

DEPLOY

lightweight design + flyovers

P5

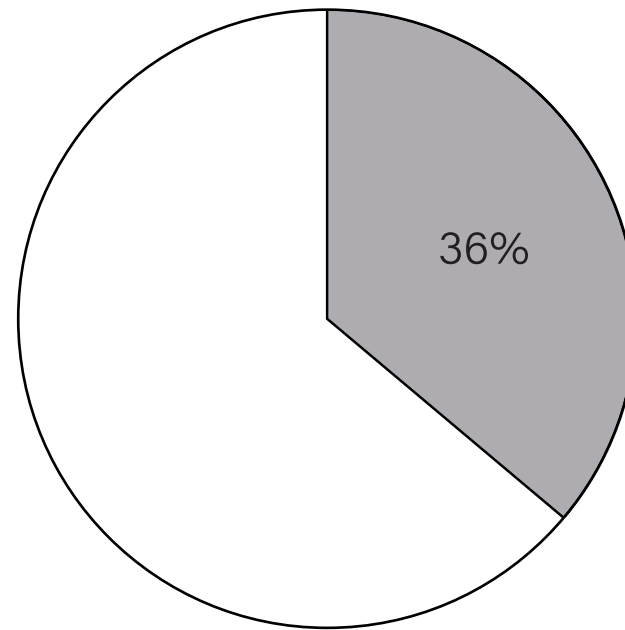
Arthur Hamelers [4475771]

studio: architectural engineering

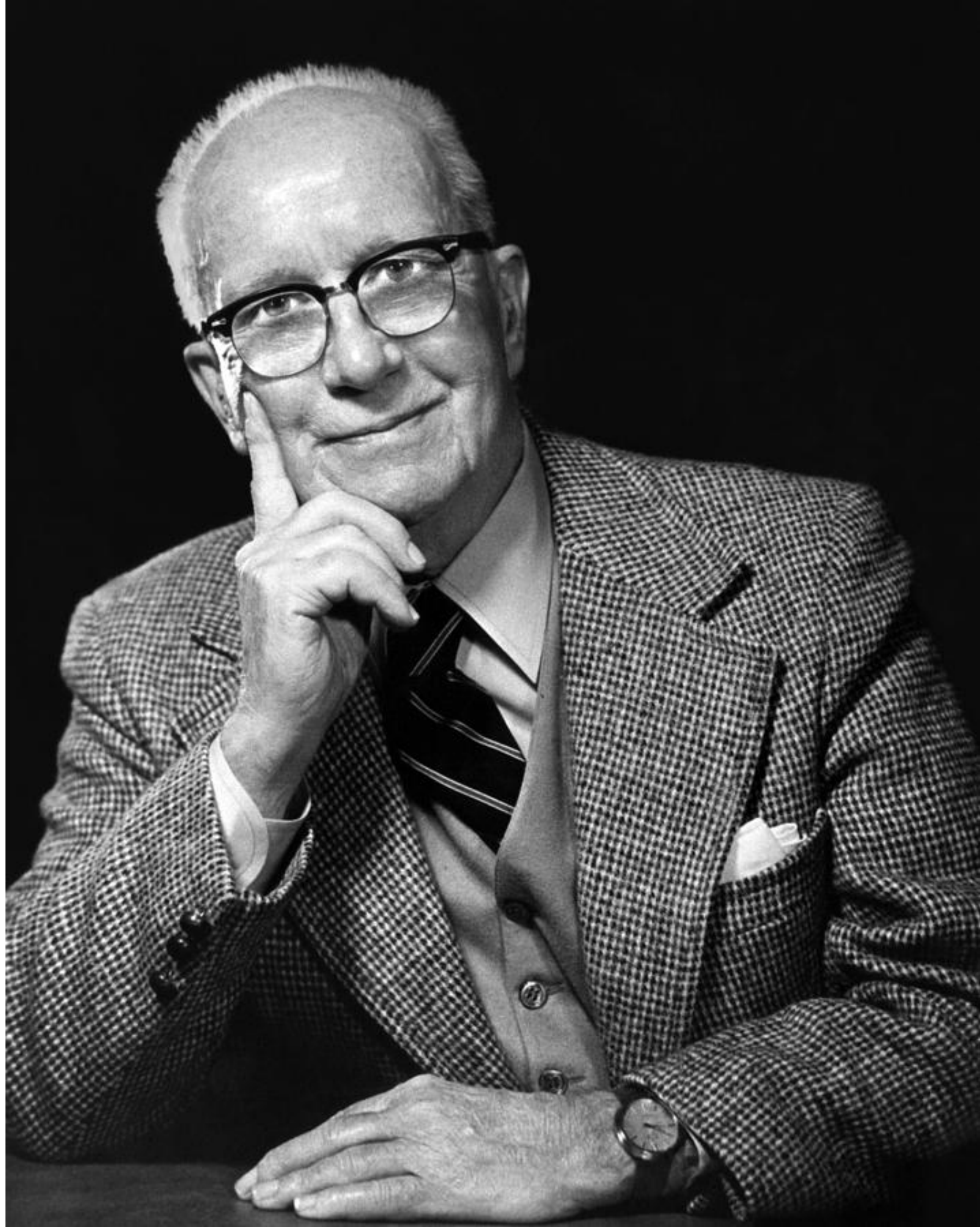
30/06/2023

GLOBAL ENERGY USE

buildings & construction sector



*"To do more and more with less and less
untill you can do **everything** with **nothing**."*



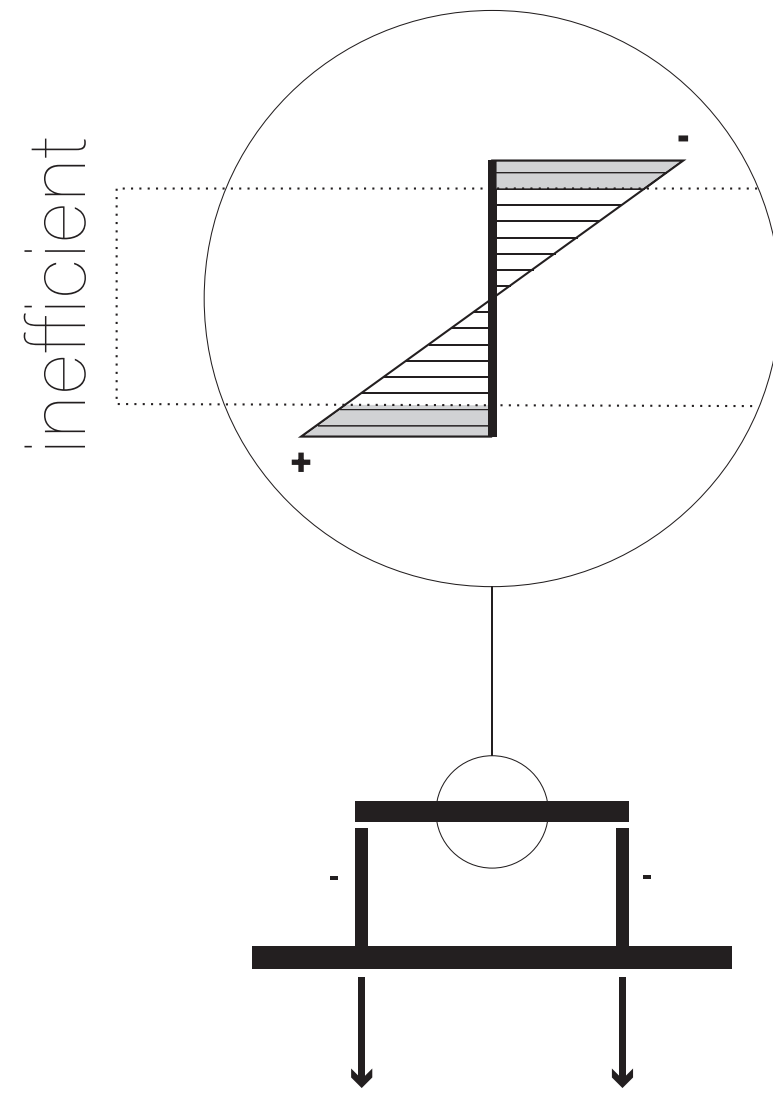
THEME



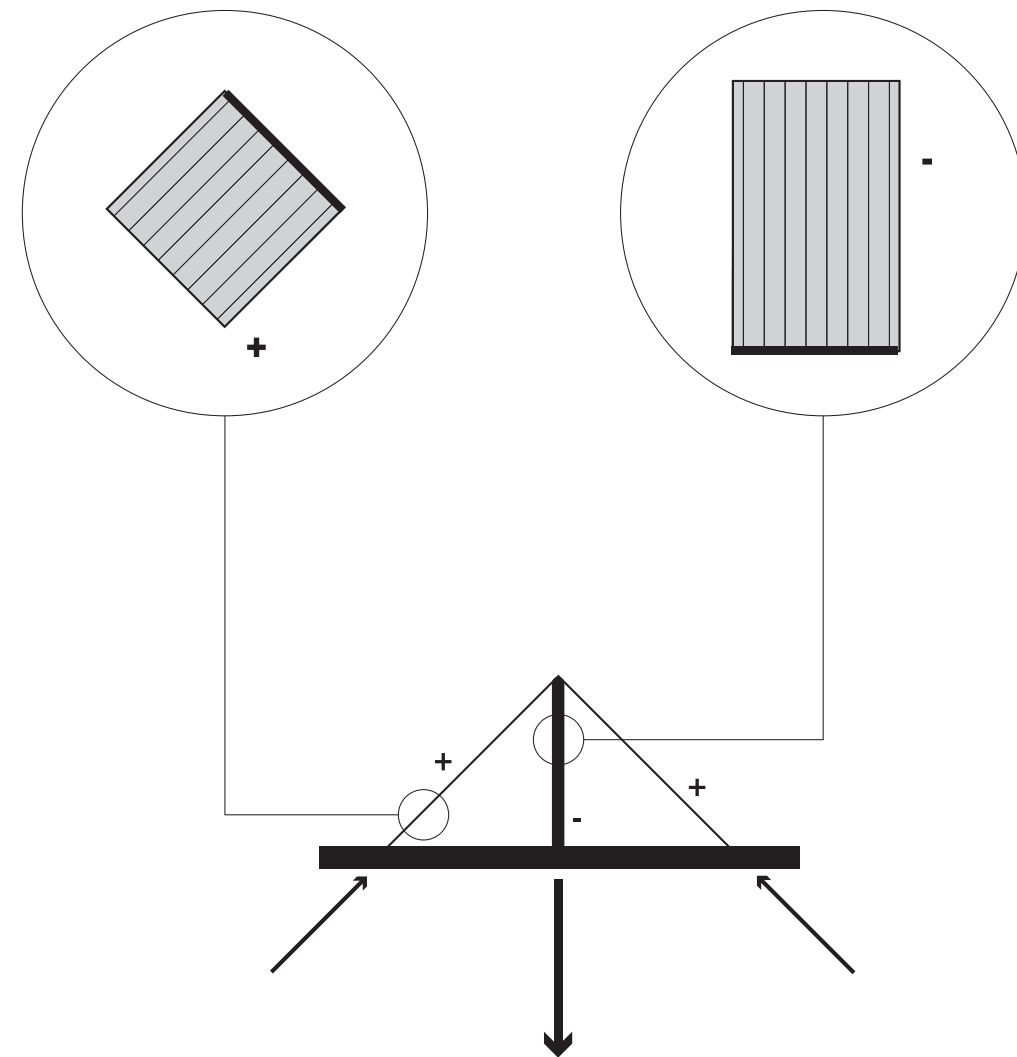
LIGHTNESS

performance per unit energy

EFFICIENCY + FLEXIBILITY



conventional buildings



tensile structures



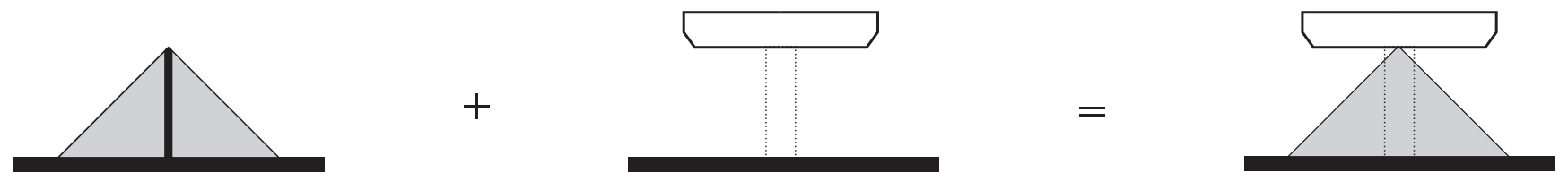
Frei Otto | form finding experiments



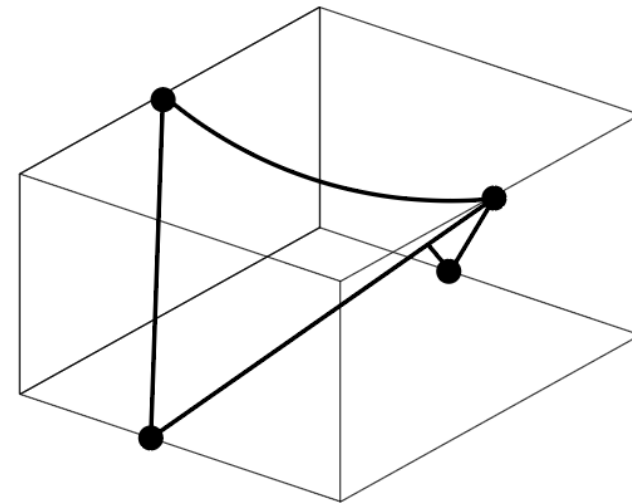
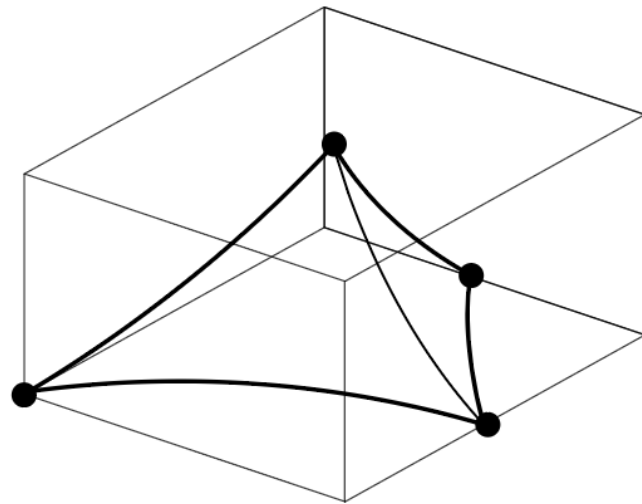
Frei Otto | olympic stadium, Munich





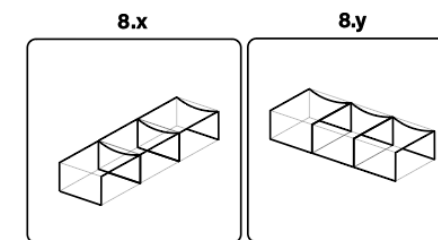
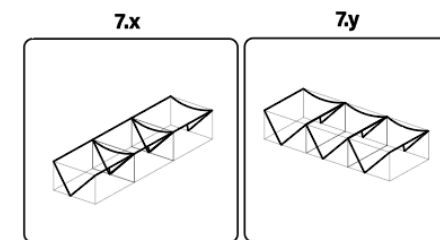
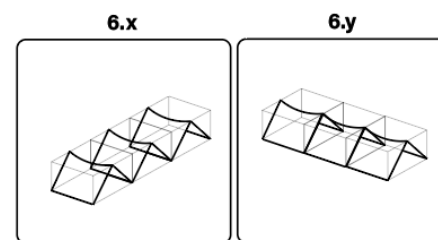
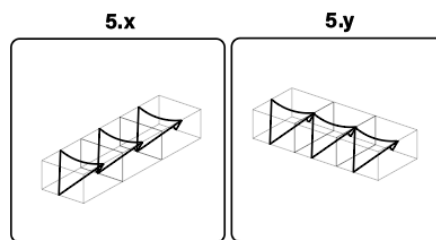
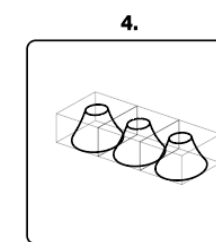
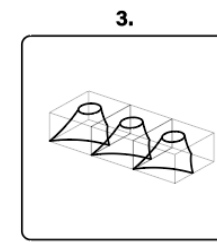
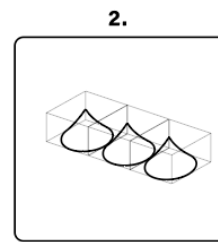
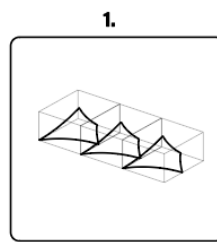


RESEARCH



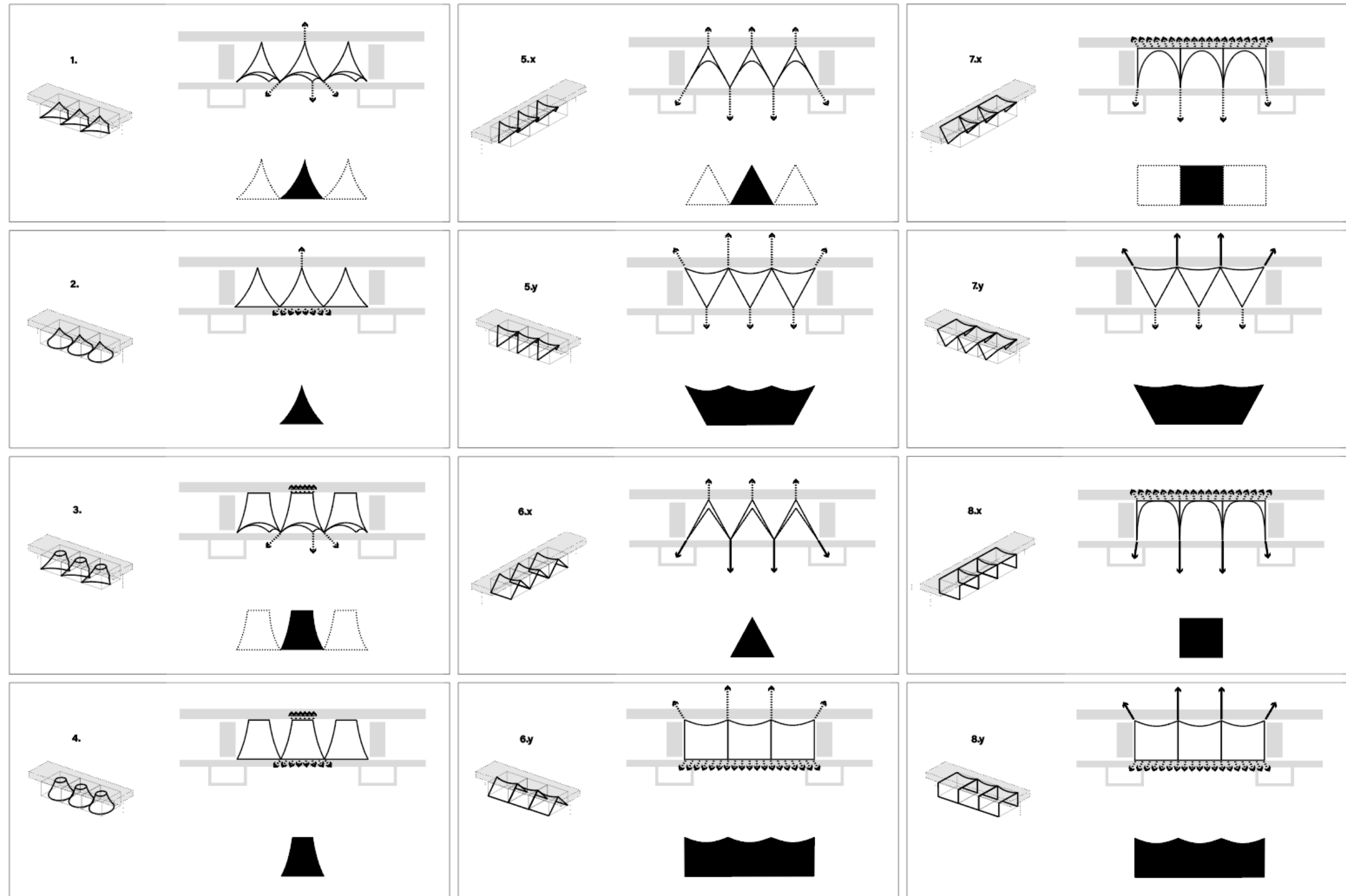
CLASSIFY

12 systems defined






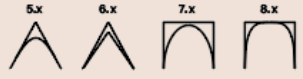


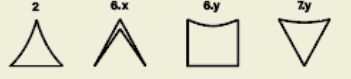



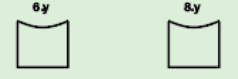
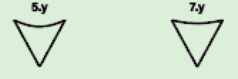
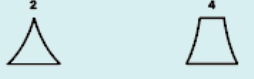
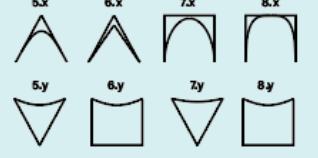
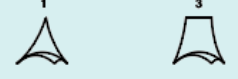
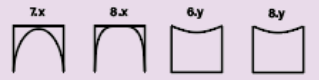



RELATE

to the flyover



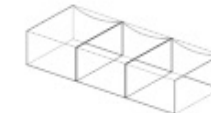
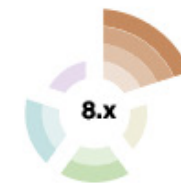
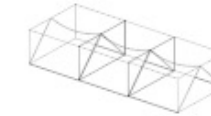
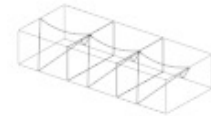
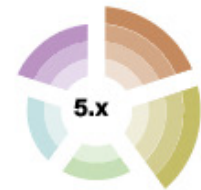
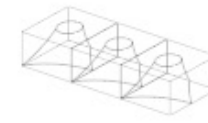
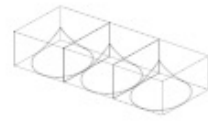
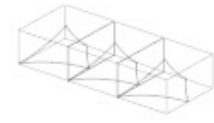
EVALUATE

according to 5 attributes

OPENNESS	 <p>DIFFICULT TO PASS THROUGH</p>			 <p>EASY TO PASS THROUGH</p>
TEMPORALITY	 <p>MANY NODES AGAINST FLYOVER (LINES)</p>			 <p>MINIMAL NODES (POINTS)</p>
ADAPTIVENESS	 <p>SMALL CONTINUOUS SPACE</p>			 <p>EXTENSIVE CONTINUOUS SPACE</p>
GEOMETRIC COMPLEXITY	 <p>SIMILAR PIECES (POINT SYMMETRY)</p>			 <p>DIFFERENT PIECES (NO SYMMETRY)</p>
STRUCTURAL INFLUENCE	 <p>NODES DISTRIBUTED & CLOSER TO FOUNDATION</p>			 <p>ONLY NODES ATTACHED TO DECK</p>

RESULTS

character sheet



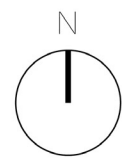
FLYOVER



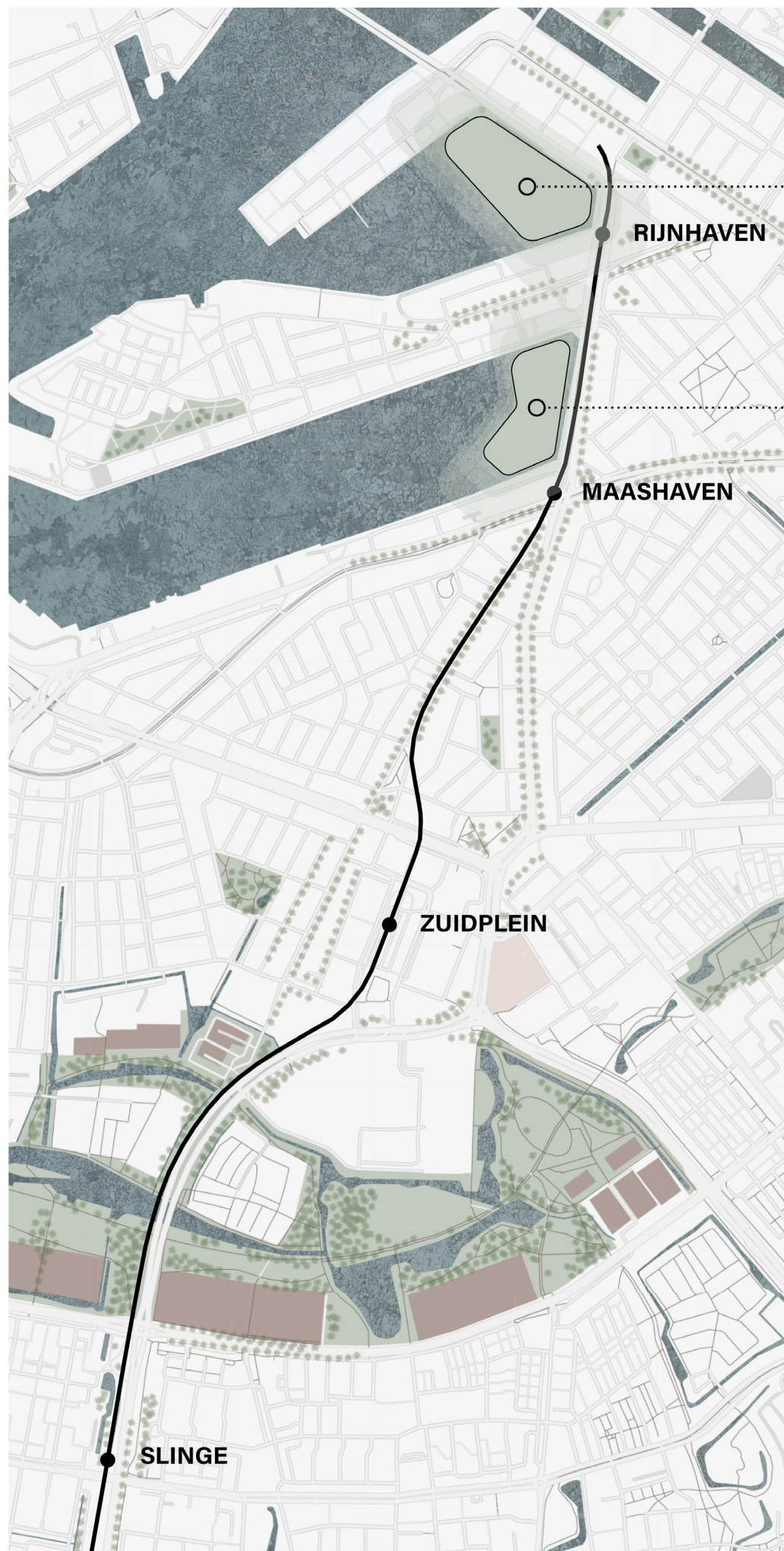
Rotterdam South:

METRO FLYOVER

(1960 - 1968)



[m]



RIJNHAVEN PARK

NELSON MANDELAPARK

RIJNHAVEN

MAASHAVEN

ZUIDPLEIN

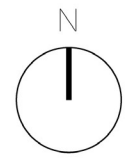
SLINGE

THE LINE
cutting through urban fabric





from
DIVIDER
to
CONNECTOR



1500
1000
500
250
0

[m]



PUBLIC EVENTS
near the Maassilo

COMMUNAL SPACE
in the Tarwewijk

STAGE
floating above zuidplein

BIRDWATCHING
over the water

EXHIBITIONS
suspended in the woods

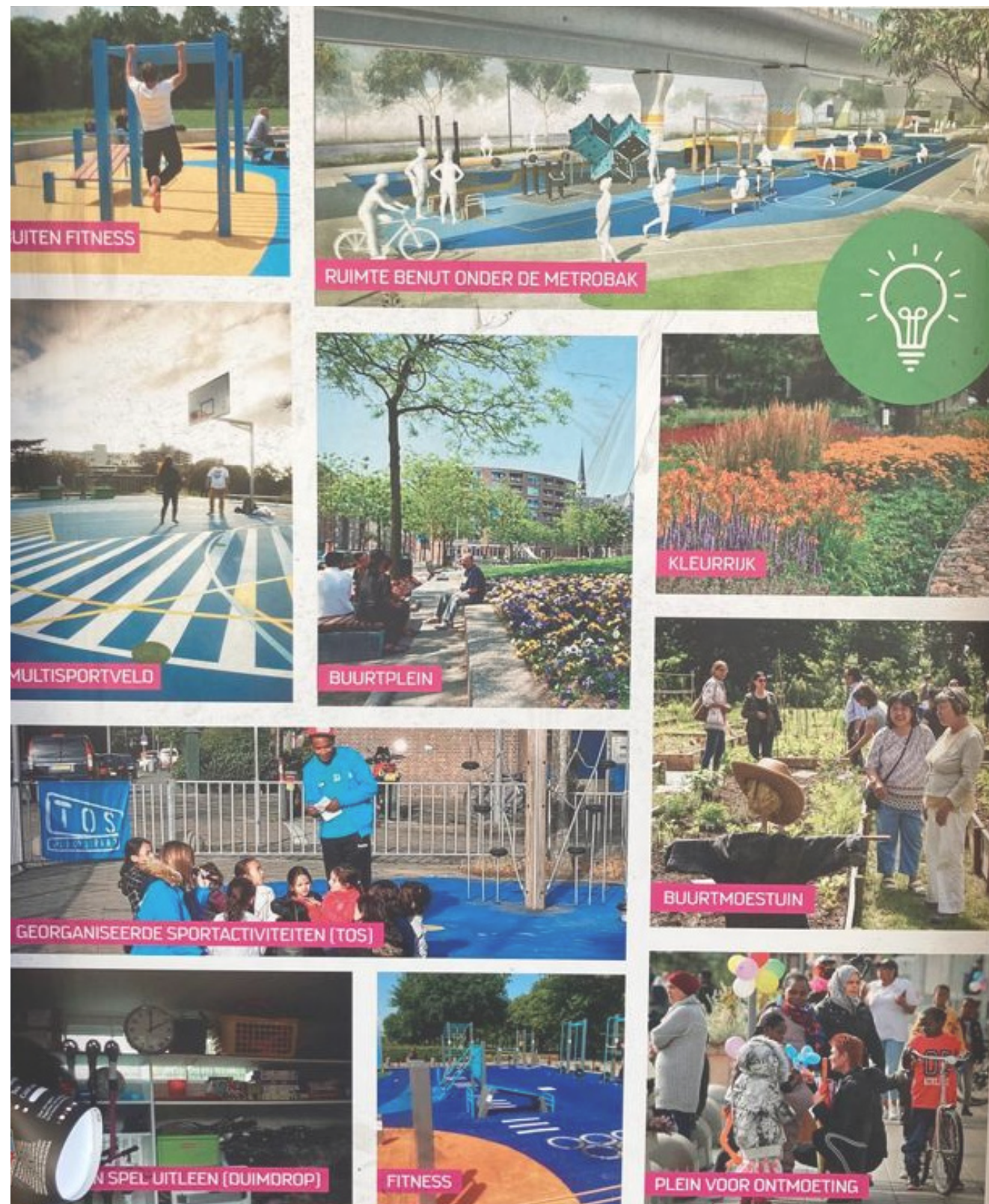
TARWEWIJK





INPUT

from the community



Ontwerp een bouwwerk

Workshop voor iedereen die een tuinpaviljoen of bouwwerk wil ontwerpen

Design a pavilion

Workshop for everyone who wants to participate in the design of a pavilion

TWEE WORKSHOPS

- DINSDAG APRIL 4th 15:30 - 17:30
- ZATERDAG APRIL 15th 15:00 - 17:00

Gratis!

Lekkers

Koffie • Thee
Gebakjes • Hapjes

Wat gaan we doen?

Tekenen • Schilderen
Verven • Bouwen

Informatie:

Cultuurwerkplaats Tarwewijk
Cillershoekstraat 1
010 751 5030
floor@cultuurwerkplaatstarwewijk.nl

WORK IN PROGRESS

reclaiming the public realm

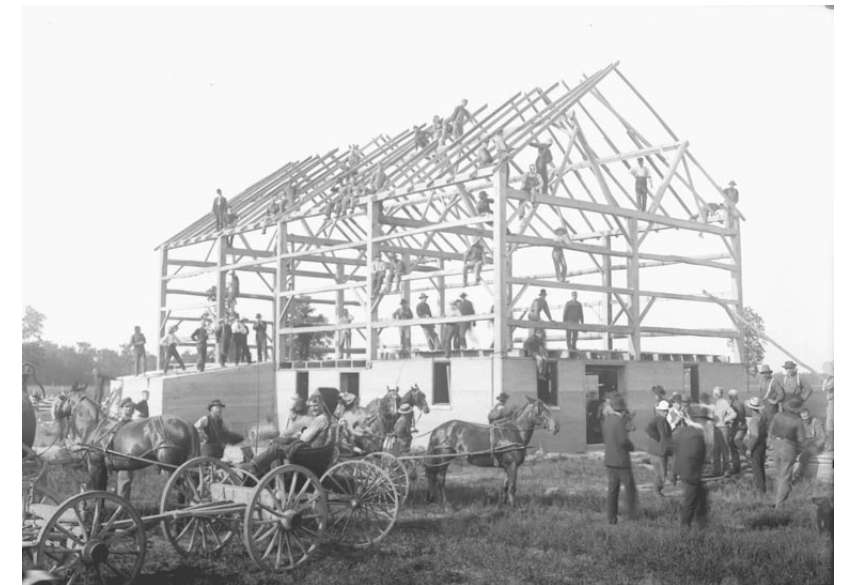


DEPLOY TARWEWIJK

A PLACE TO MEET

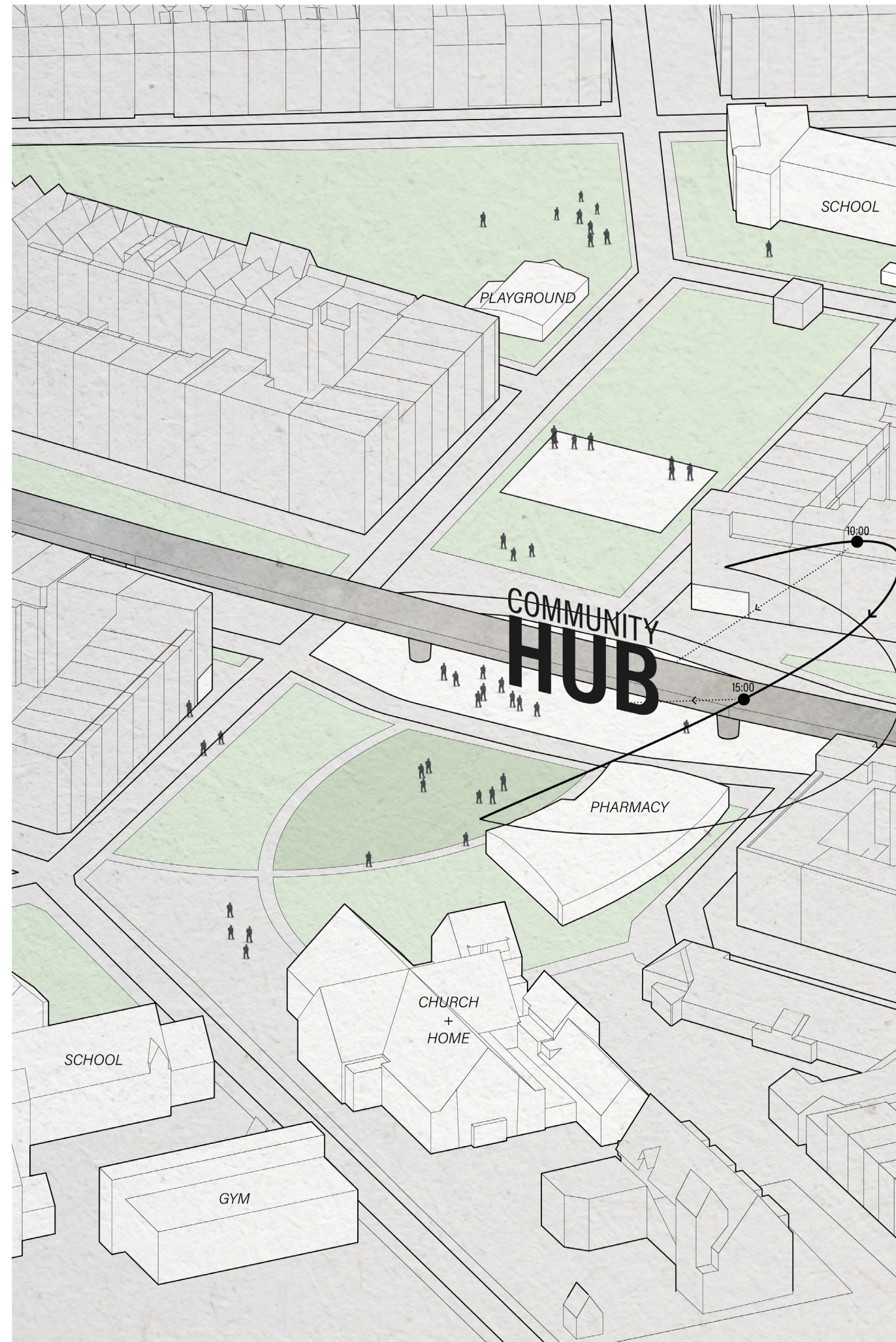


BUILT BY THE USERS



CONNECT

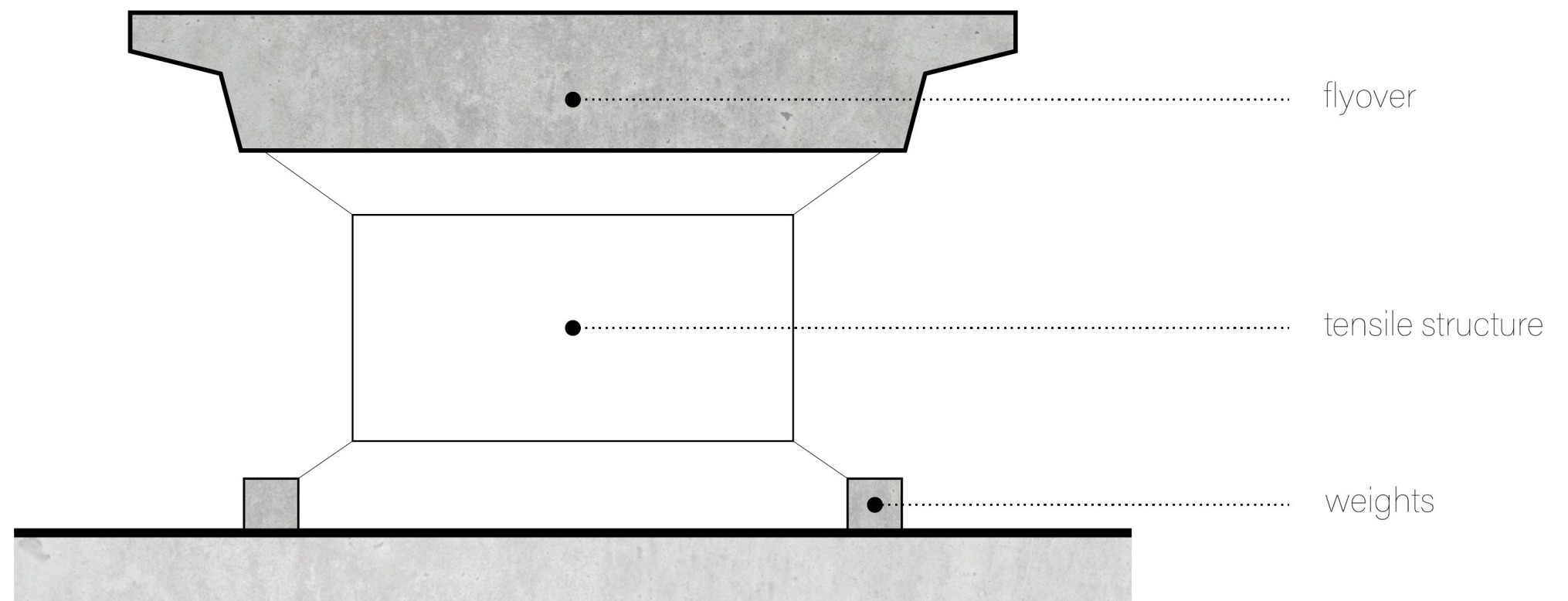
the neighbourhood



DESIGN

STRUCTURAL CONCEPT

heavy vs light



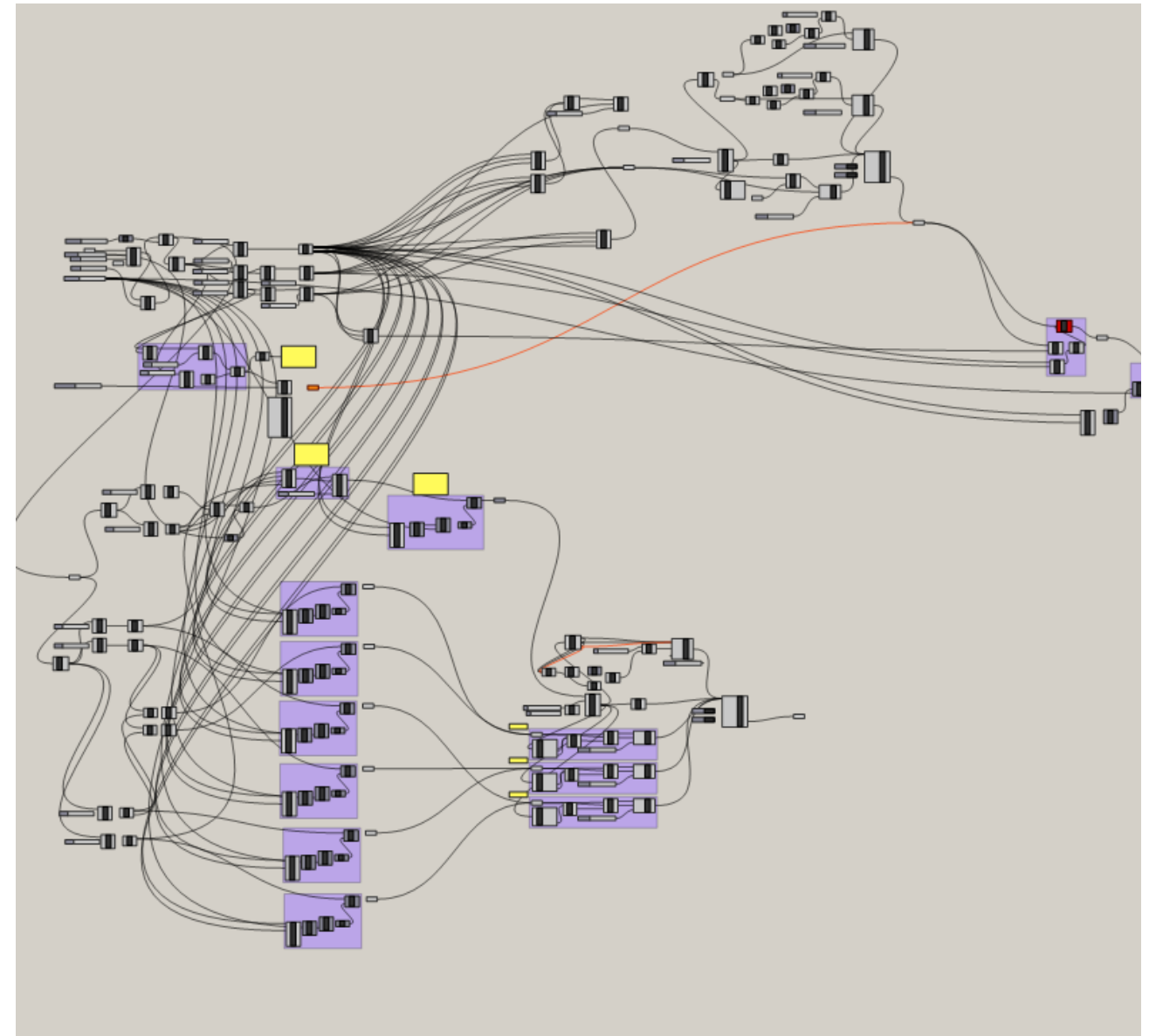
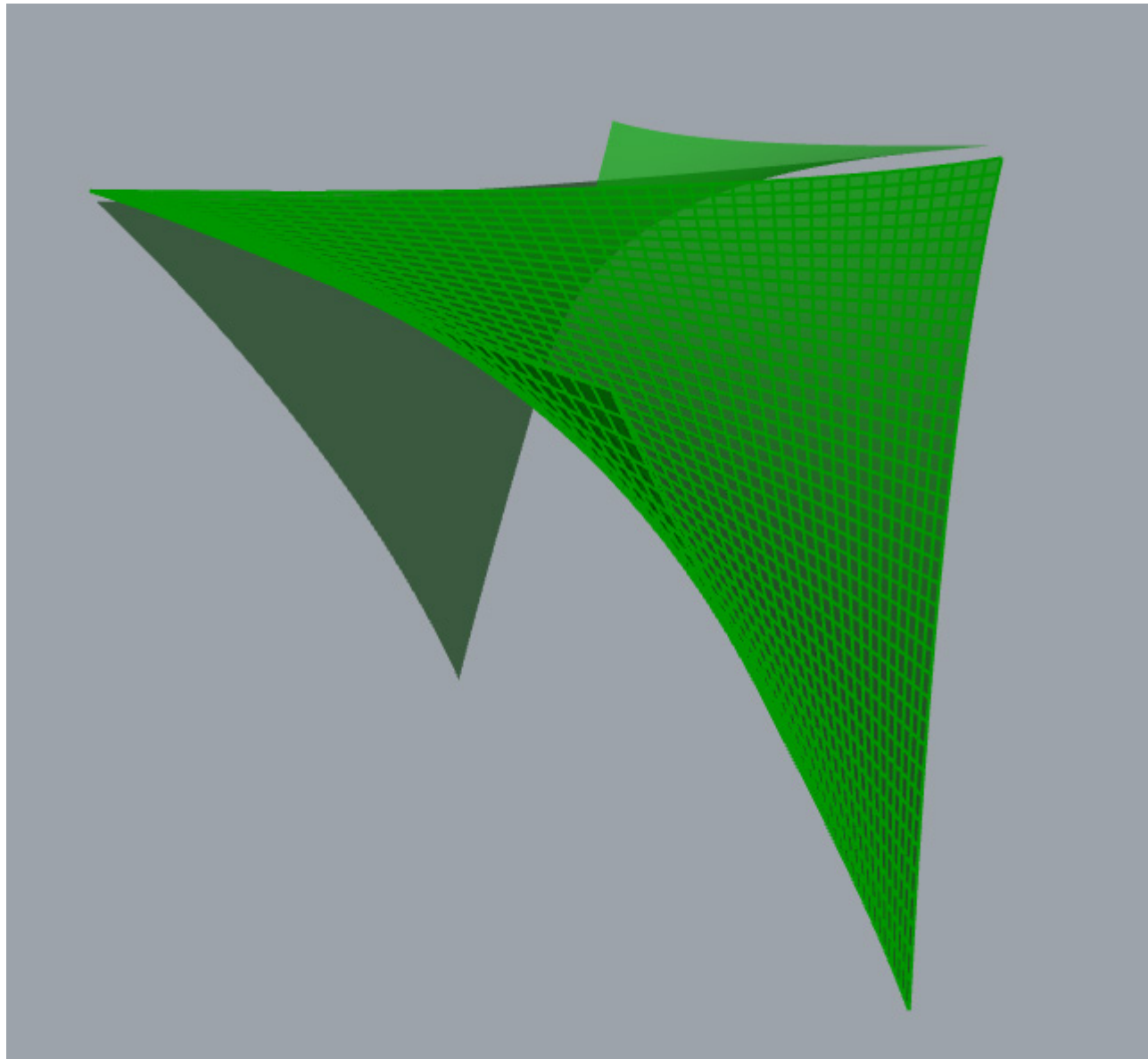
RECLAIMED MATERIAL

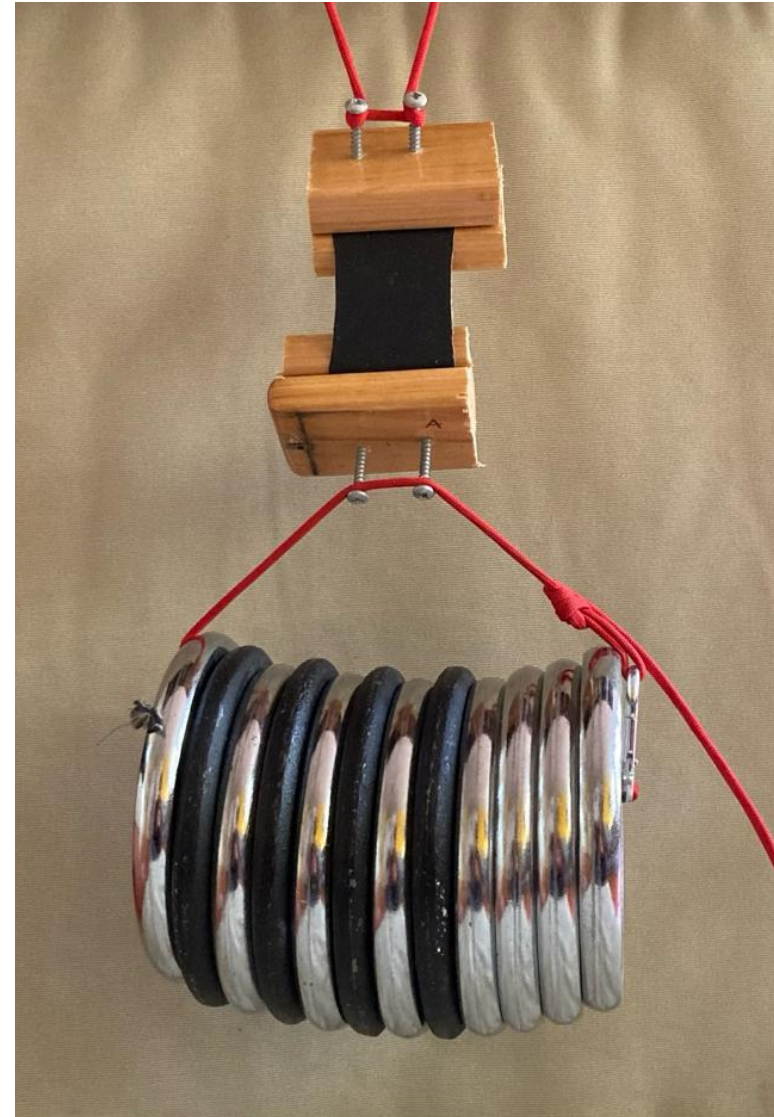
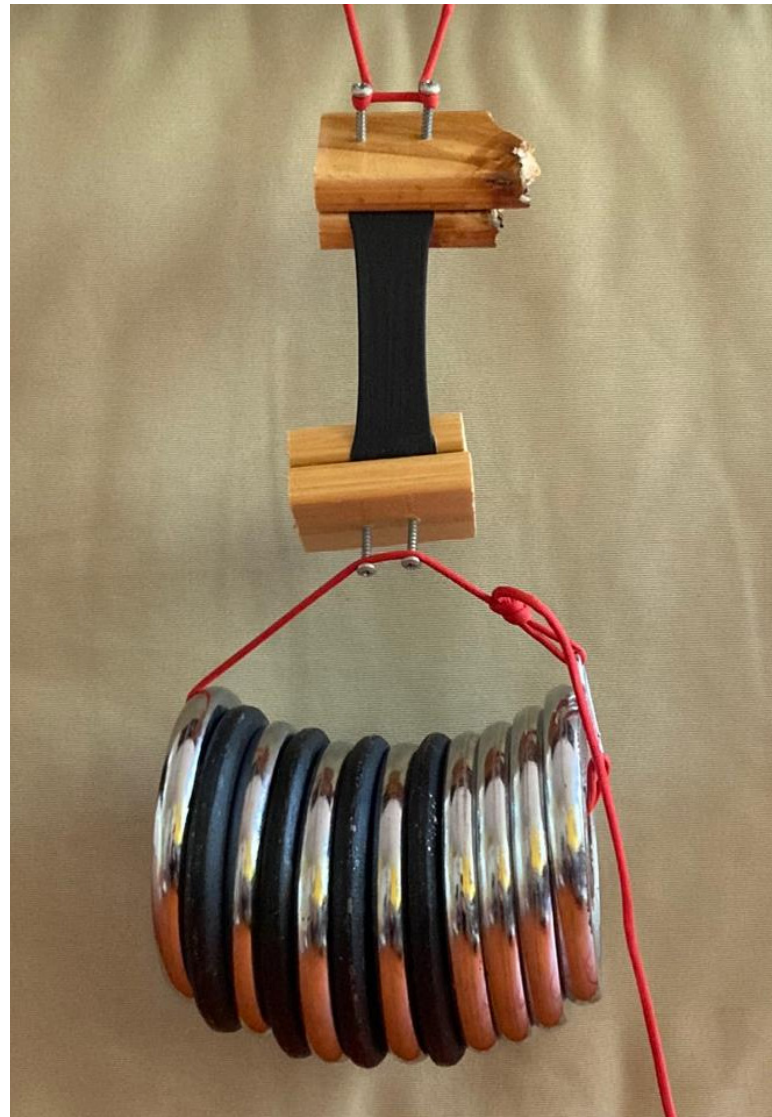
banners from Ahoy



PROCESS: DIGITAL TOOLS

repeatable solution





STRENGTH

material reserach

strength needed: 0,5 - 2,5 kN/m

tested: 2,4 kN/m



SHAPE

material research

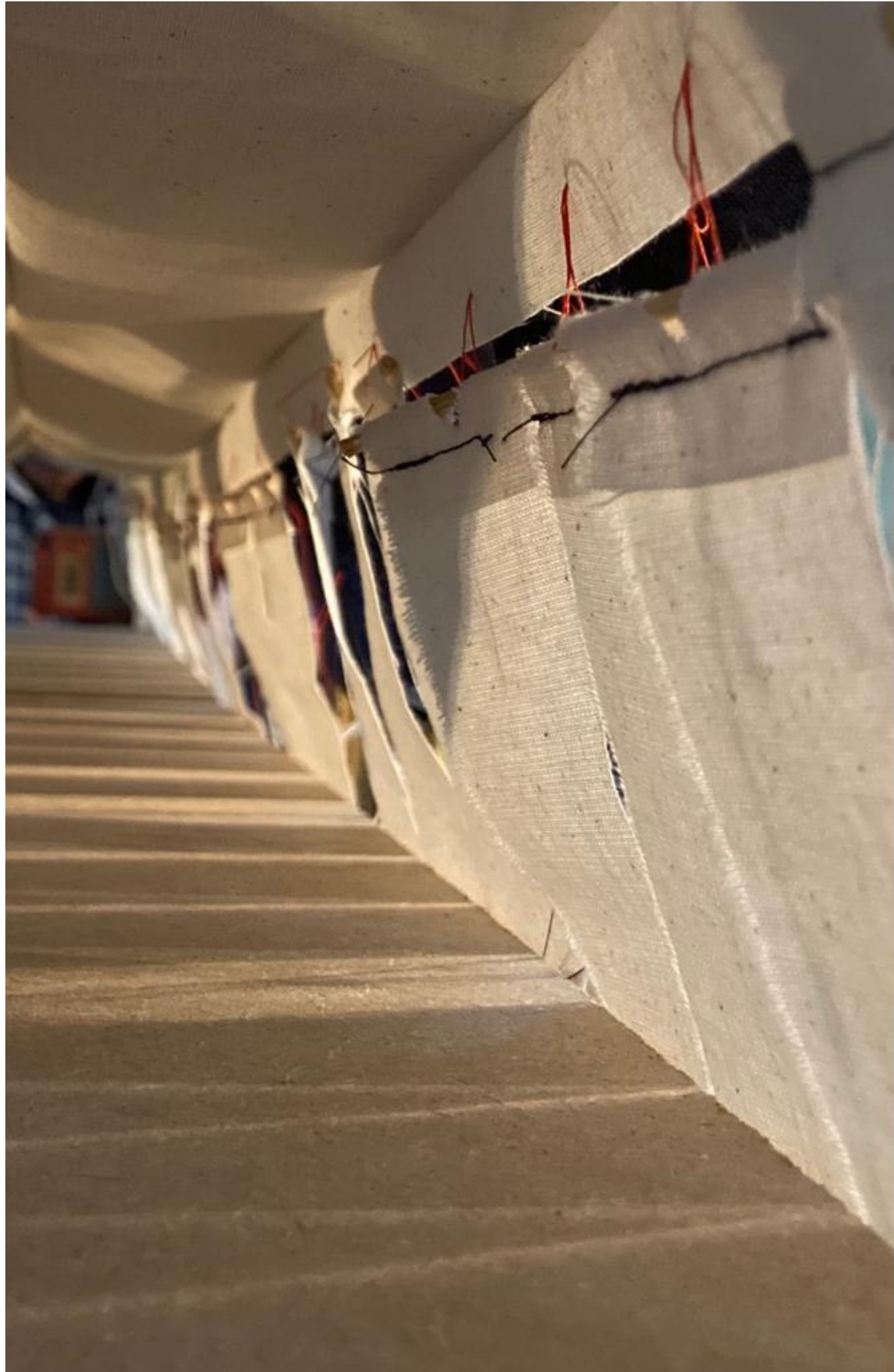
STRUCTURE

material research



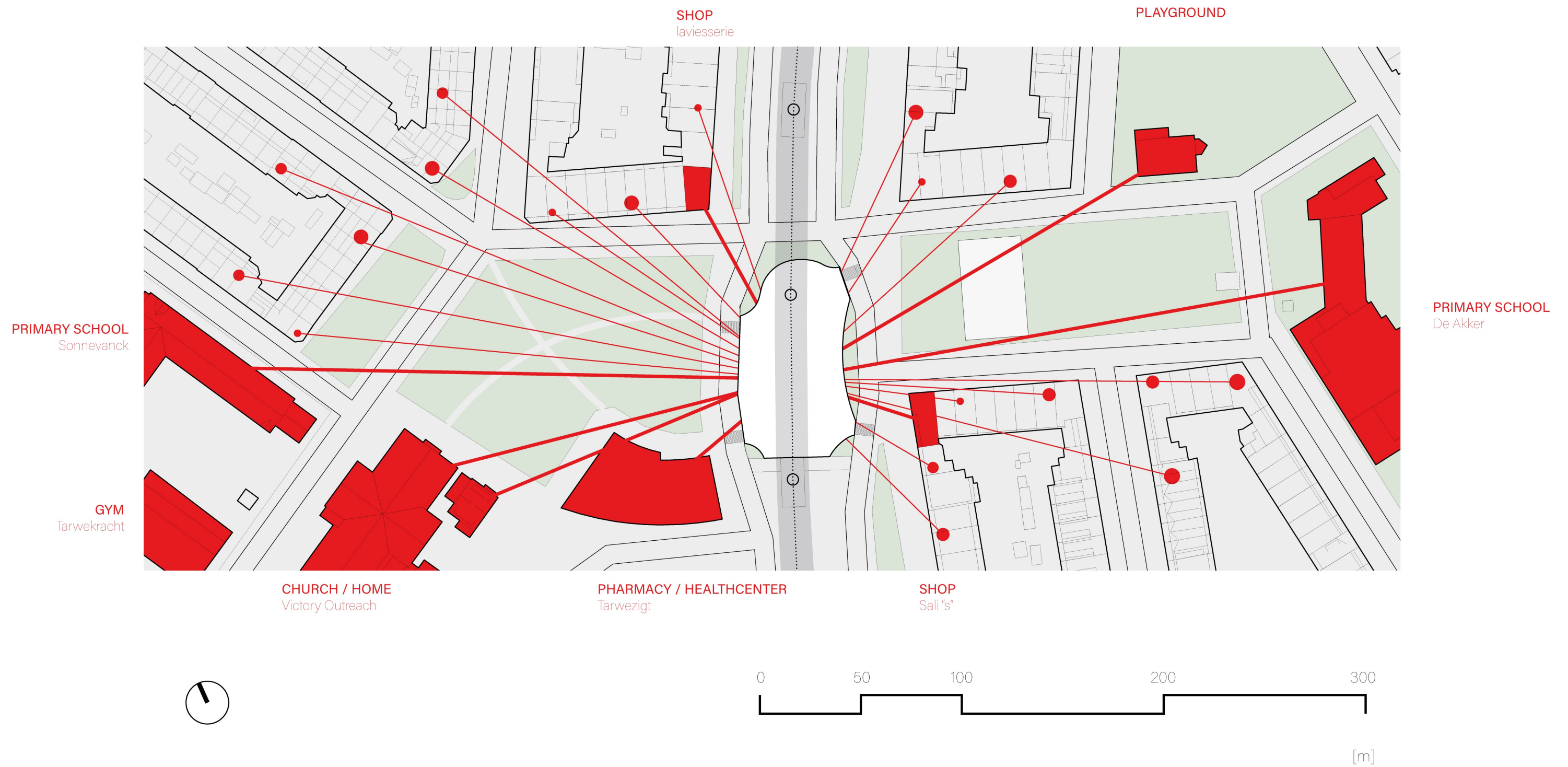
ATMOSPHERE

material research



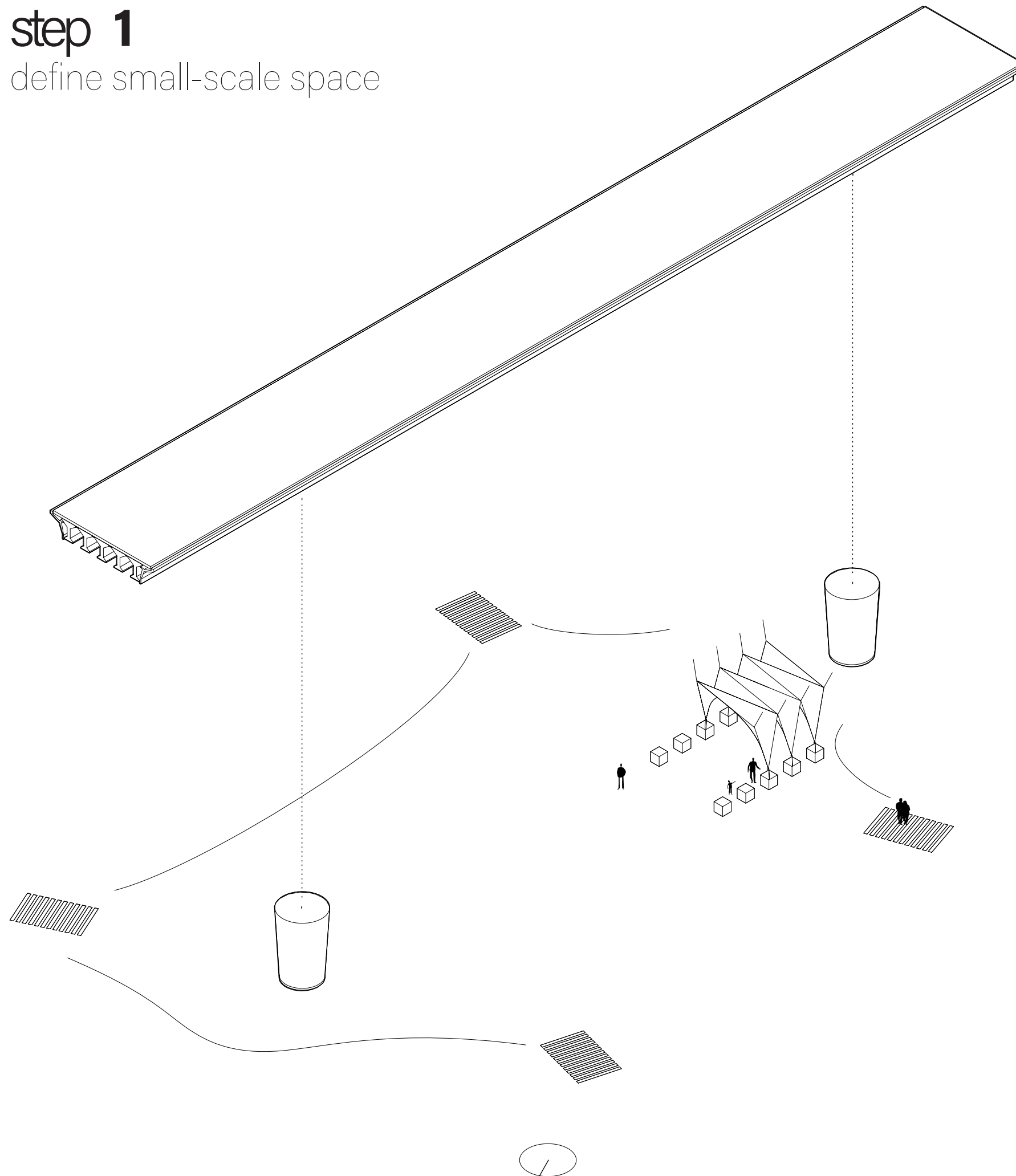
PLAN

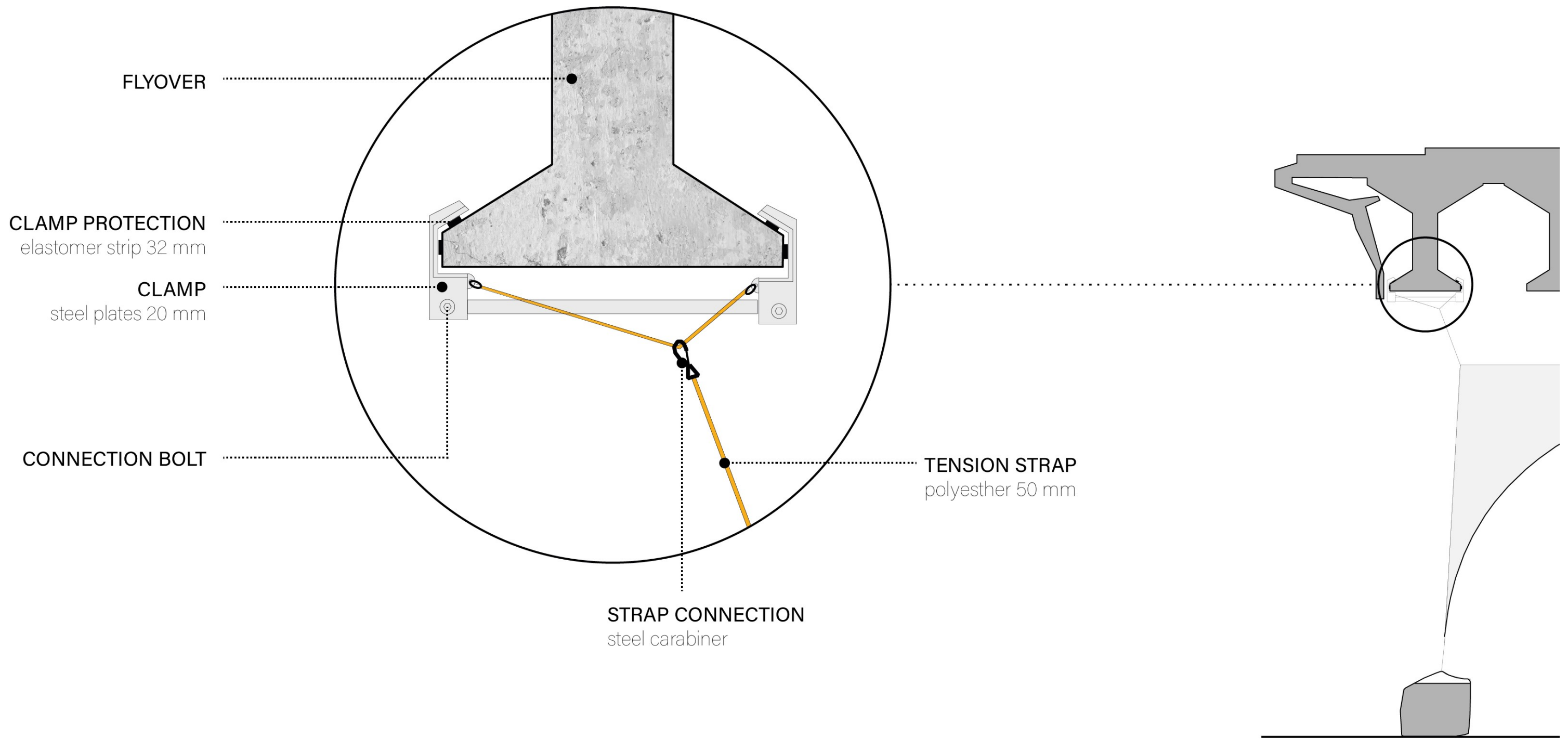
neighbourhood participation

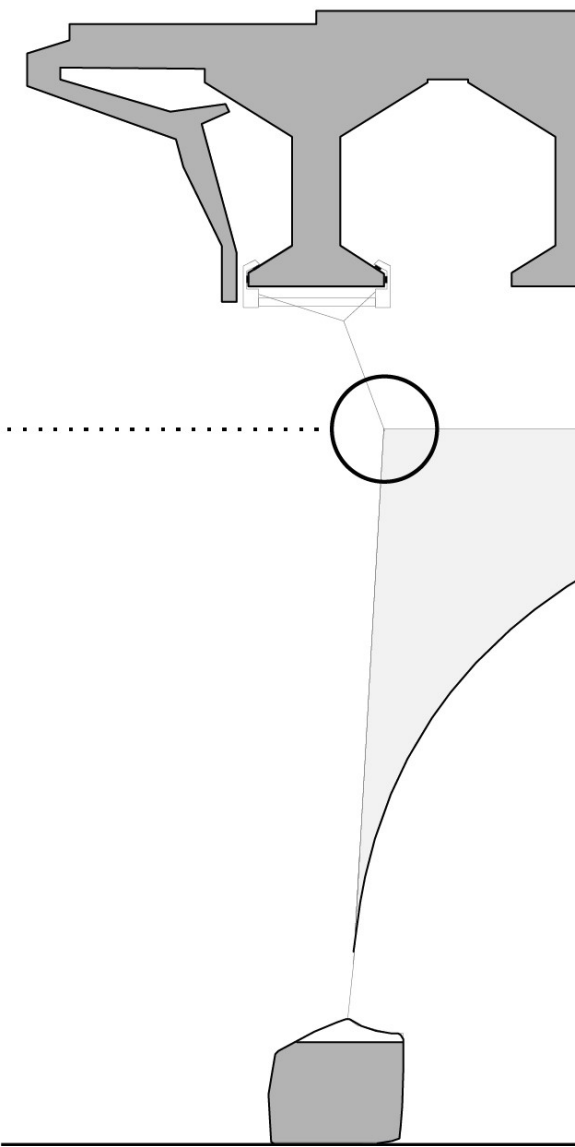
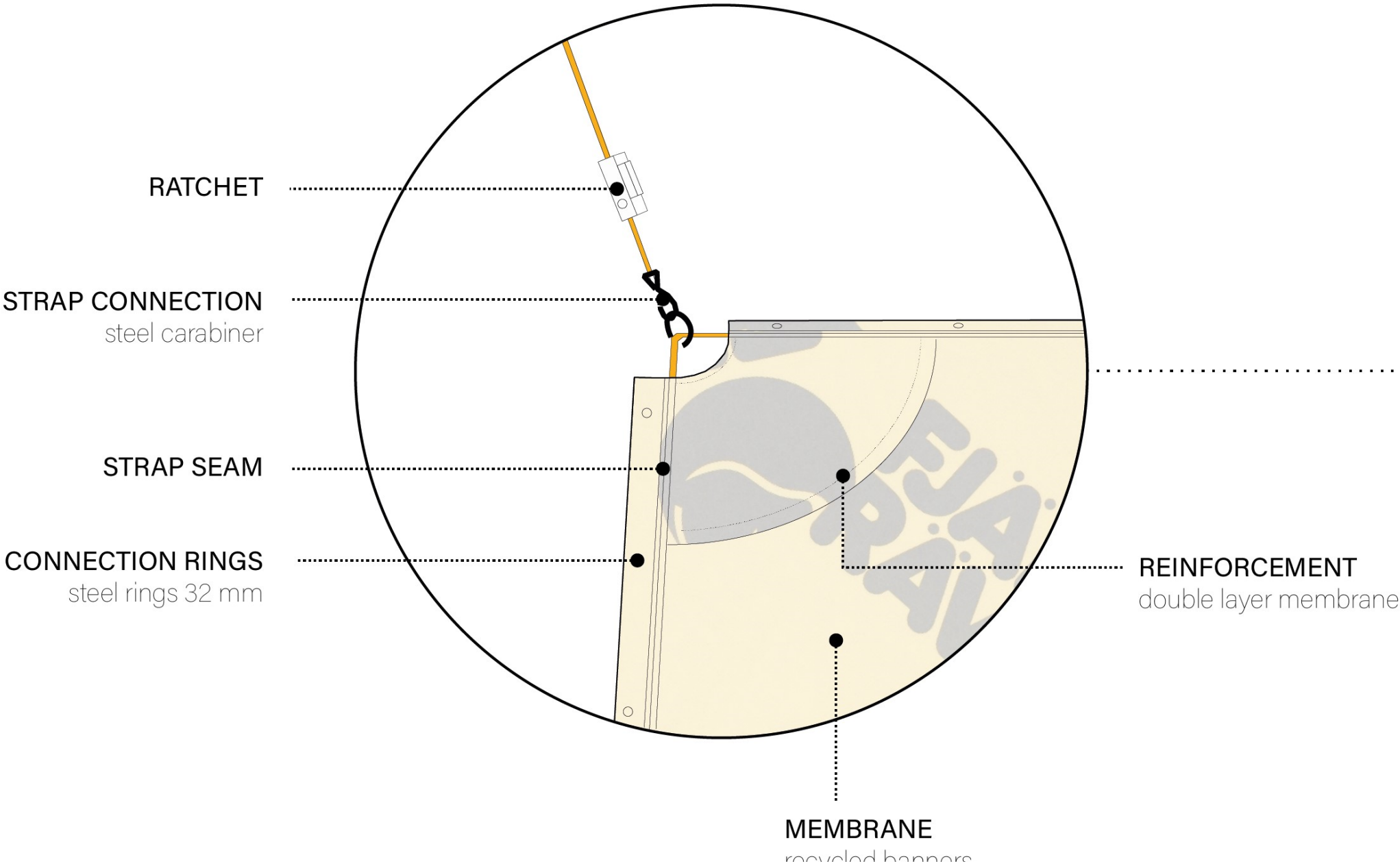


step 1

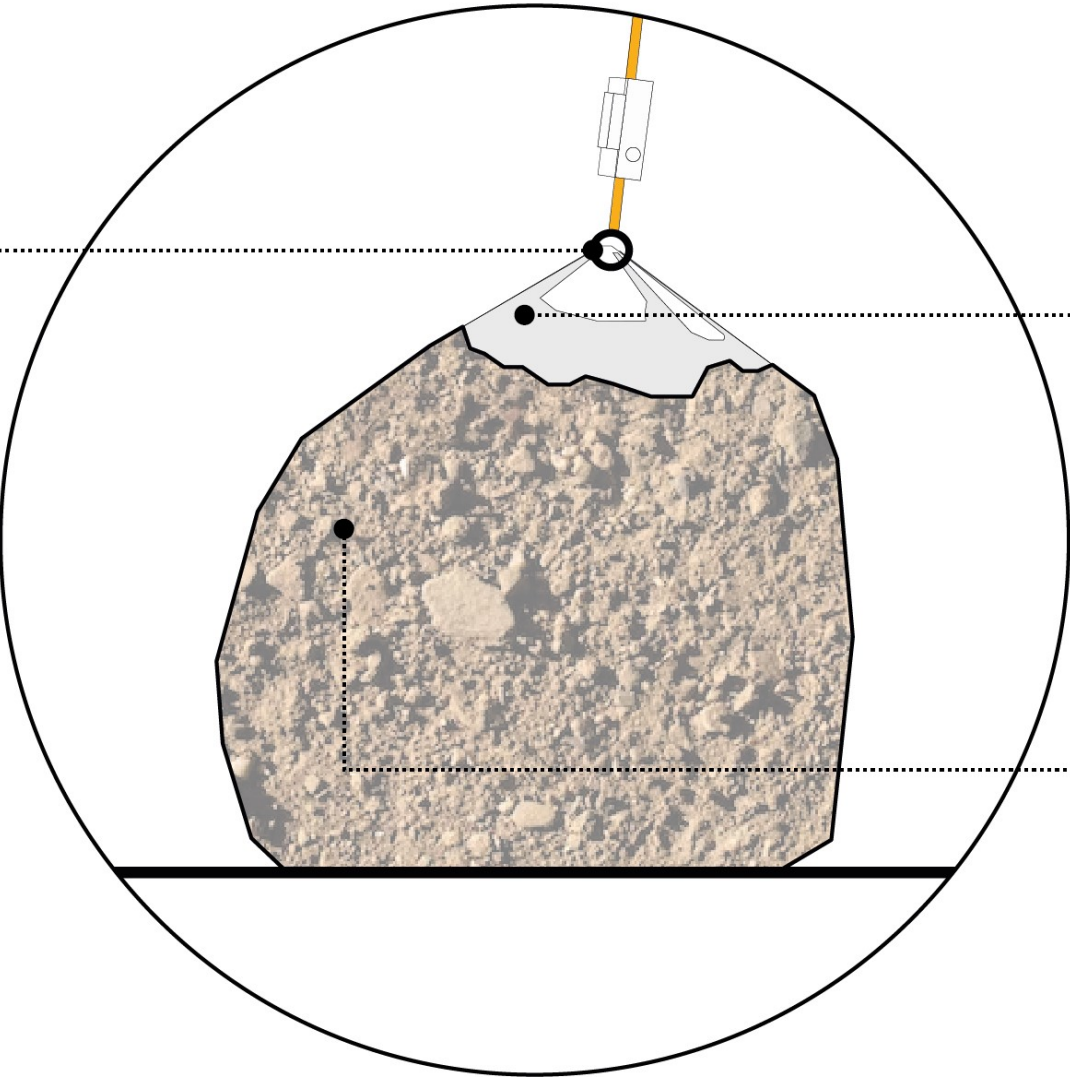
define small-scale space





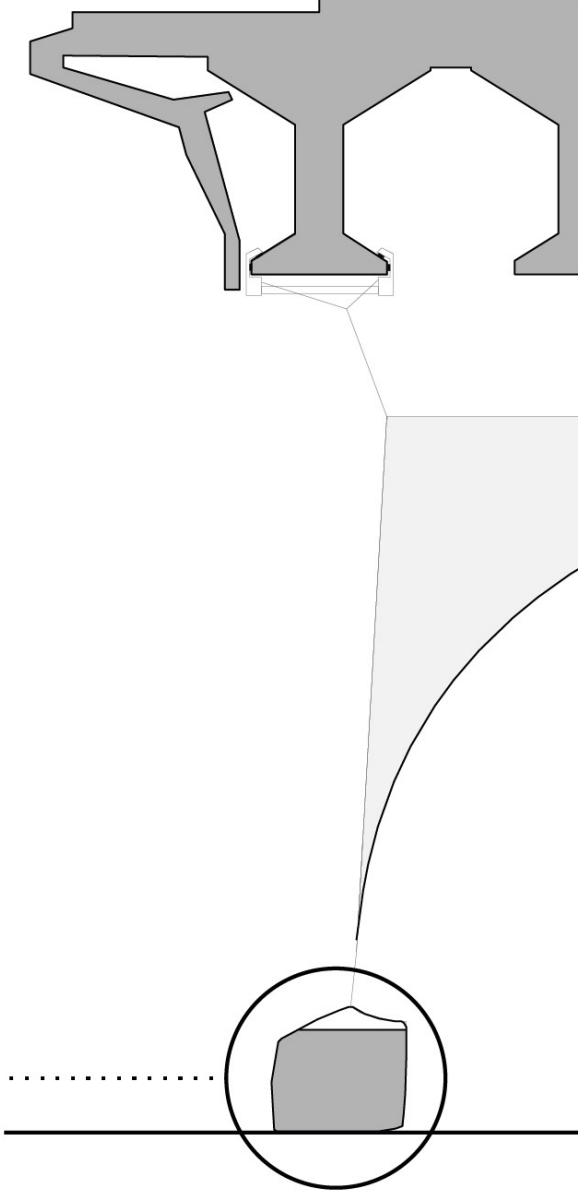


BIG BAG CONNECTION
steel ring

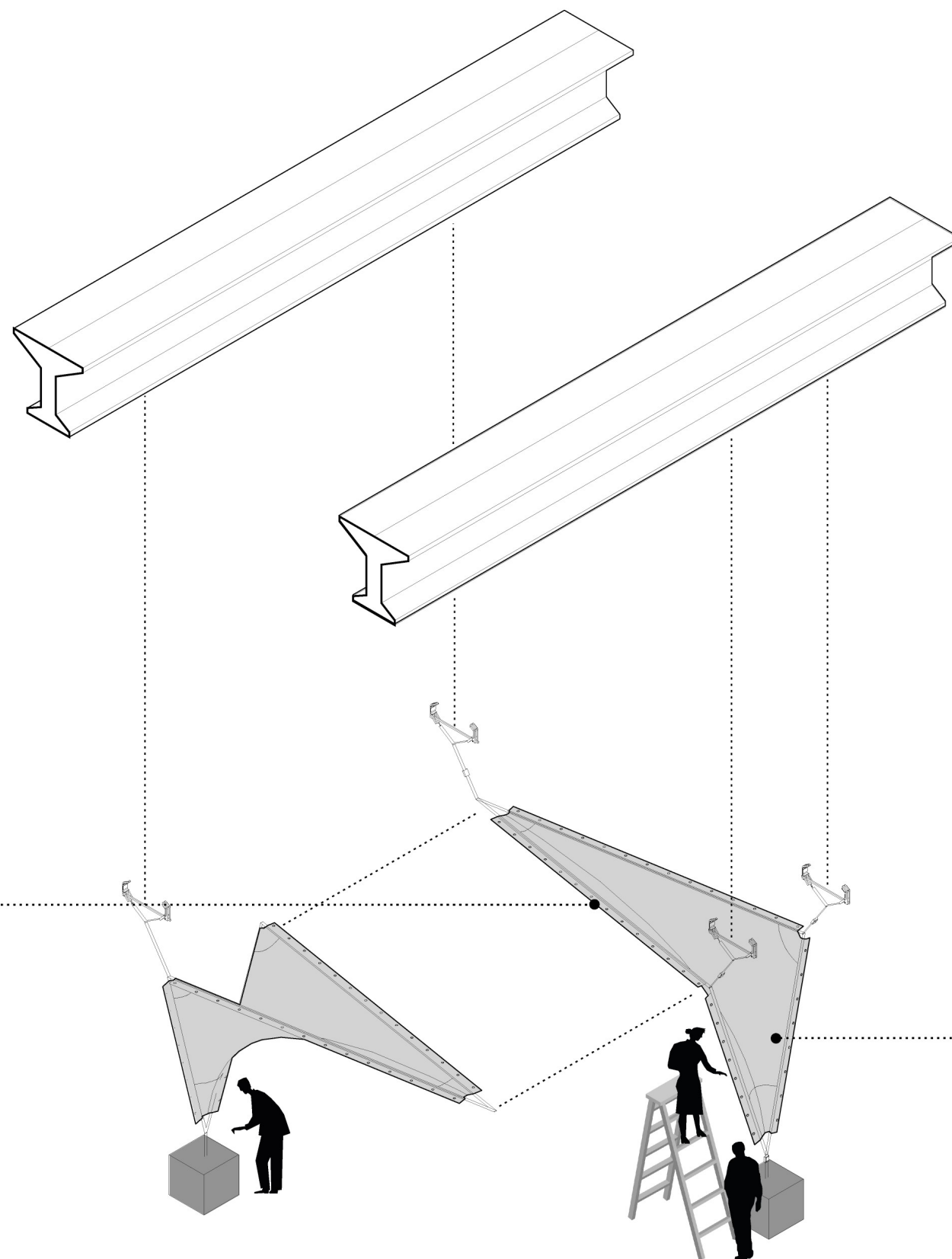
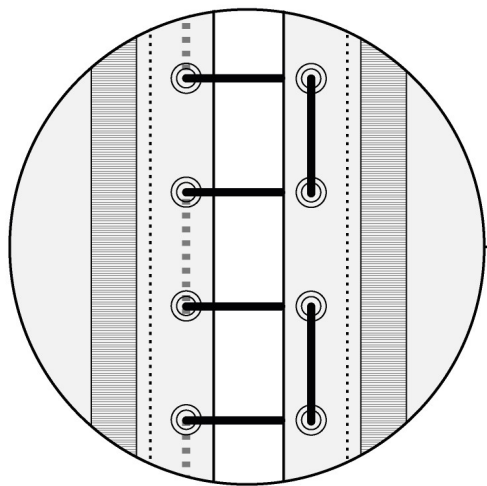


BIG BAG

WEIGHT
rubble / sand / bricks



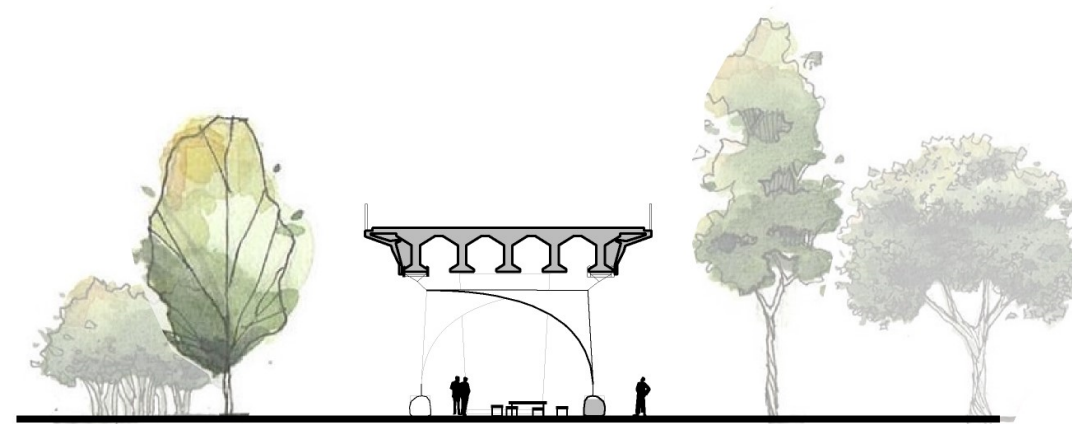
LACING
connecting the pieces



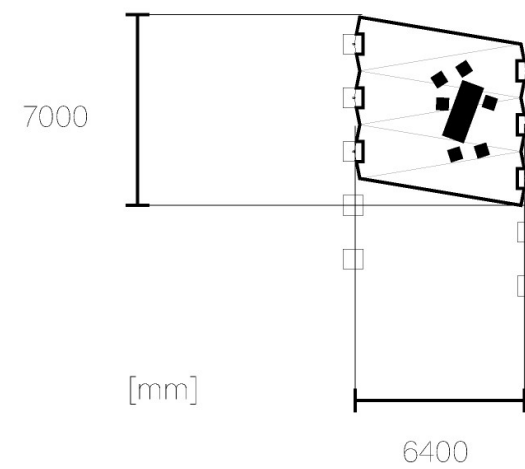
BLACKBACK BANNERS



SECTION



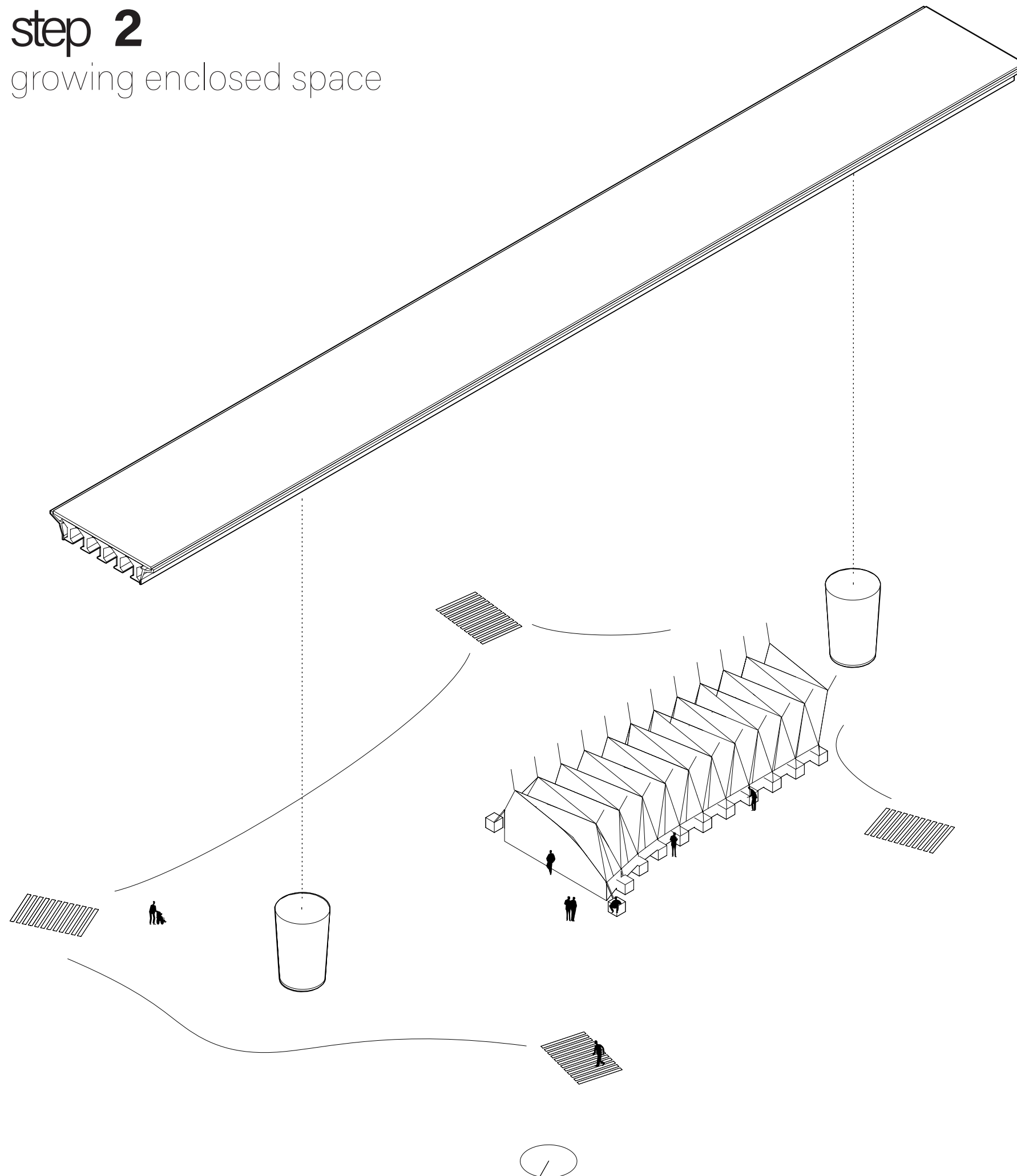
PLAN

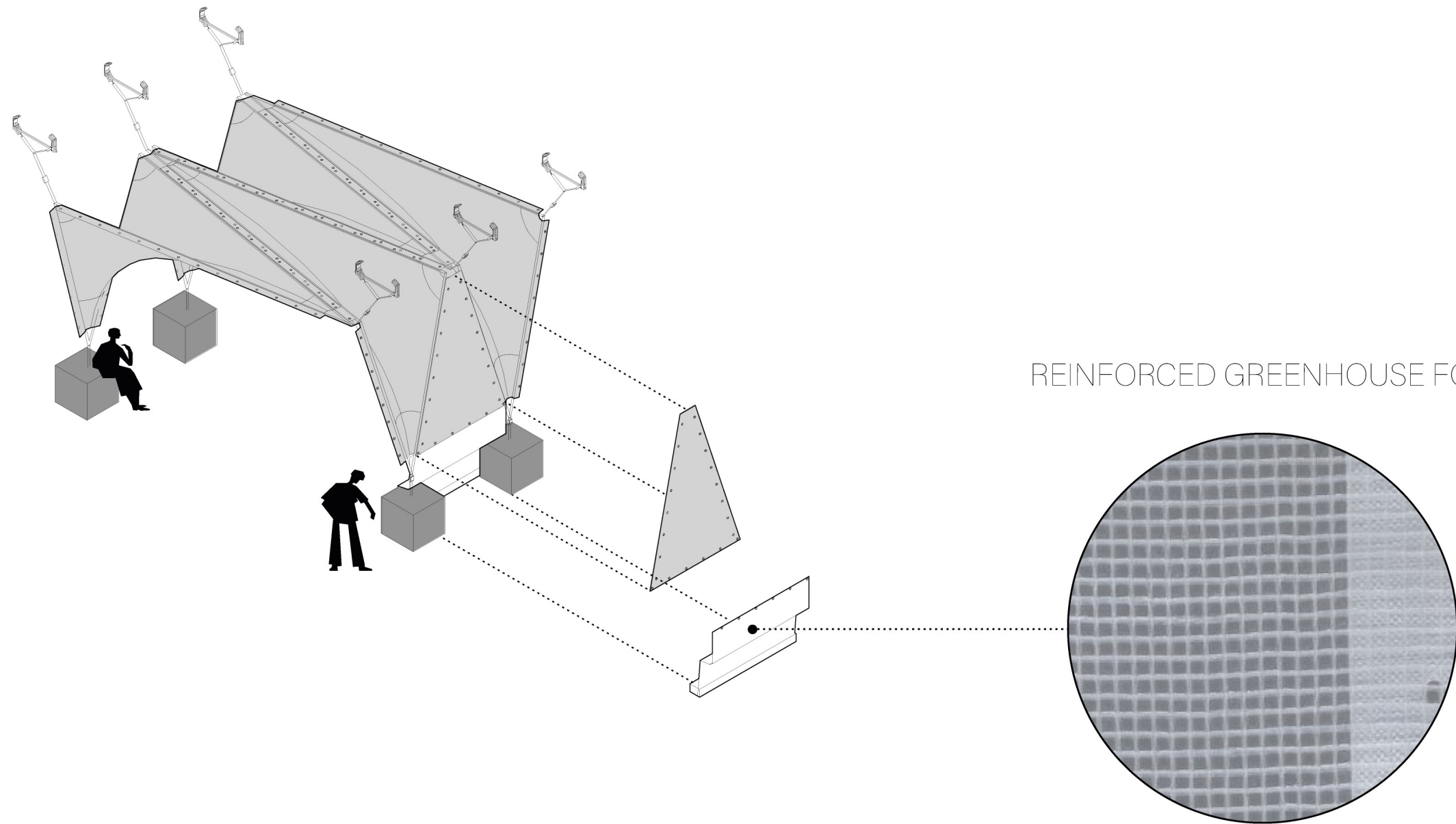


SPACE DEFINED
lunch + neighbourhood meetings

step 2

growing enclosed space

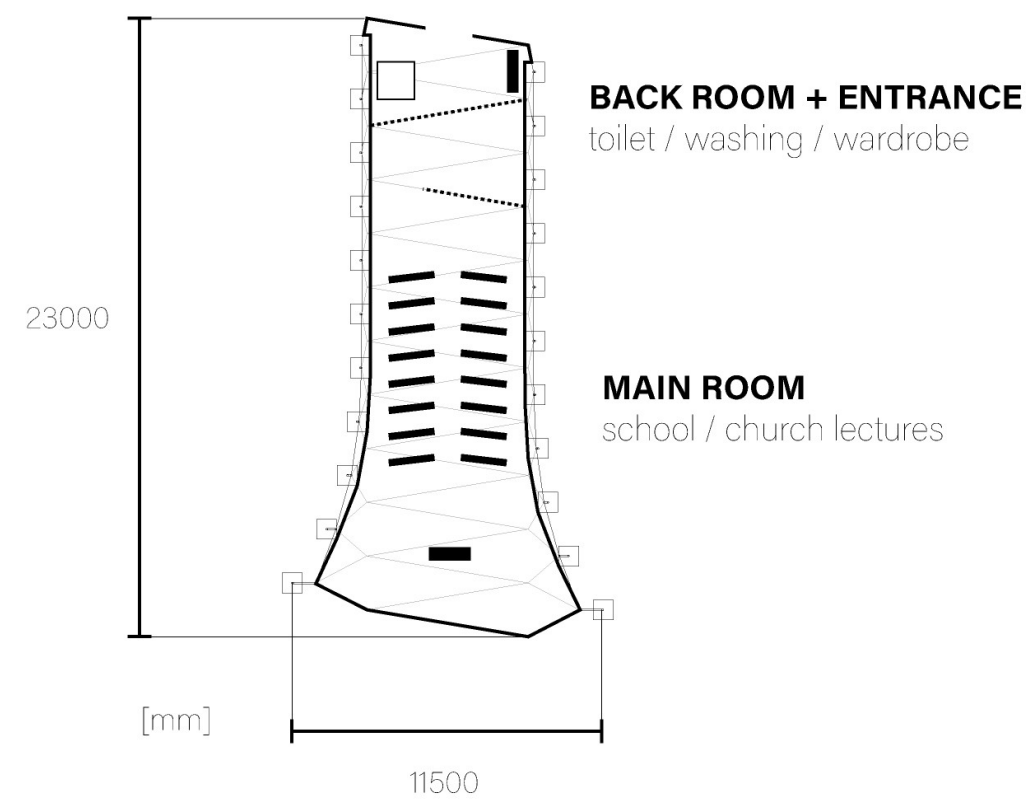




SECTION

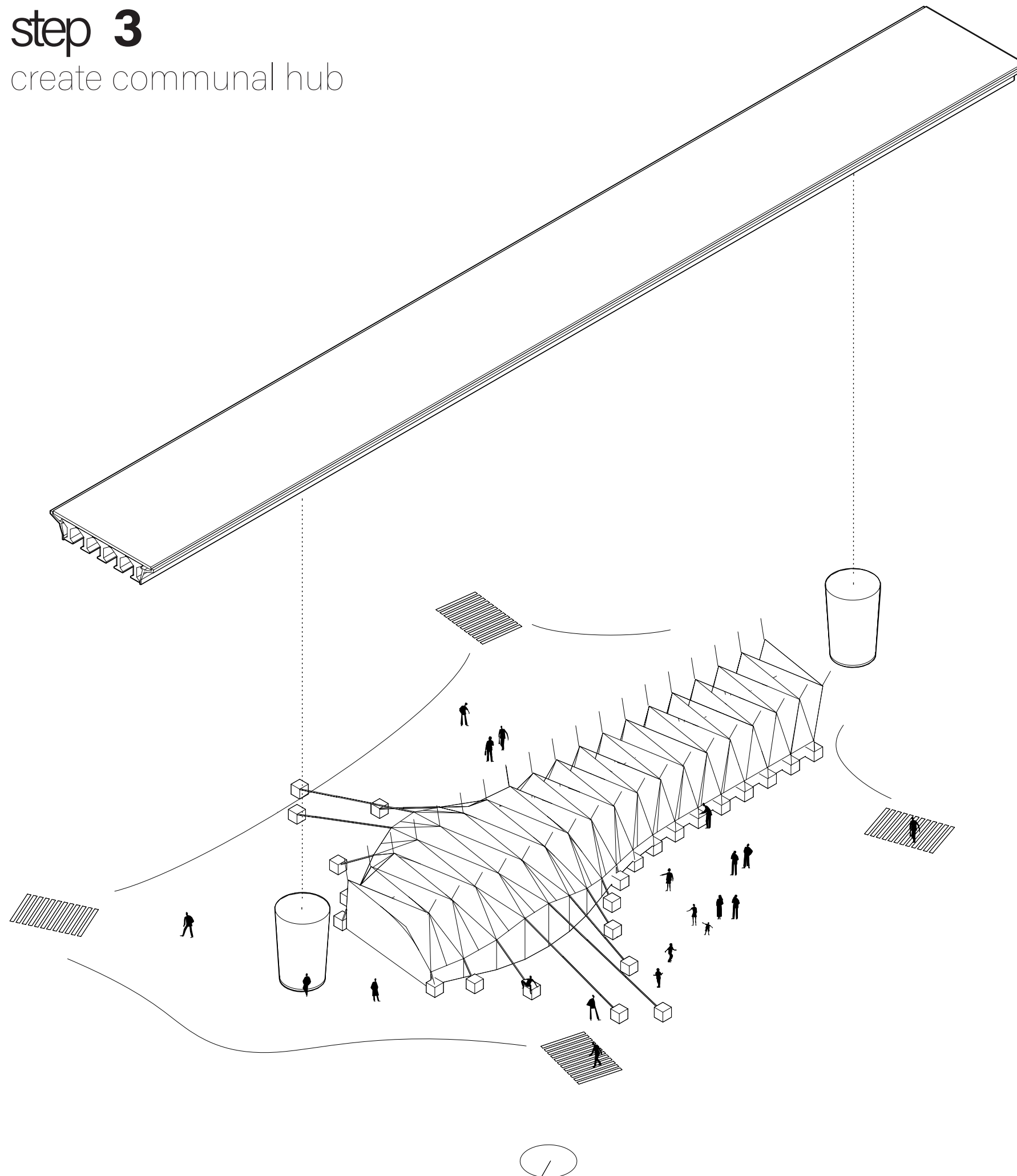


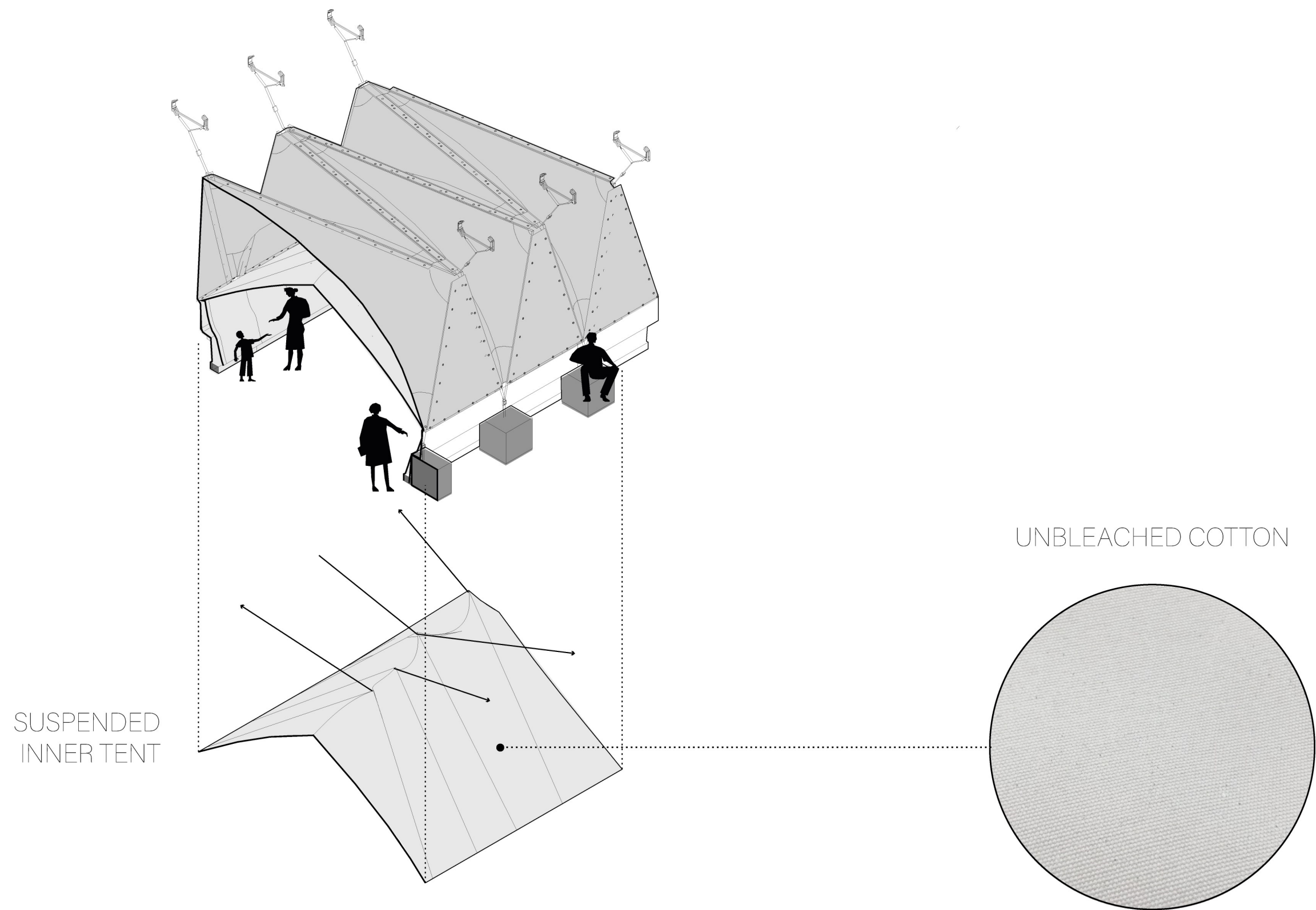
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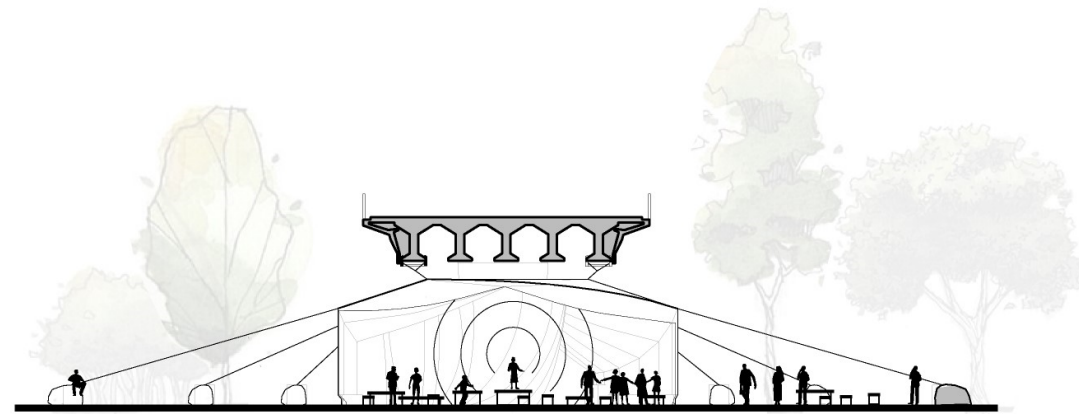
step 3

create communal hub

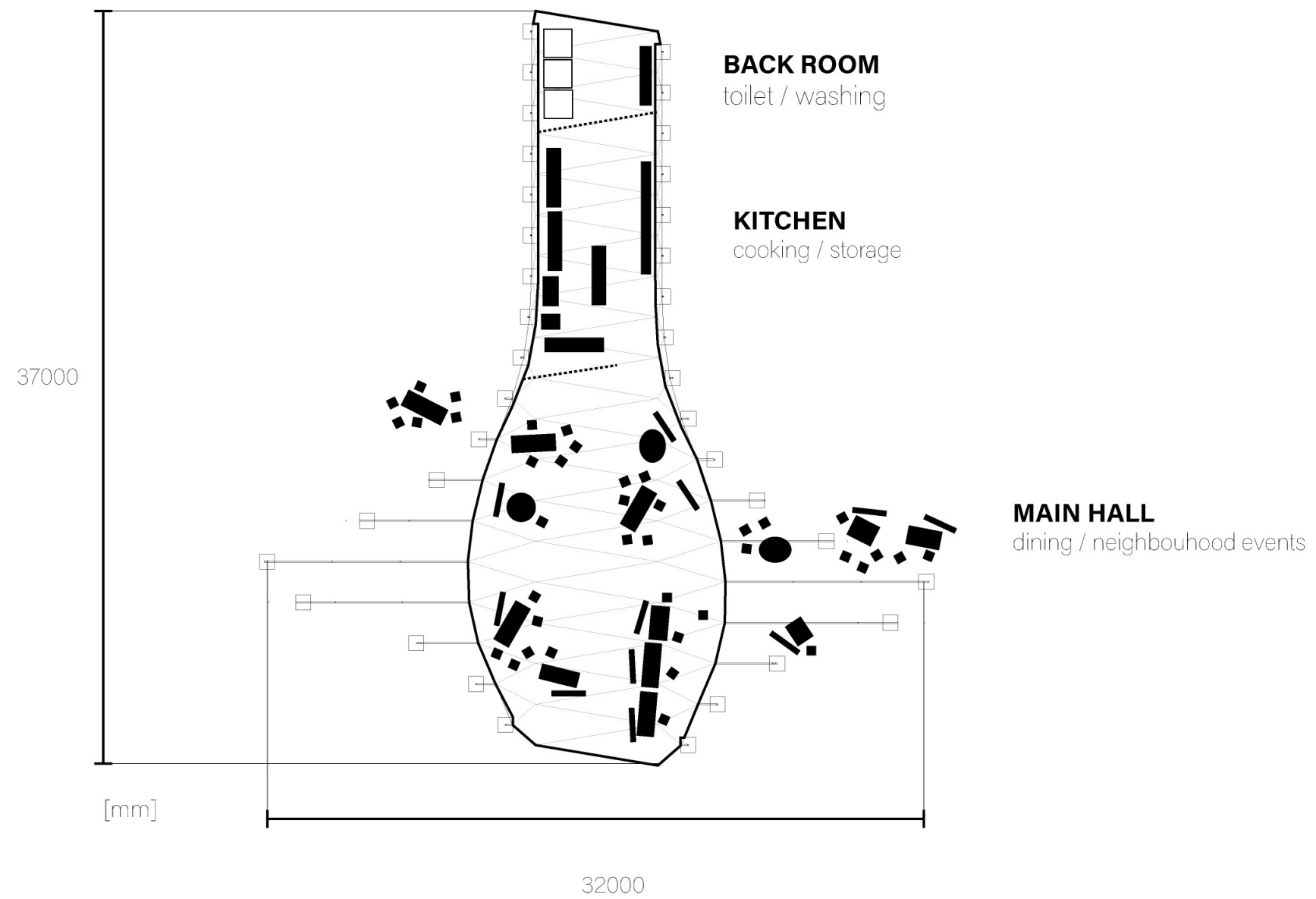




SECTION



PLAN





BACK ROOM

toilet / washing

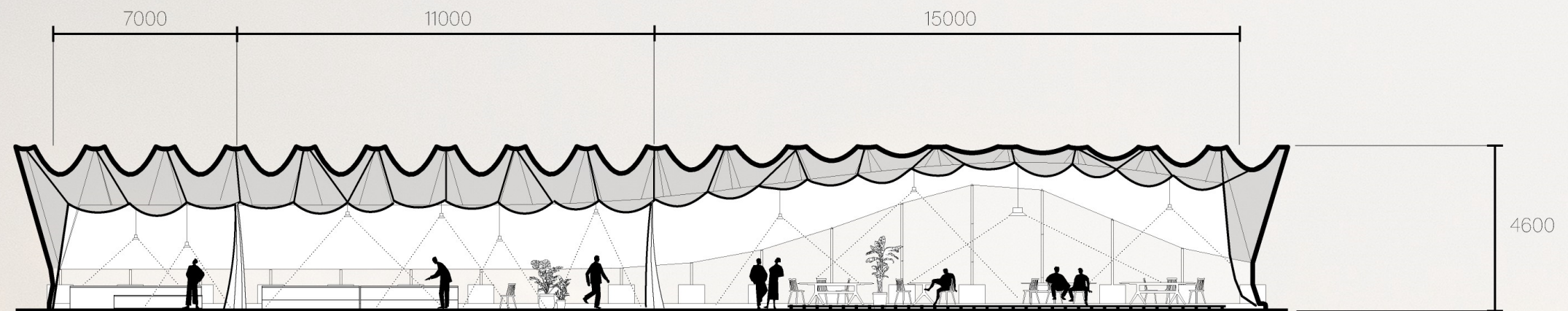
KITCHEN

cooking / storage

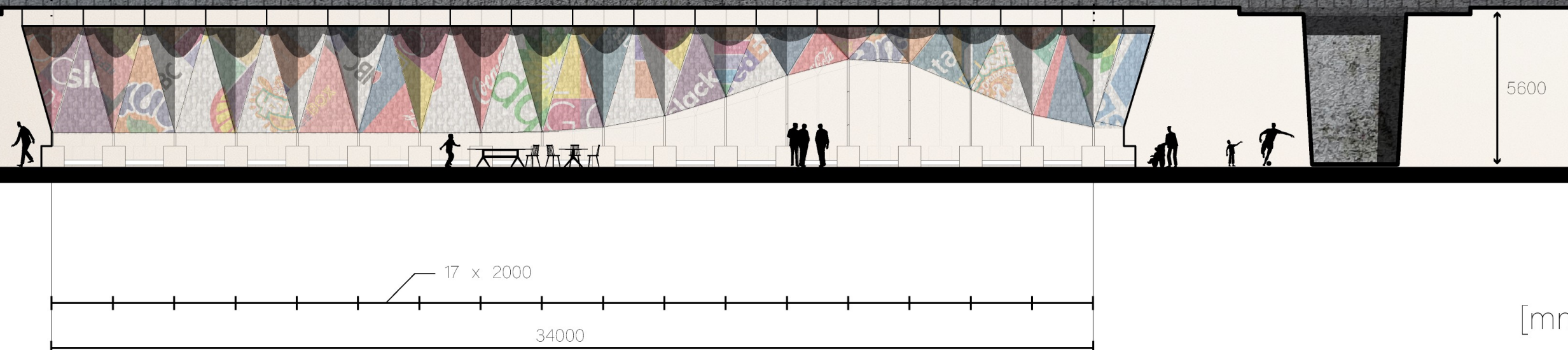
MAIN HALL

dining / events

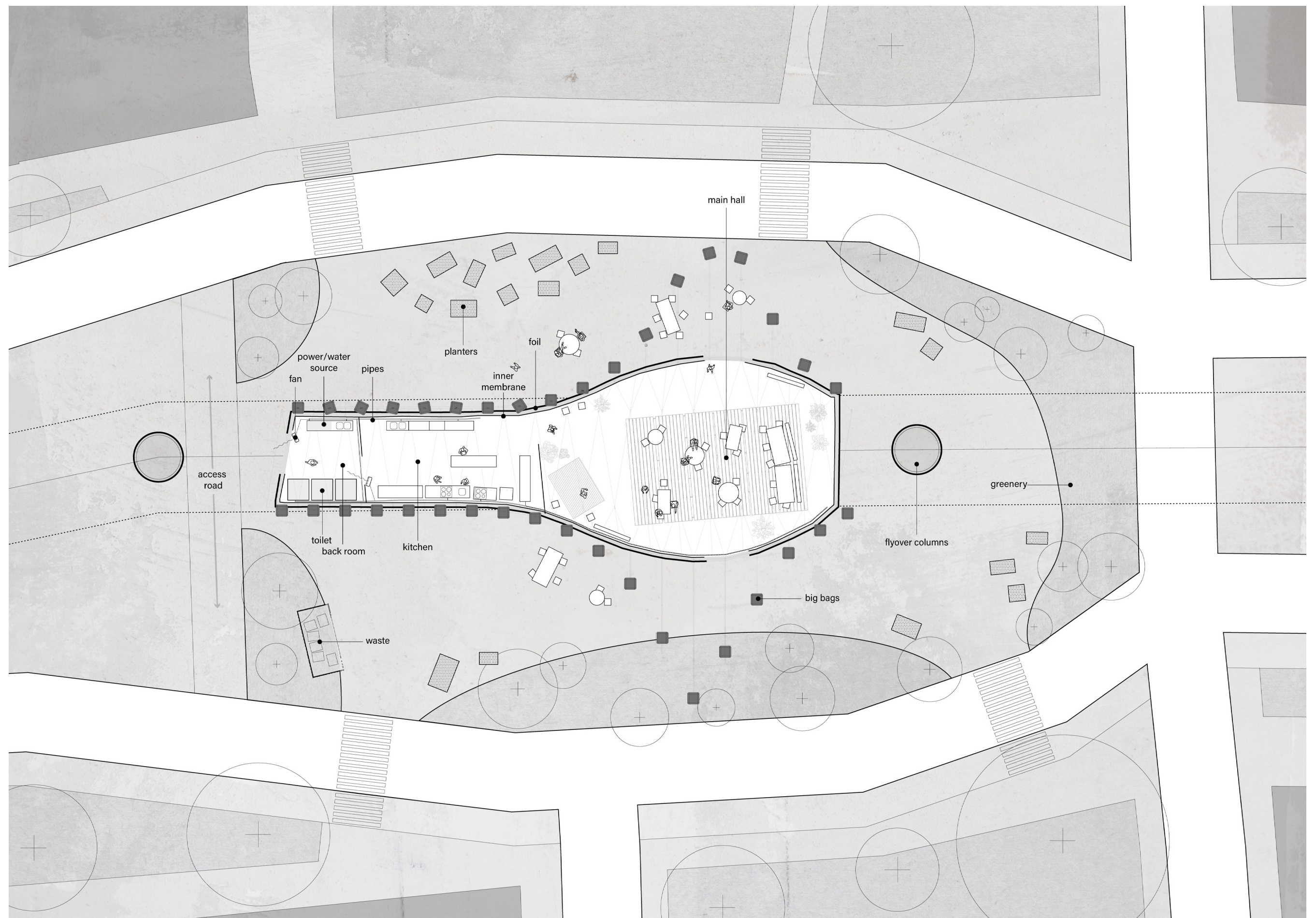
SECTION [S-N]



ELEVATION [S-N]



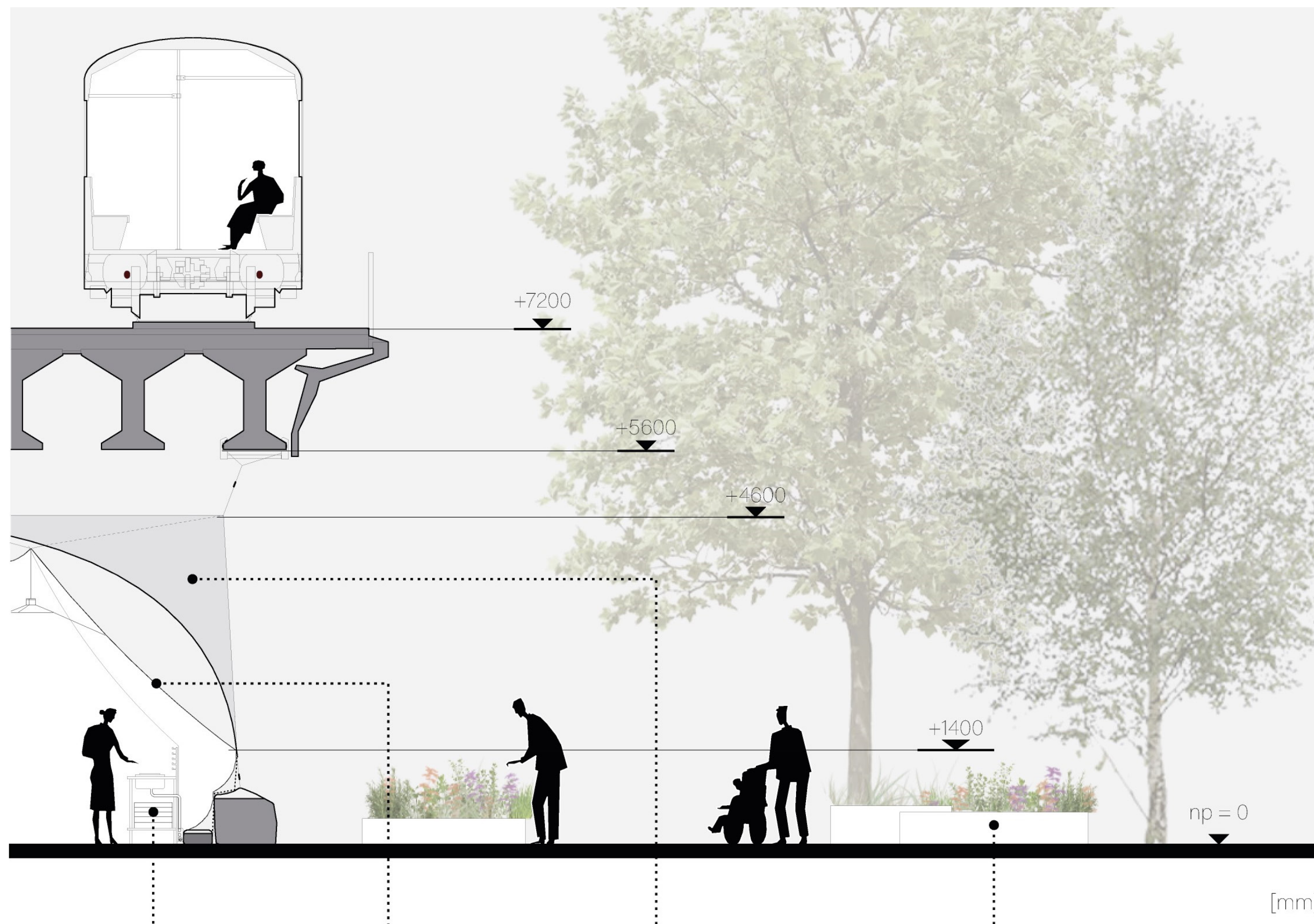
[mm]



PLAN

opening up to the public



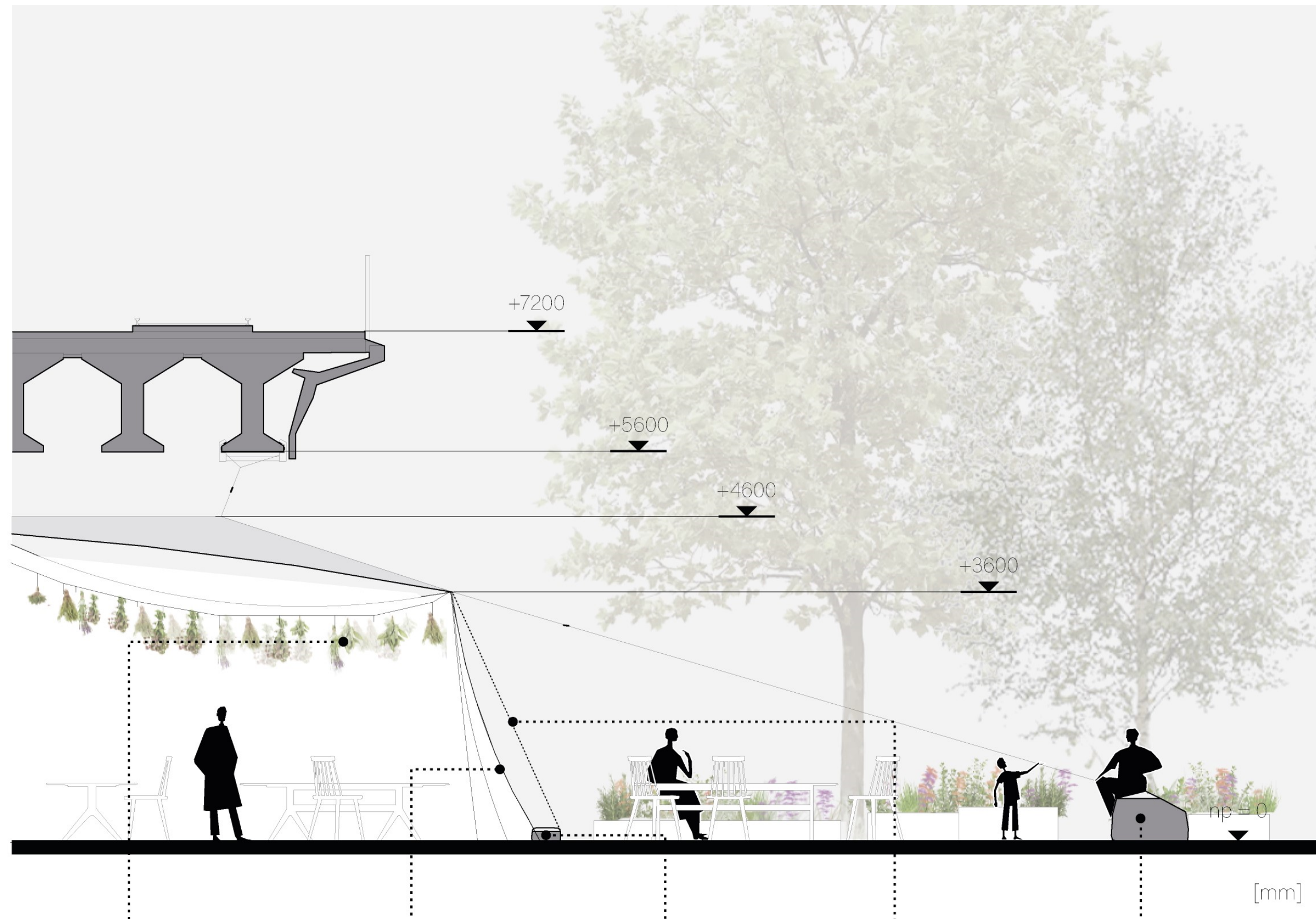


KITCHEN
stainless steel base +
splash guard

INNER MEMBRANE
unbleached
cotton

OUTER MEMBRANE
recycled banners

PLANTERS



DRYING HERBS
basil, chives, lemon balm,
tarragon, coriander,
mint, oregano, parsley,
rosemary, sage, thyme

CURTAIN
unbleached cotton

FACADE WEIGHTS
banners + rubble

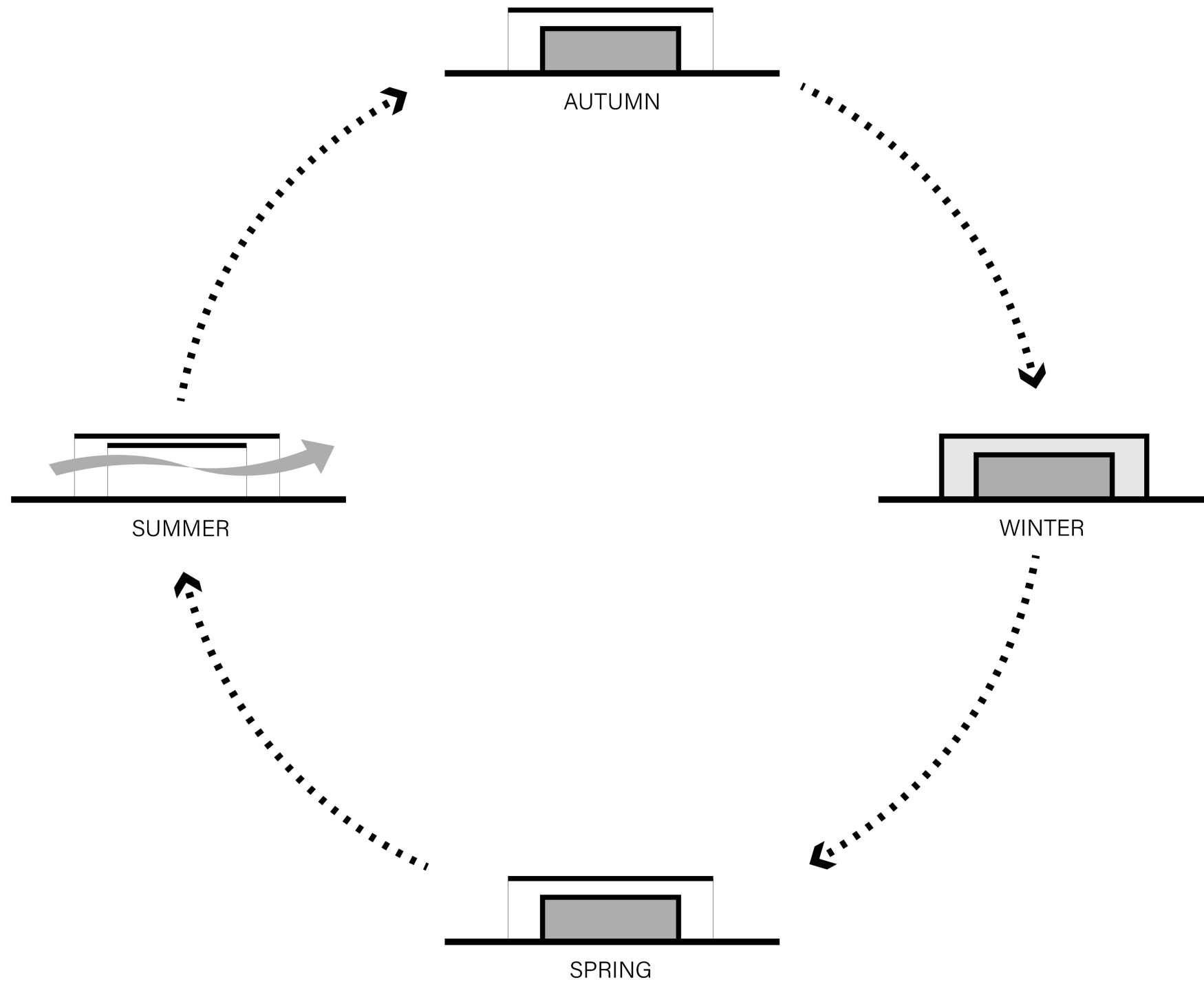
FOIL
reinforced
greenhouse foil

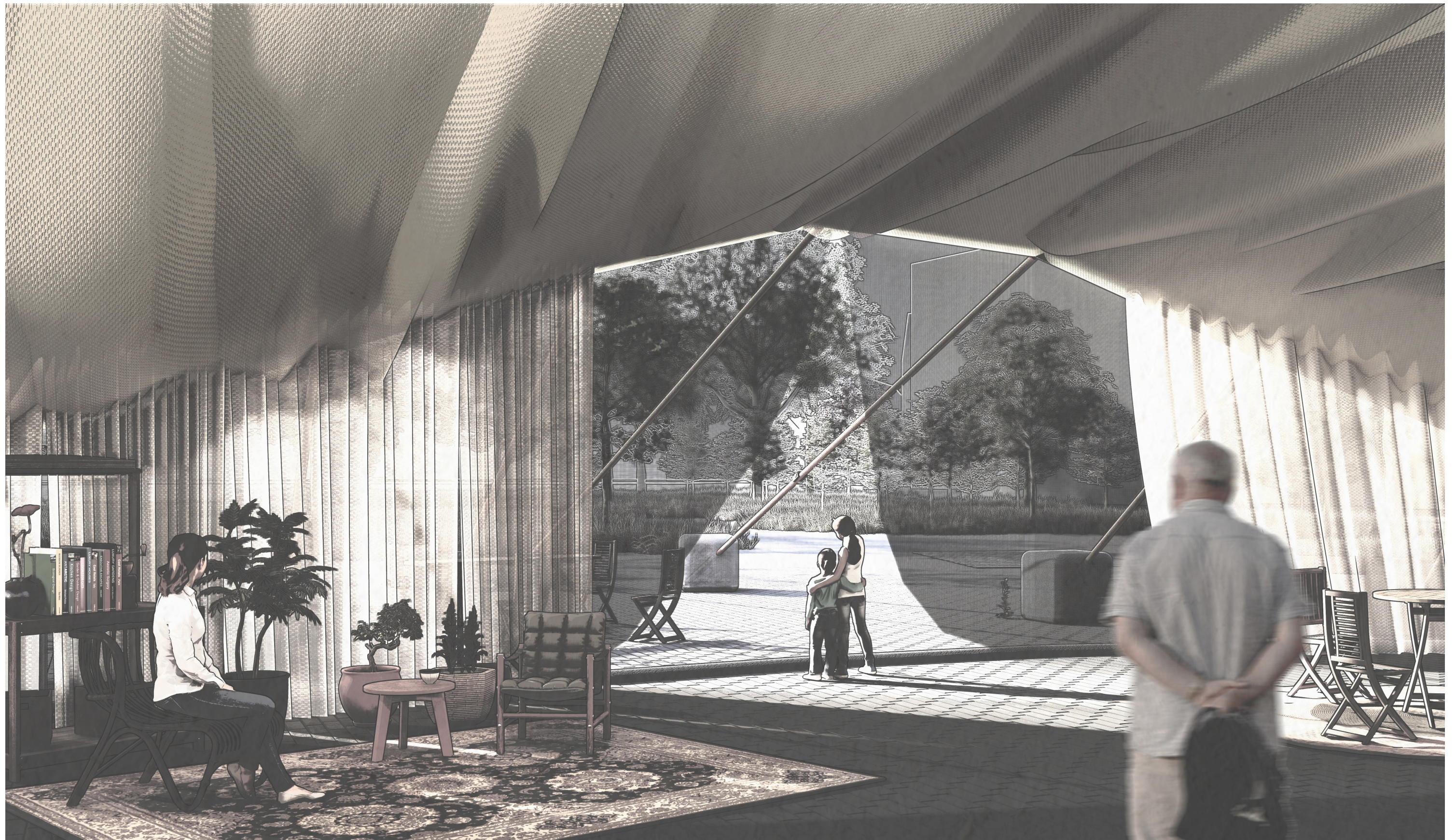
WEIGHTS
big bags + rubble

[mm]

CLIMATE DIAGRAM

changing through the year



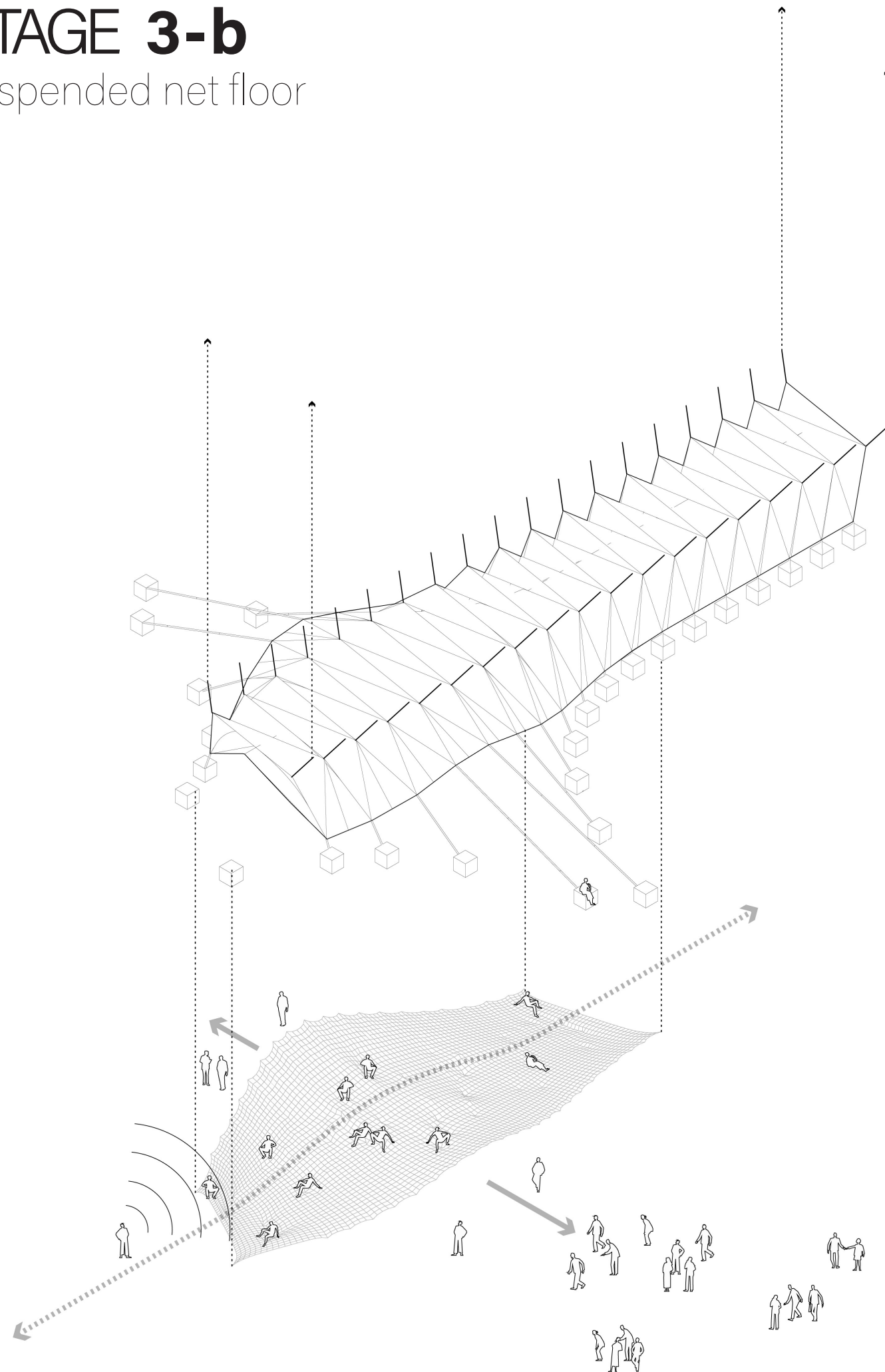


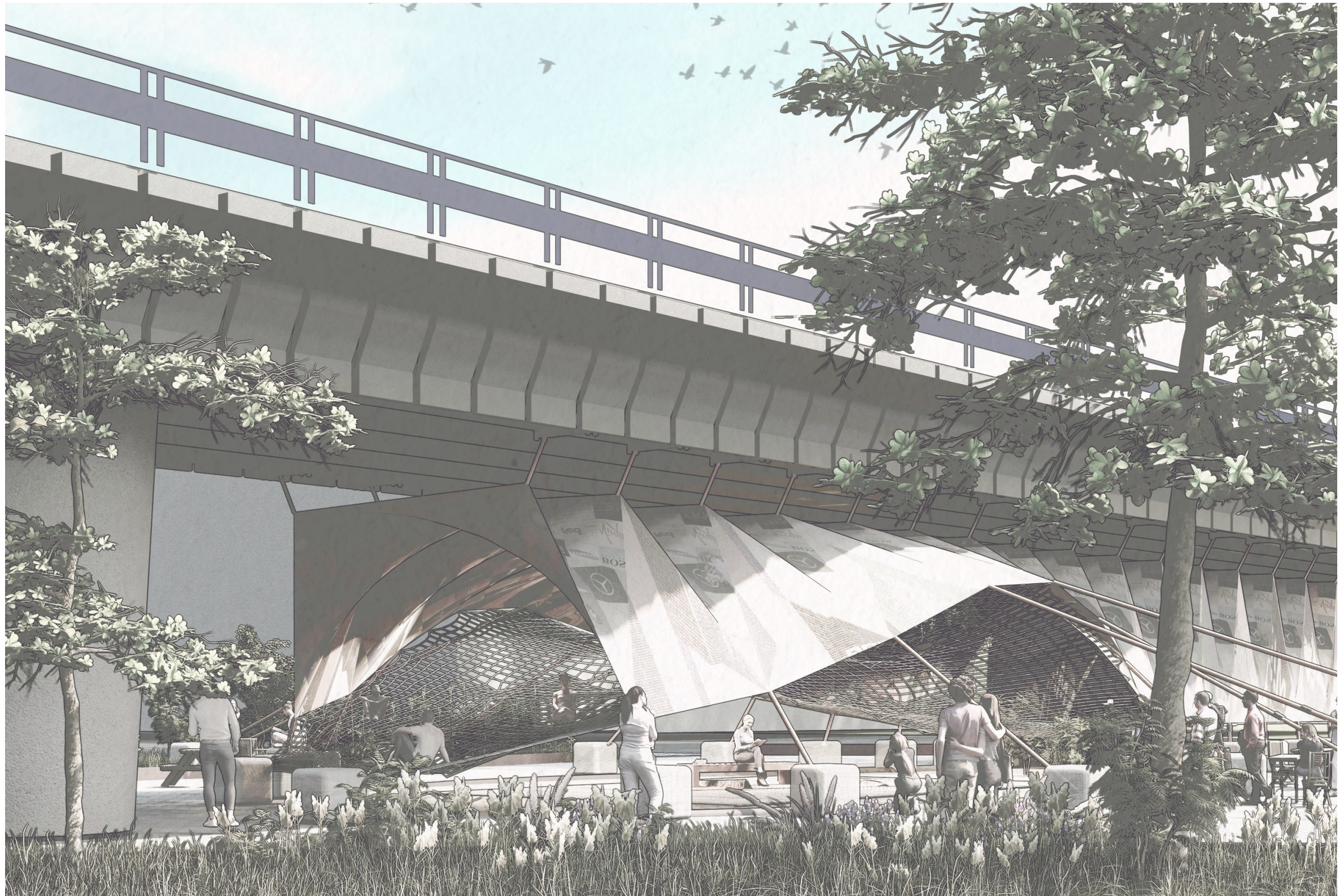
common room for the neighbourhood



STAGE 3-b

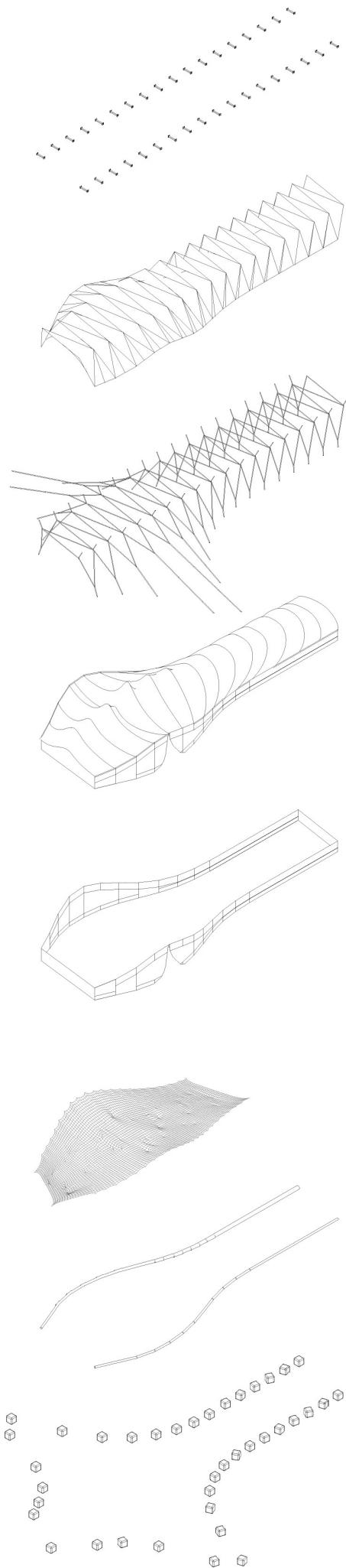
suspended net floor





events: surrounded by audience

weight of the parts



CLAMPS
 $0,38 \text{ m}^3 \times 7750 \text{ kg} = 2945 \text{ kg}$

OUTER MEMBRANE
 $525 \text{ m}^2 \times 0,26 \text{ kg} = 137 \text{ kg}$

TENSION STRAPS
 $839 \text{ m} \times 0,414 \text{ kg} = 347 \text{ kg}$

INNER MEMBRANE
 $545 \text{ m}^2 \times 0,150 \text{ kg} = 82 \text{ kg}$

FOIL
 $168 \text{ m}^2 \times 0,290 \text{ kg} = 49 \text{ kg}$

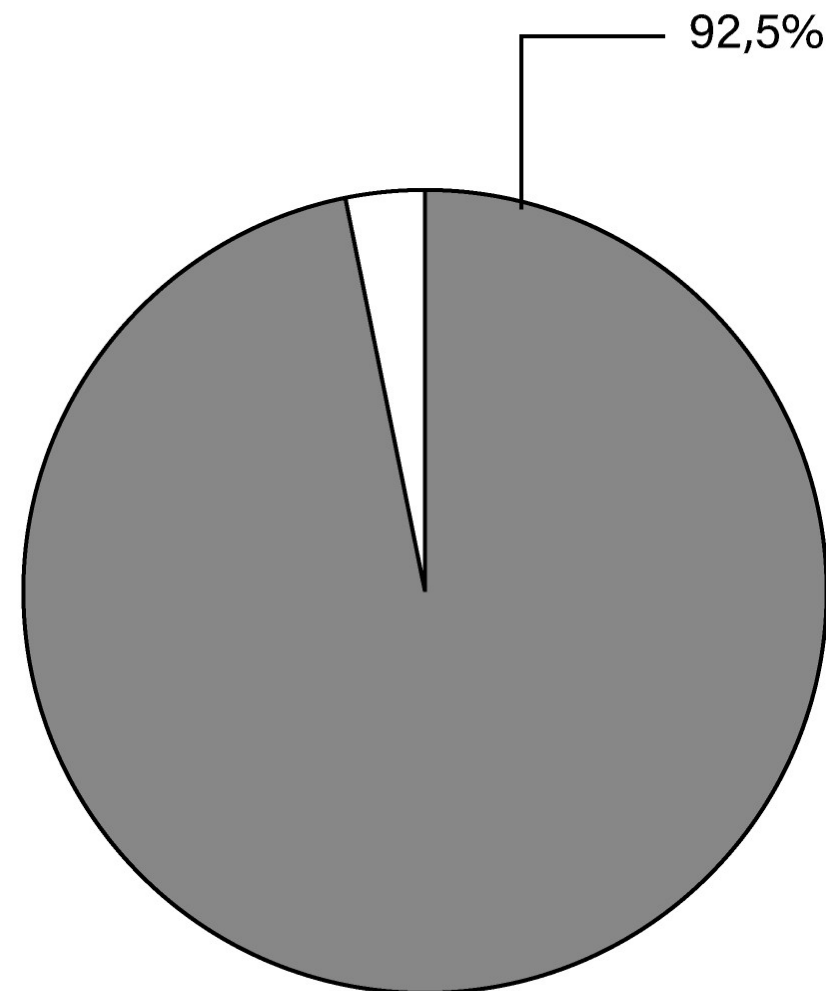
NET
 $284 \text{ m}^2 \times 0,94 \text{ kg} = 267 \text{ kg}$

FACADE WEIGHT
 $1 \text{ m}^2 \times 1500 \text{ kg} = 1500 \text{ kg}$

BIG BAG WEIGHT
 $38 \times 1200 \text{ kg} = 45600 \text{ kg}$

TOTAL WEIGHT: 50927 KG

172 kg / m²

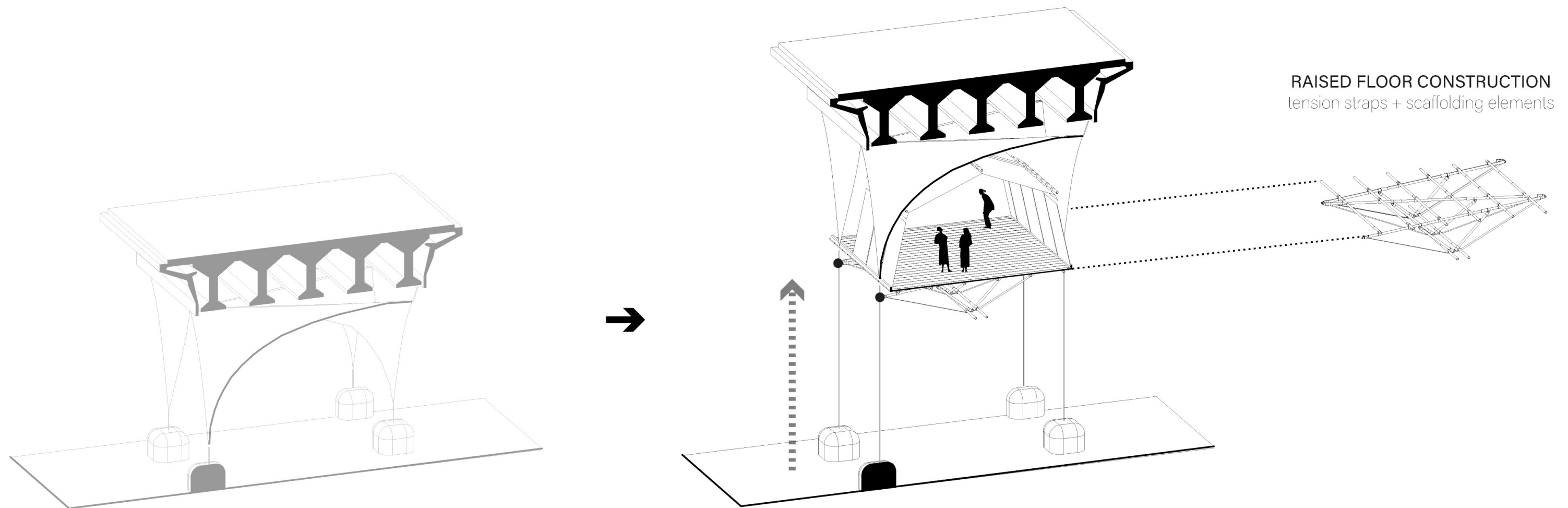


weight of conventional buildings:
1500 kg/m²



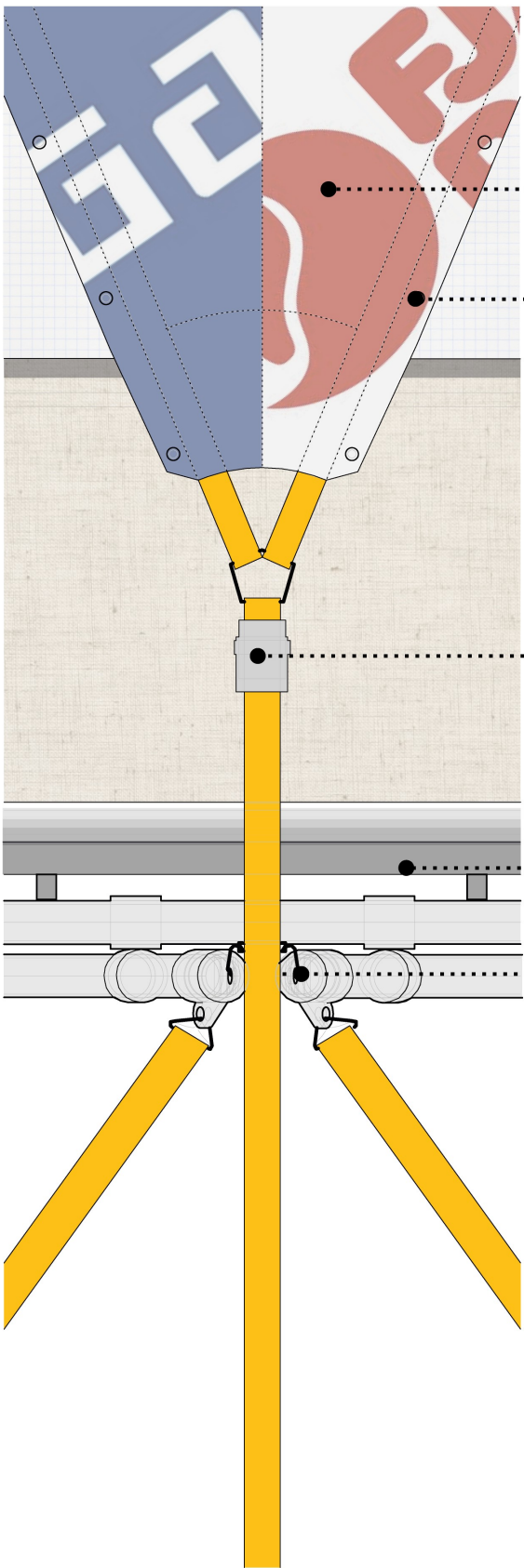
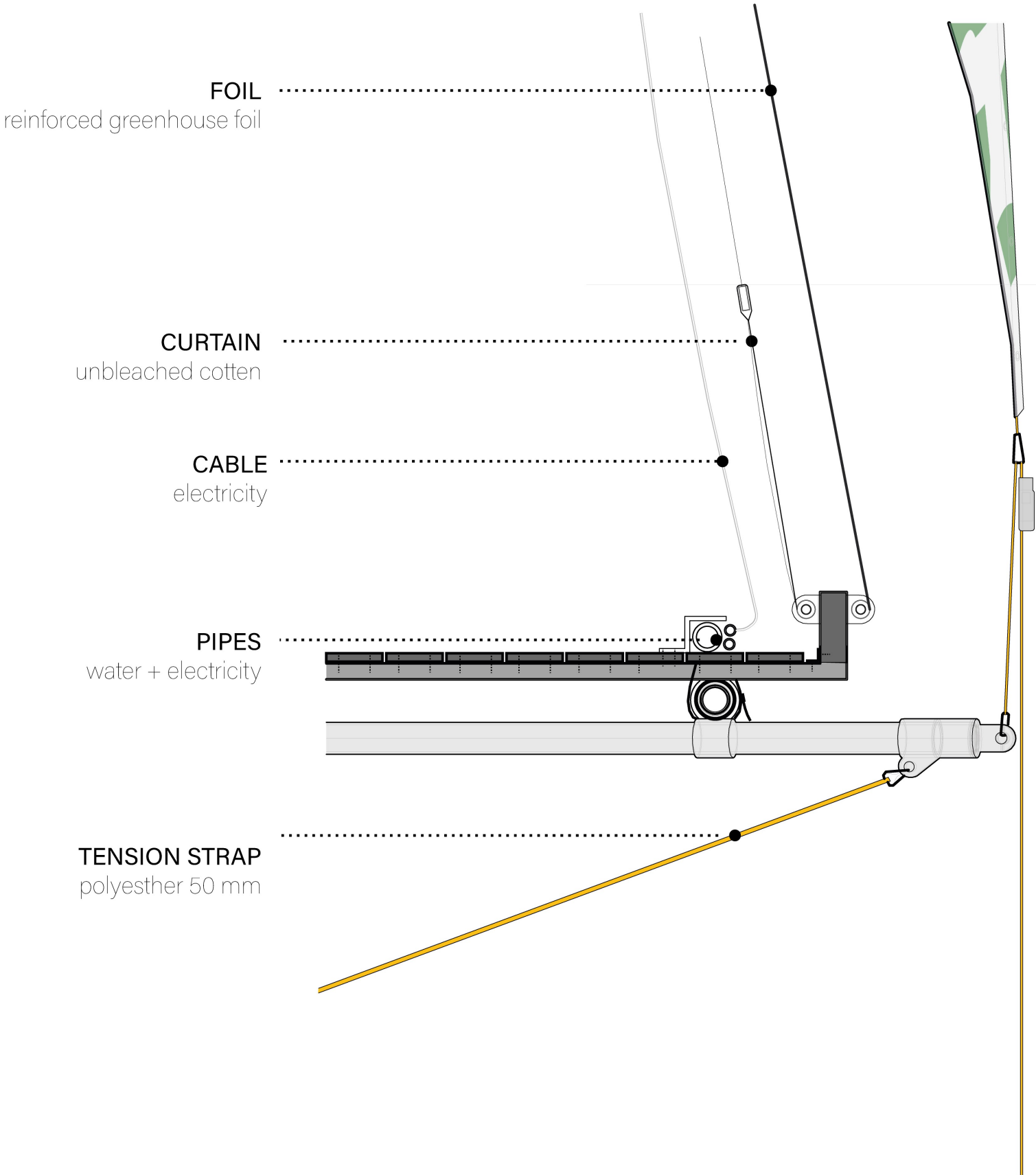
TRANSLATION

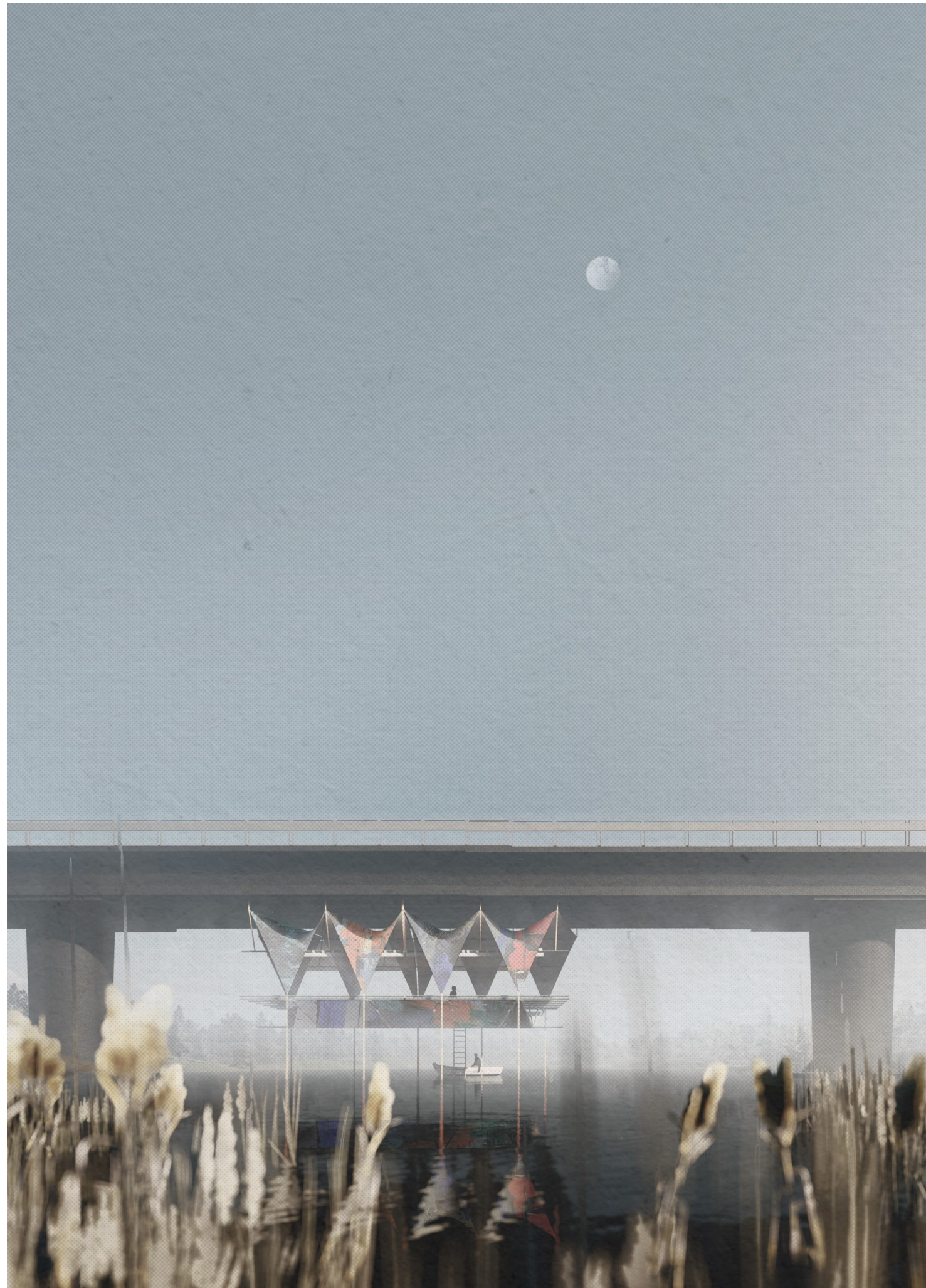




DETAIL

suspended floor



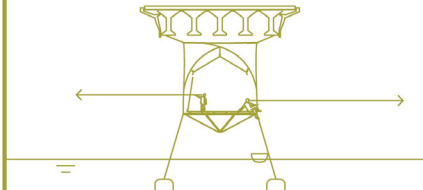


the line as

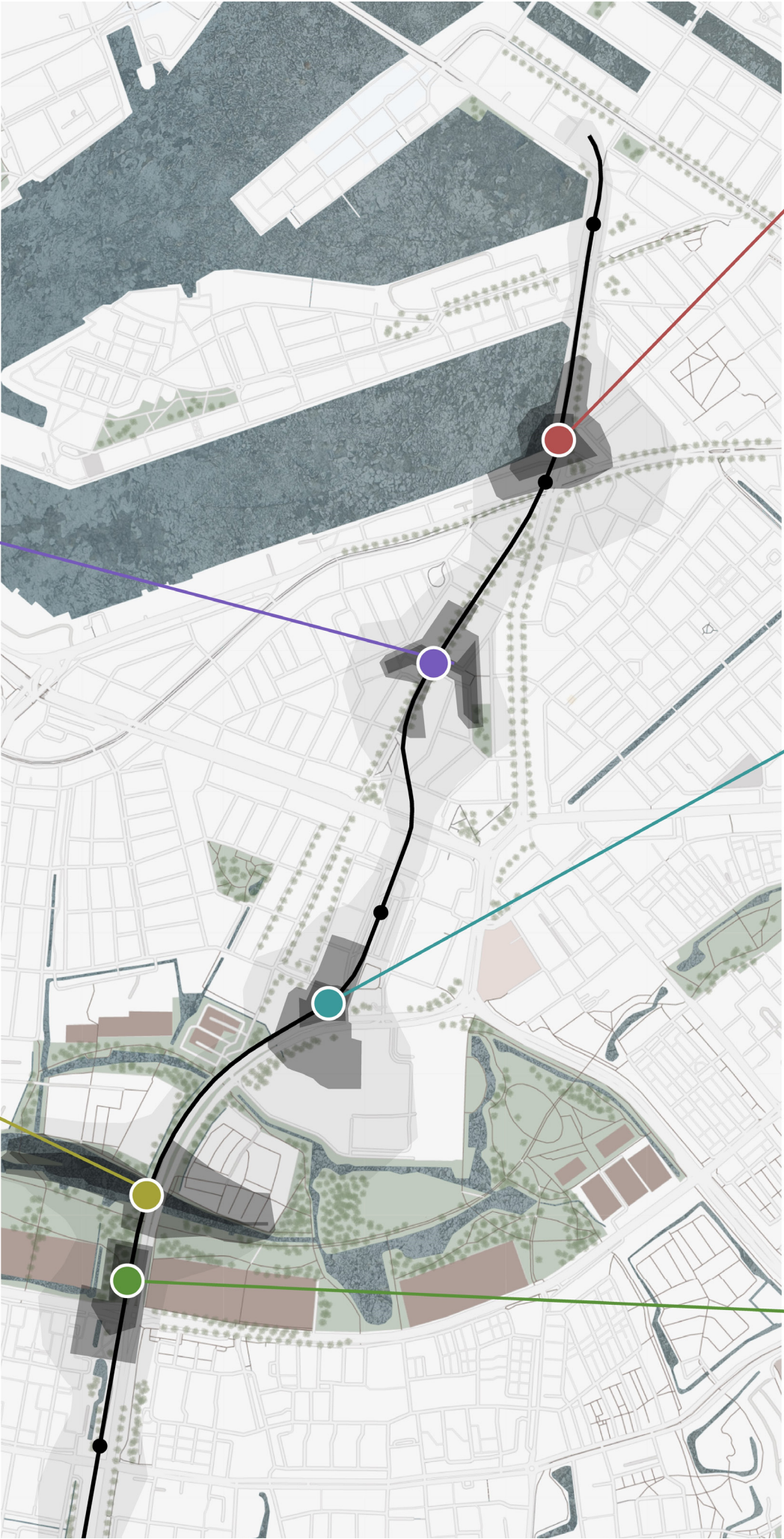
URBAN CONNETCTOR




COMMUNAL SPACE
Tarwewijk



BIRDWATCHING
over the water



PUBLIC EVENTS
near the Maasslo



FLOATING STAGE
above Zuidplein

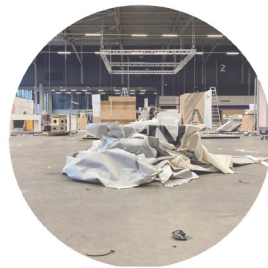


EXHIBITION
in the woods



according to location:

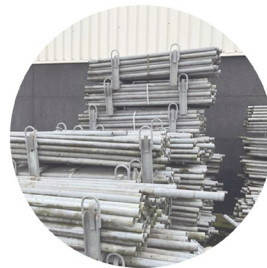
REPLACING MATERIAL



RECYCLED BANNERS



OLD CLOTHING



SCAFFOLDING ELEMENTS



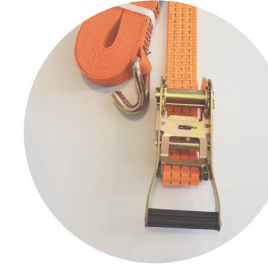
BAMBOO



BIG BAGS / WEIGHT



STONE BLOCKS



TENSION BELTS



CLIMBING ROPE



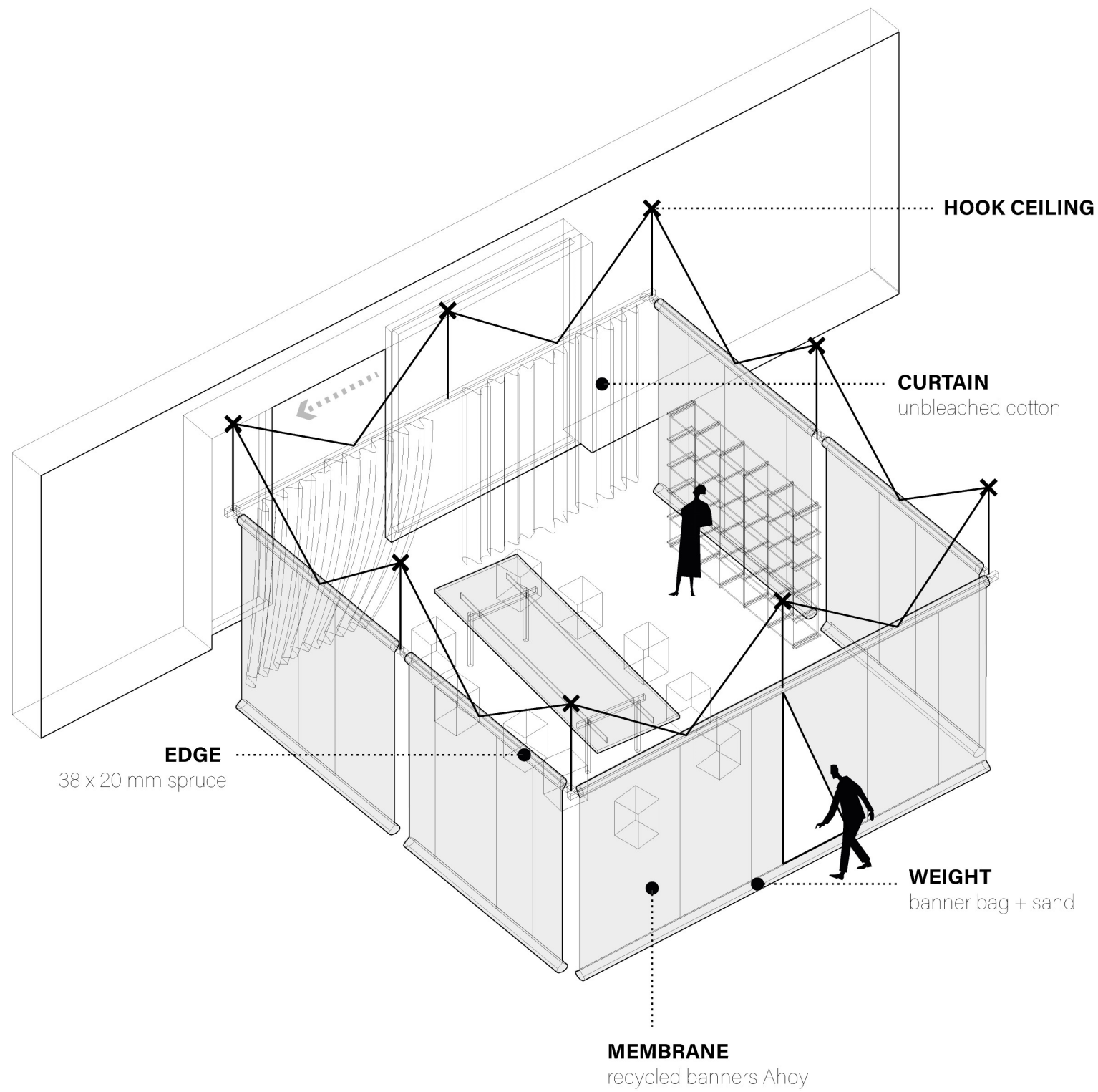
TREE TRUNKS



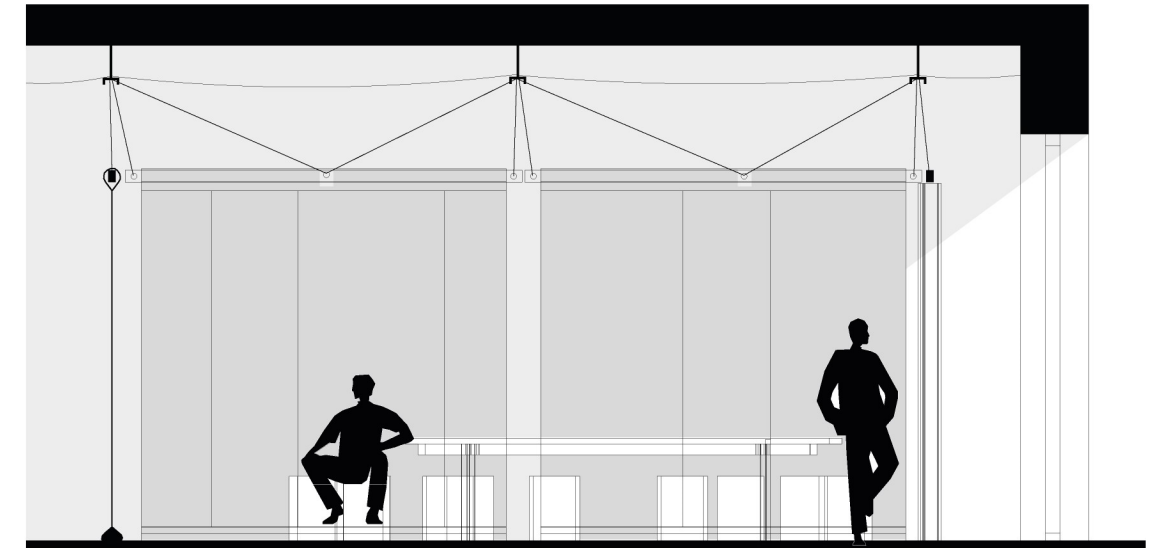
APPENDIX

Deploy × Onder een Brug

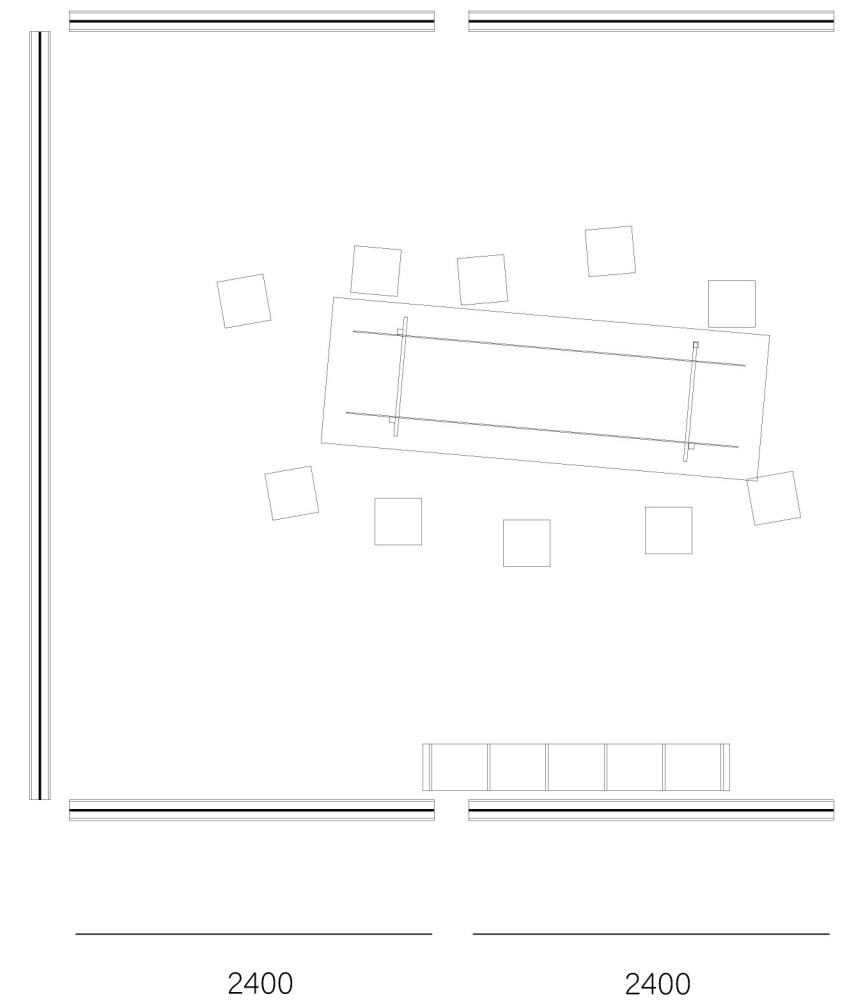




2400



5000



[mm]















thank you

QUESTIONS?