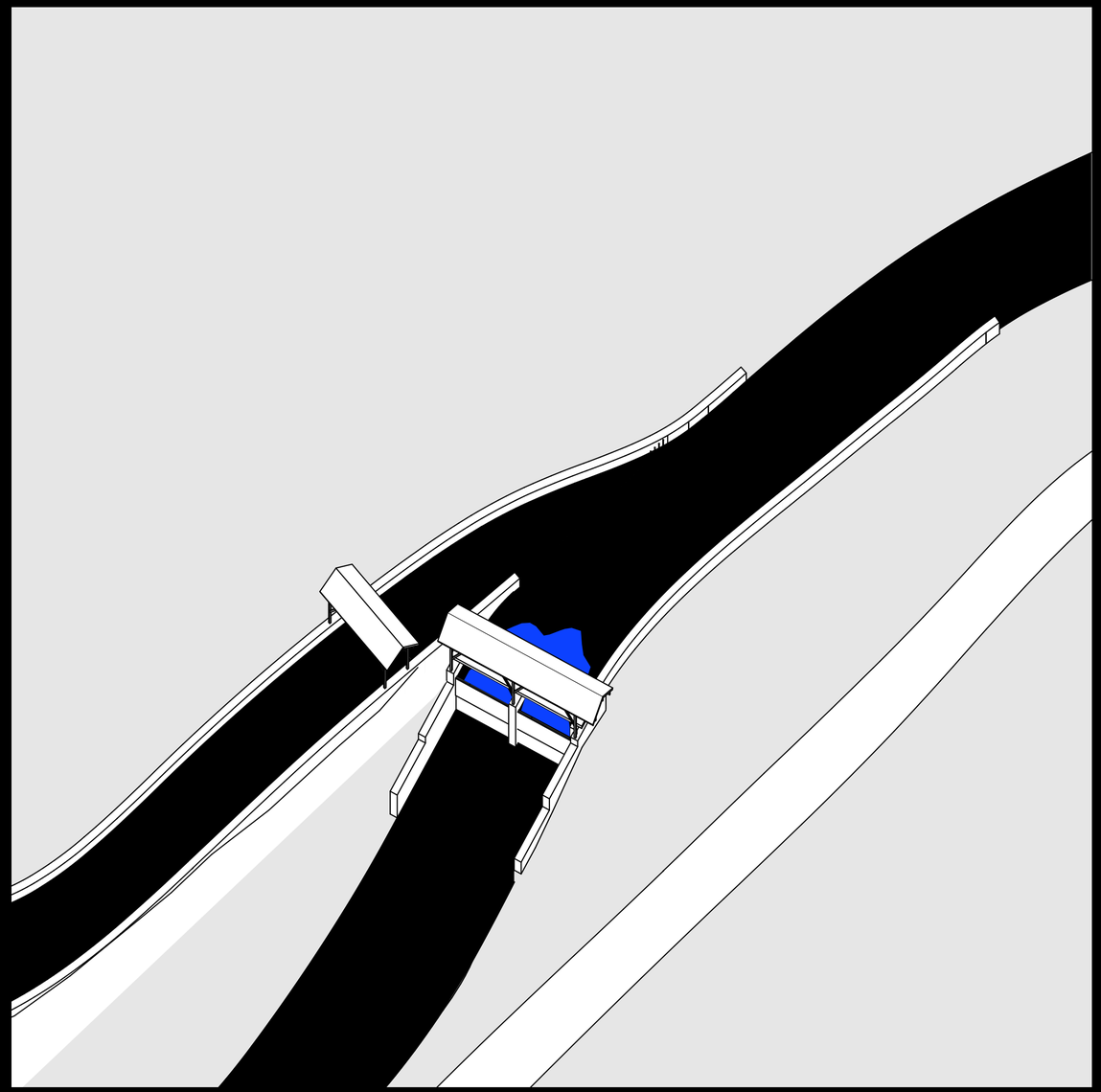


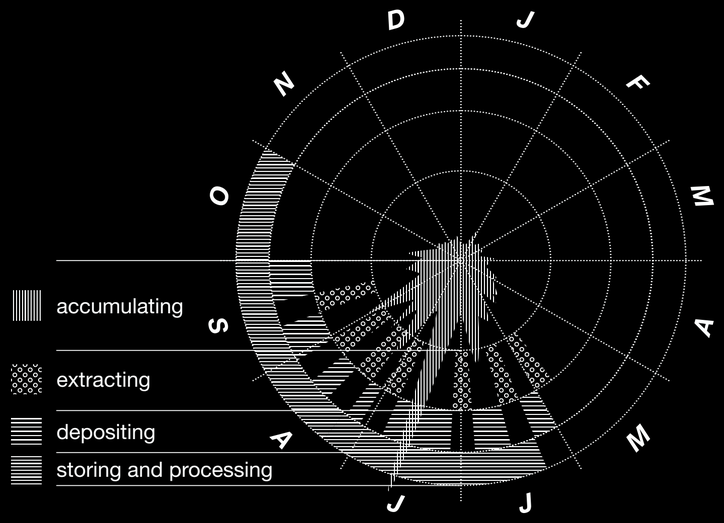
transportation during heavy rainfall



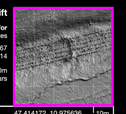
accumulation of bedload rock at weir

observations





erosion in the anthropocene



glacier lift

resource for
metal frames
year of construction: 1967
number of frames: 14

max. glacier thickness: 30m
est. time until extinction: 10 years

47.414172, 10.975636 10m

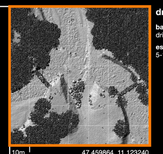


47.471137, 11.118252 10m

hydropower plant

barrier for
rock bedload

est. annual extraction
max. 1.000 m³

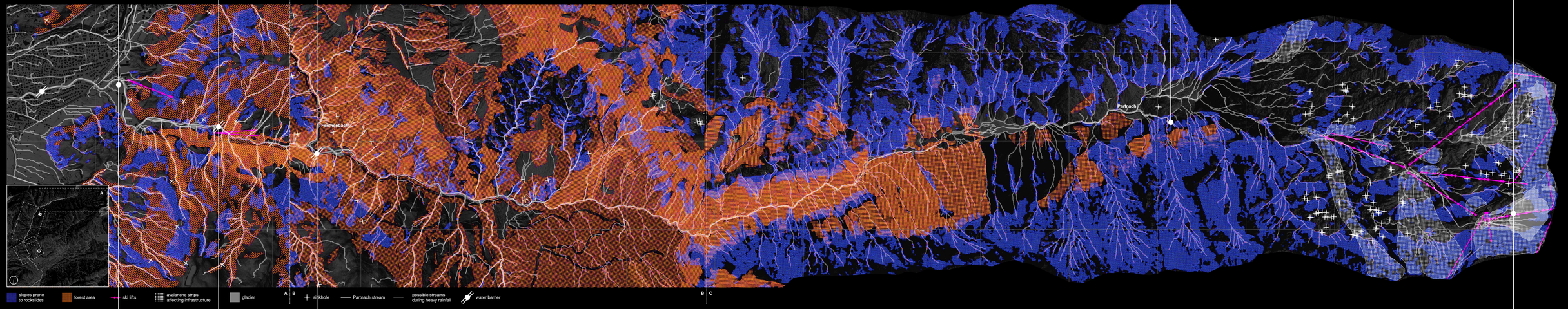


10m 47.459864, 11.123240

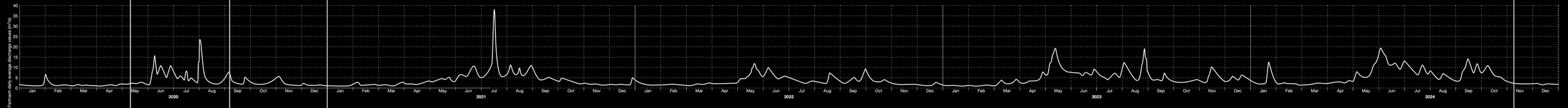
driftwood rake

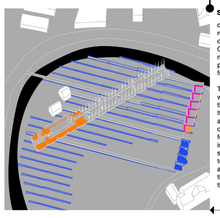
barrier for
driftwood

est. annual extraction
5-120 linear meters



slopes prone to rockslides · forest area · ski lifts · avalanche strips affecting infrastructure · glacier · A B sinkhole · Partnach stream · possible streams during heavy rainfall · water barrier · B C



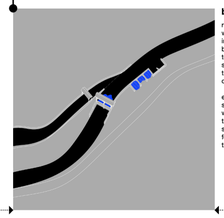


sediment school

collected driftwood and bedload rock are stored at a floodzone om the edge of the town of Garmisch-Partenkirchen. A roof made from former Skilift frames protects the drying driftwood from rain.

The school itself rests on gabion walls filled with the same stone that is collected from the river. Its walls are slowly building up as the driftwood accumulates, dries and is cut into the same format of slabs. Once the school is in use the very sediment the school is build from can be used to teach becoming craftsman and artists a way of working with the irregularity of material that the mountain provides

1,55 km 770m

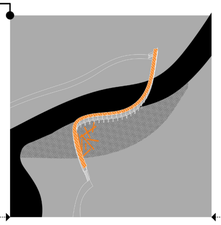


bedload pool

right in front of the weir several walls provide a structure for the initial sorting of extracted bedload rock. It acts as a short term storage before the sediment gets picked up by a truck to be transported further down the mountain.

emering from this same structure stairs step down into the river in which visitors can cool down their body during the hot summer months and let their feet feel the moving sediment on the riverbed.

1,51 km 40m

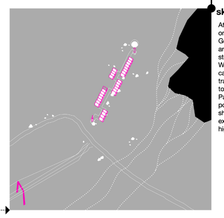


driftwood bridge

at the confluence of the river Partnach and Ferchenbach a newly built driftwood rake catches falled logs during flooding. It is built to protect the highly frequented Partnach gorge from clogging up.

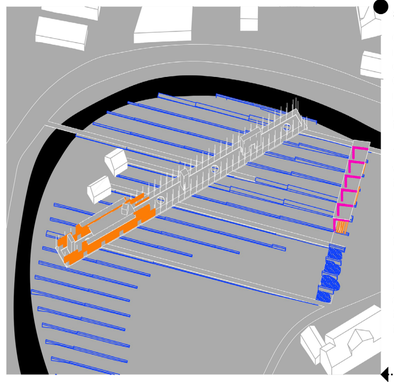
The transformation of this array of steel poles into a bridge lets visitors interact with the material themselves as the pathway faces the collection site. After flooding visitors can watch how these stranded logs are collected and transported away via trucks making their way towards the valley.

18,04 km 1.150m



skipole shelter

At the northern Schneeferner, one of the last 4 glaciers in Germany. One can watch the Ski area turn into a collection site of steel eroded steel structures. While frames of former Ski-lifts can be dissasembled and transported with the cog-railway to the town of Garmisch-Partenkirchen, bigger Ski lift poles are reassembled into shelters for hikers willing to experience the harshness of a high alpine climate.



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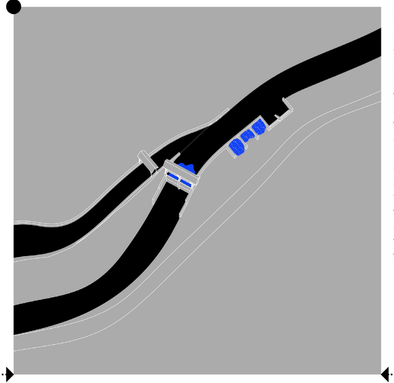

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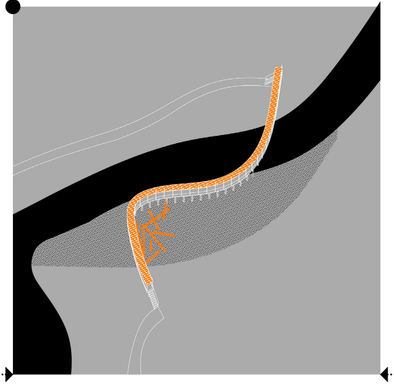

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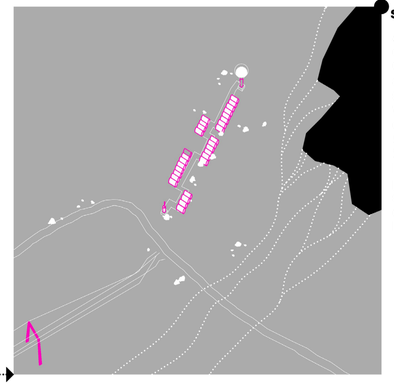

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designing sedimentation


garmisch-partenkirchen

programme

sediment sculpting school



site



1 hay barns



2 sawmill





3 olympic ski jump



4 start of hiking path

flooding



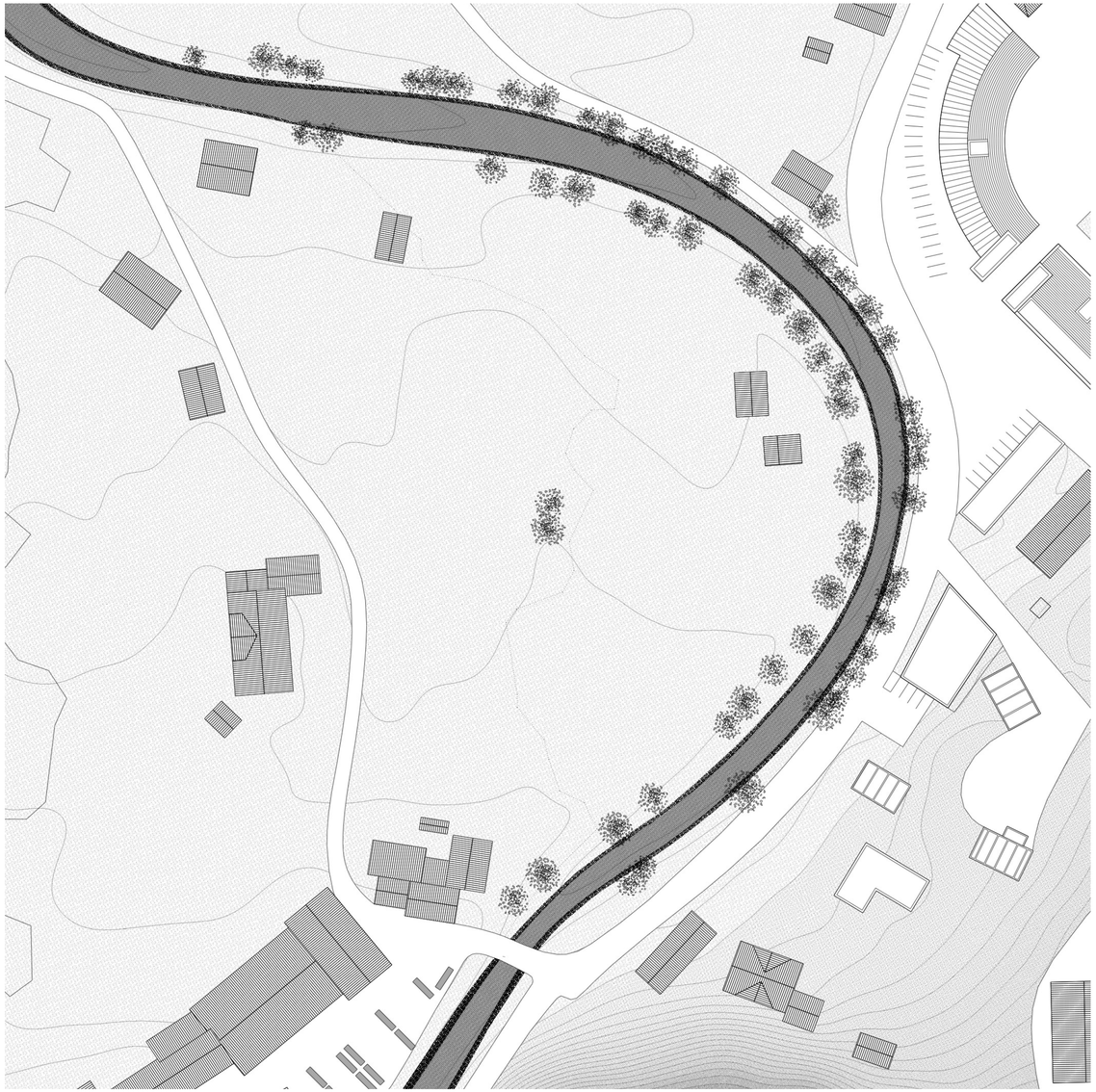
flashflood in Garmisch-Partenkirchen
1999

flooding



recent flood protection measures
restricting the river

site

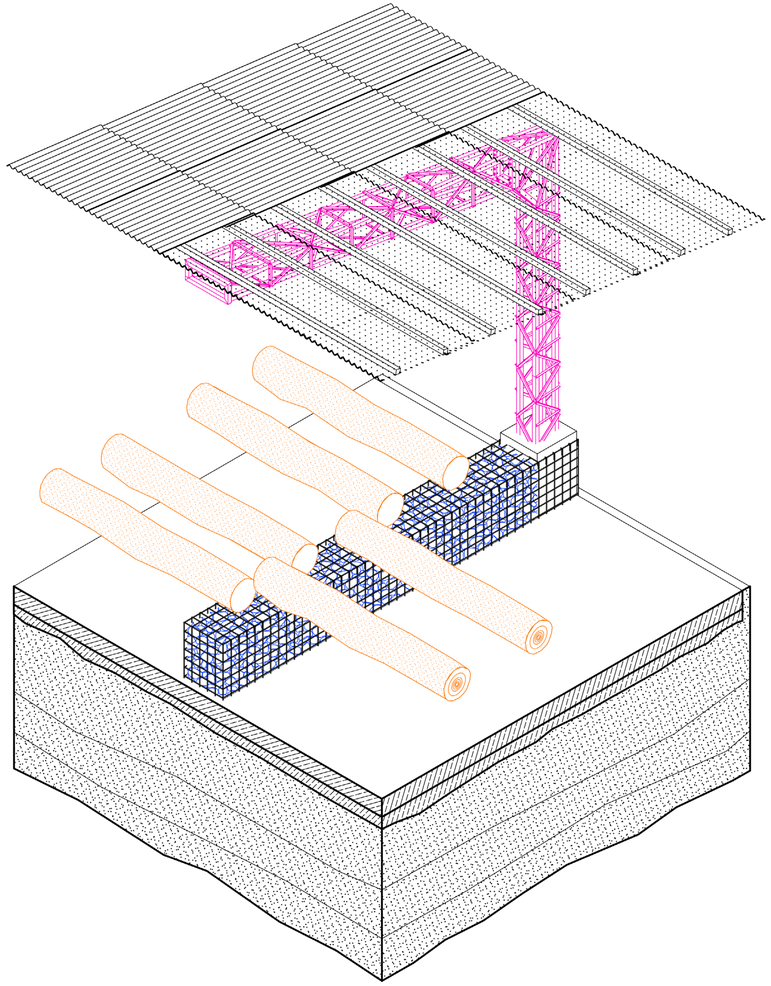


process



collection site

reused skilift frames / corrugated metal sheets /concrete base /
gabion walls filled with bedload rock / Asphalt floor

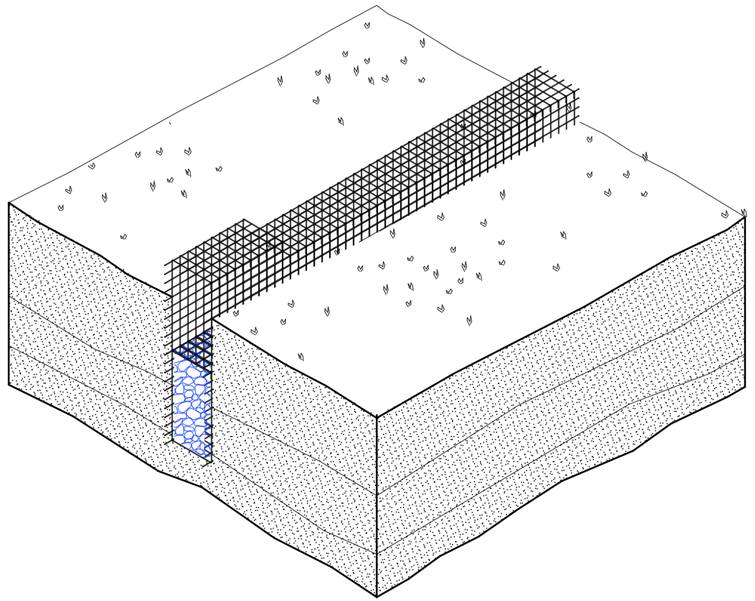


process

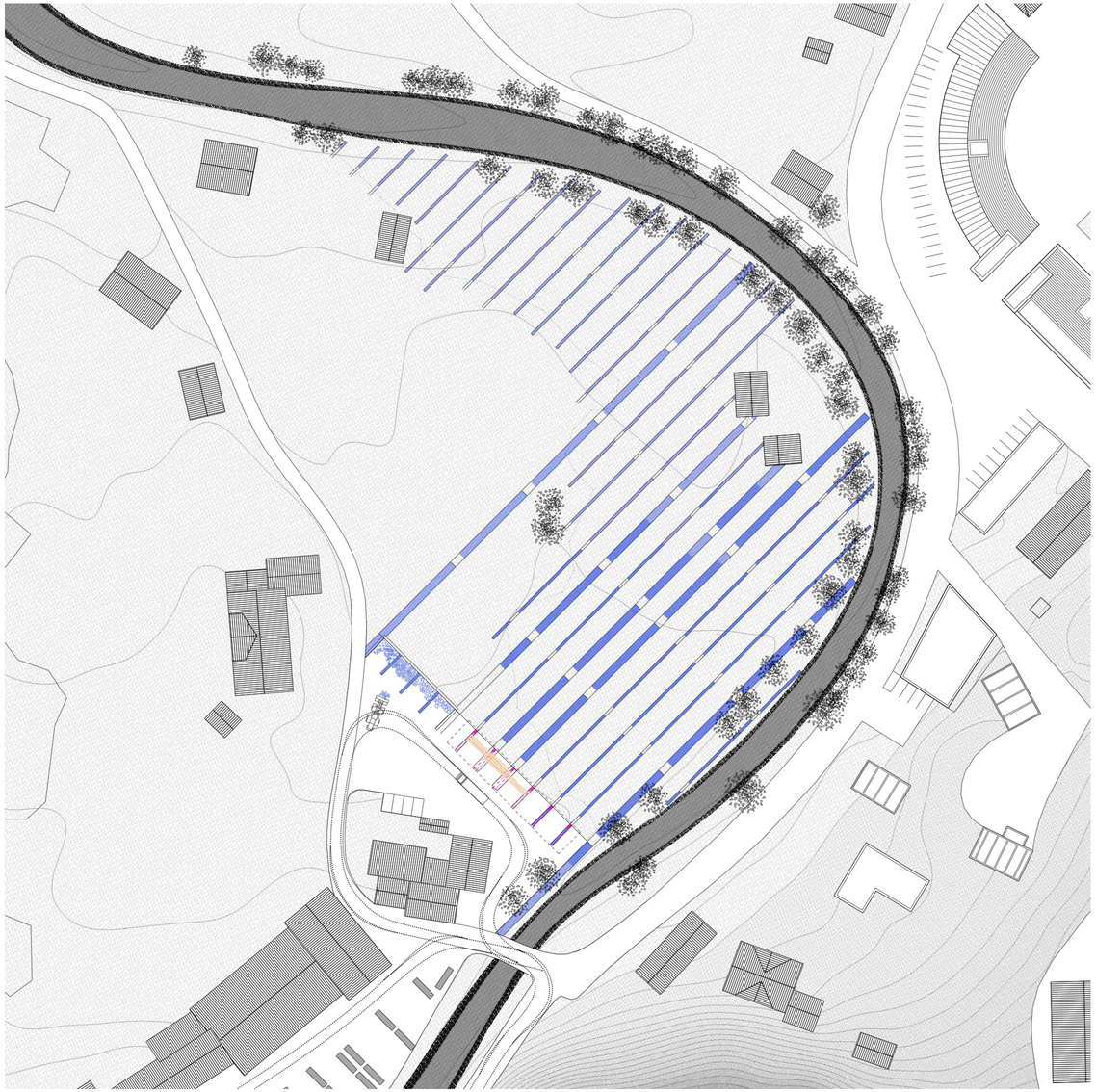


gabion walls lines

dug out soil / steel gabion walls

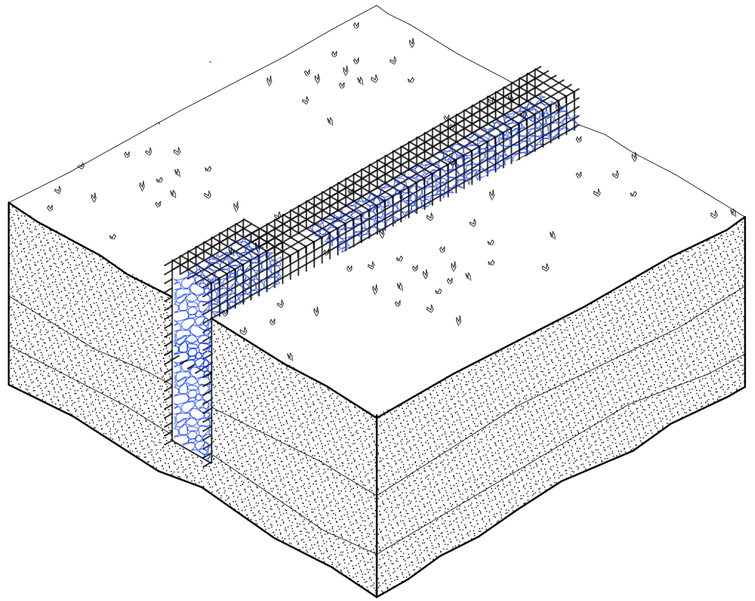


process

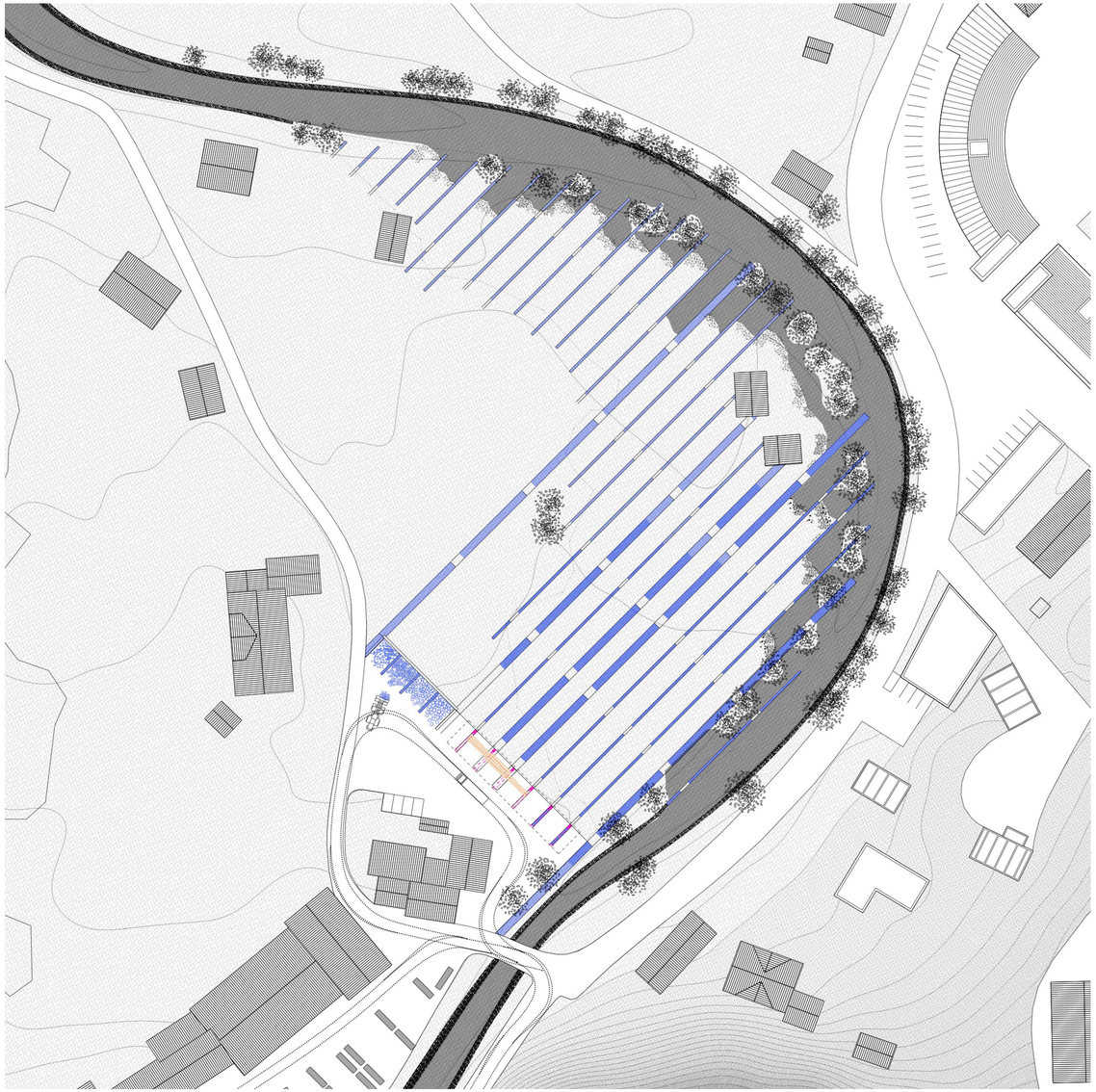


gabion wall filling

bedload rock / various grain sizes

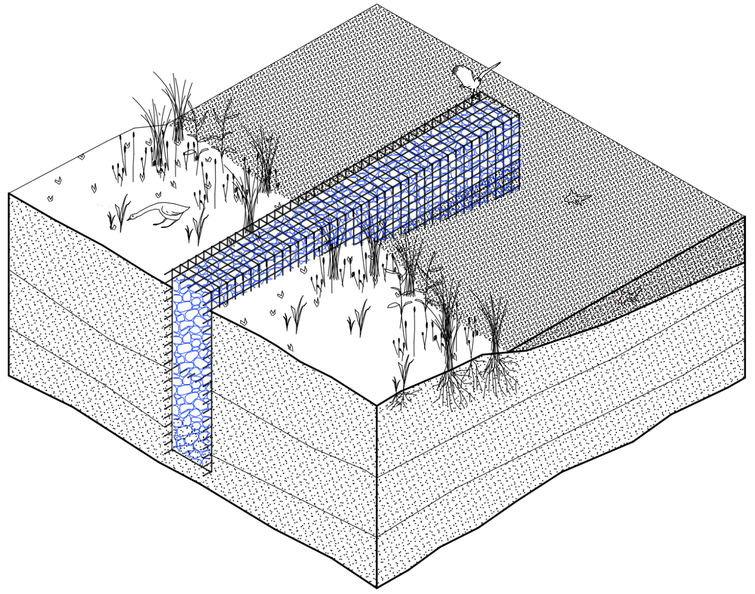


process

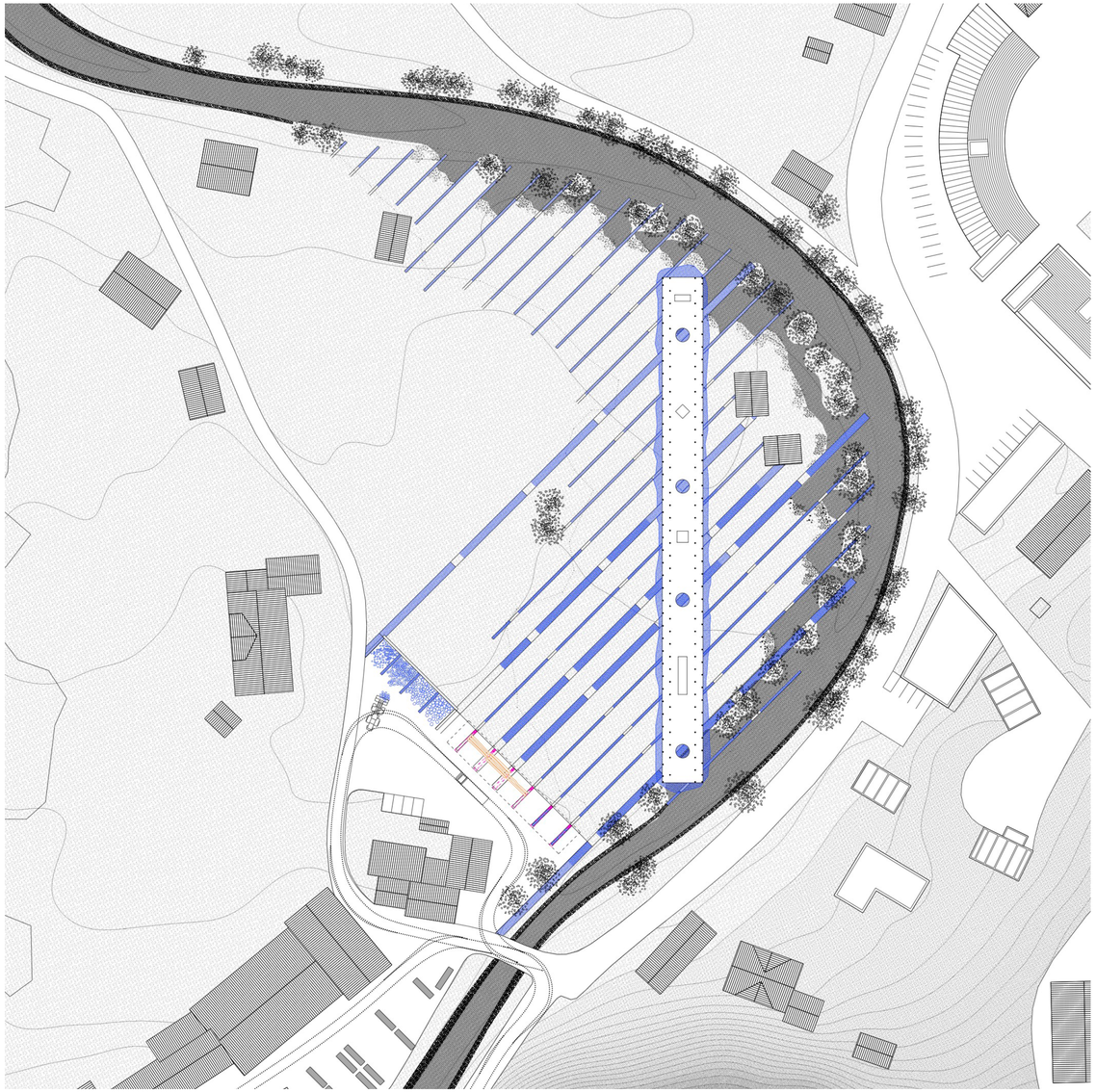


bank widening

calm water ponds for fish breeding / growth of high grasses

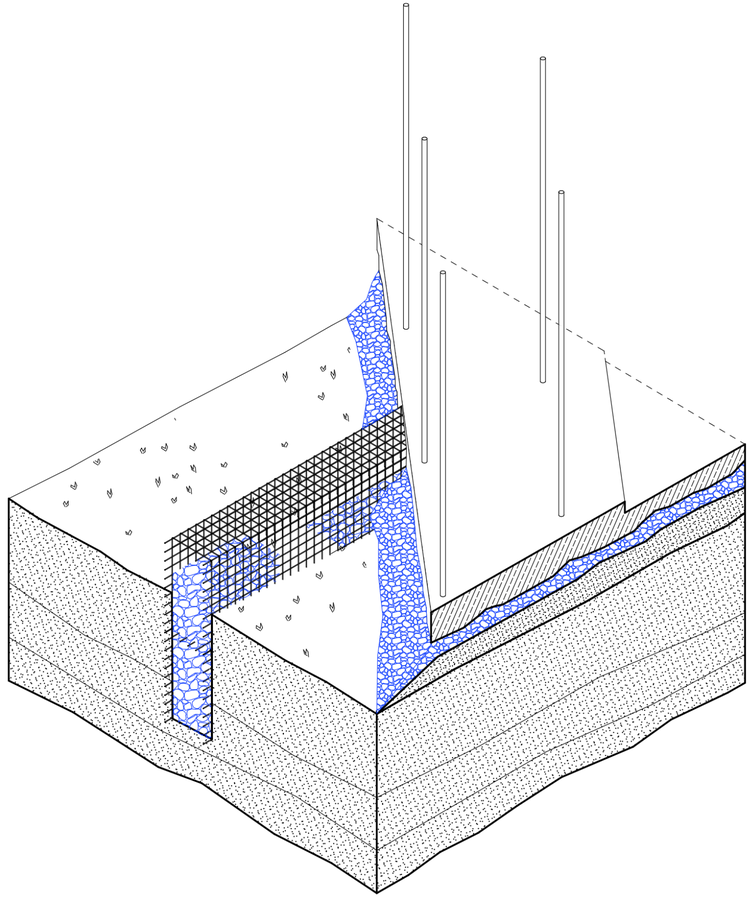


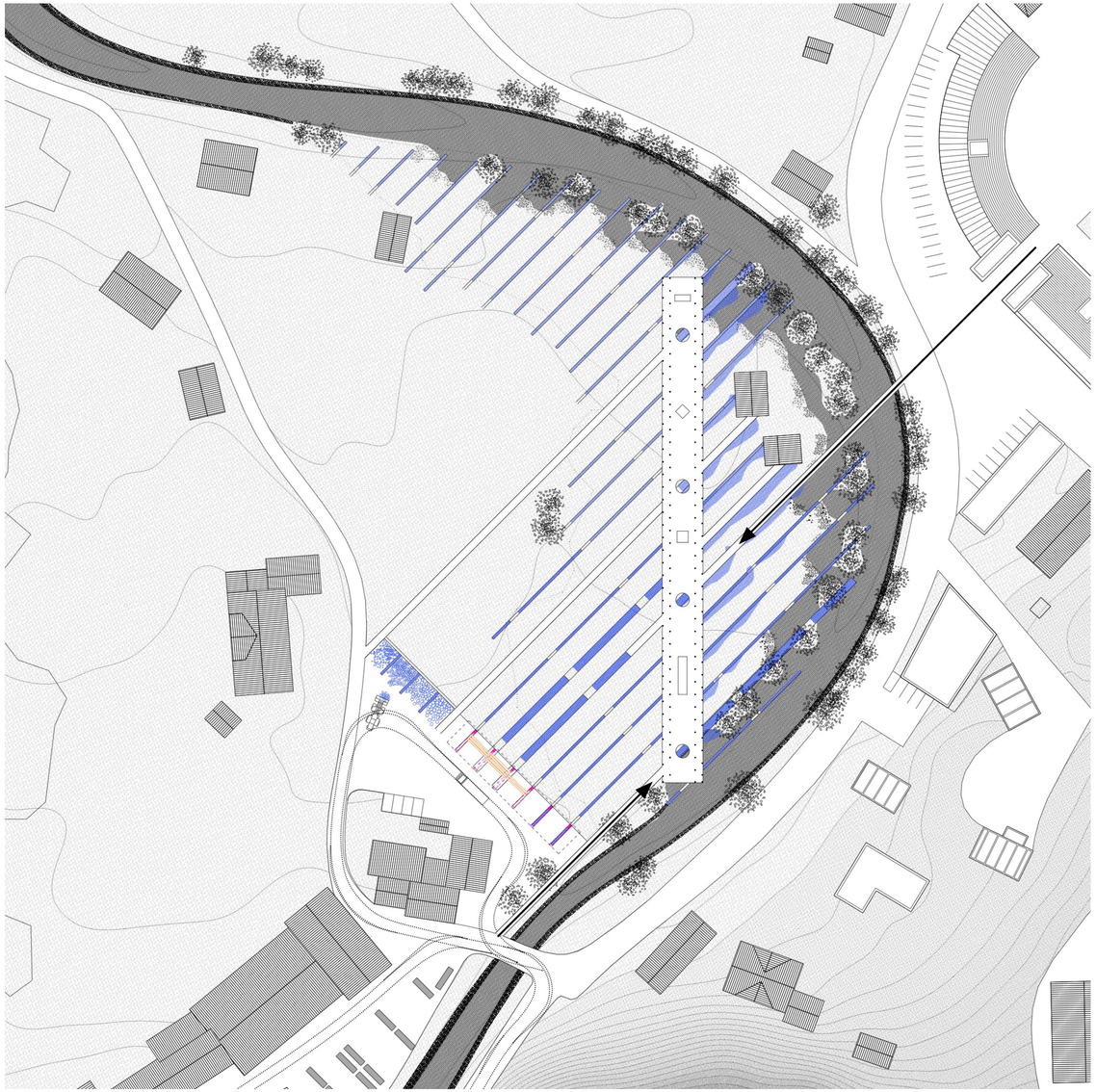
process



concrete pouring

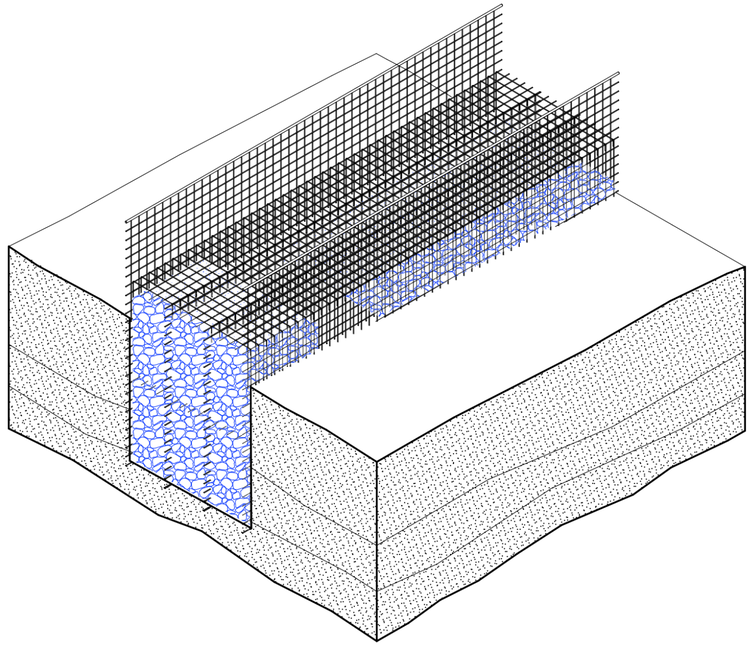
reinforced concrete / threaded rods / pile of smaller bedload rock / wooden cconcrete casting



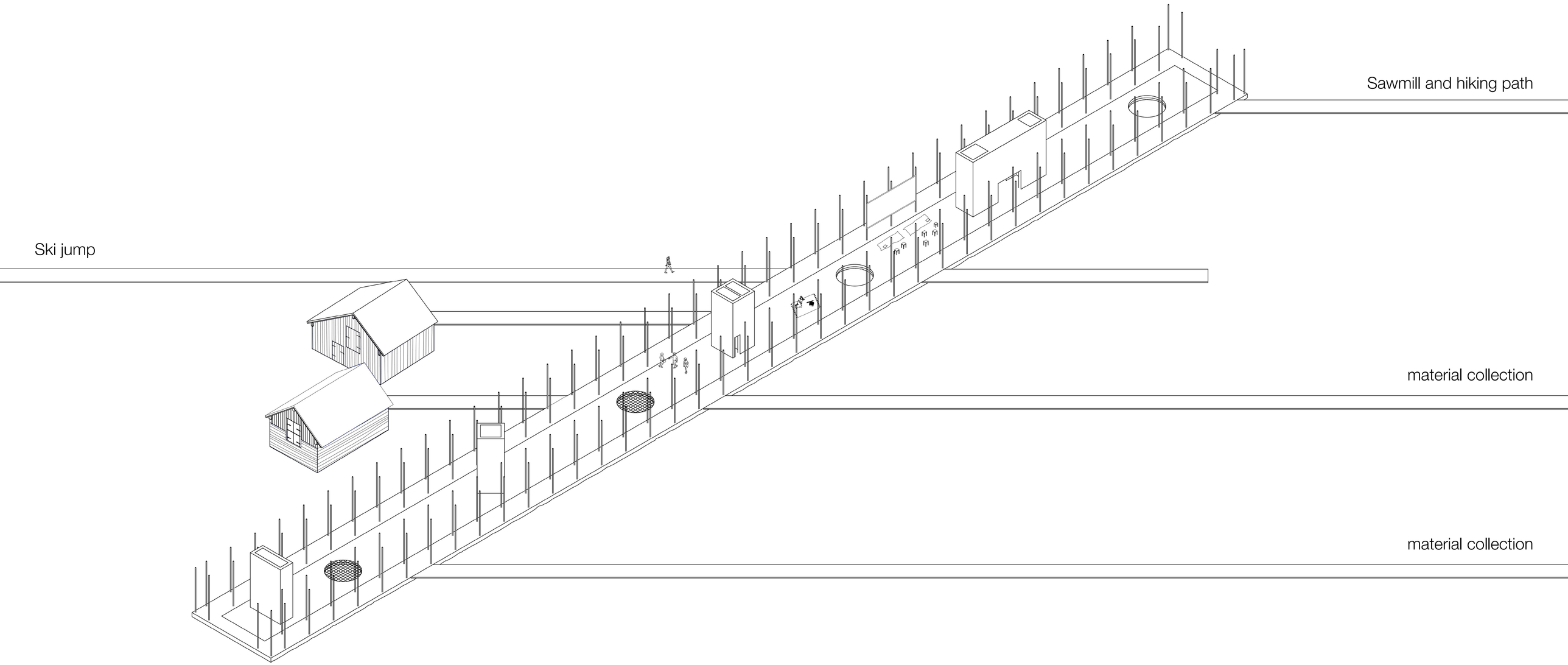


pathways

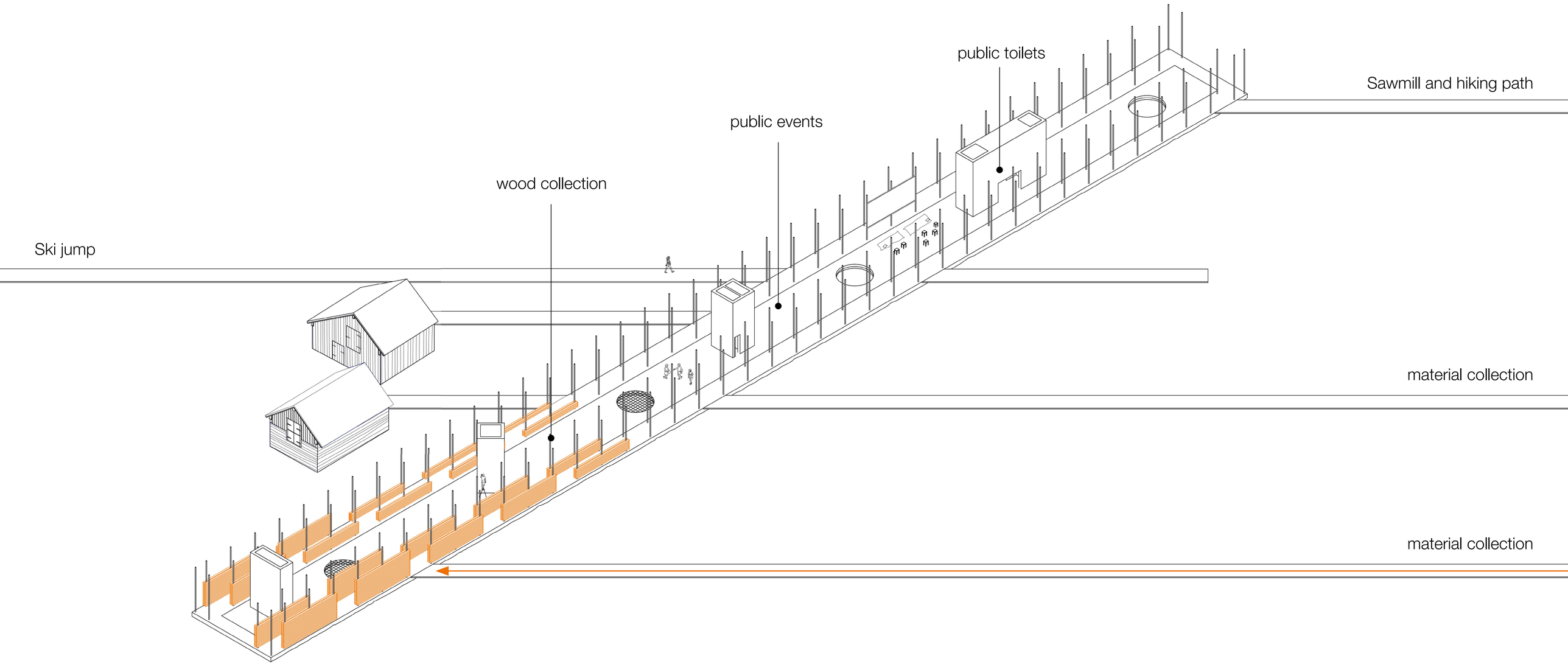
grated steel platform / railing from gabion wall



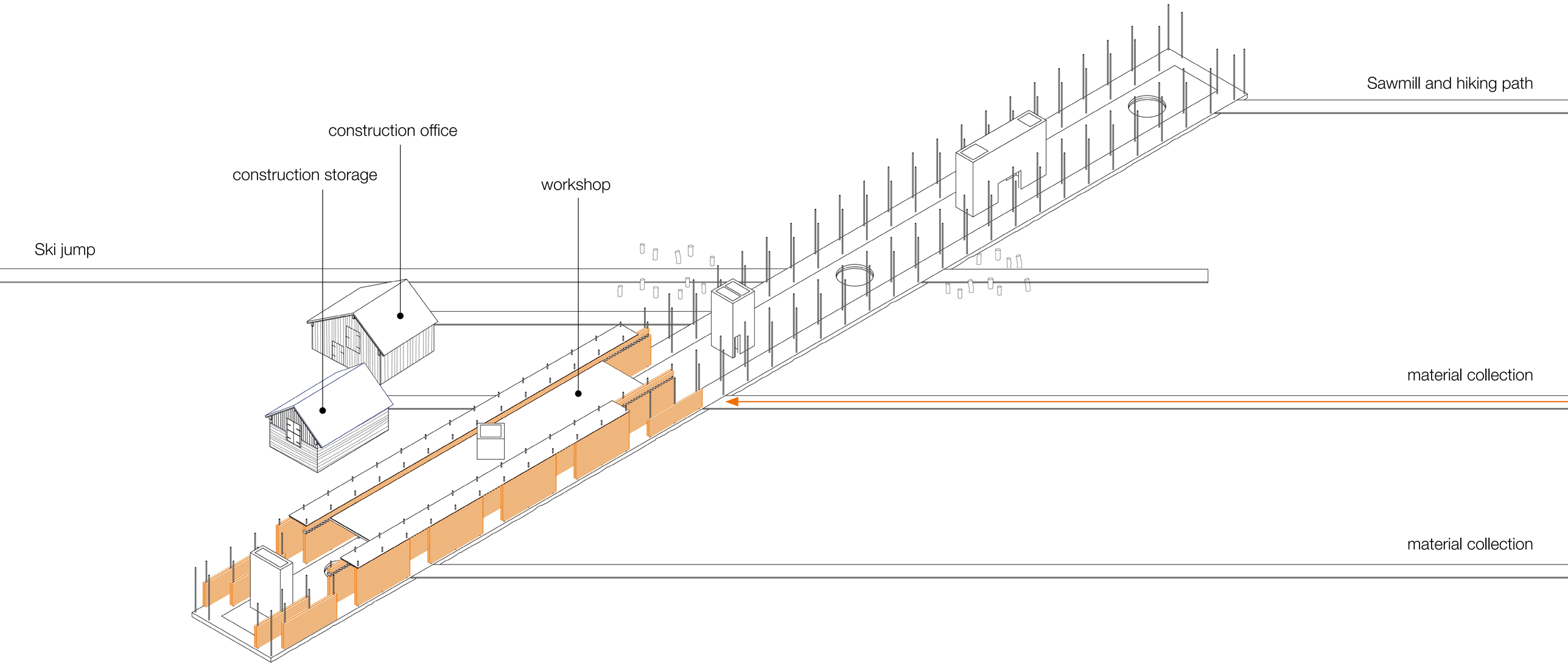
pathways


Sawmill and hiking path
Ski jump
material collection
material collection

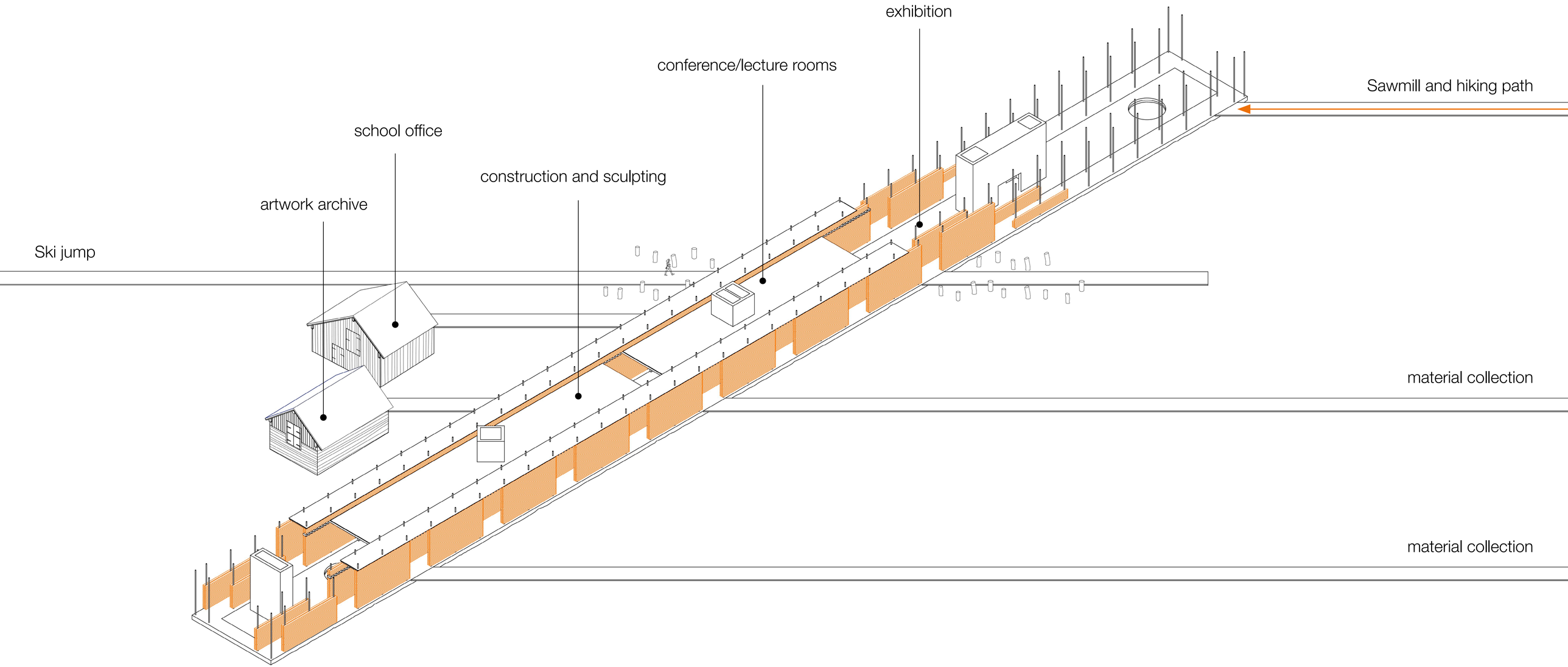
phase 1


public toilets
Sawmill and hiking path
public events
wood collection
Ski jump
material collection
material collection

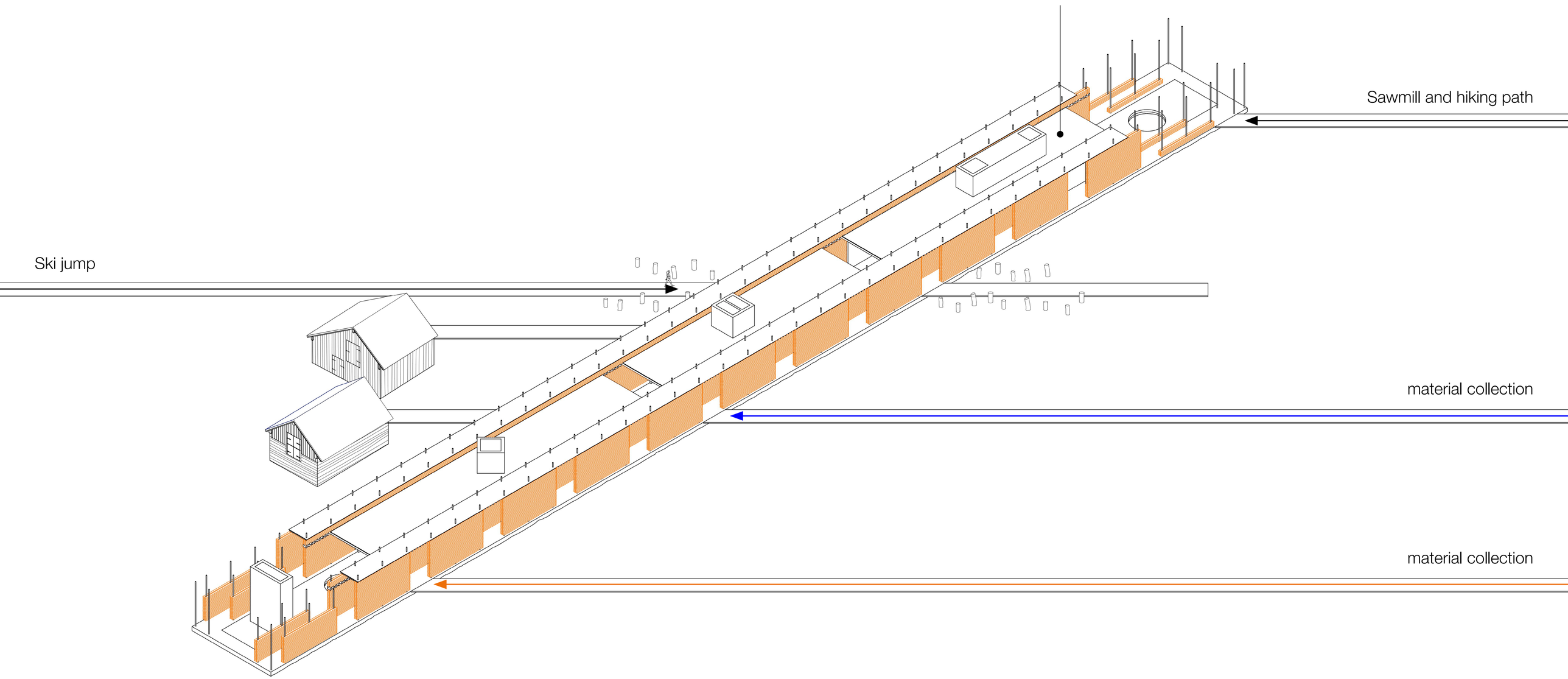
phase 2


construction office
construction storage
workshop
Ski jump
Sawmill and hiking path
material collection
material collection

phase 3

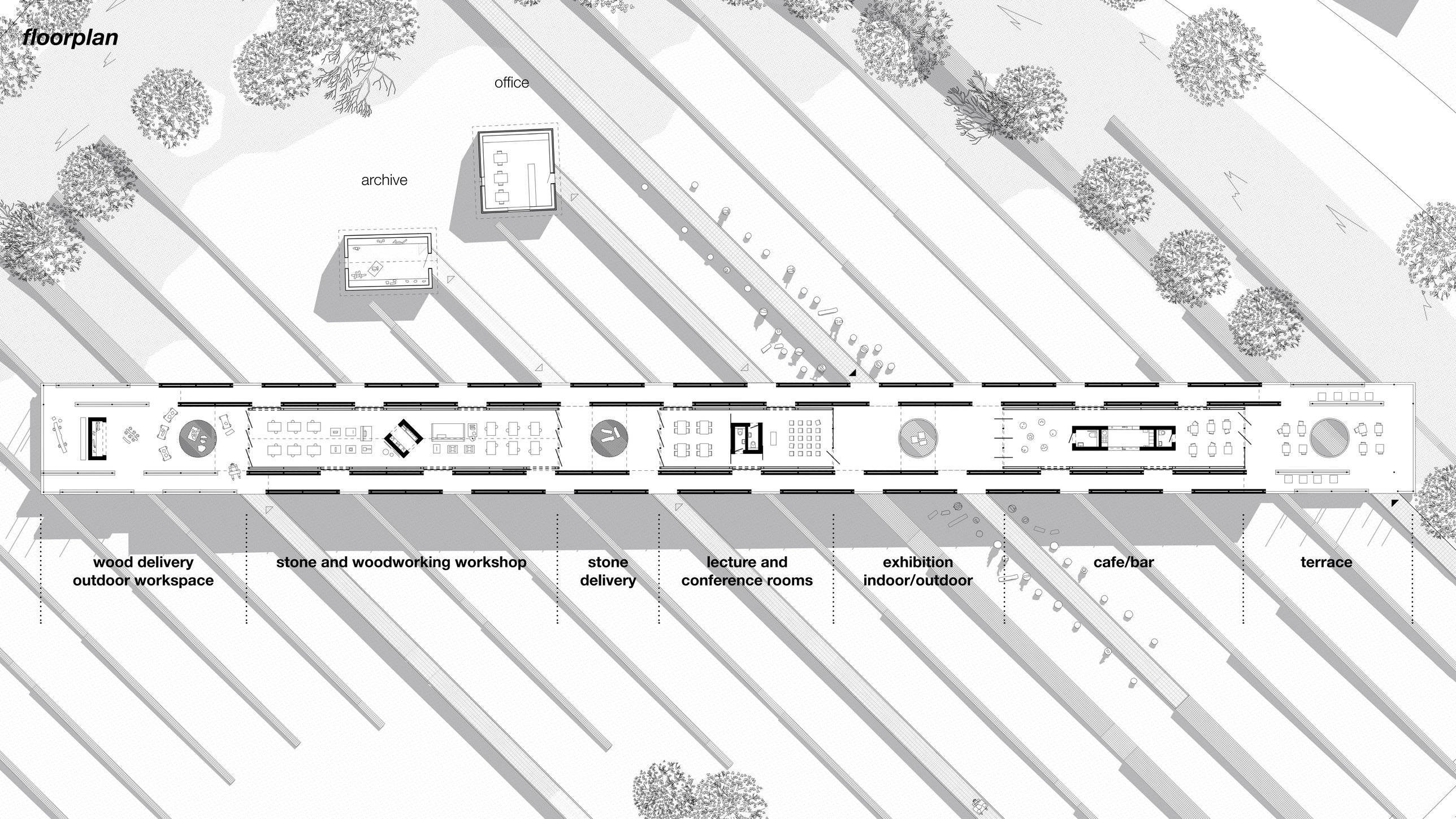

exhibition
conference/lecture rooms
Sawmill and hiking path
school office
construction and sculpting
artwork archive
Ski jump
material collection
material collection

phase 4


cafe for students and visitors
Sawmill and hiking path
Ski jump
material collection
material collection

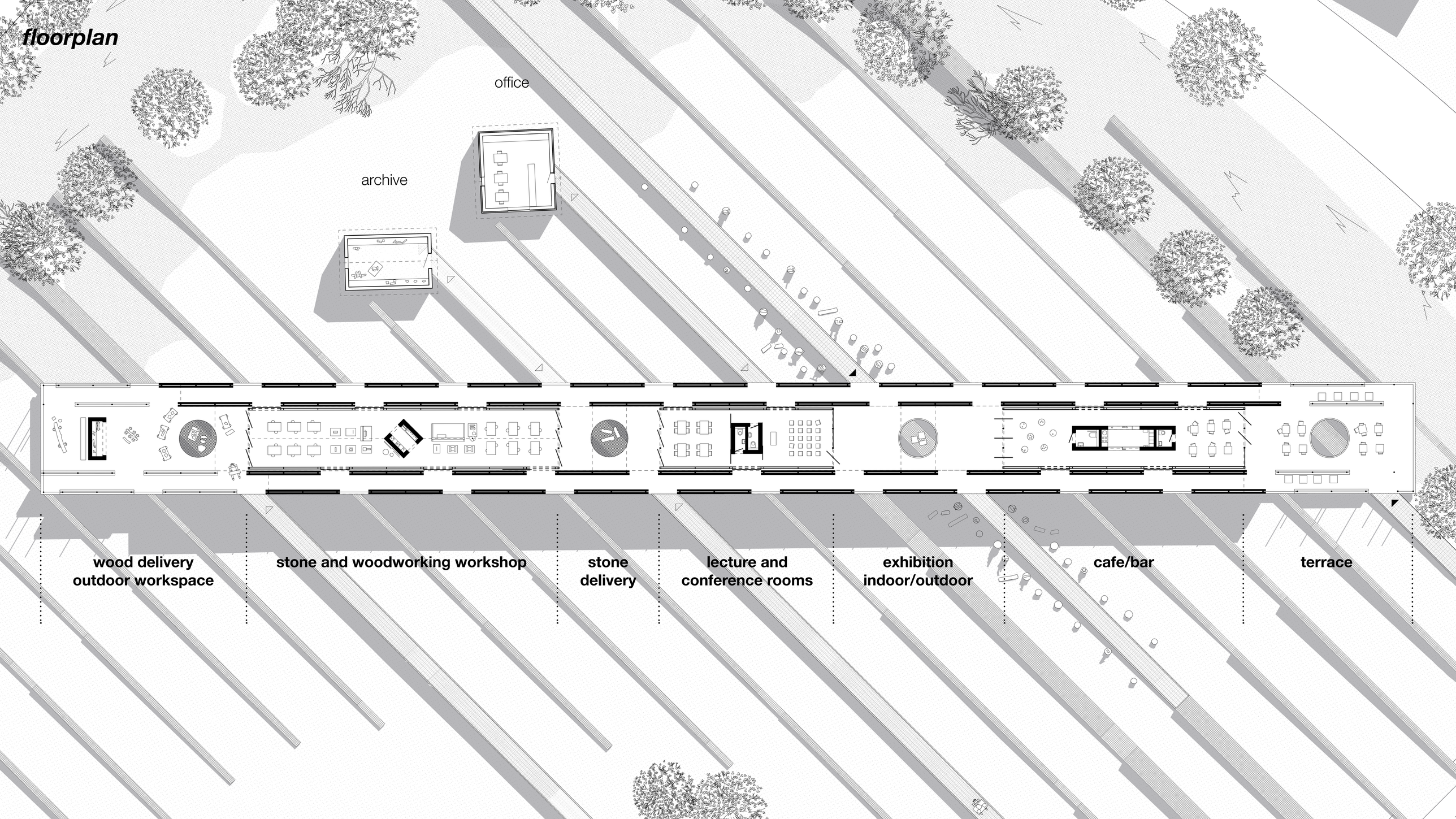


floorplan

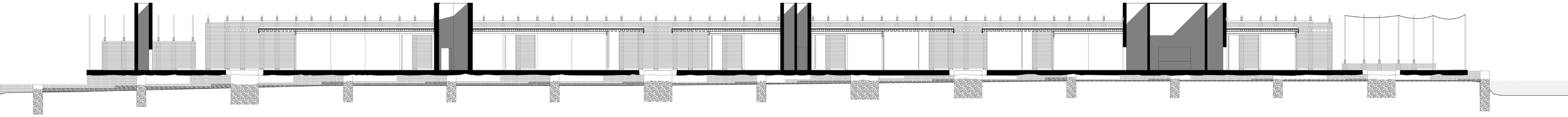

office
archive
wood delivery
outdoor workspace
stone and woodworking workshop
stone
delivery
lecture and
conference rooms
exhibition
indoor/outdoor
cafe/bar
terrace



floorplan

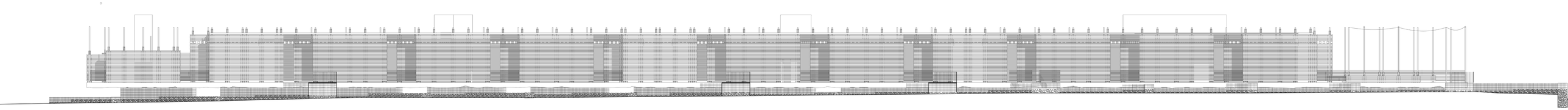

office
archive
wood delivery
outdoor workspace
stone and woodworking workshop
stone
delivery
lecture and
conference rooms
exhibition
indoor/outdoor
cafe/bar
terrace

section





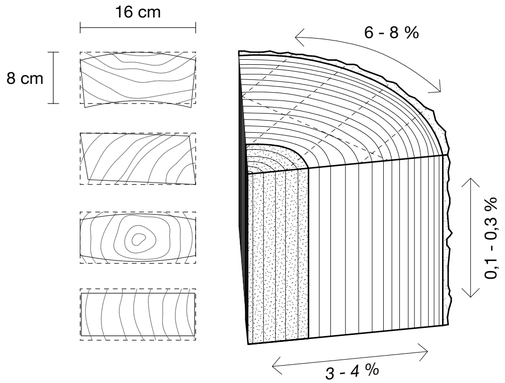
elevation

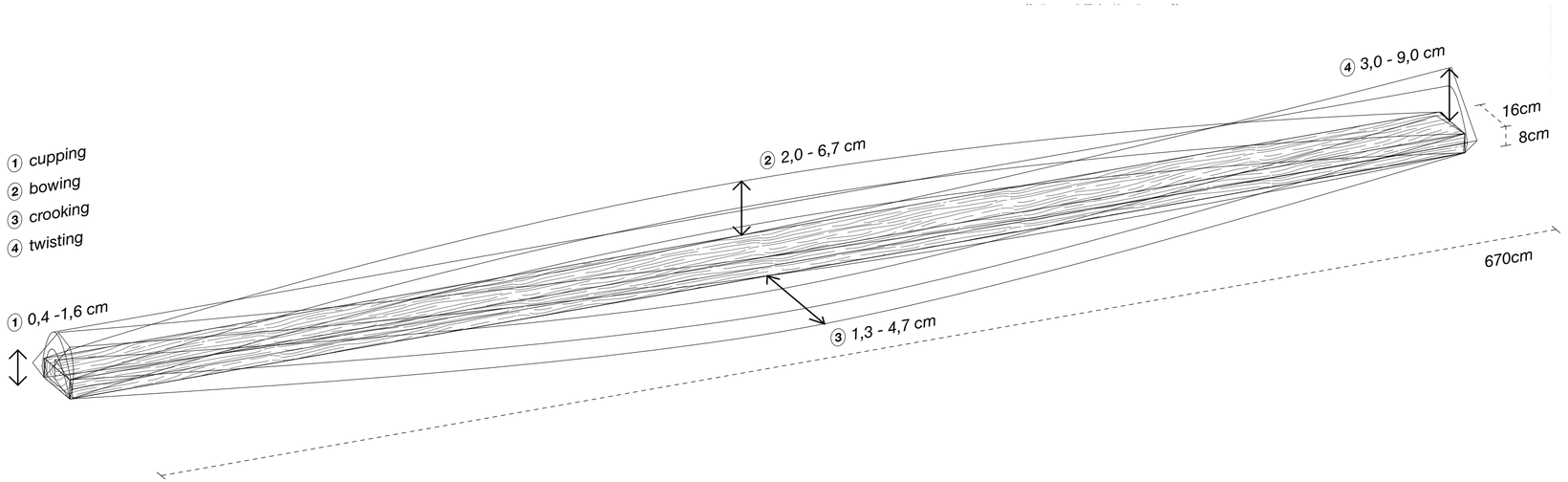


embracing

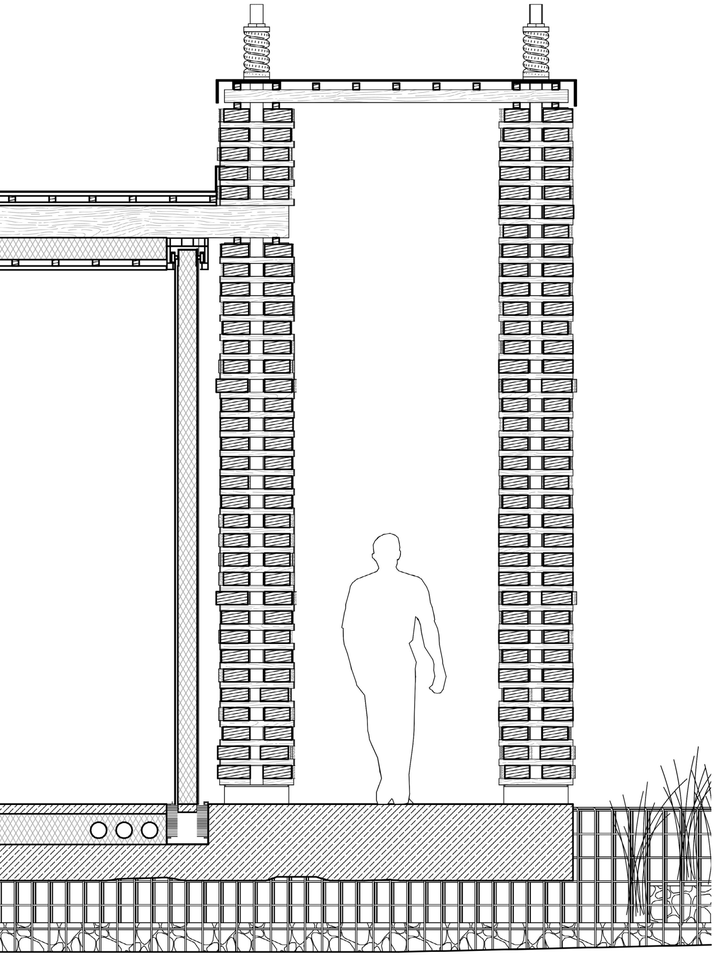
decay

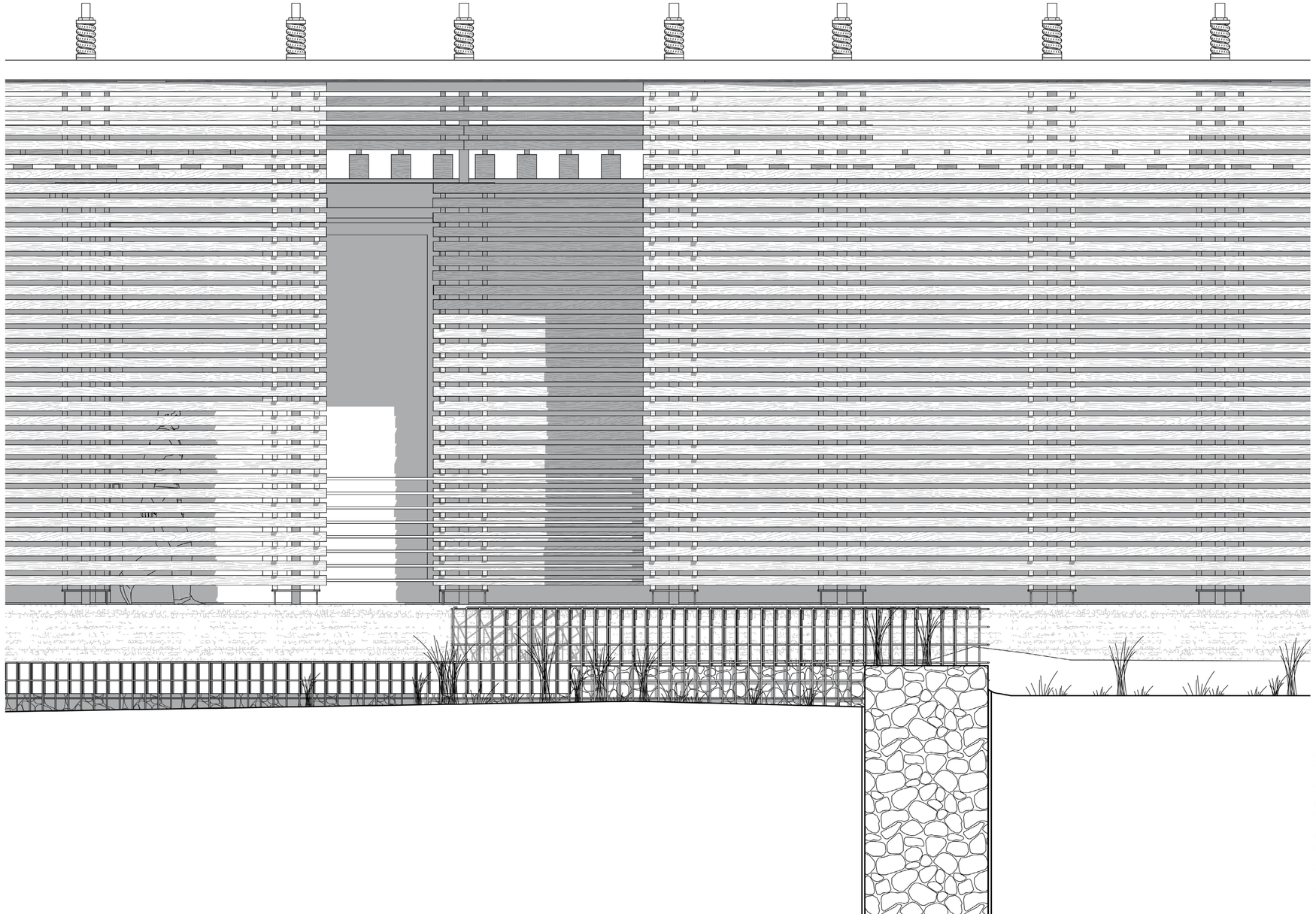
wood drying


16 cm
8 cm
6 - 8 %
0,1 - 0,3 %
3 - 4 %

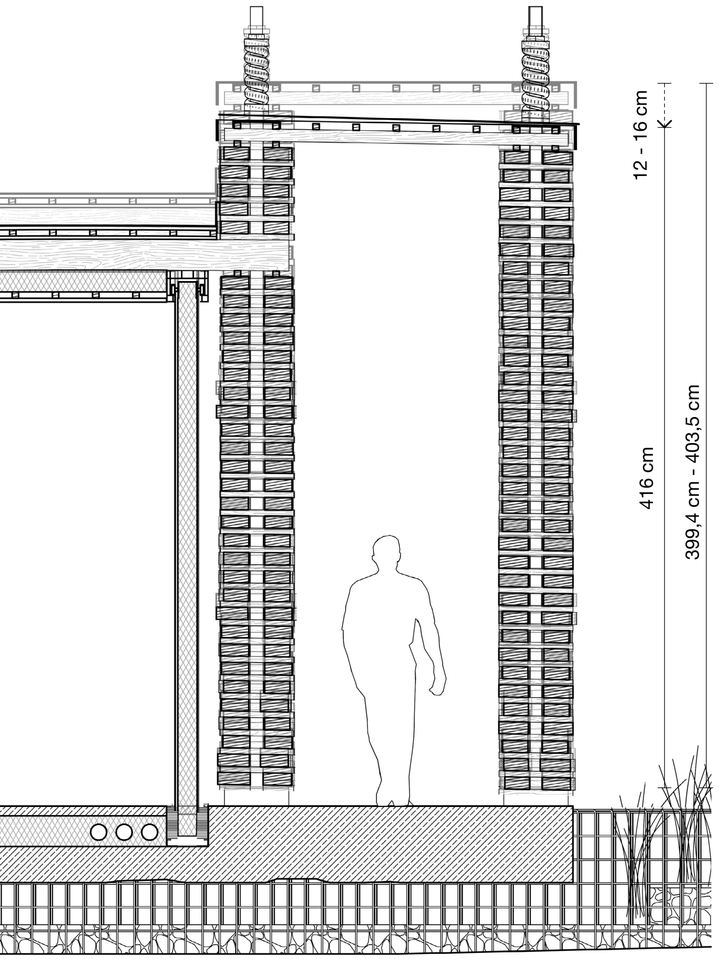

① cupping
② bowing
③ crooking
④ twisting
① 0,4 -1,6 cm
② 2,0 - 6,7 cm
③ 1,3 - 4,7 cm
④ 3,0 - 9,0 cm
16cm
8cm
670cm

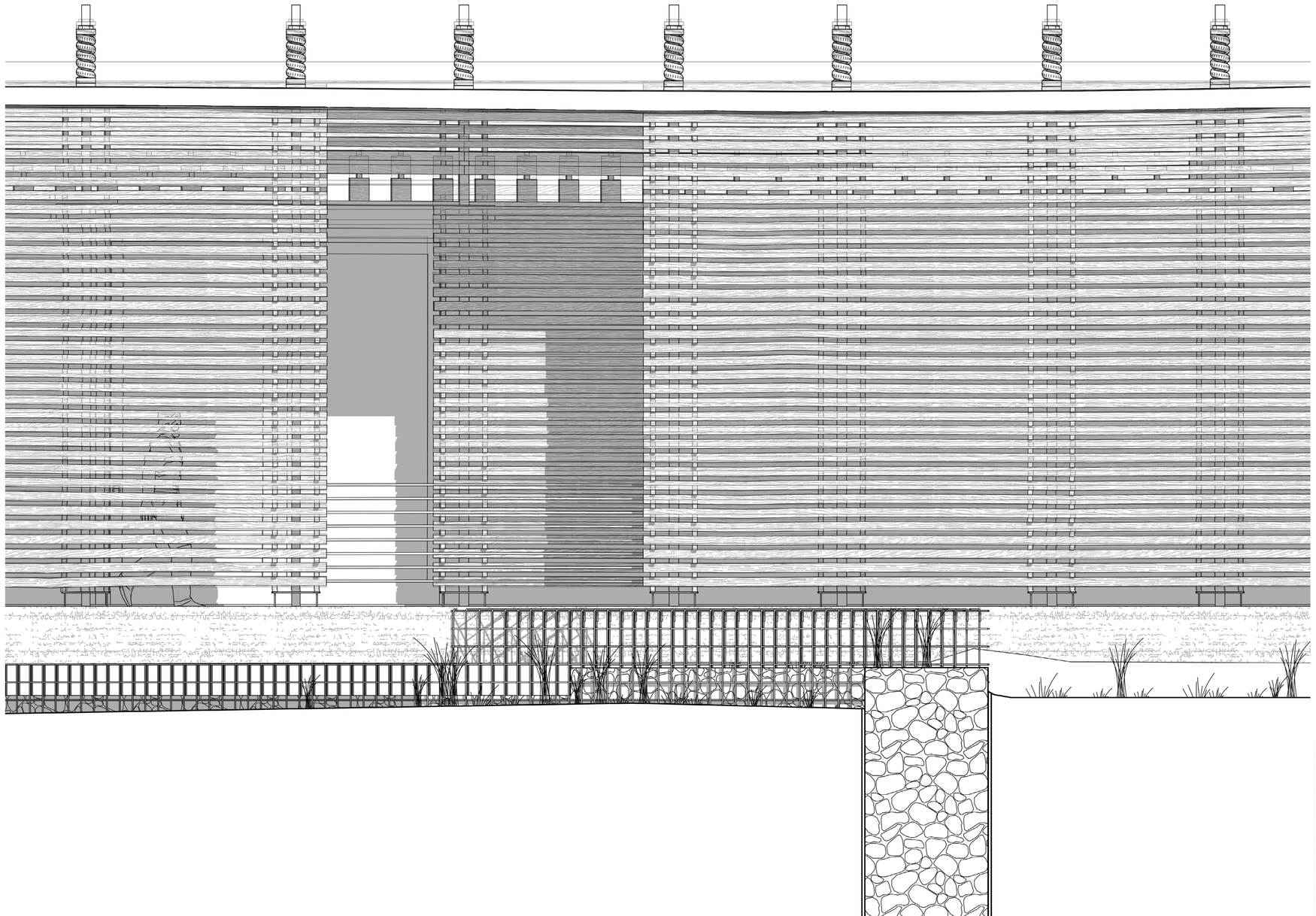
façade movement



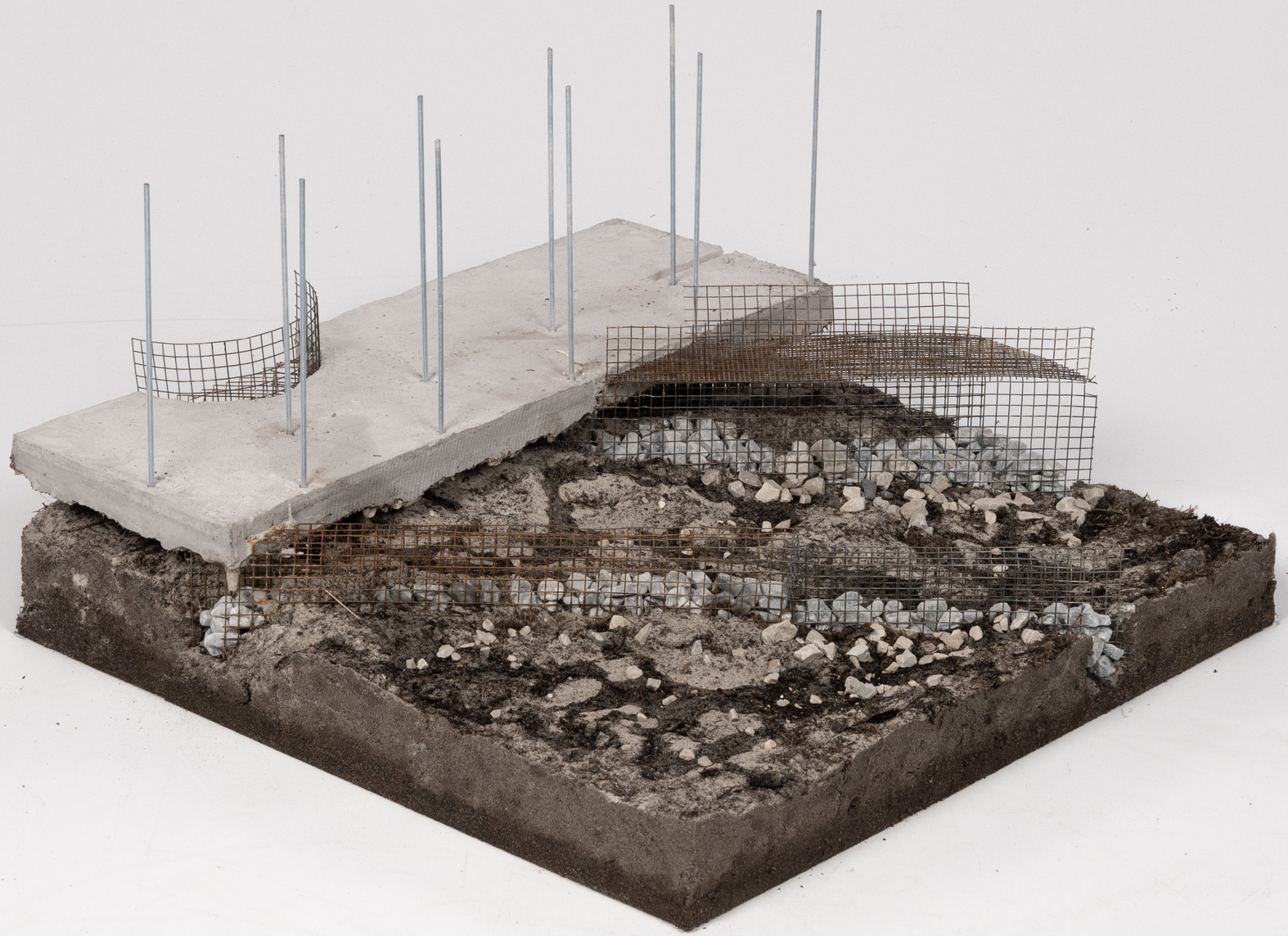


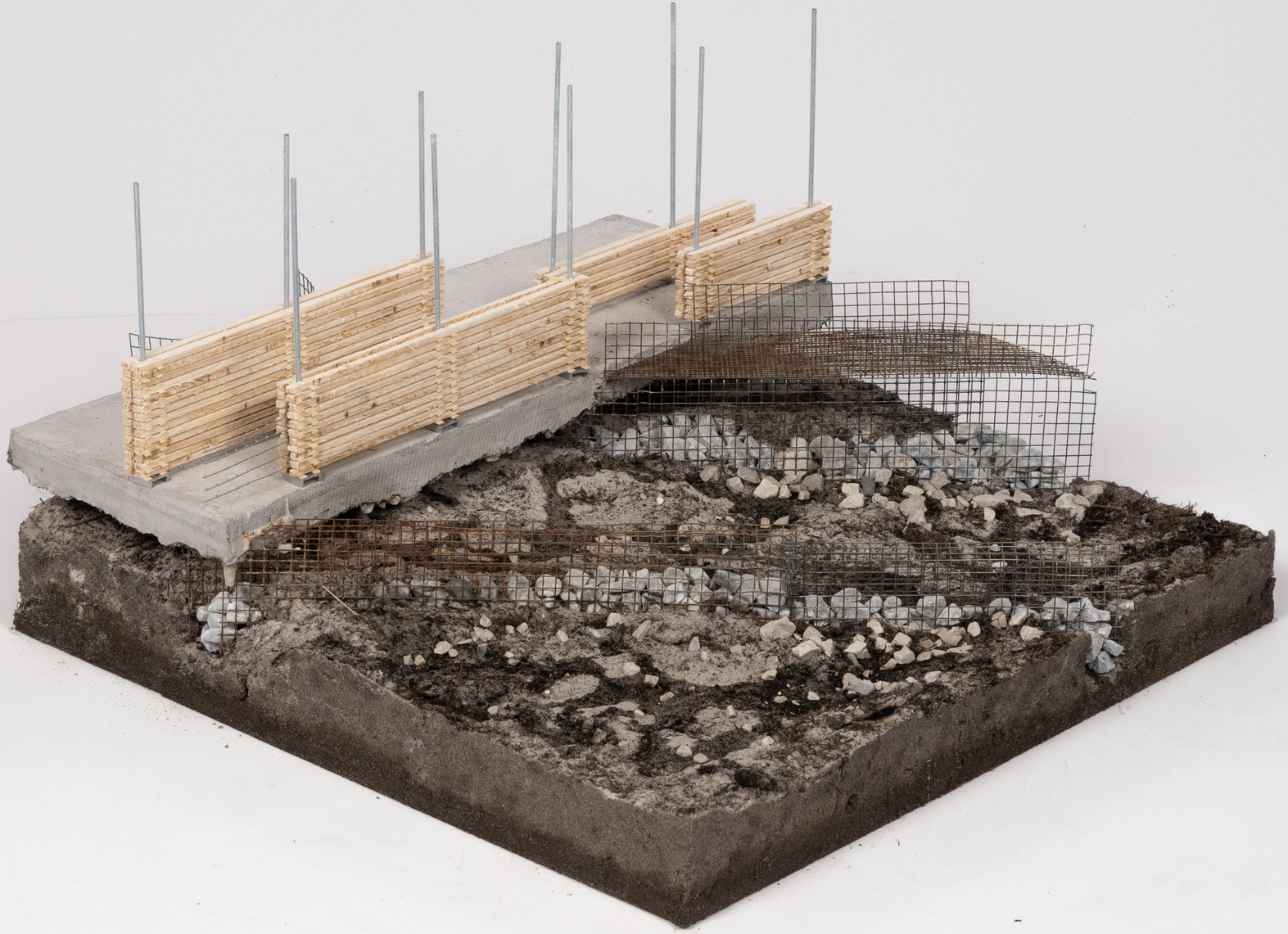
façade movement





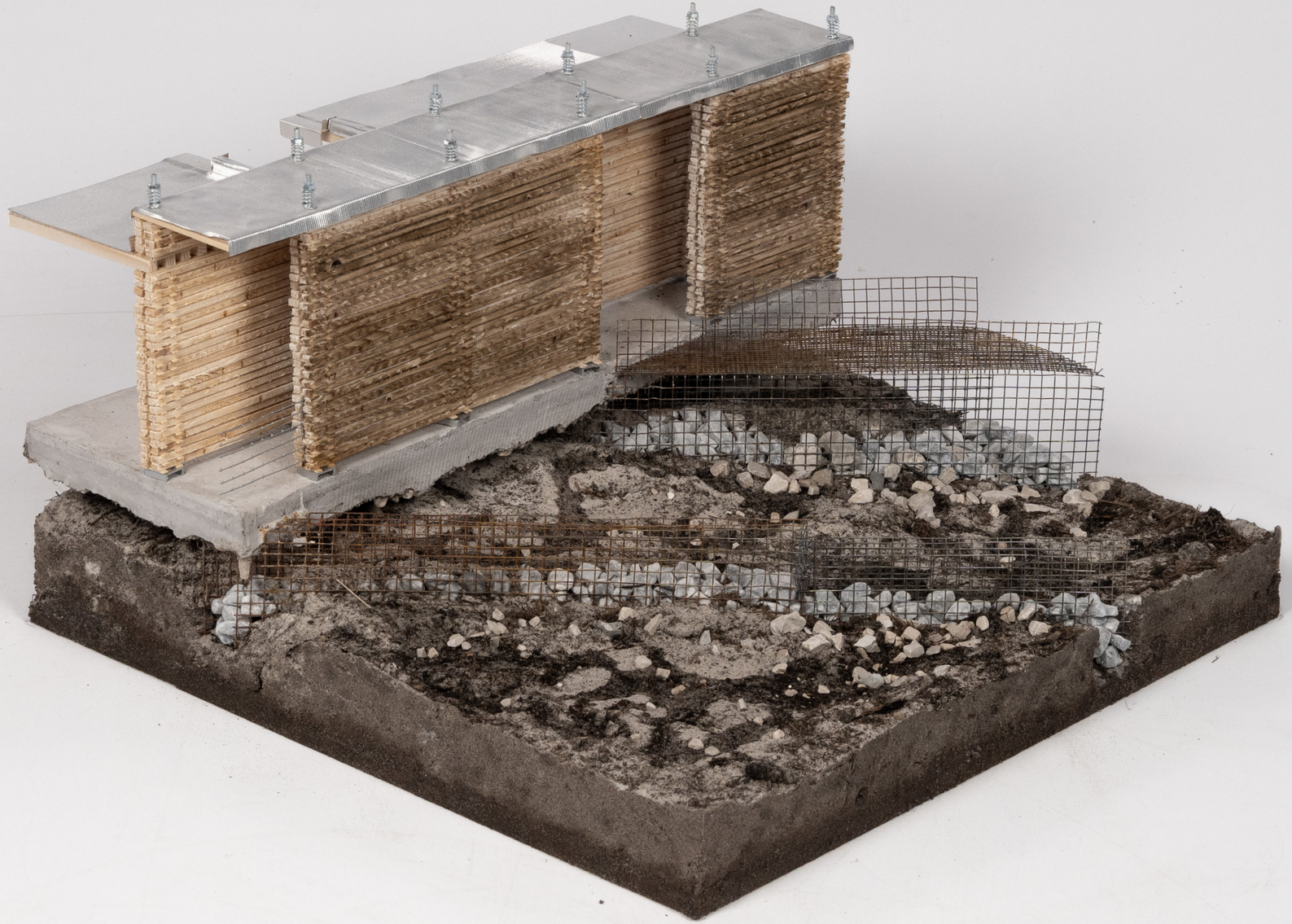
















experiencing

erosion

satbility vs. fragility

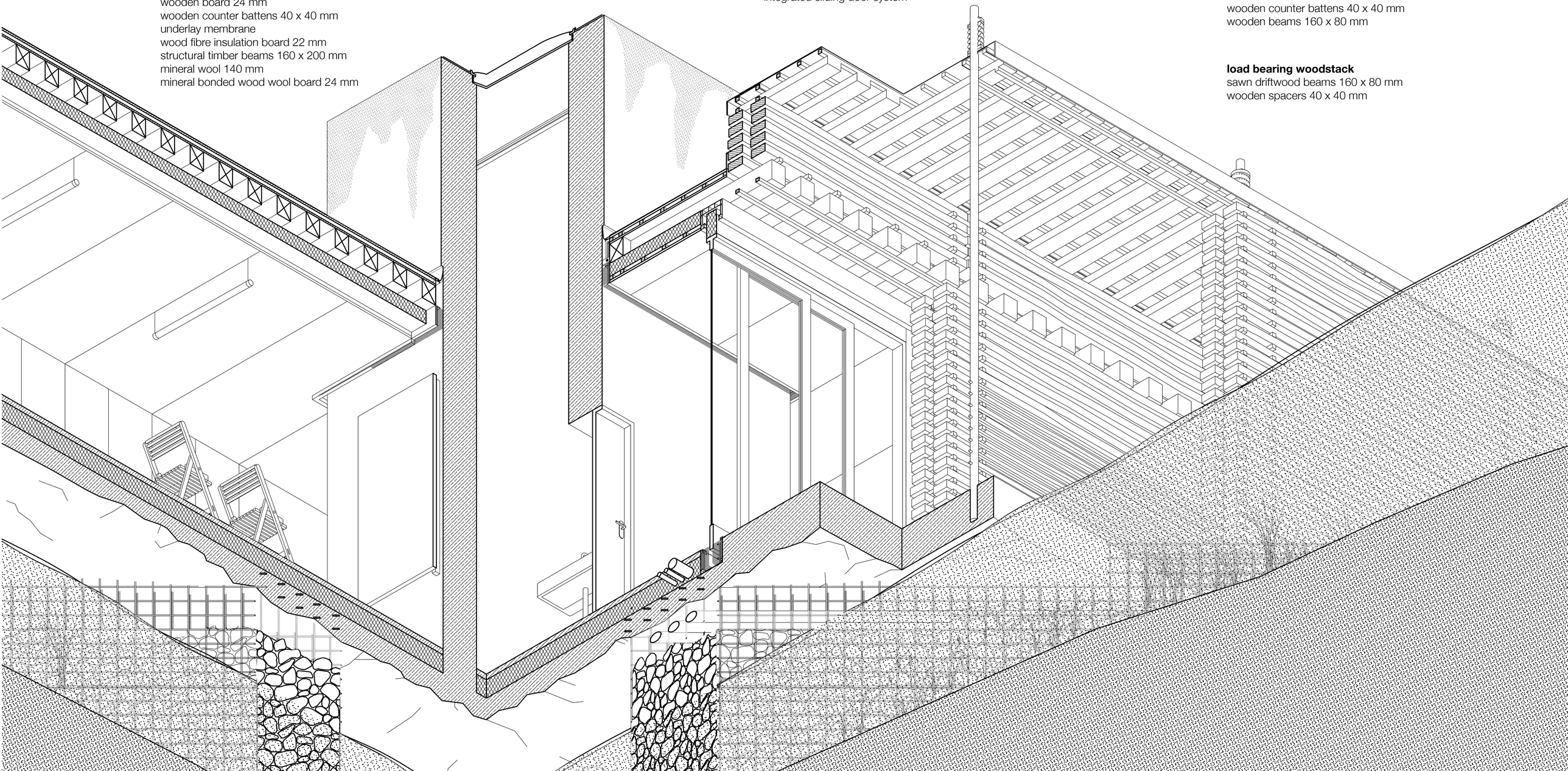
roof
sheet metal 0,4 mm
wooden board 24 mm
wooden counter battens 40 x 40 mm
underlay membrane
wood fibre insulation board 22 mm
structural timber beams 160 x 200 mm
mineral wool 140 mm
mineral bonded wood wool board 24 mm

floor
polished concrete 60 mm
insulation, floor heating and piping 180mm
reinforced concrete 200 - 600 mm
gabion walls dug up to 3 m into the soil

suspended walls
brushed stainless steel panels
12 cm rockwool insulation
integrated sliding door system

hallway cover
adjustment nut
compression spring
threaded steel rod 80 mm
sheet metal 0,4mm
wooden counter battens 40 x 40 mm
wooden beams 160 x 80 mm

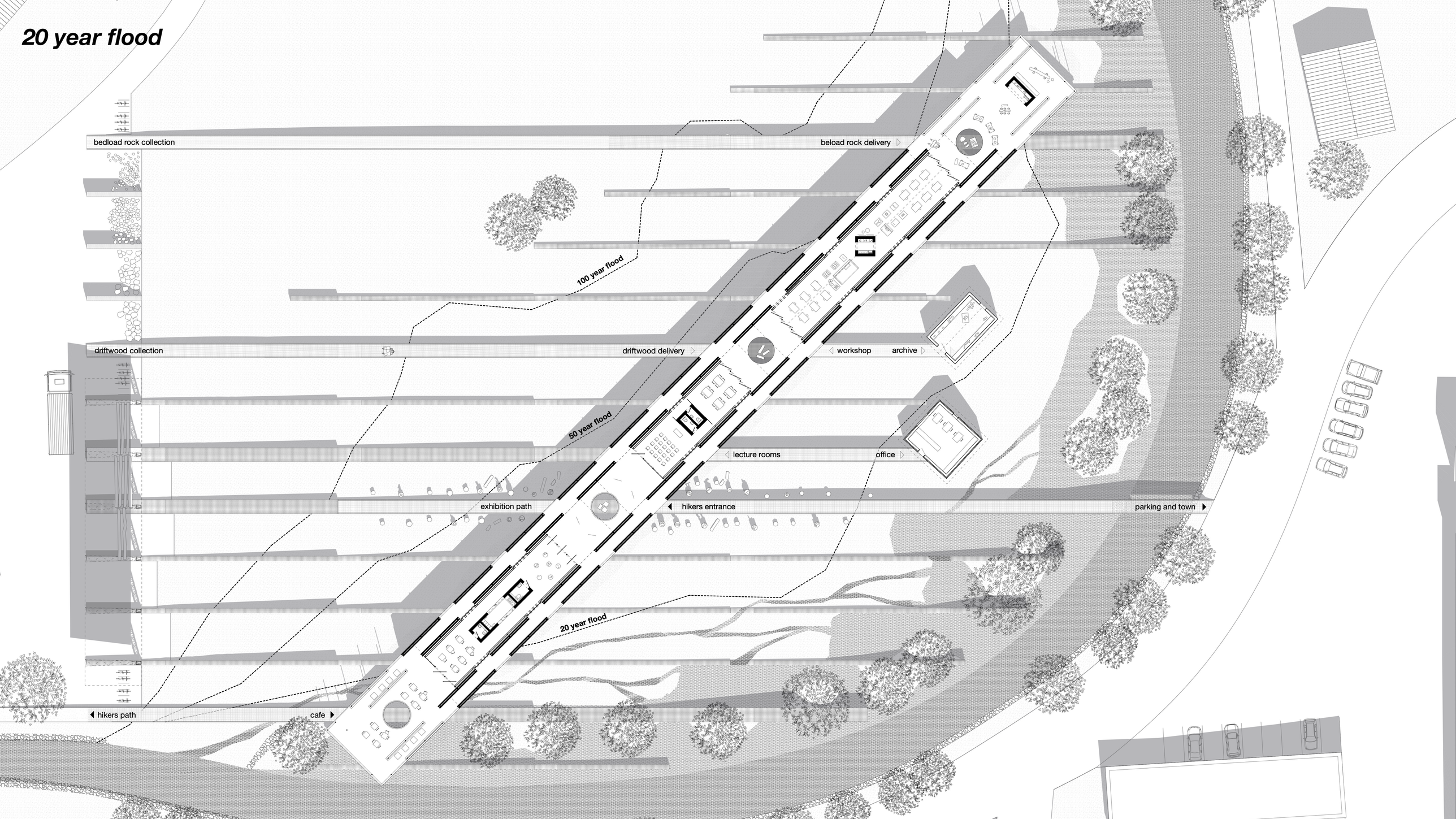
load bearing woodstack
sawn driftwood beams 160 x 80 mm
wooden spacers 40 x 40 mm

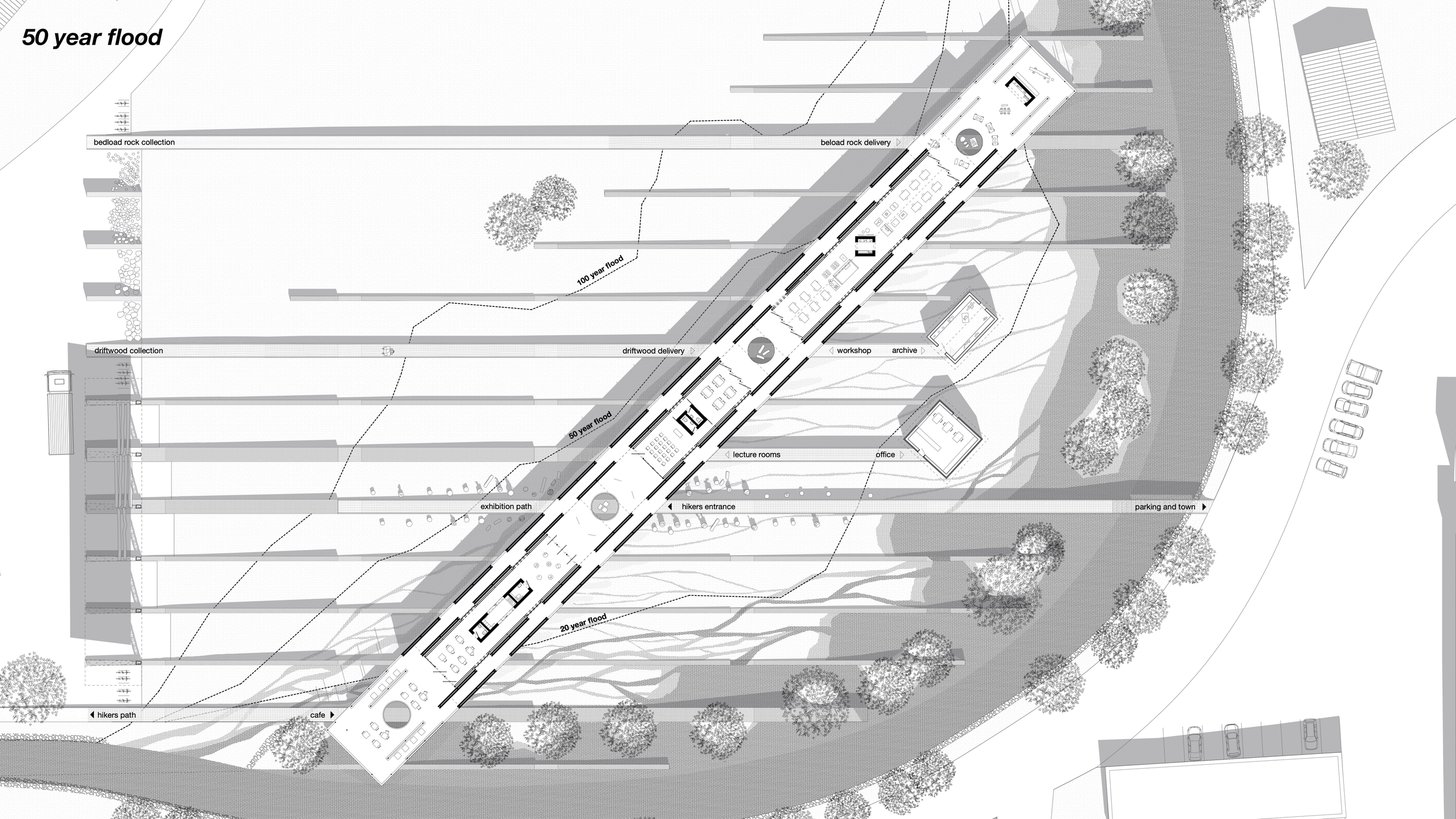


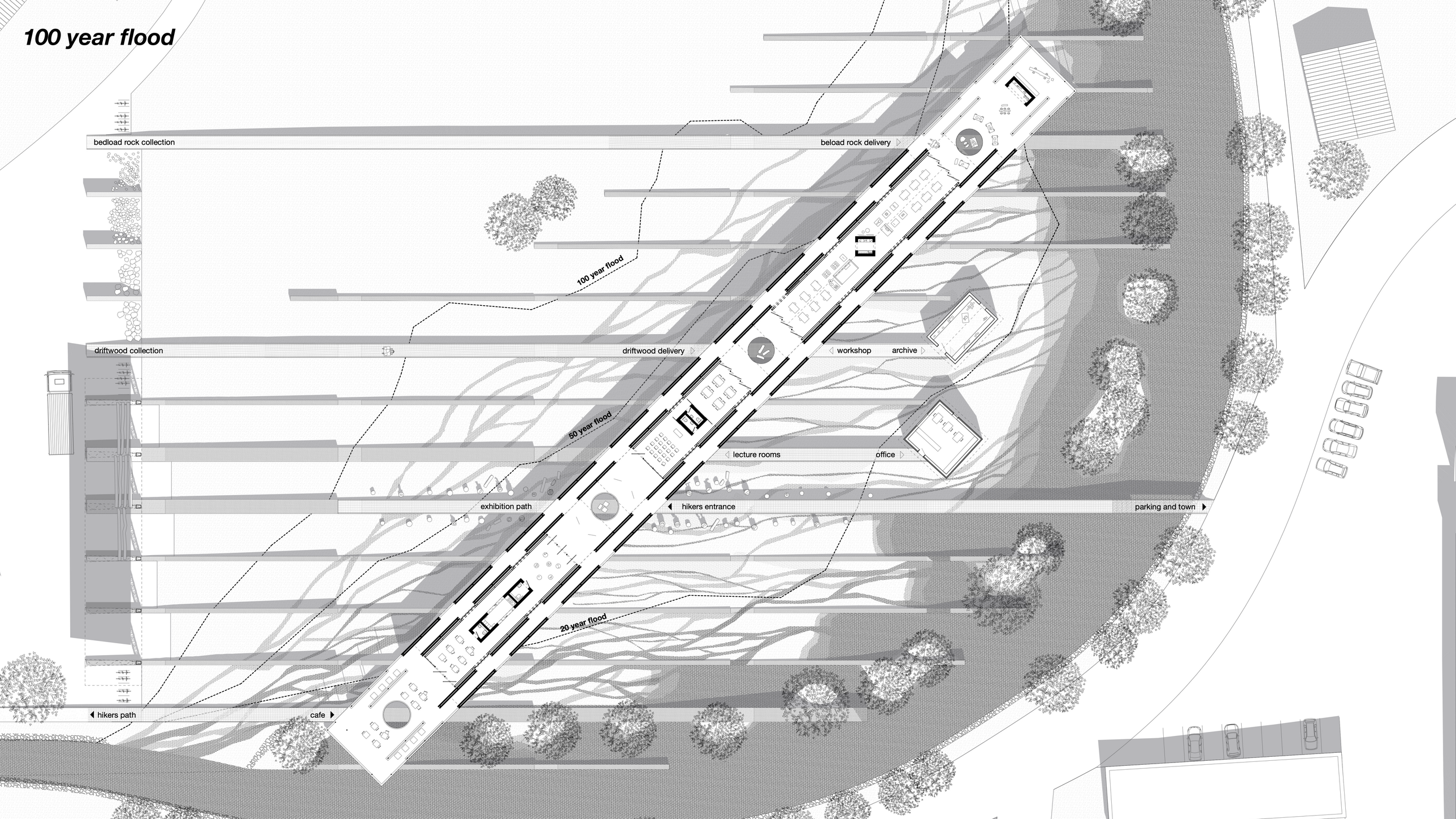

NANLITE
NANLITE



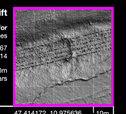
20 year flood




50 year flood
bedload rock collection
beload rock delivery
100 year flood
driftwood collection
driftwood delivery
workshop
archive
50 year flood
lecture rooms
office
exhibition path
hikers entrance
parking and town
20 year flood
hikers path
cafe


100 year flood
bedload rock collection
beload rock delivery
100 year flood
driftwood collection
driftwood delivery
workshop
archive
50 year flood
lecture rooms
office
exhibition path
hikers entrance
parking and town
20 year flood
hikers path
cafe

erosion in the anthropocene



glacier lift

resource for
metal frames
year of construction: 1967
number of frames: 14

max. glacier thickness: 30m
est. time until extinction: 10 years

47.414172, 10.975636 10m

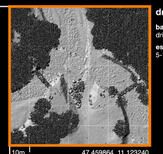


47.471137, 11.118252 10m

hydropower plant

barrier for
rock bedload

est. annual extraction
max. 1.000 m³

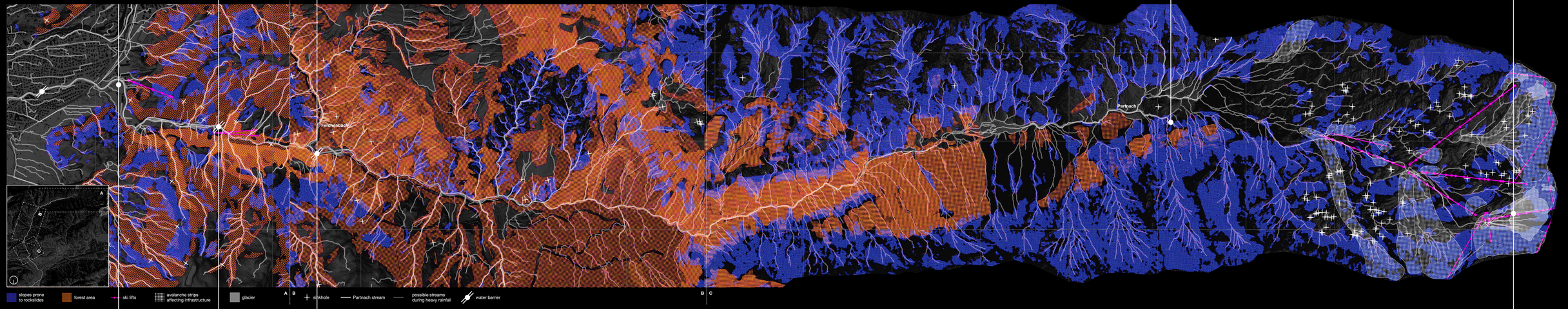


10m 47.459864, 11.123240

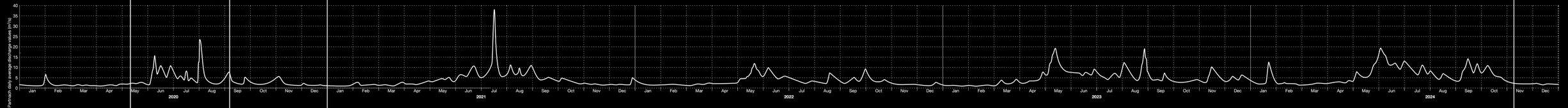
driftwood rake

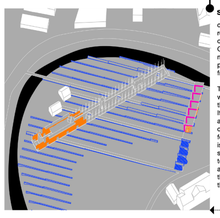
barrier for
driftwood

est. annual extraction
5-120 linear meters



slopes prone to rockslides · forest area · ski lifts · avalanche strips affecting infrastructure · glacier · A B sinkhole · Partnach stream · possible streams during heavy rainfall · water barrier · B C



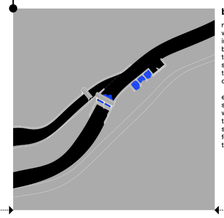


sediment school

collected driftwood and bedload rock are stored at a floodzone om the edge of the town of Garmisch-Partenkirchen. A roof made from former Skilift frames protects the drying driftwood from rain.

The school itself rests on gabion walls filled with the same stone that is collected from the river. Its walls are slowly building up as the driftwood accumulates, dries and is cut into the same format of slabs. Once the school is in use the very sediment the school is build from can be used to teach becoming craftsman and artists a way of working with the irregularity of material that the mountain provides

1,55 km 770m

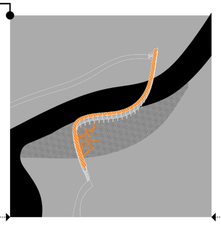


bedload pool

right in front of the weir several walls provide a structure for the initial sorting of extracted bedload rock. It acts as a short term storage before the sediment gets picked up by a truck to be transported further down the mountain.

emering from this same structure stairs step down into the river in which visitors can cool down their body during the hot summer months and let their feet feel the moving sediment on the riverbed.

1,51 km 40m

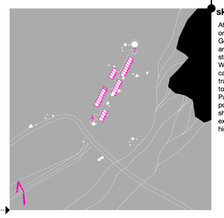


driftwood bridge

at the confluence of the river Partnach and Ferchenbach a newly built driftwood rake catches falled logs during flooding. It is built to protect the highly frequented Partnach gorge from clogging up.

The transformation of this array of steel poles into a bridge lets visitors interact with the material themselves as the pathway faces the collection site. After flooding visitors can watch how these stranded logs are collected and transported away via trucks making their way towards the valley.

18,04 km 1.150m



skipole shelter

At the northern Schneeferner, one of the last 4 glaciers in Germany. One can watch the Ski area turn into a collection site of steel eroded steel structures. While frames of former Ski-lifts can be dissasembled and transported with the cog-railway to the town of Garmisch-Partenkirchen, bigger Ski lift poles are reassembled into shelters for hikers willing to experience the harshness of a high alpine climate.

