



WEATHERING ARCHITECTURE

a climate responsive city spa for Amsterdam

The Color Inside
James Turrell Skyspace, Overland Partners



PART I

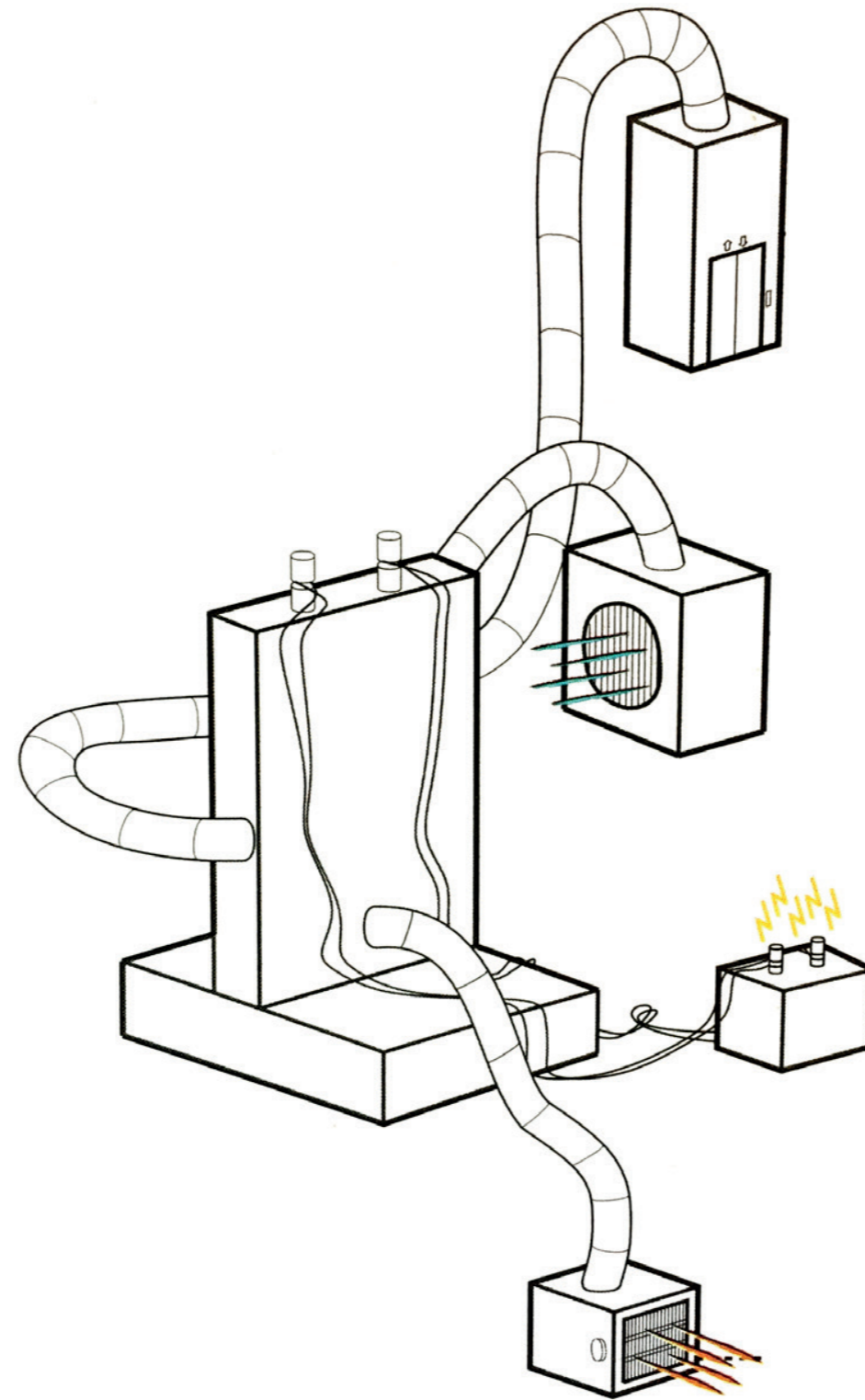
ARCHITECTURE OF THE INVISIBLE



Laugiers primitive hut,
Charles Eisen

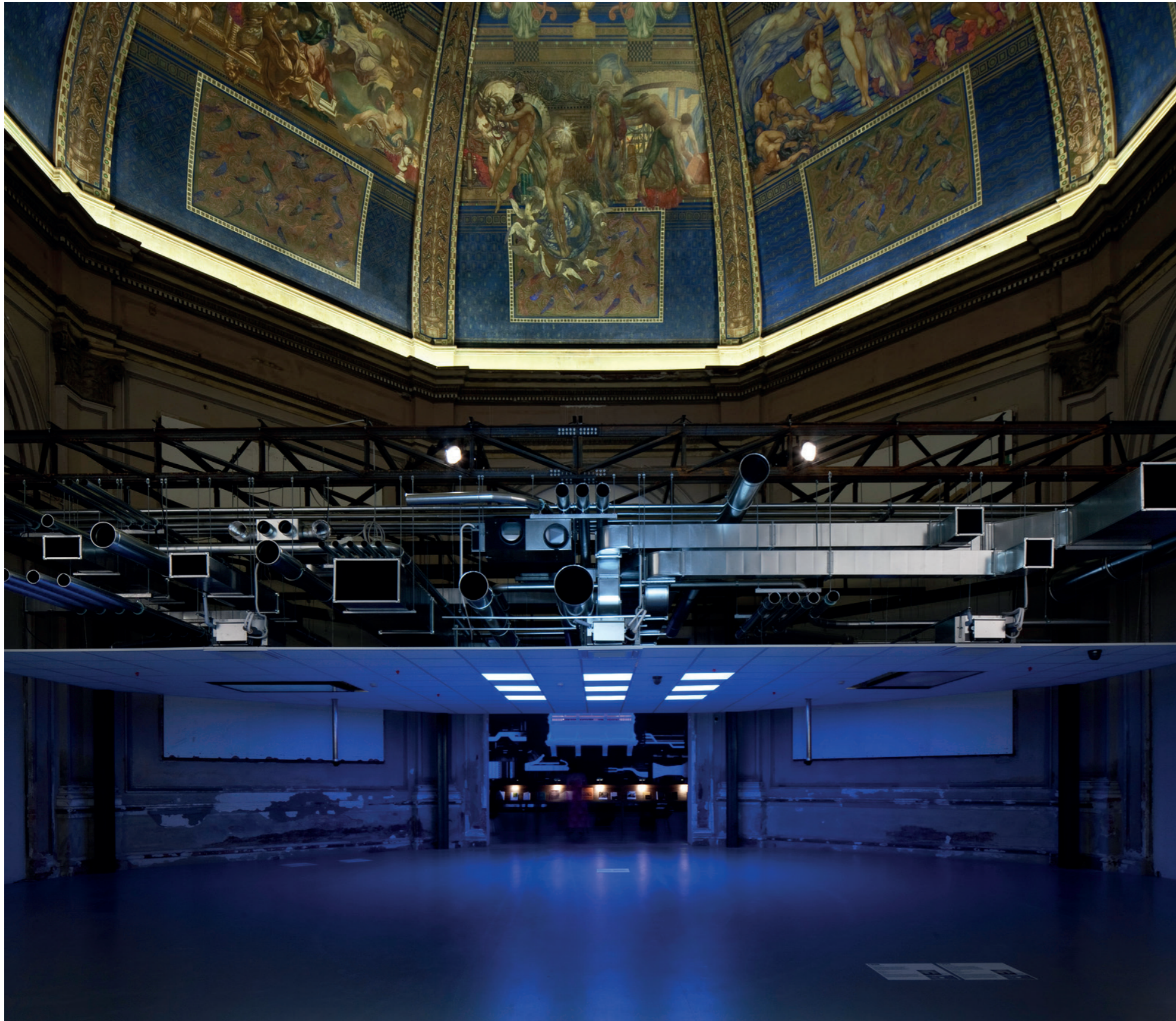


Deltse Poort, Rotterdam
Abe Bonnema



PROBLEM STATEMENT

Contemporary architecture is often disconnected from its climatic environment.





TURKEY



DENMARK



IRAQ



MALAYSIA



KAMEROON



JAPAN

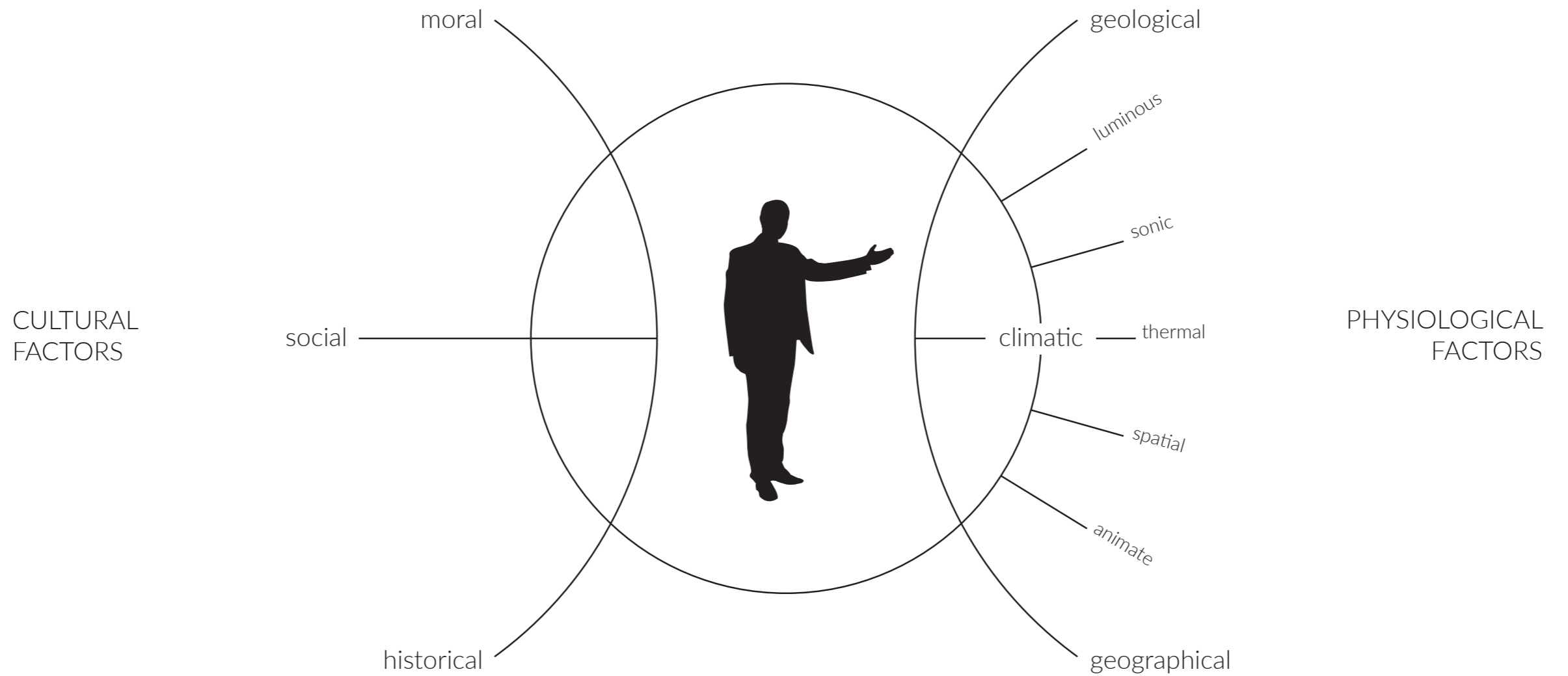
RESEARCH QUESTION

How can the relationship between buildings and their climatic environment be reenforced through architectural design?



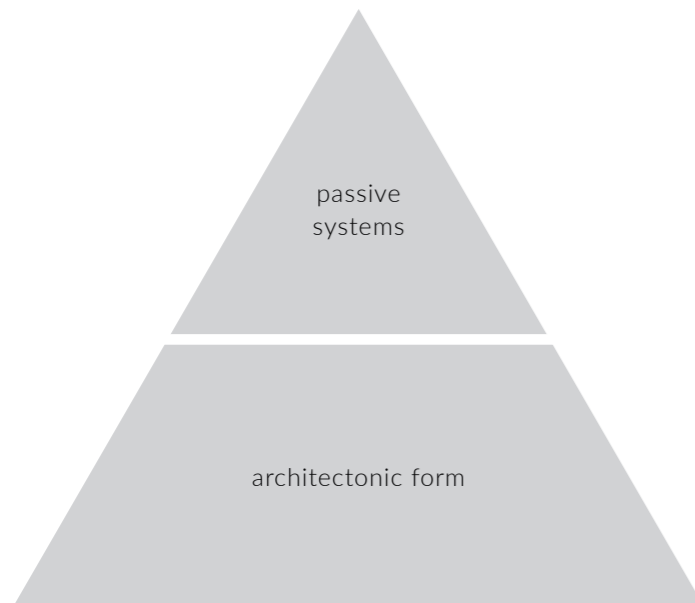
VERNACULAR STRATEGIES

architecture as a climate strategy

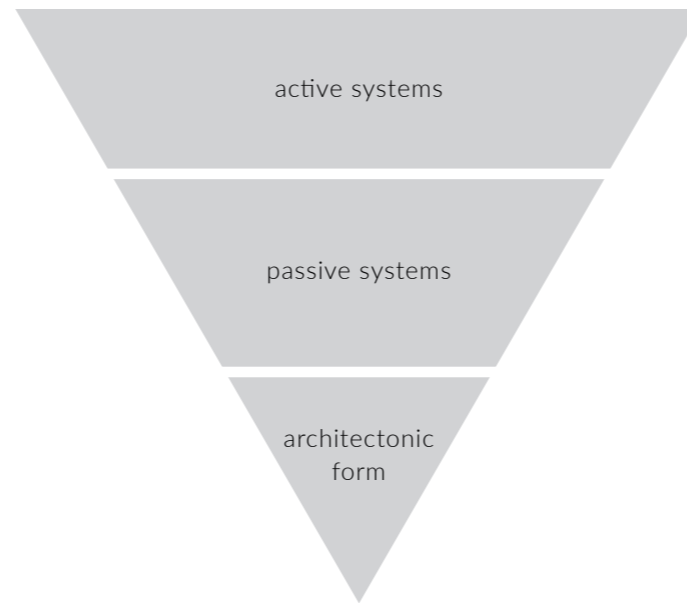


ARCHITECTURAL CONTEXT

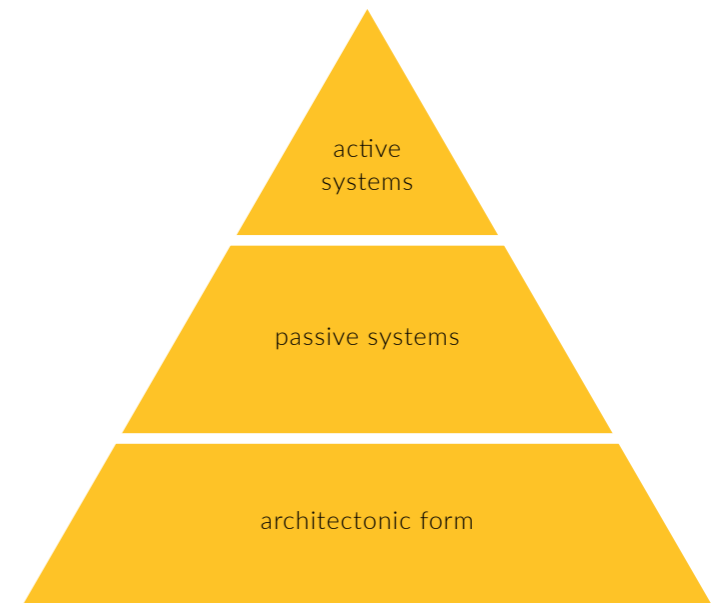
climate as an architectural context



VERNACULAR



MODERNISM



CLIMATE RESPONSIVE

HYRARCHY OF STRATEGIES

climate as an architectural context

SUNLIGHT



SOLAR HEAT



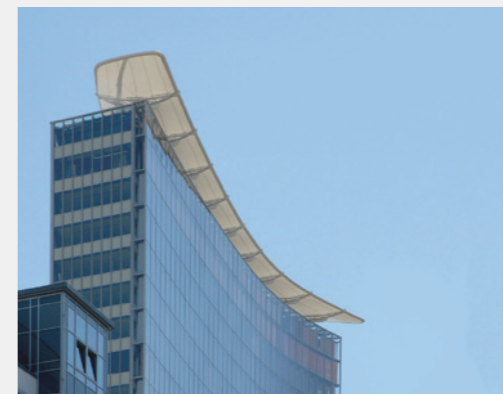
WIND



urban form



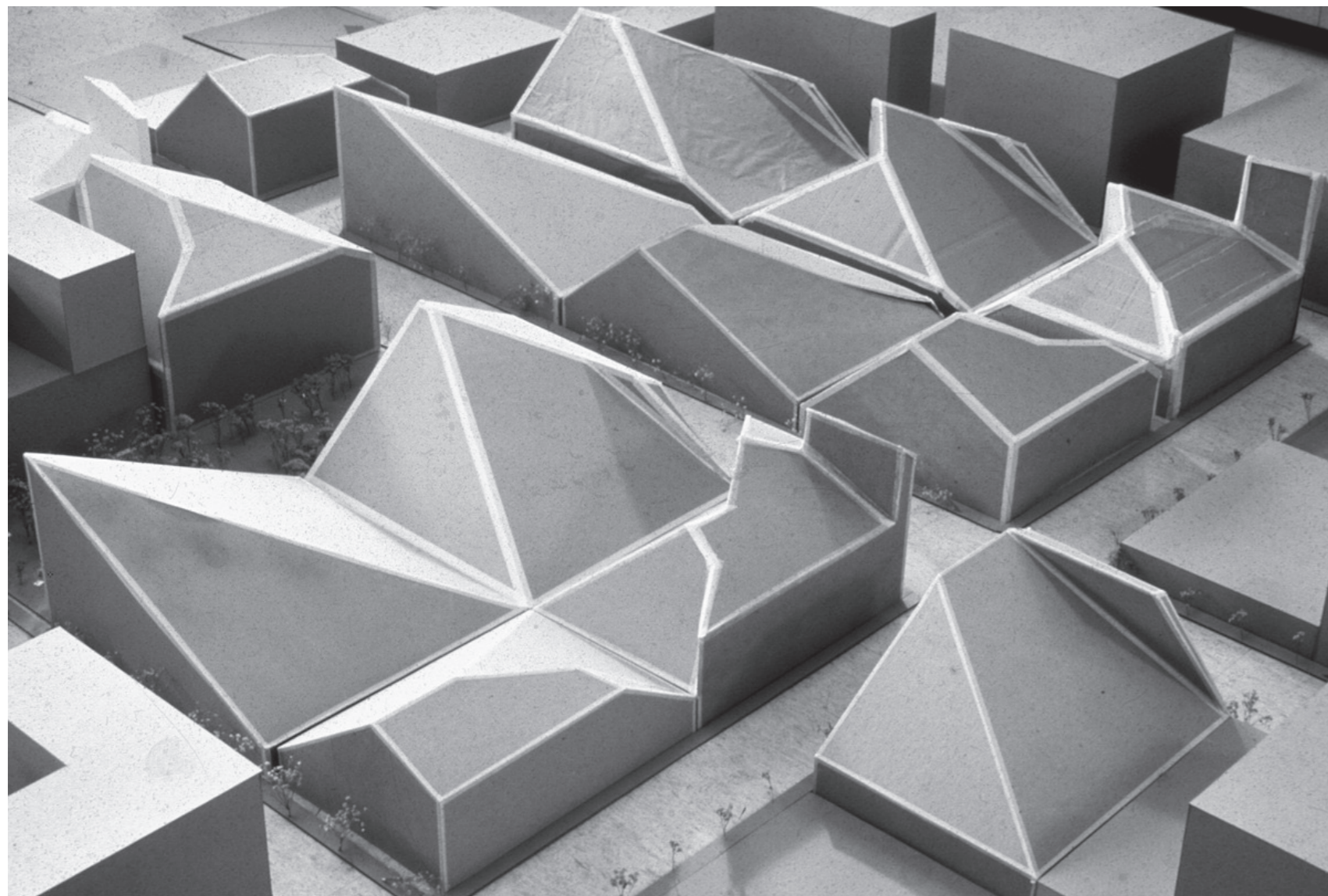
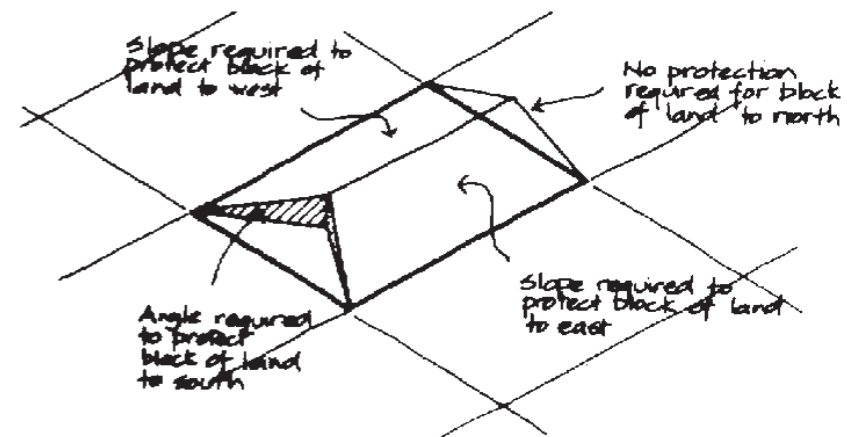
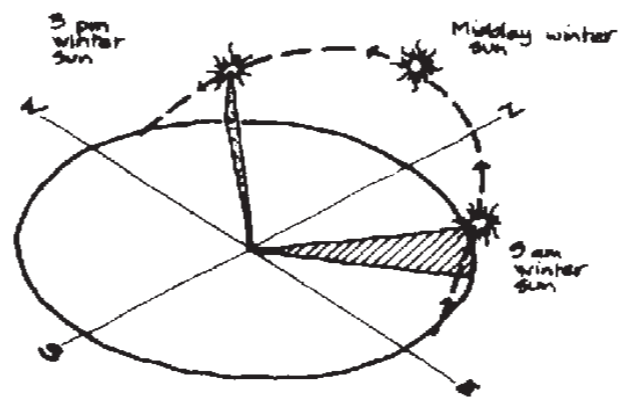
building shape



facade geometry

CASE STUDIES

on buildings shaped by their climatic context



MAIN CONCLUSION

By allowing sunlight, solar heat and wind to influence architecture in its urban form, building shape and facade, a location specific and climatically balanced built environment can be created.

PART II

REDISCOVERING URBAN NATURE



DESIGN OBJECTIVE

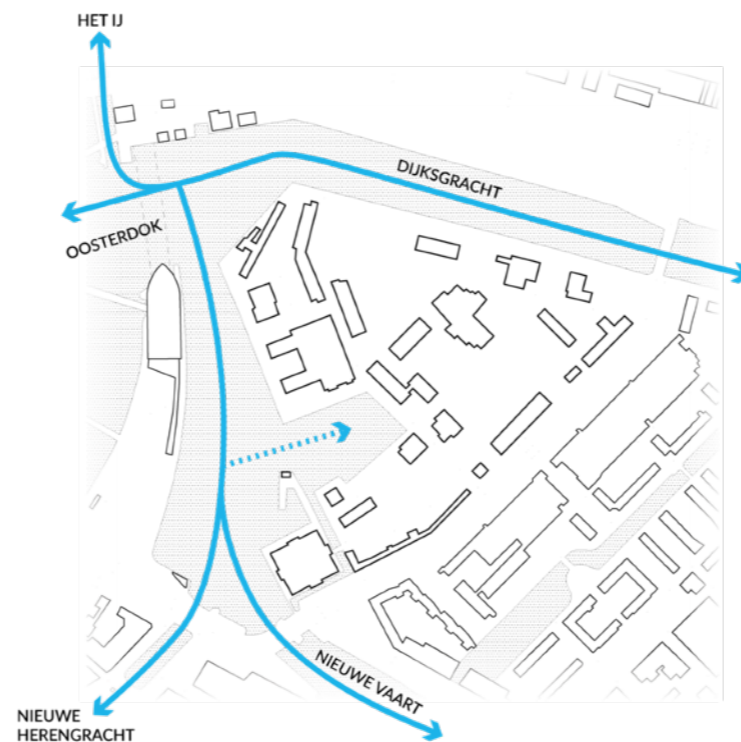
To rediscover the beauty of weather and climate as the last truly natural context in the modern city.

MARINETERRAIN

NEMO

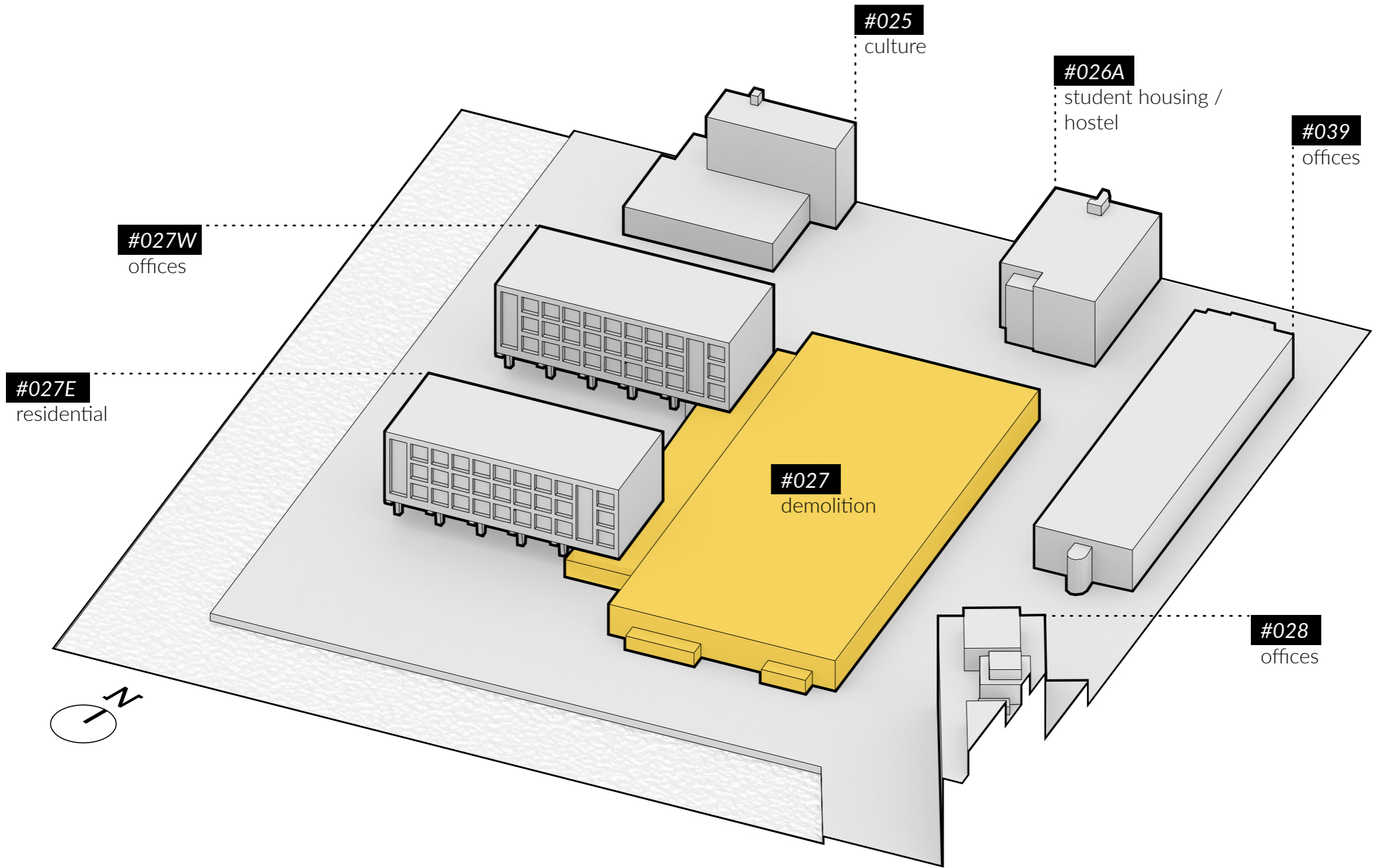
SCHEEPVAART
MUSEUM





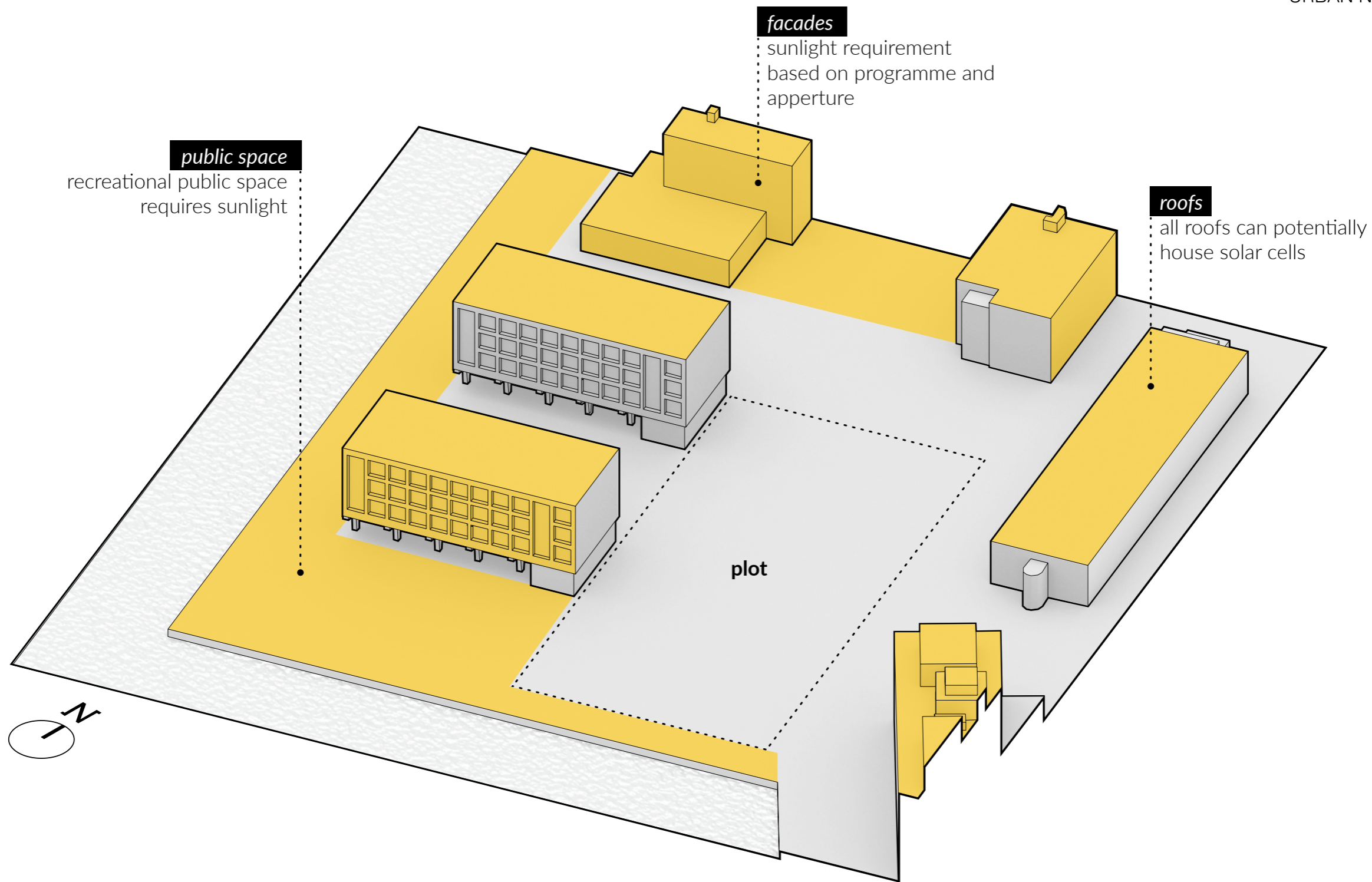
MARINETERRAIN

a true urban island



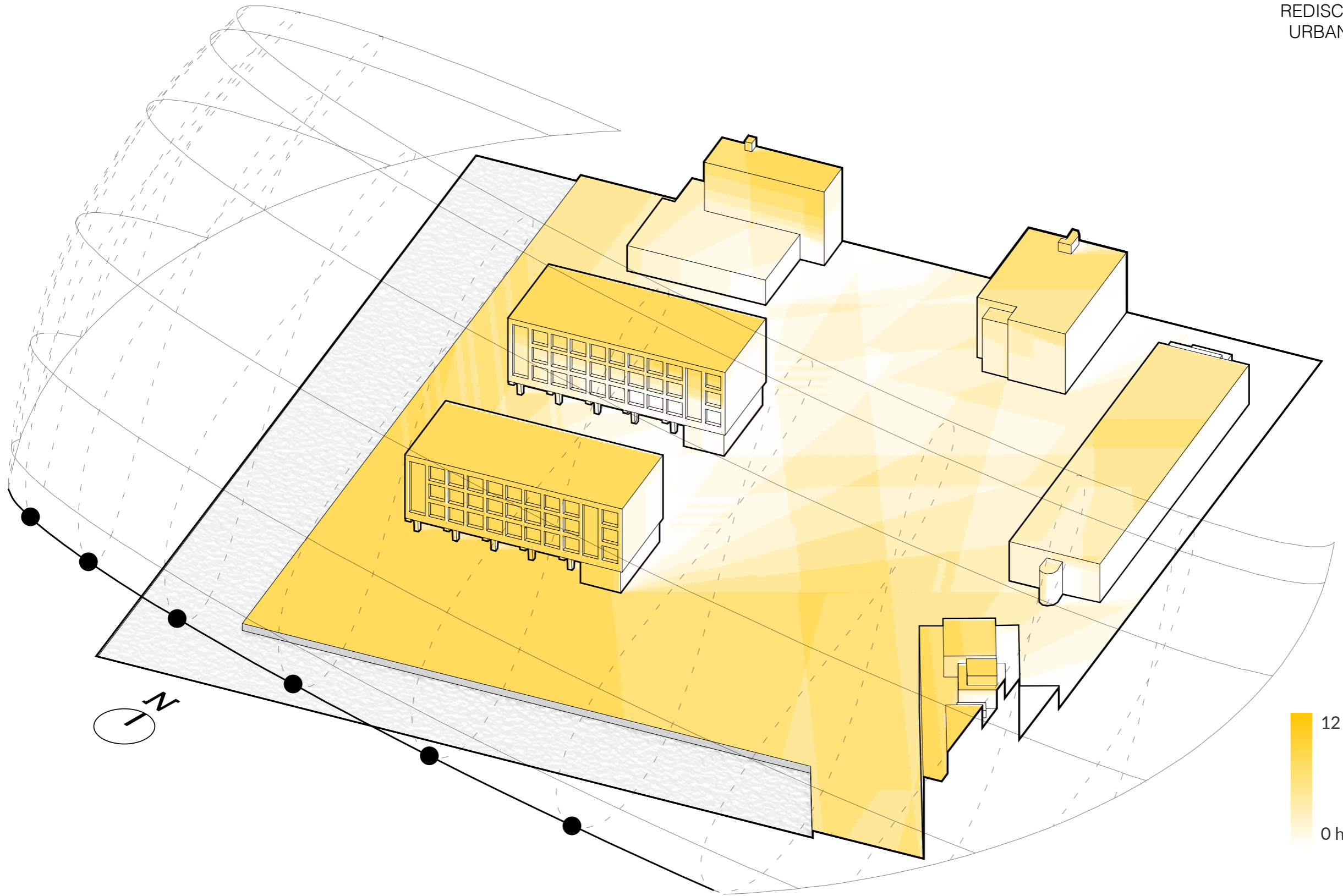
PLANNED INTERVENTIONS

transformation and demolition



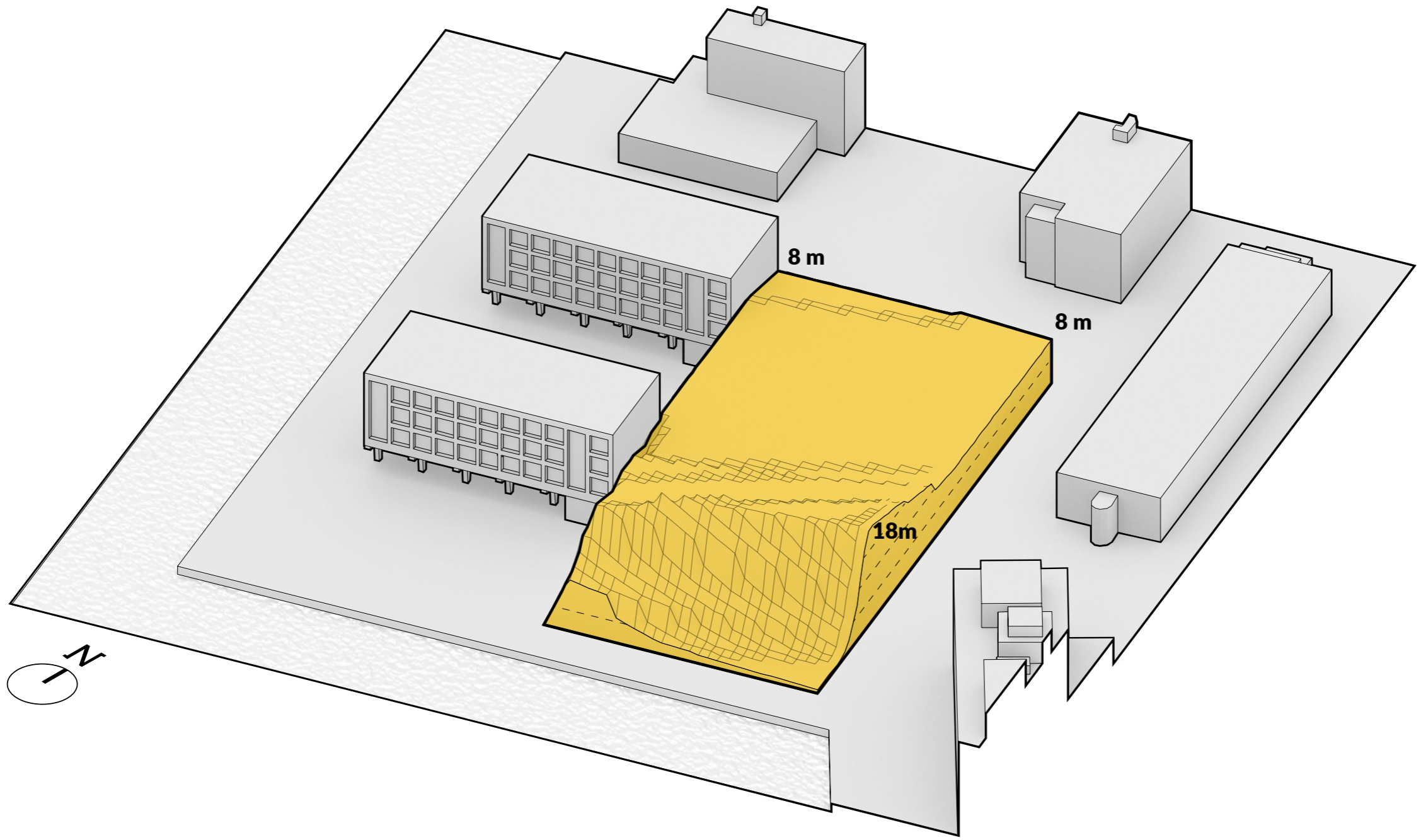
SHADE TOLERANCE

of neighboring buildings and public space



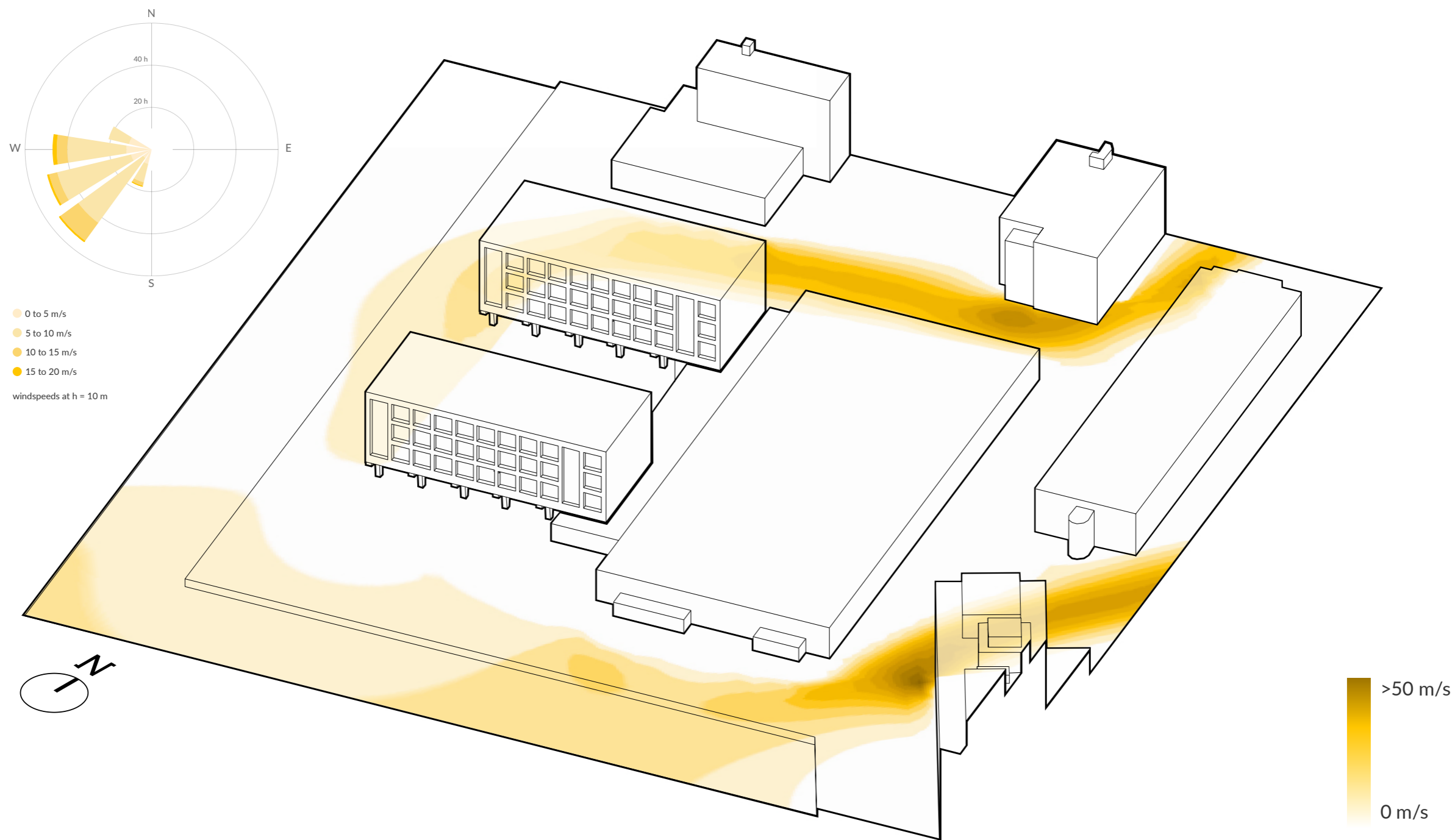
SOLAR ACCESS

during winter solstice



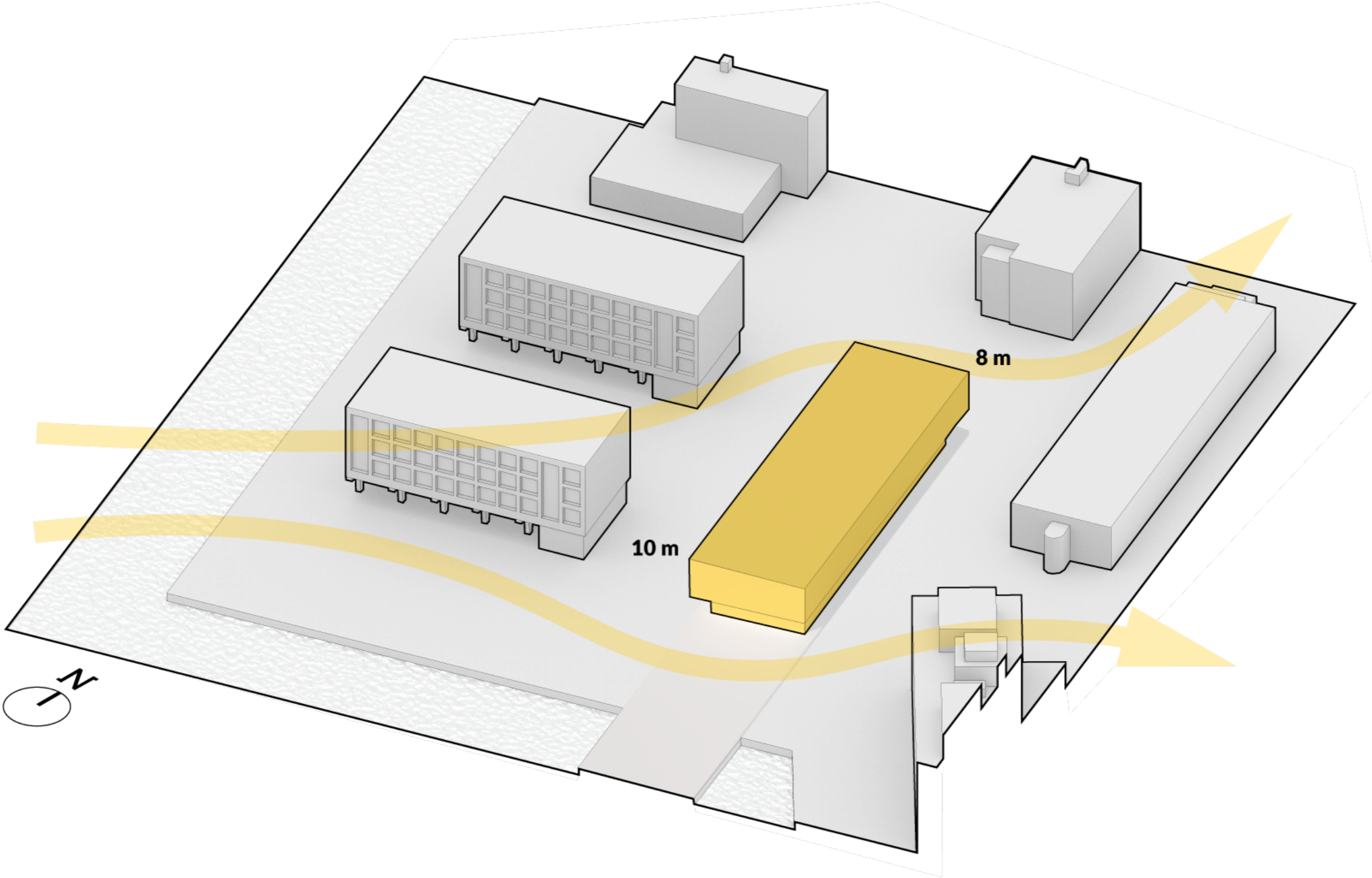
SOLAR RIGHTS ENVELOPE

for 6 hours of solar access



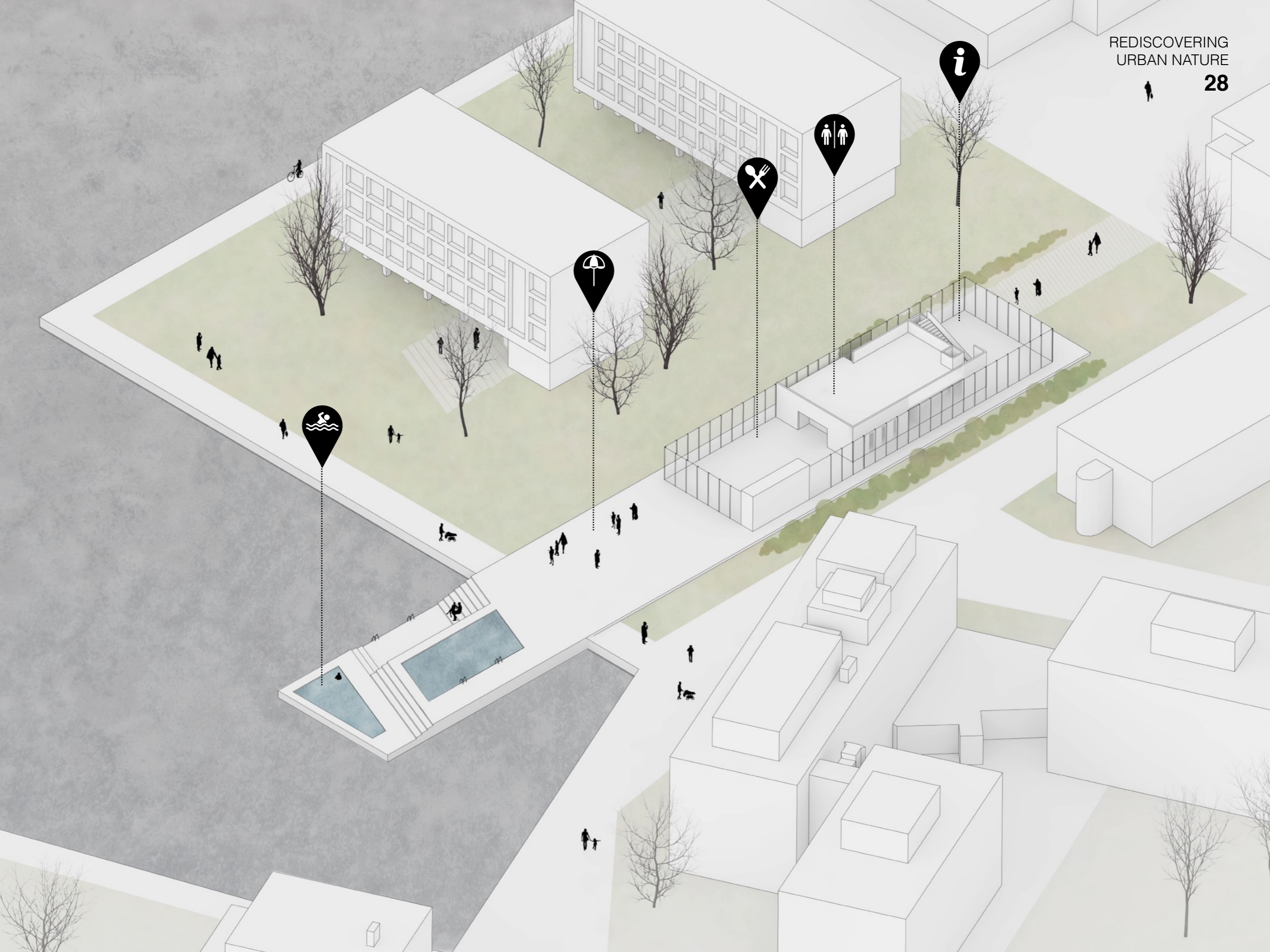
WINDFLOW

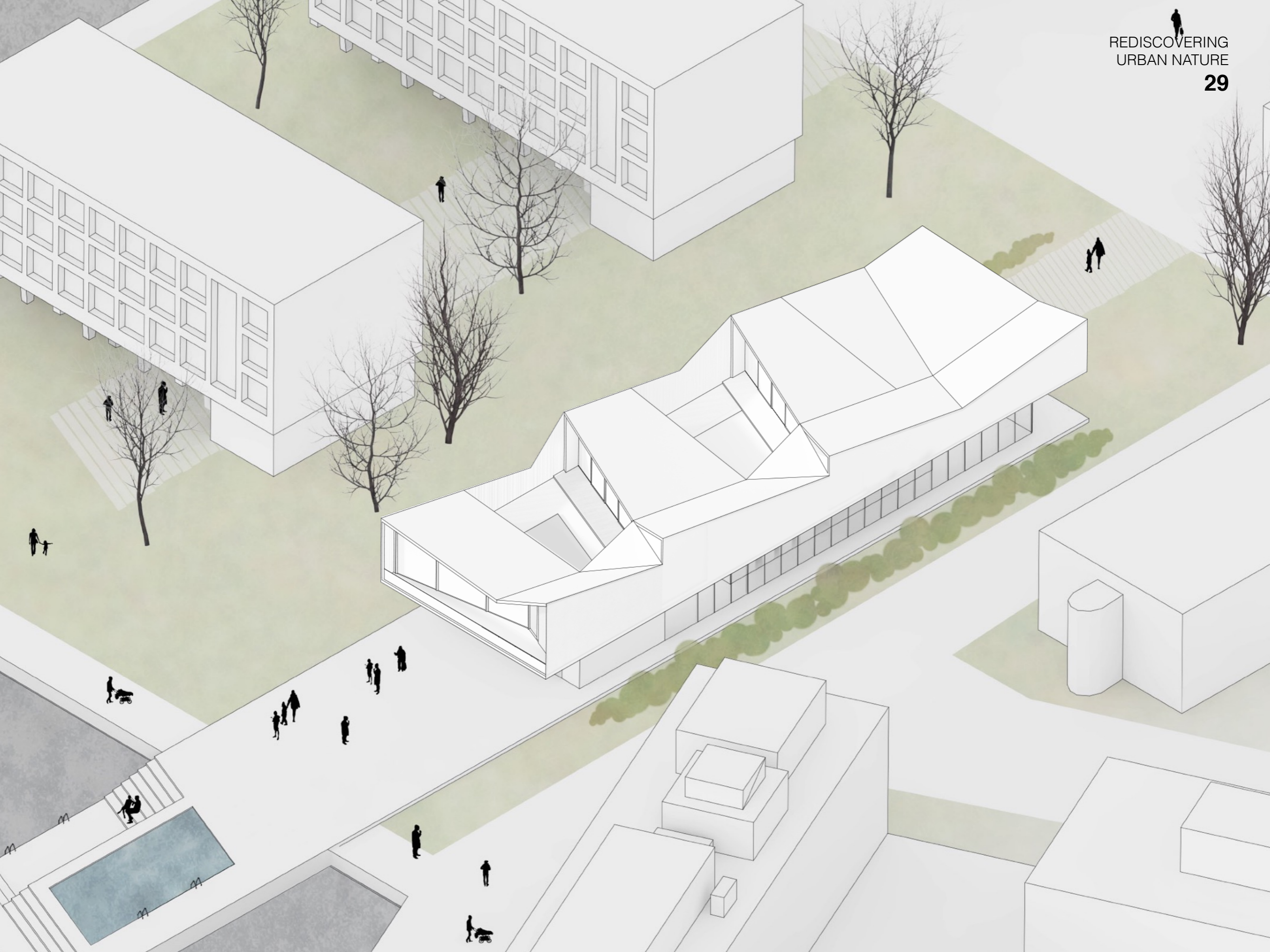
at street level for 10 m/s SW winds



PROPOSED MASS

within generated boundaries



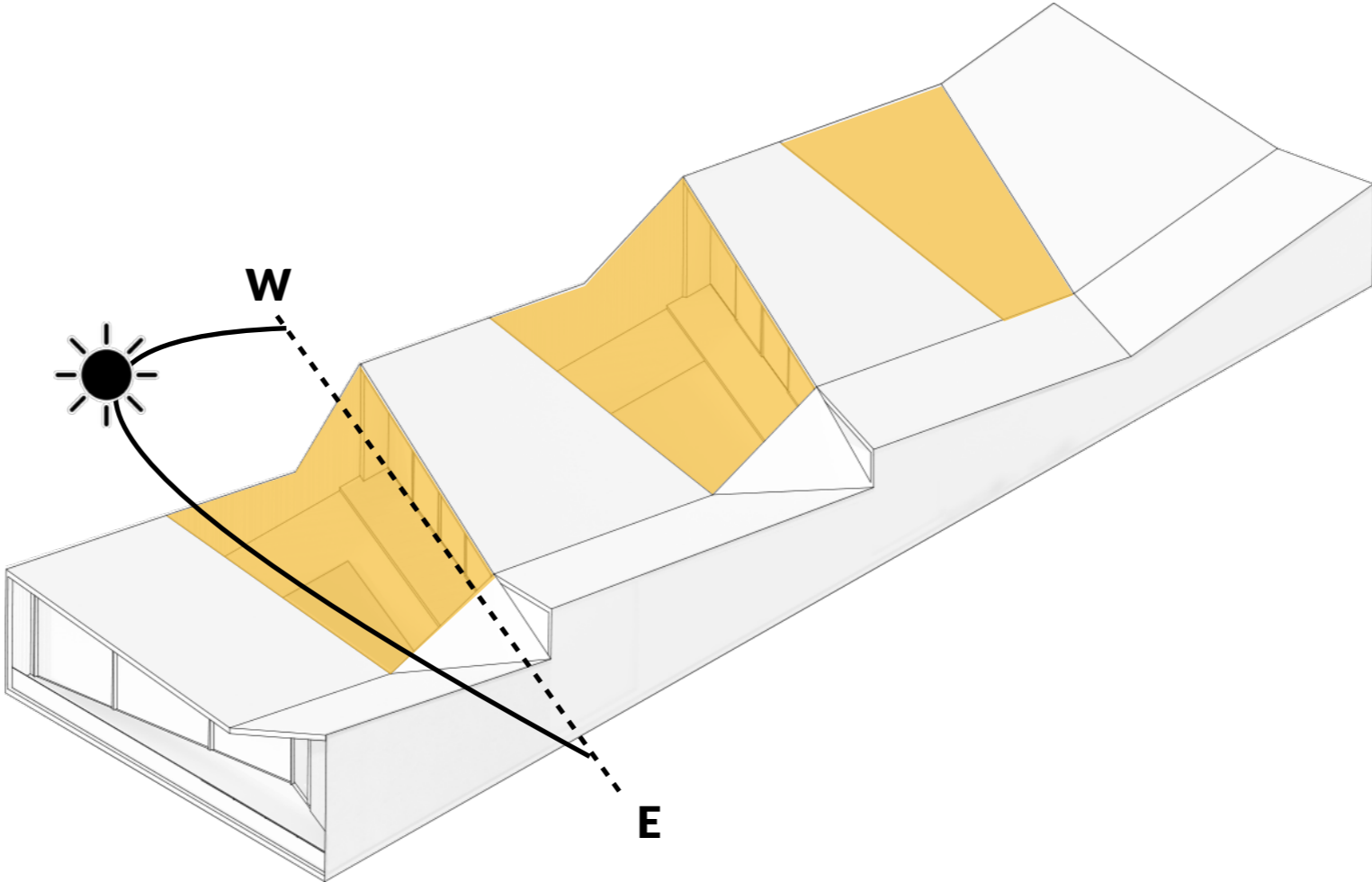




OUTSIDE POOL

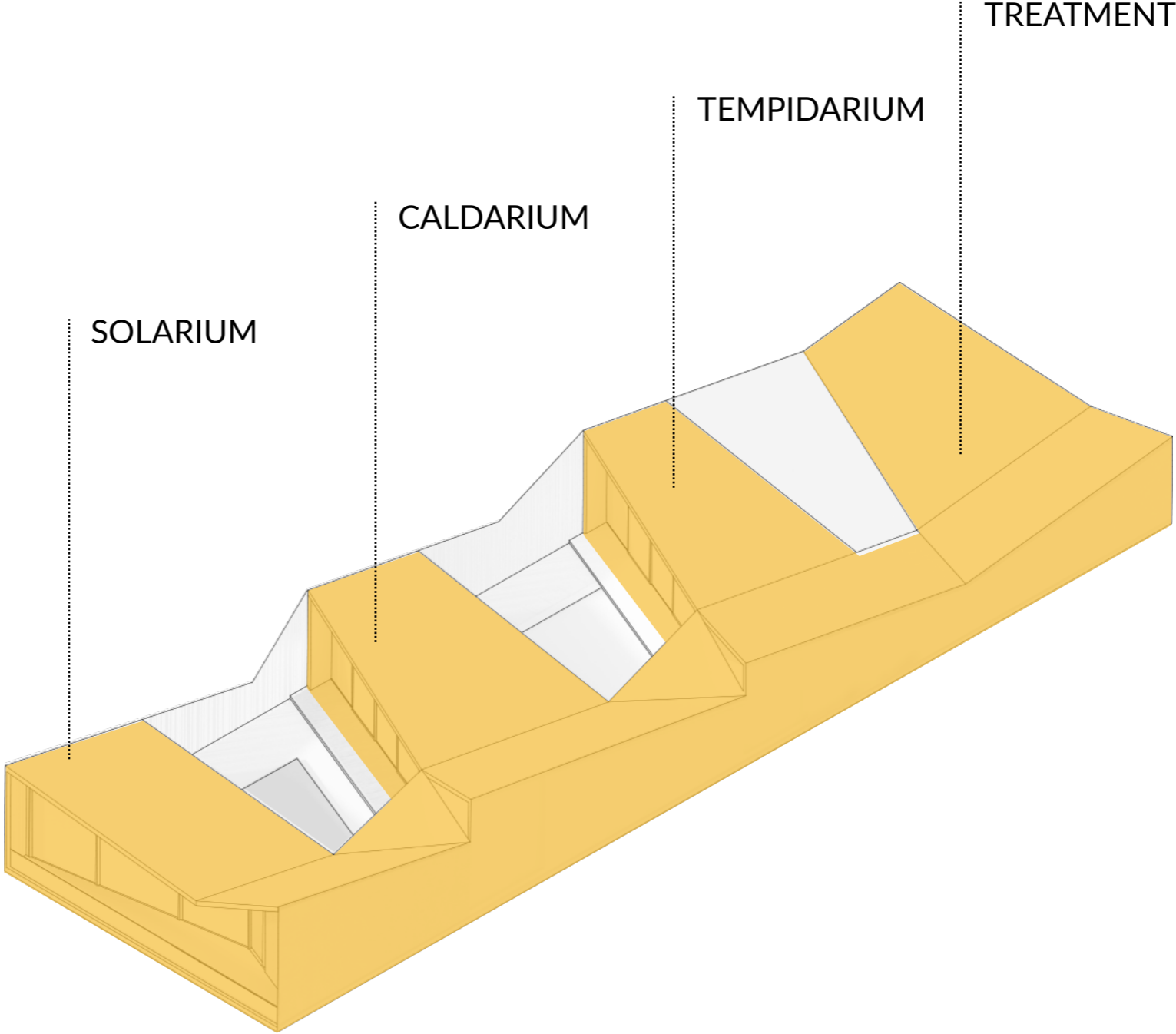
ATRIUM

PATIO



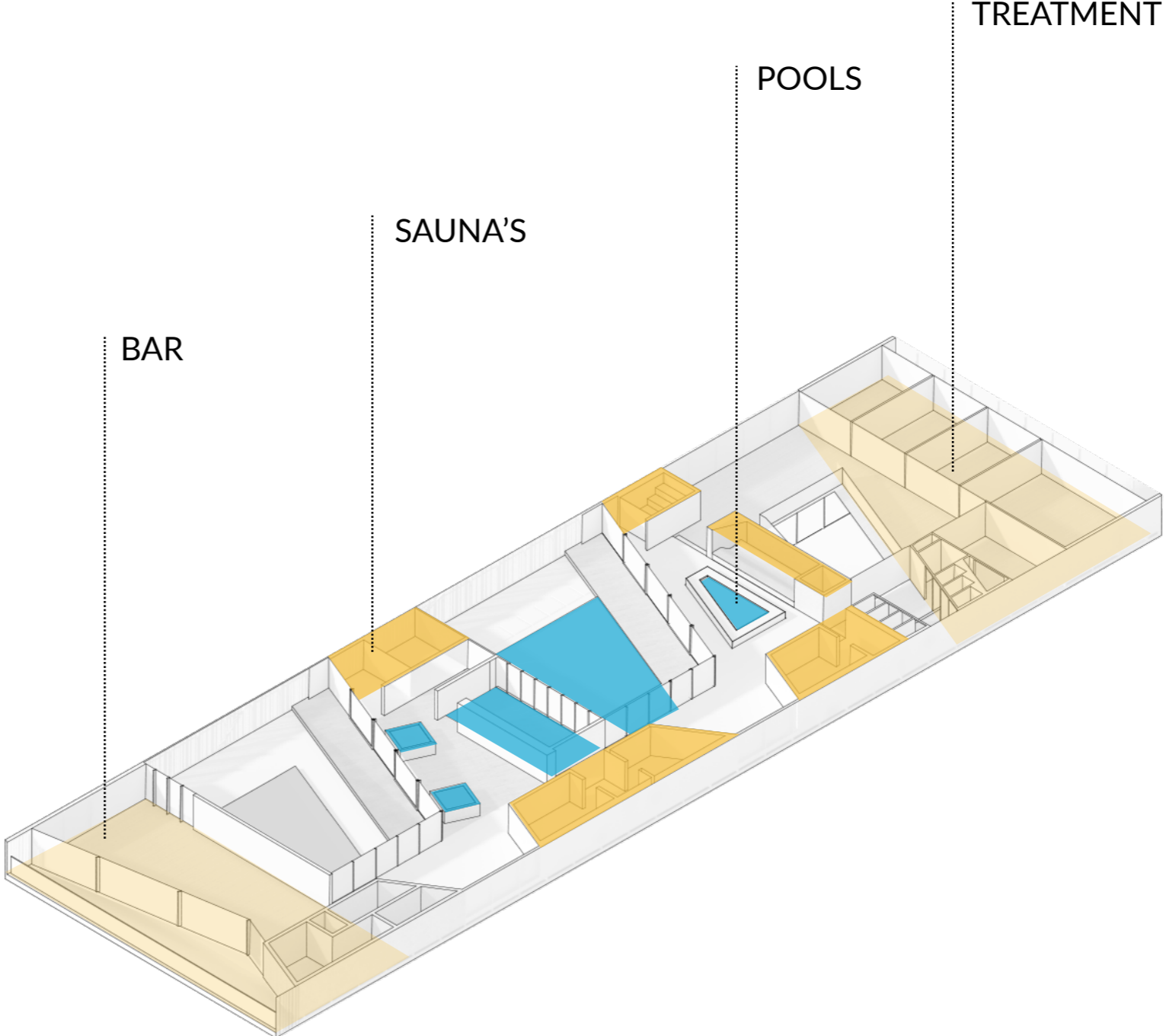
SPA LAYOUT

semi outdoor spaces



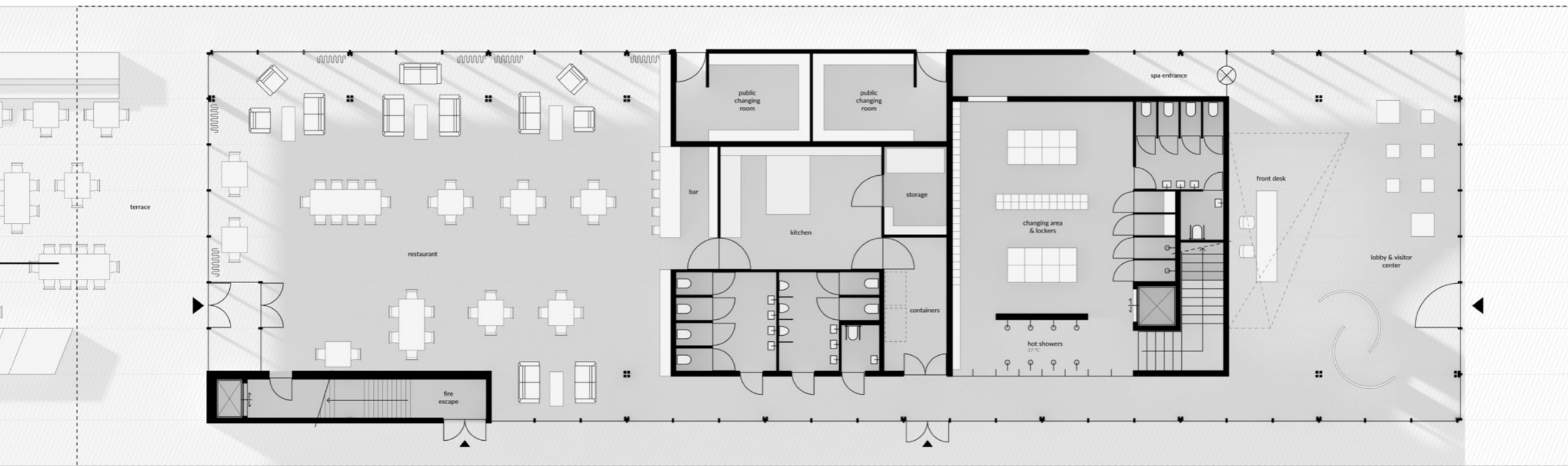
SPA LAYOUT

interior spaces

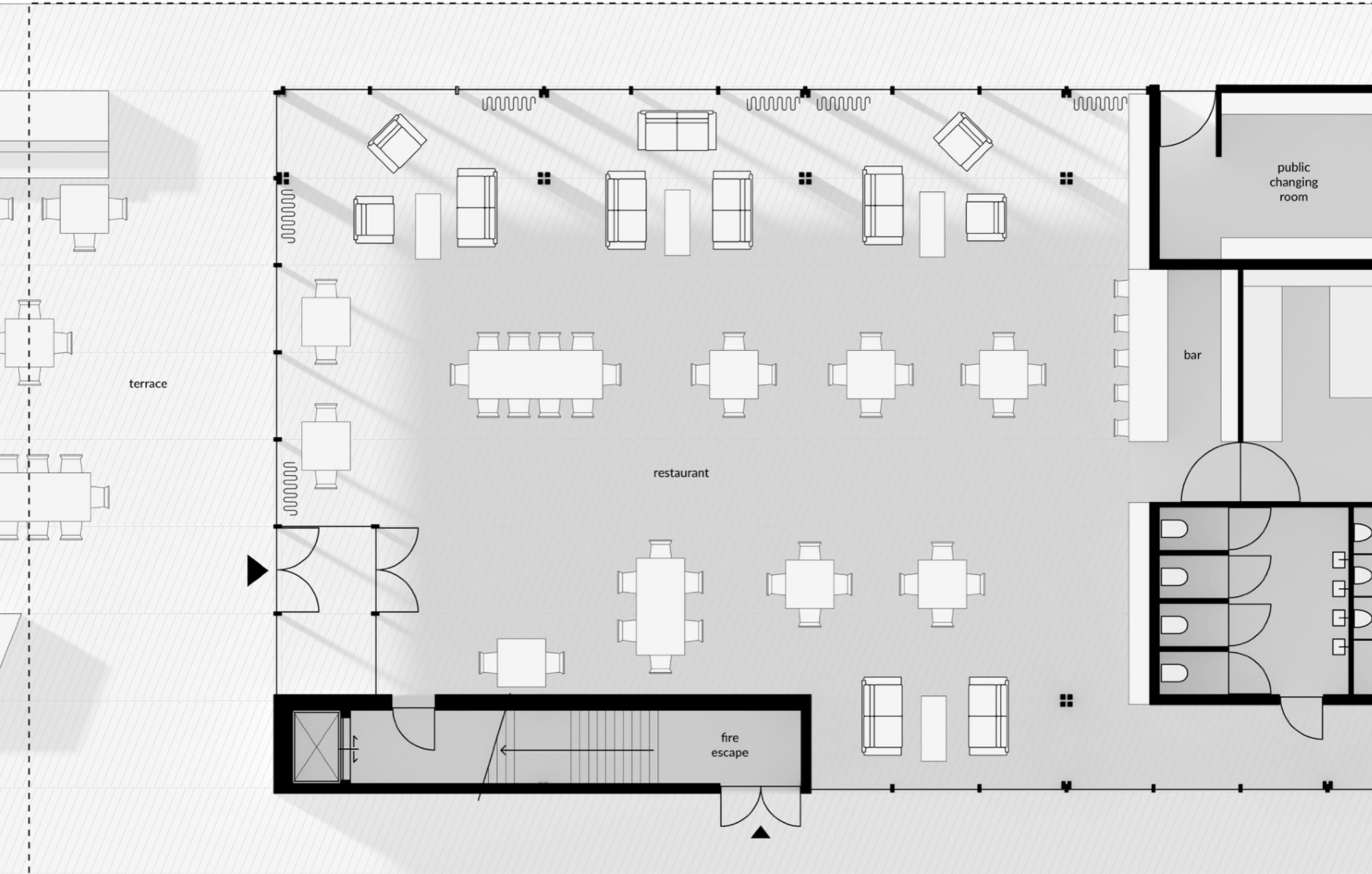


SPA LAYOUT

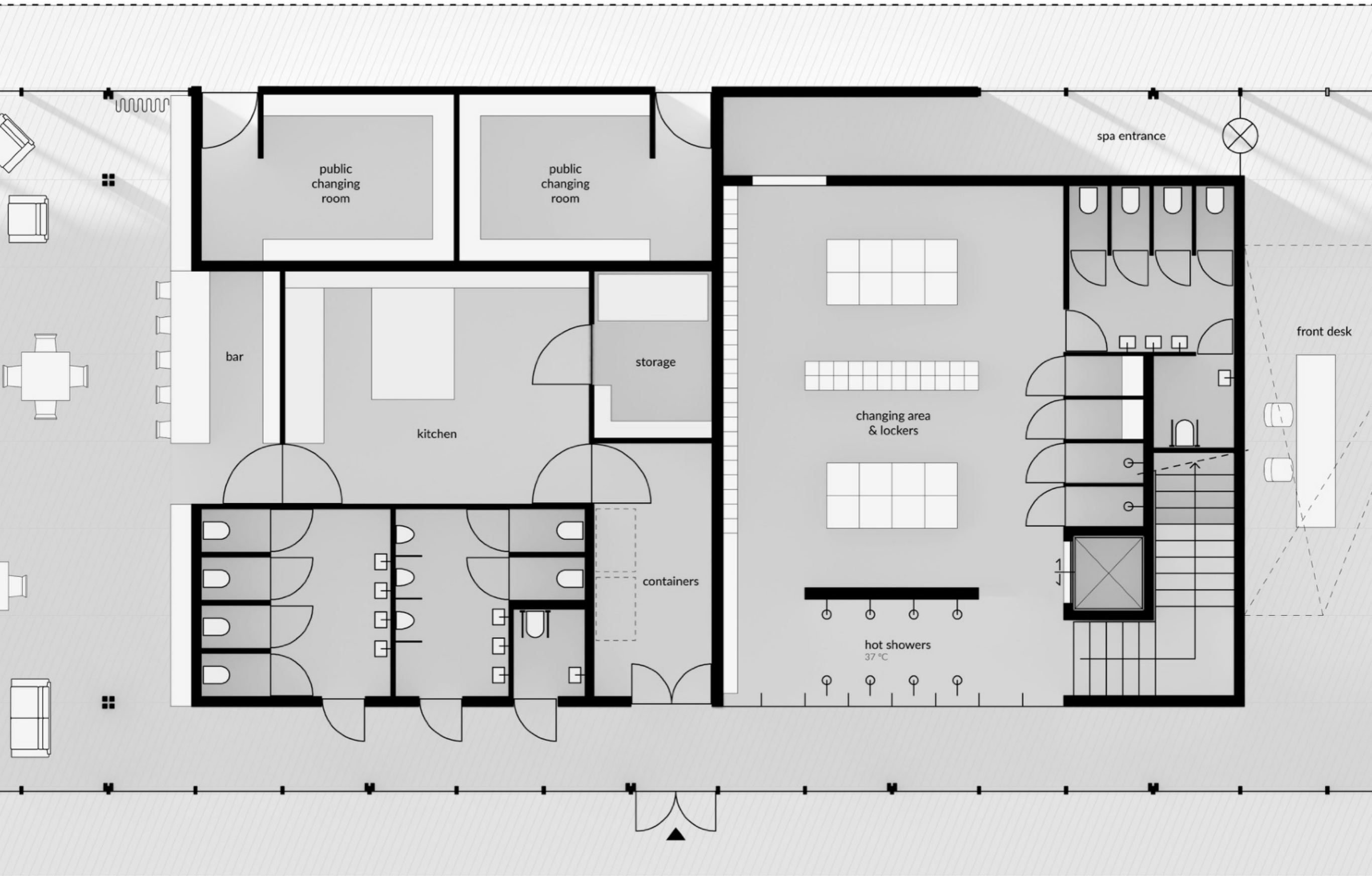
baths and sauna's



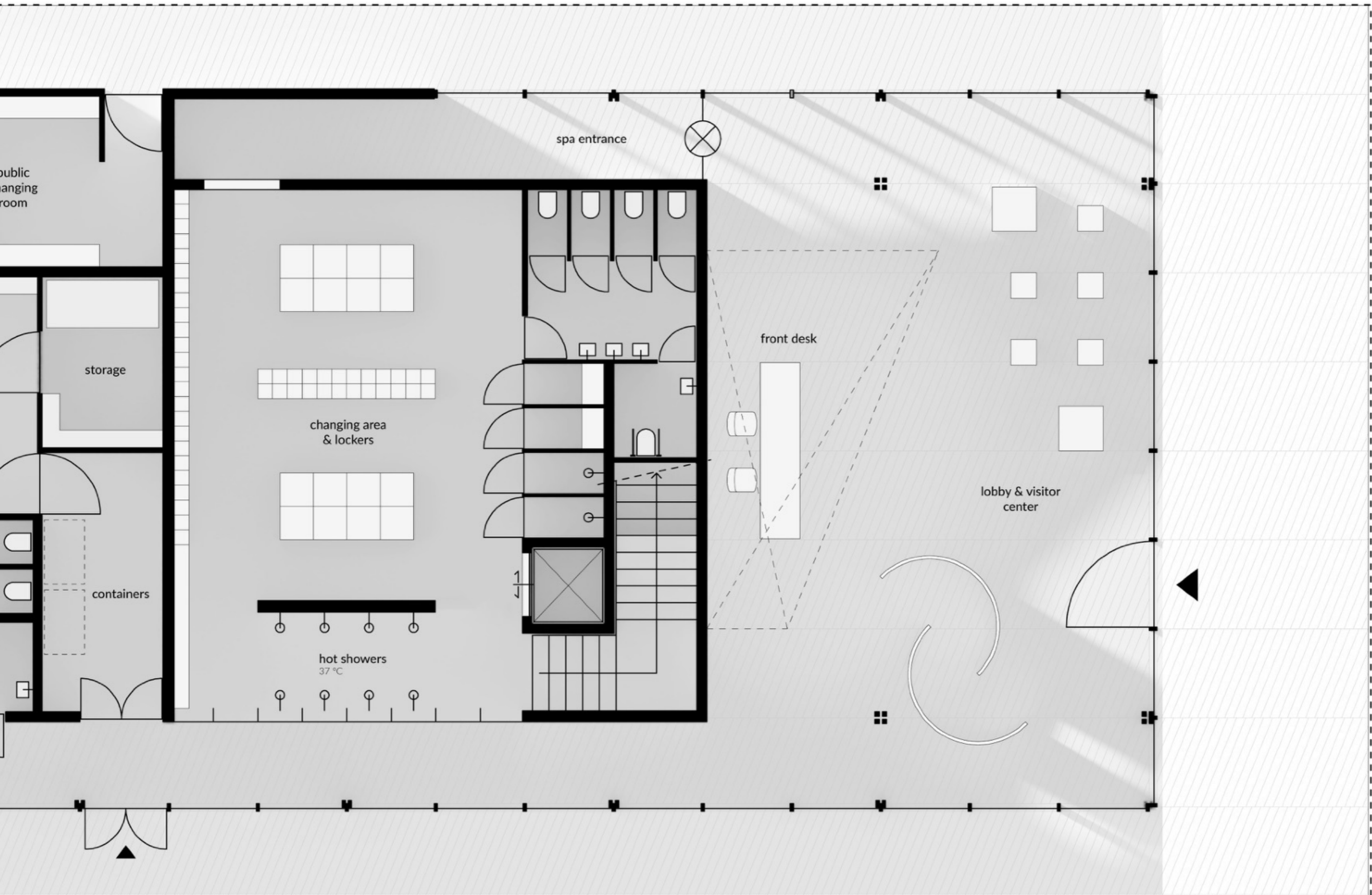
GROUND FLOOR



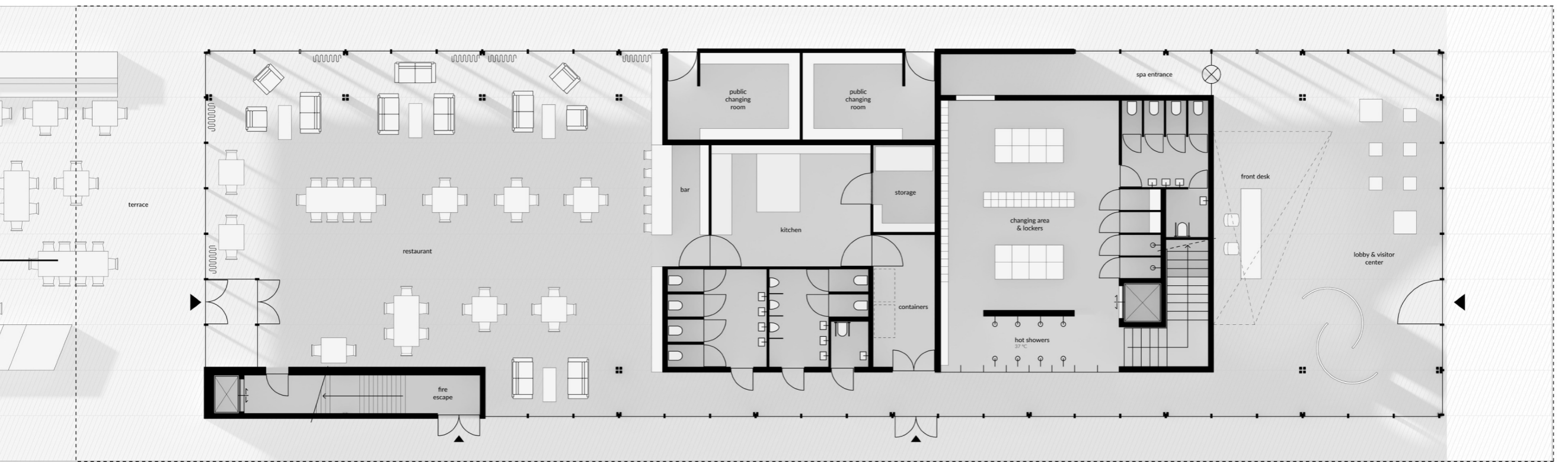
RESTAURANT



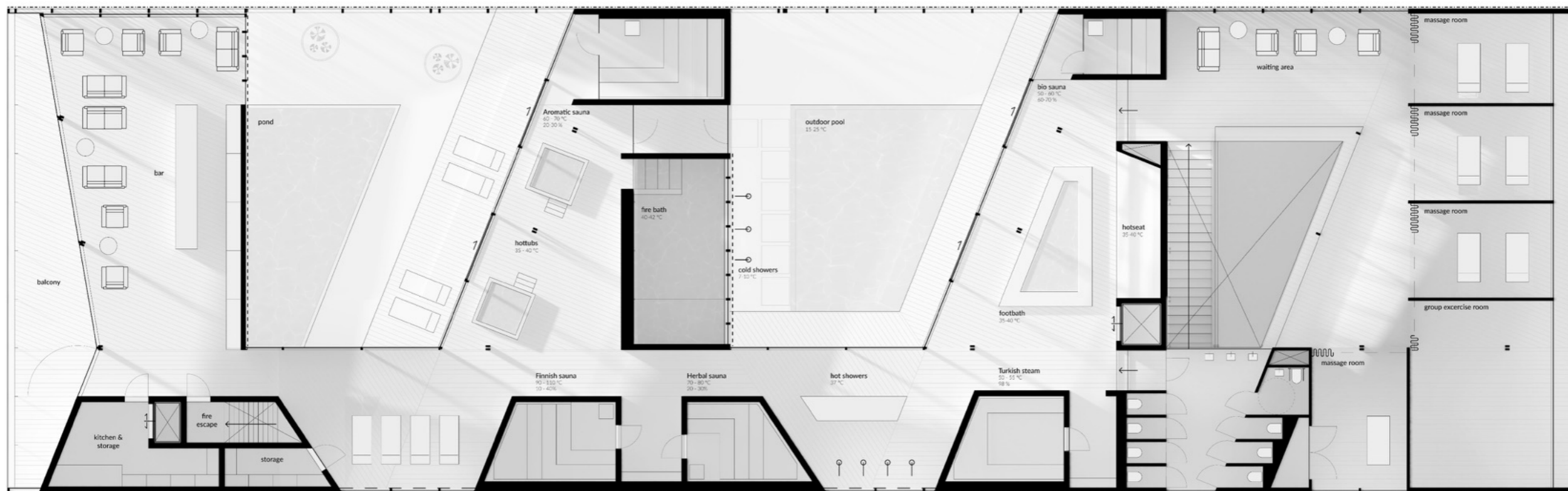
FACILITIES



LOBBY & VISITOR CENTER



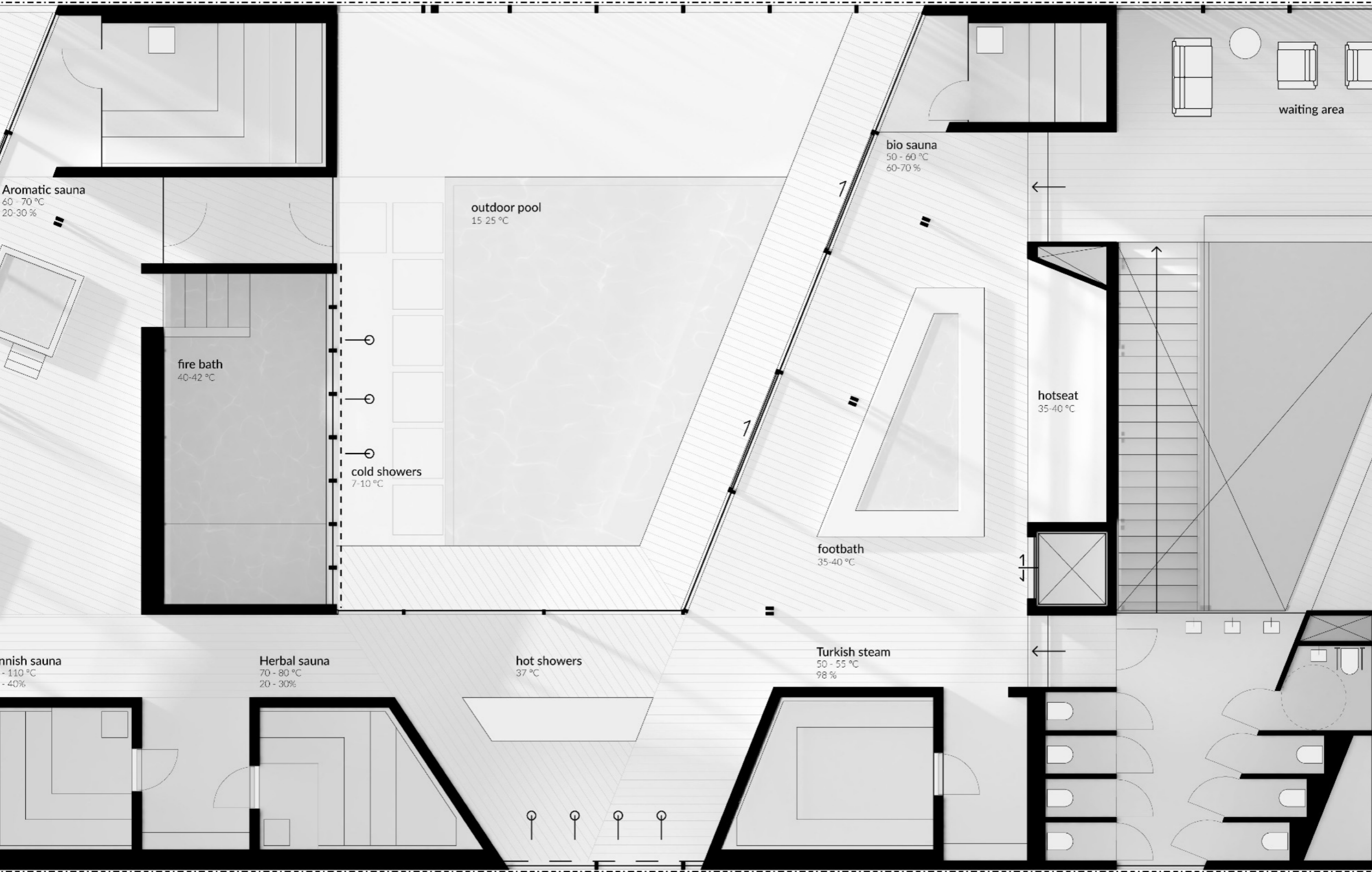
GROUND FLOOR



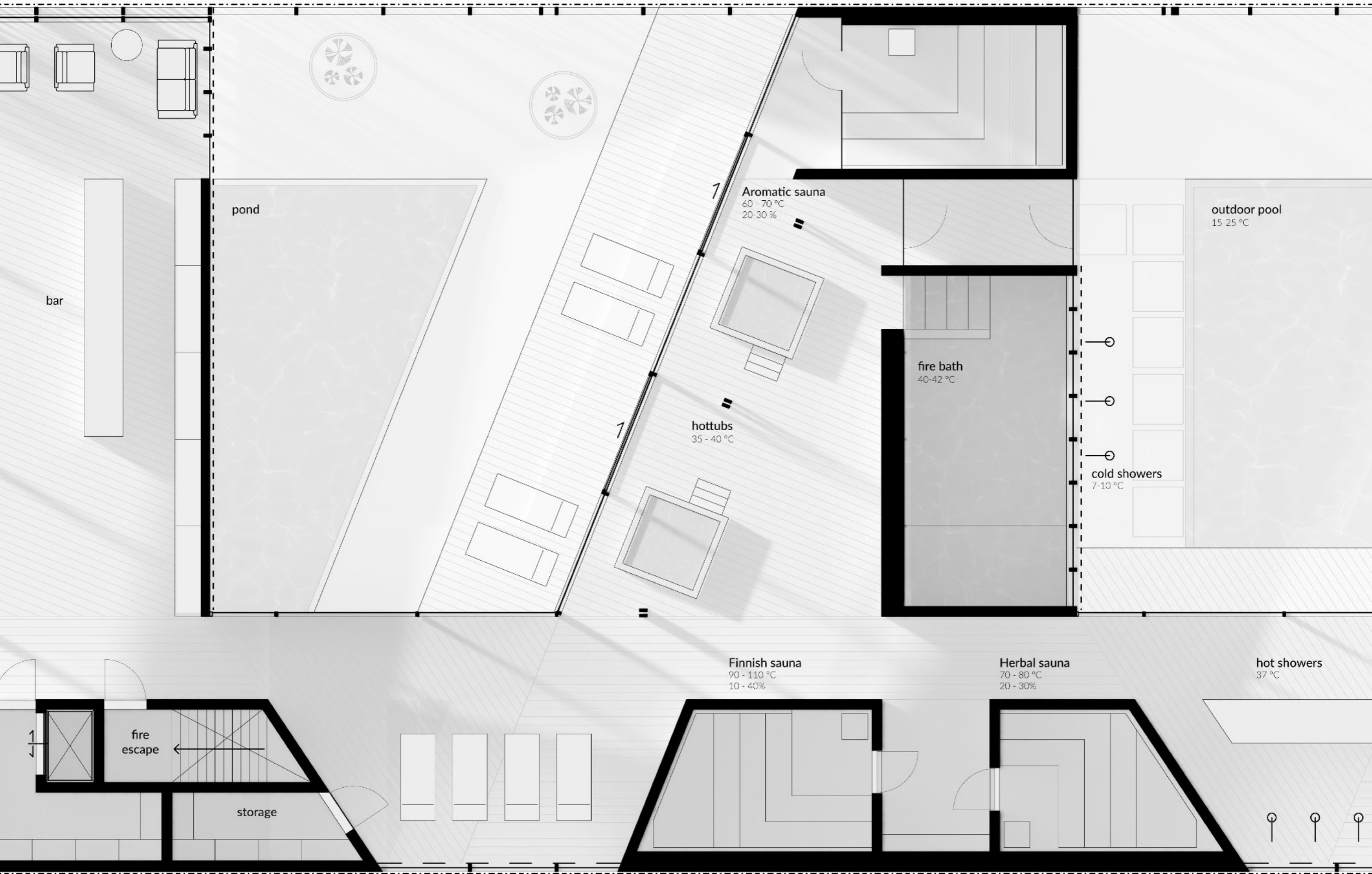
FIRST FLOOR



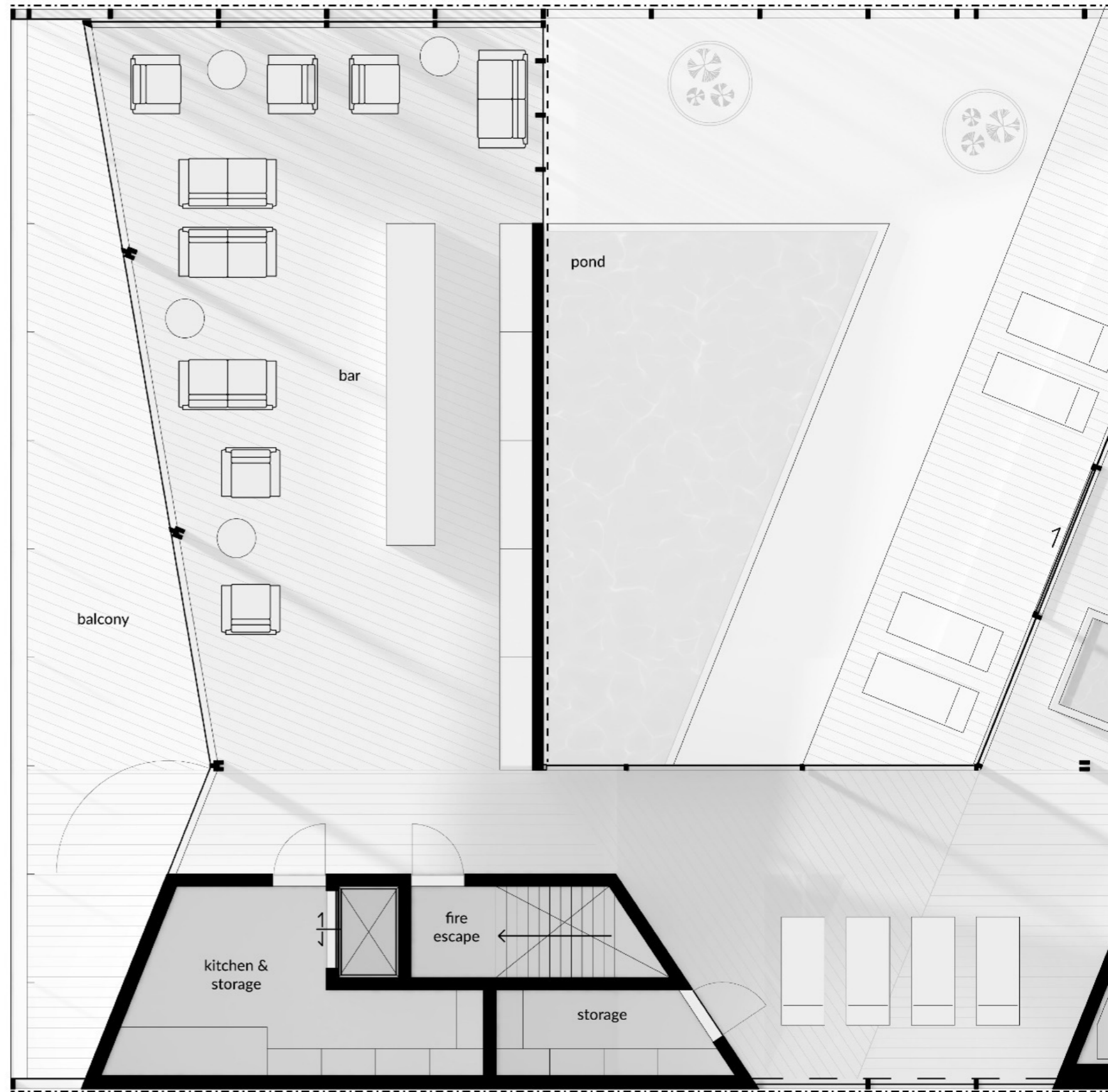
TREATMENT AREA



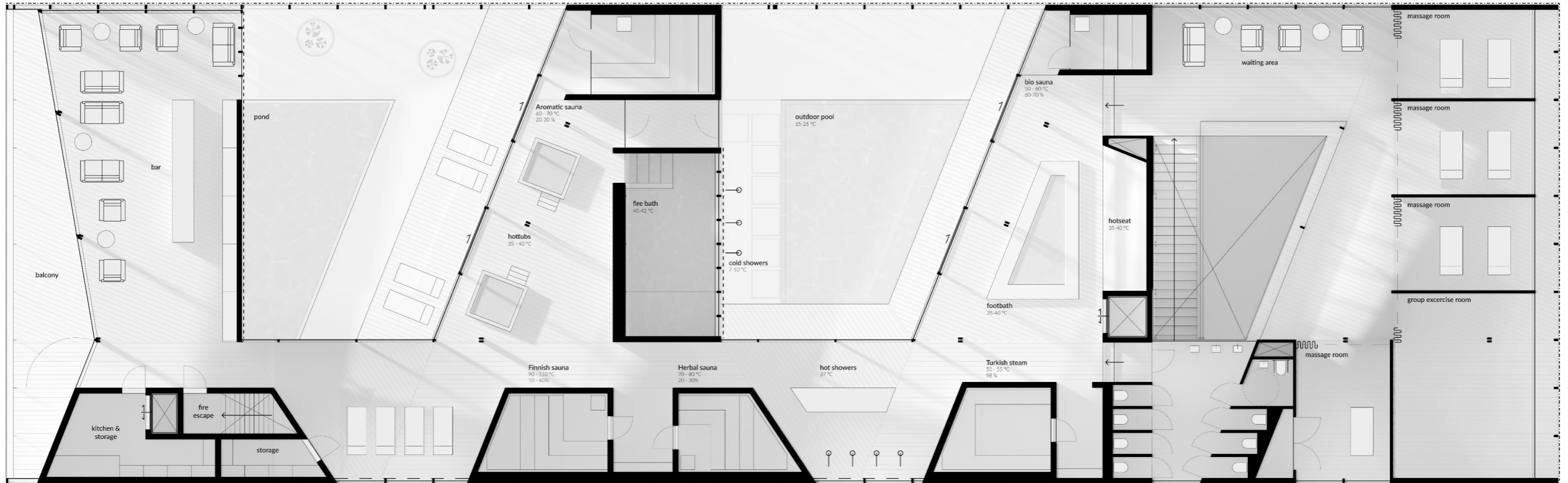
TEMPIDARIUM



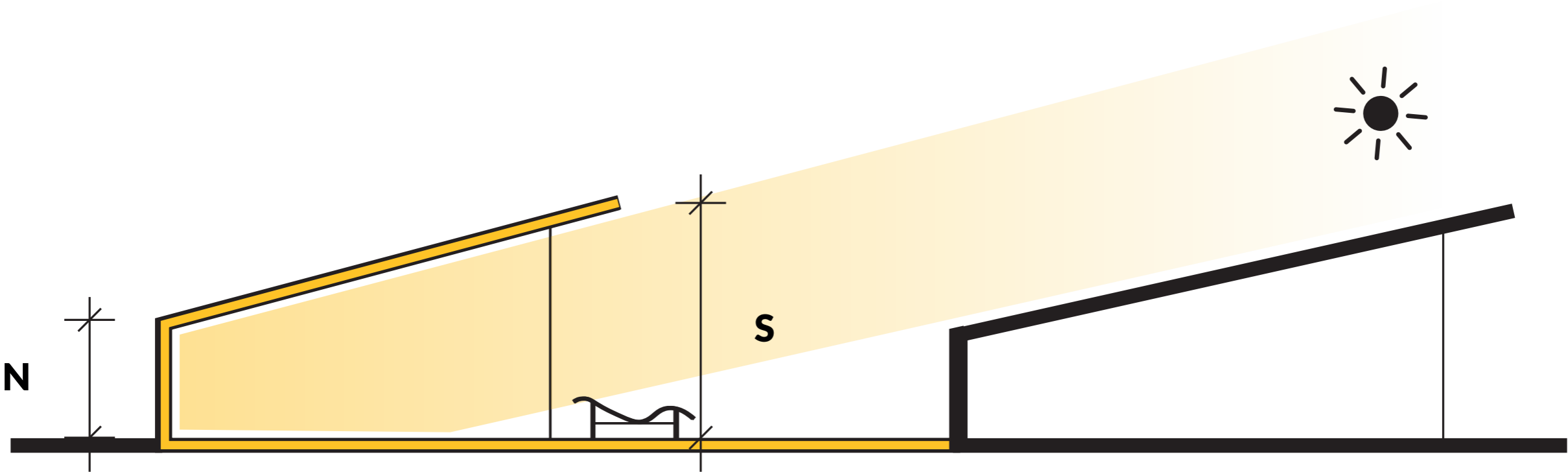
CALDARIUM

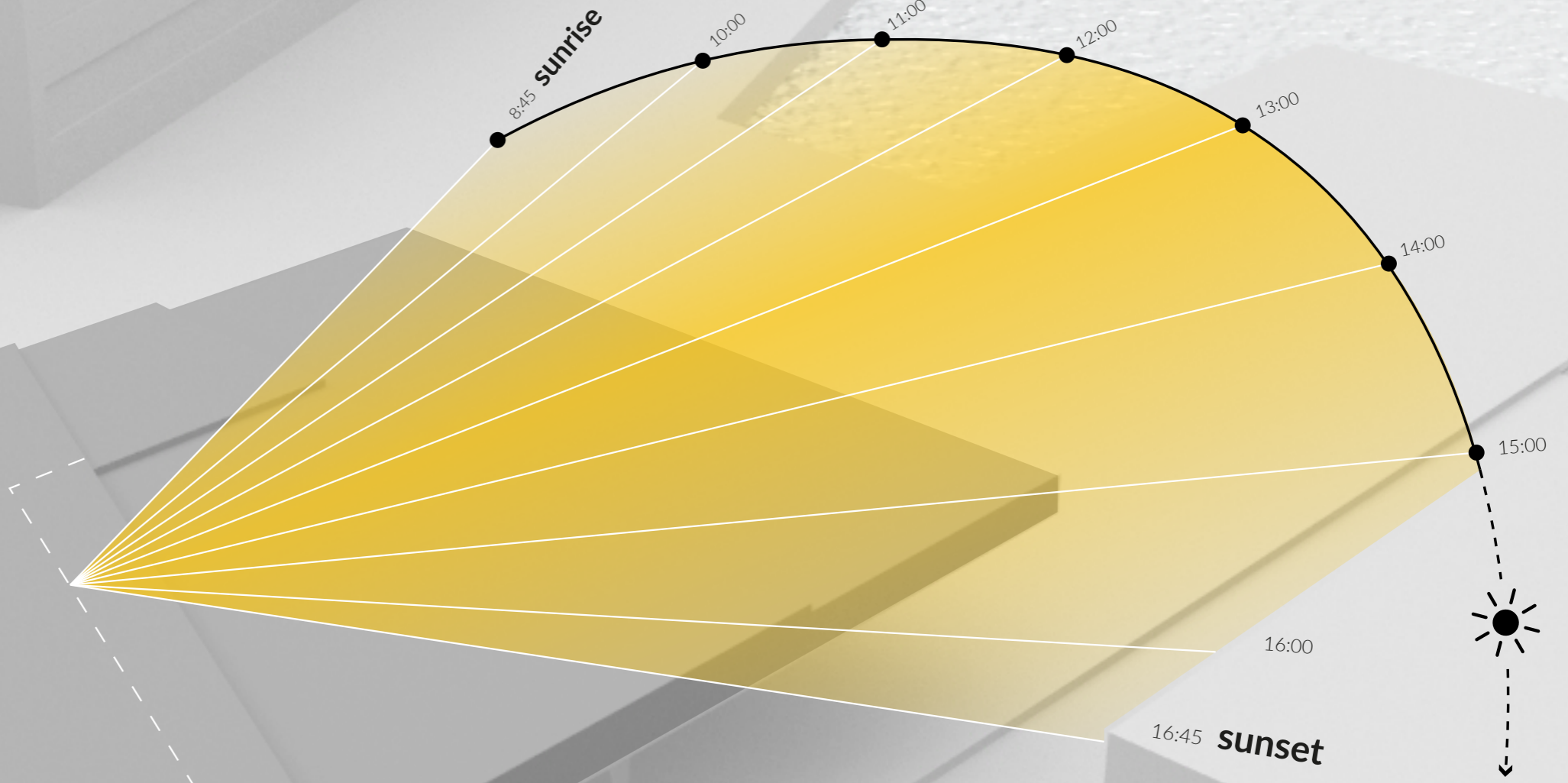


SOLARIUM



FIRST FLOOR





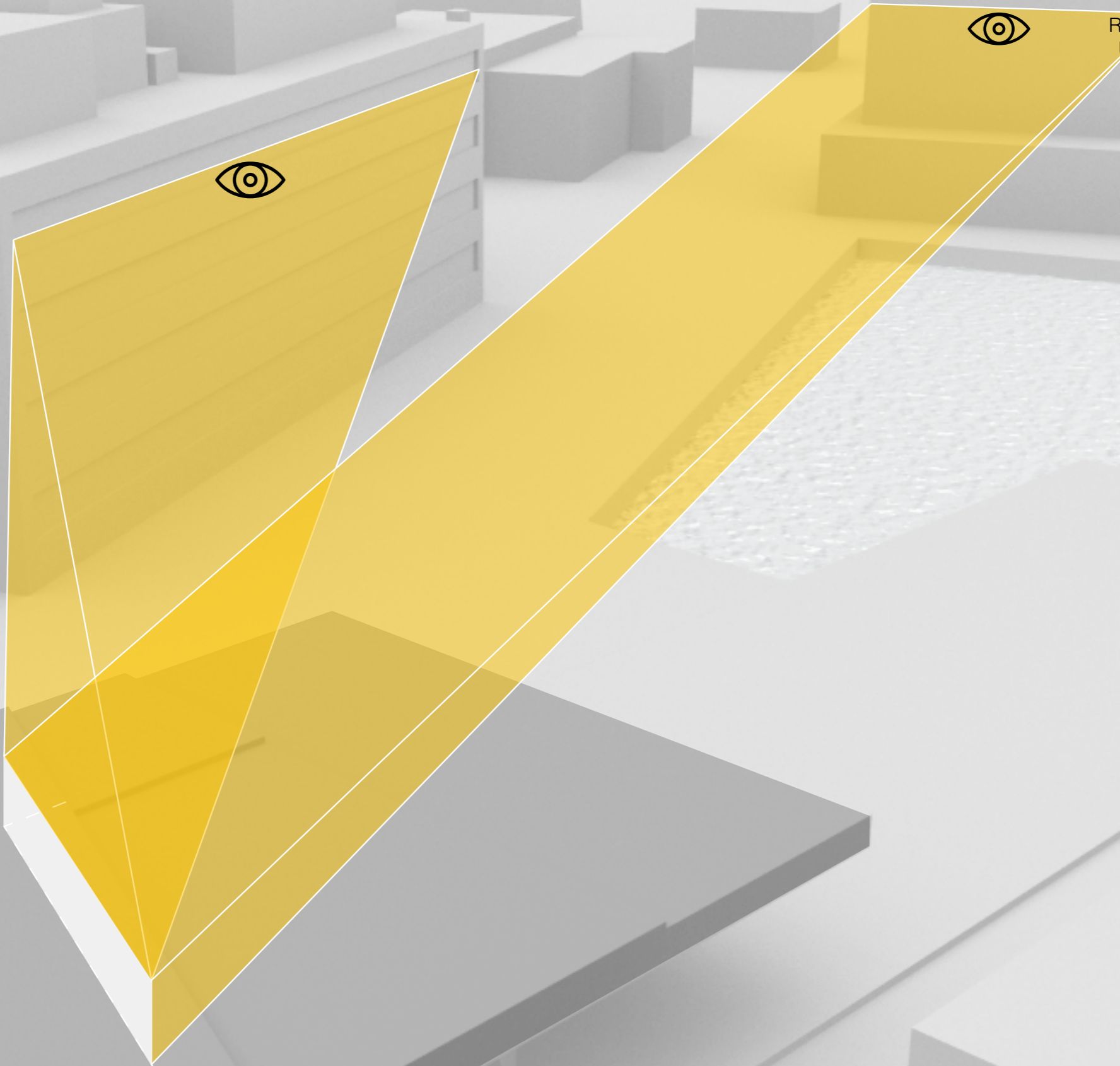
SOLAR PATH

for winter solstice



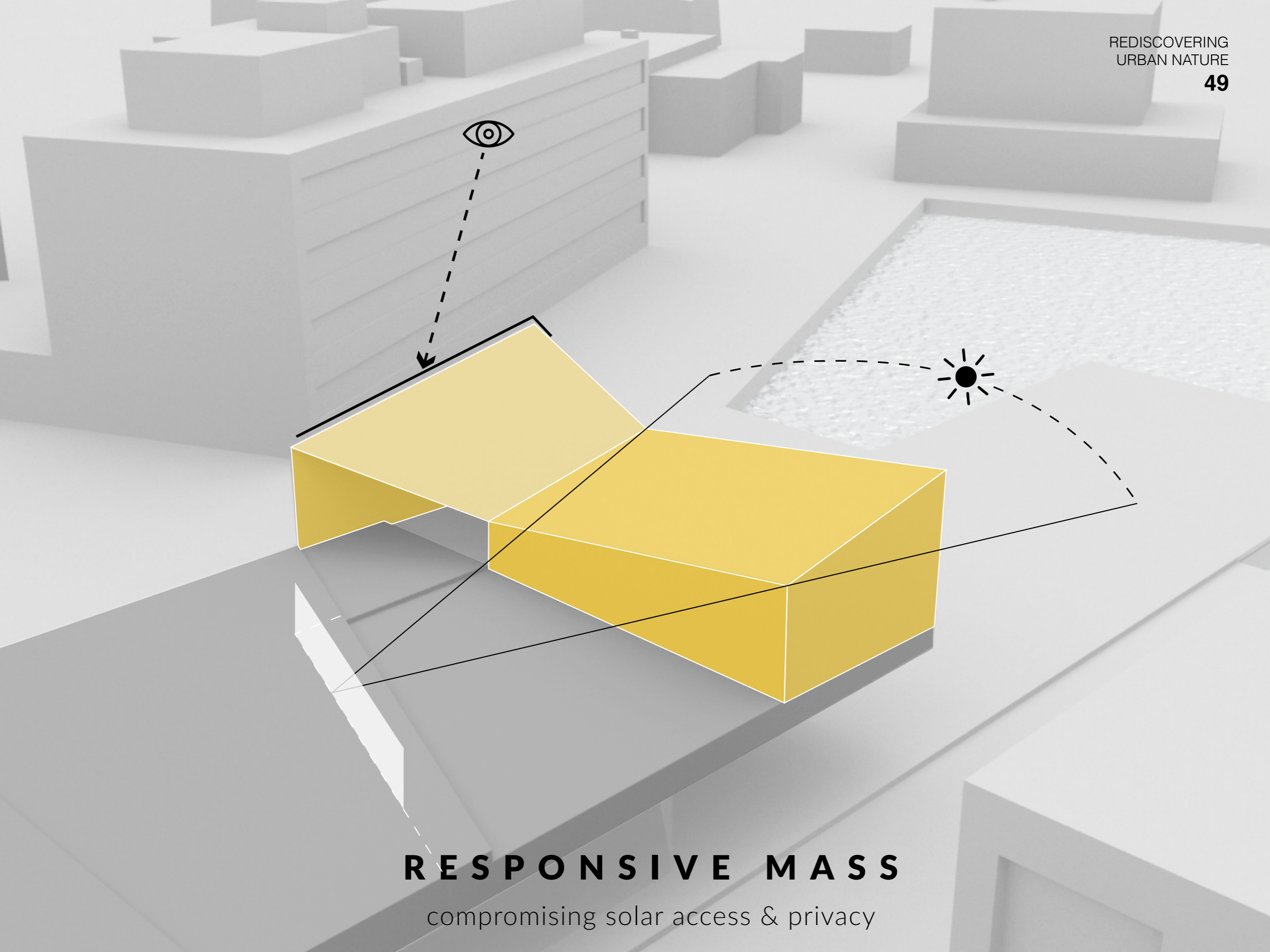
SOLAR RESTRICTIONS

from neighboring buildings



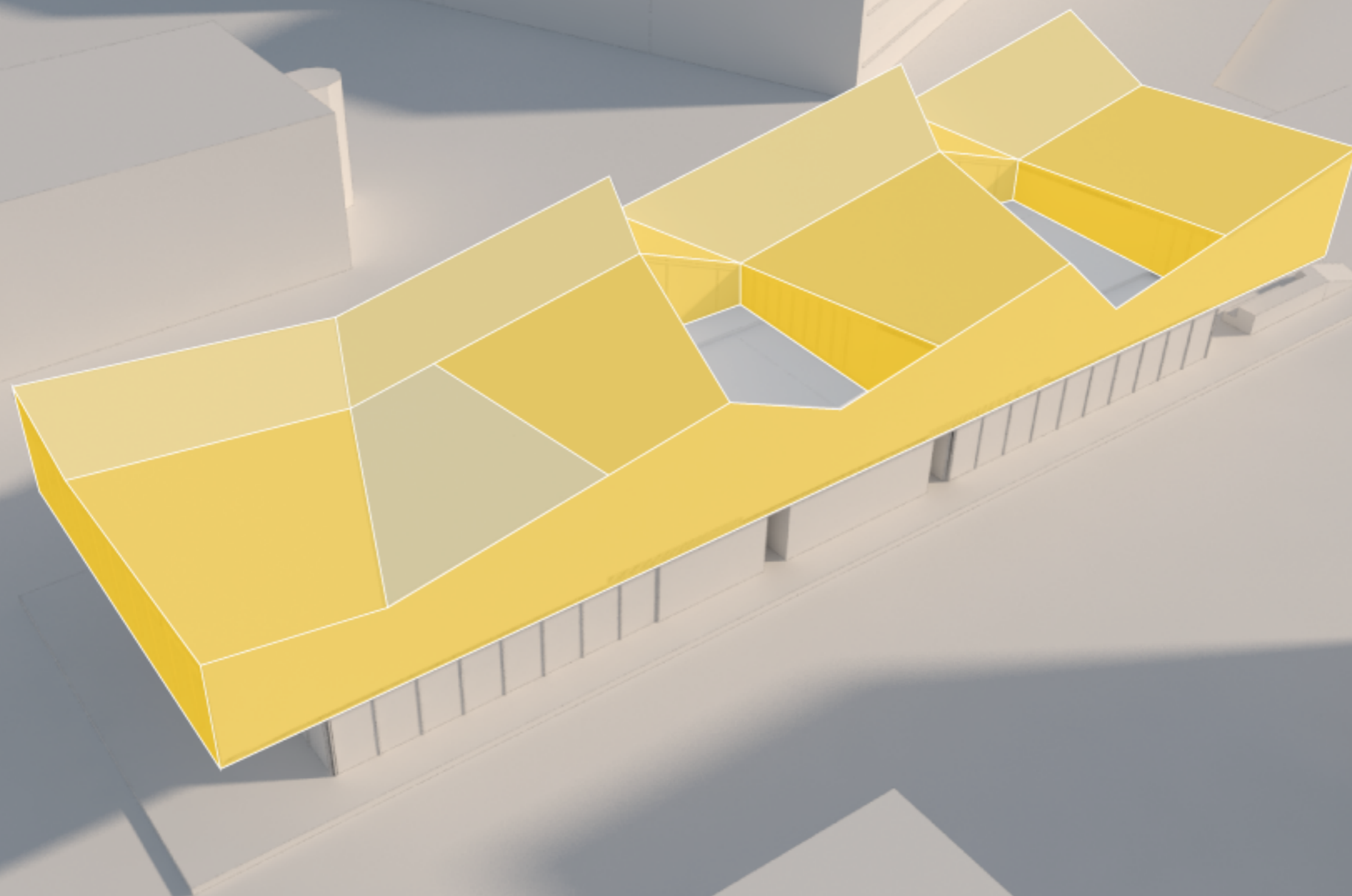
PRIVACY

from neighboring buildings



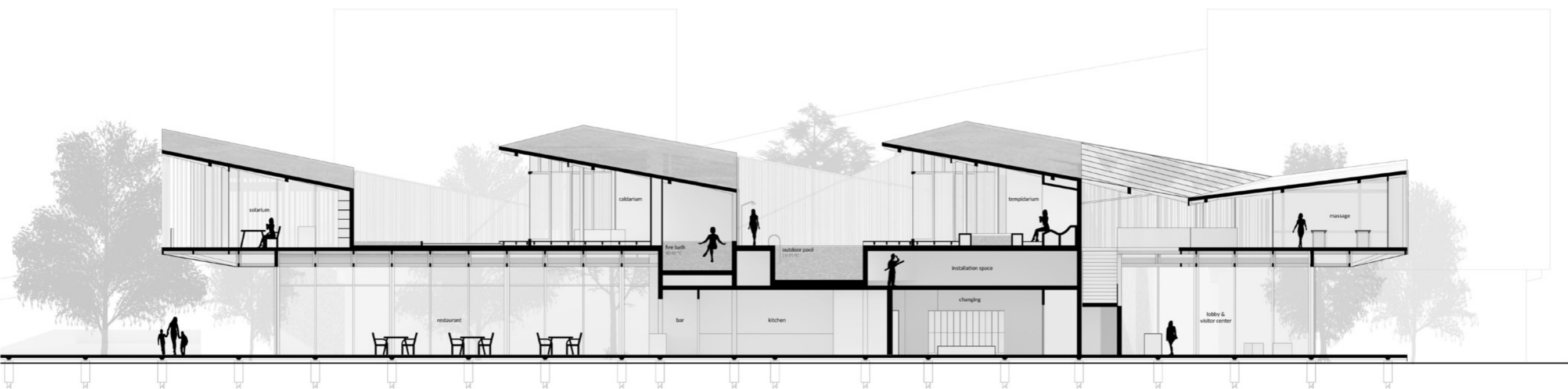
RESPONSIVE MASS

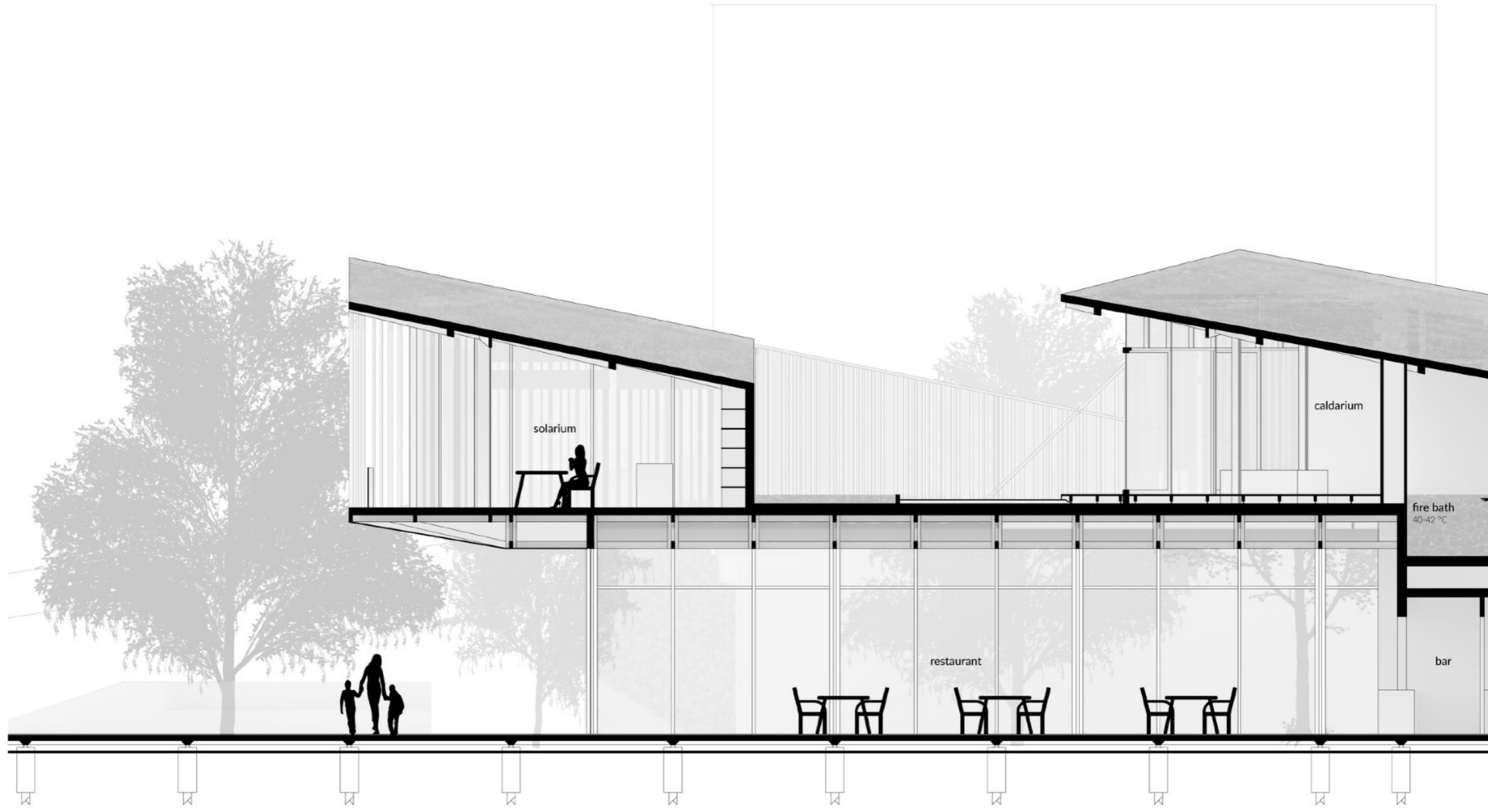
compromising solar access & privacy



R E S P O N S I V E M A S S

compromising solar access & privacy





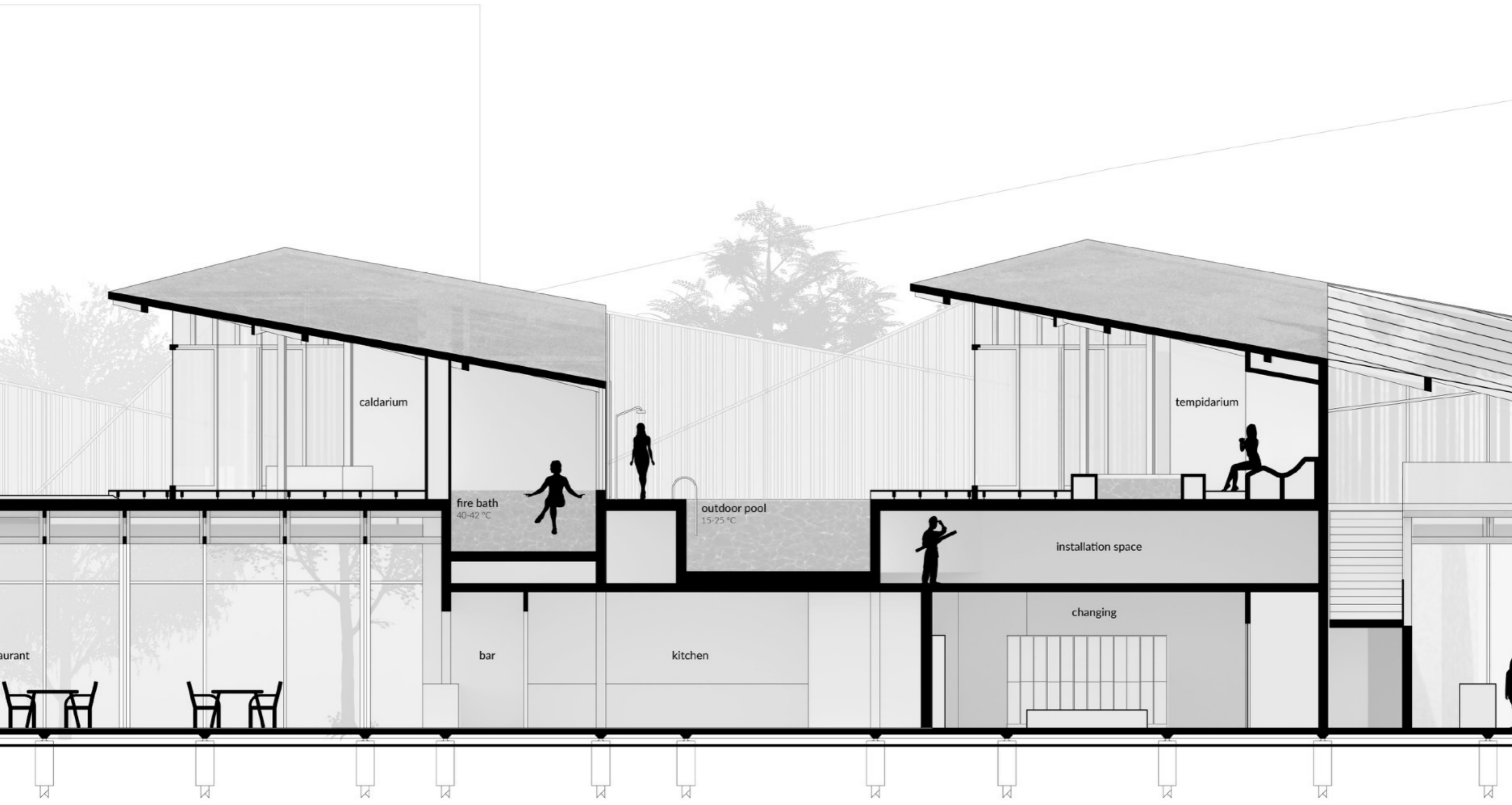
solarium

caldarium

fire bath
40-42 °C

restaurant

bar



caldarium

tempidarium

fire bath
40-42 °C

outdoor pool
15-25 °C

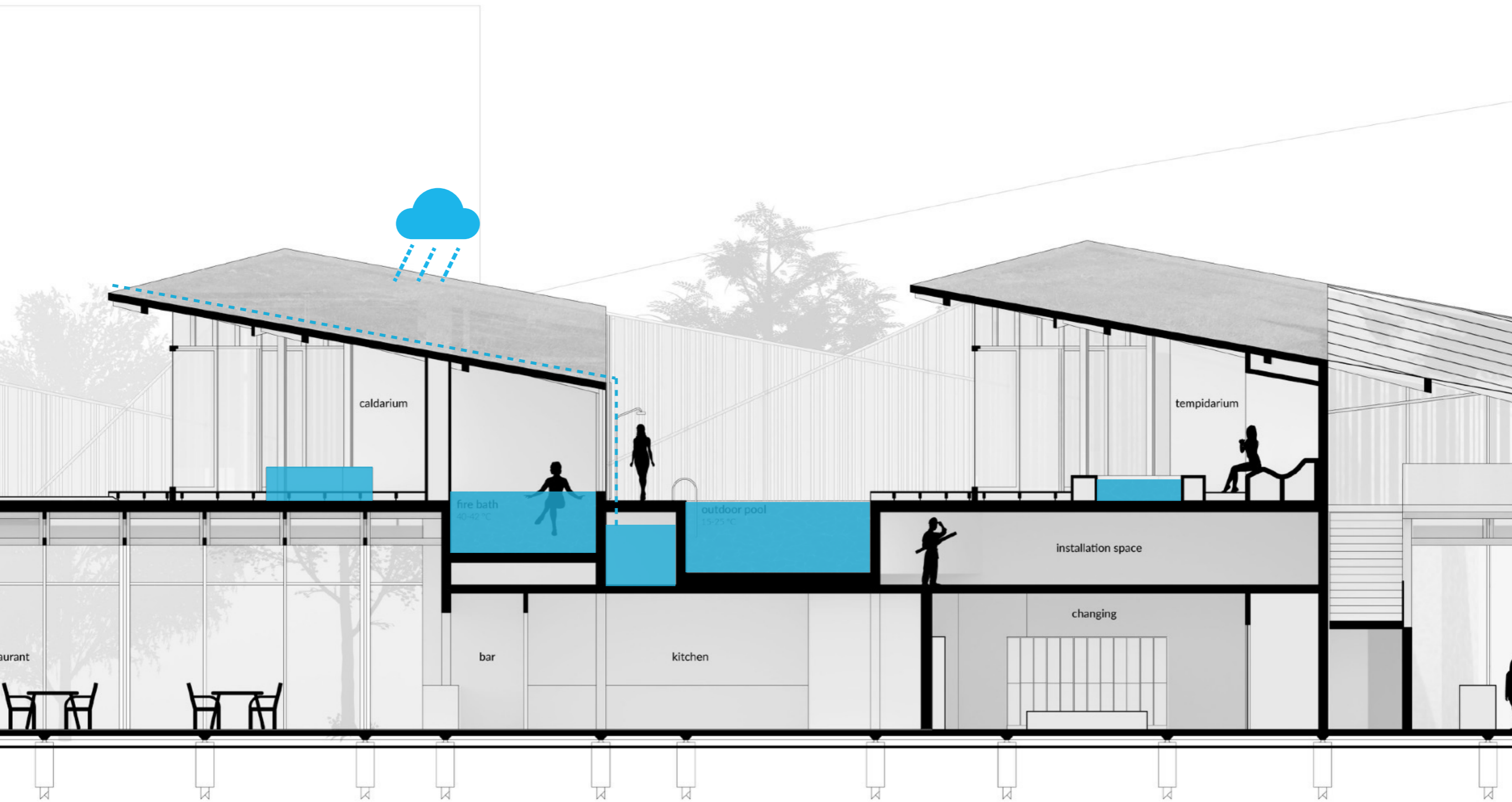
installation space

changing

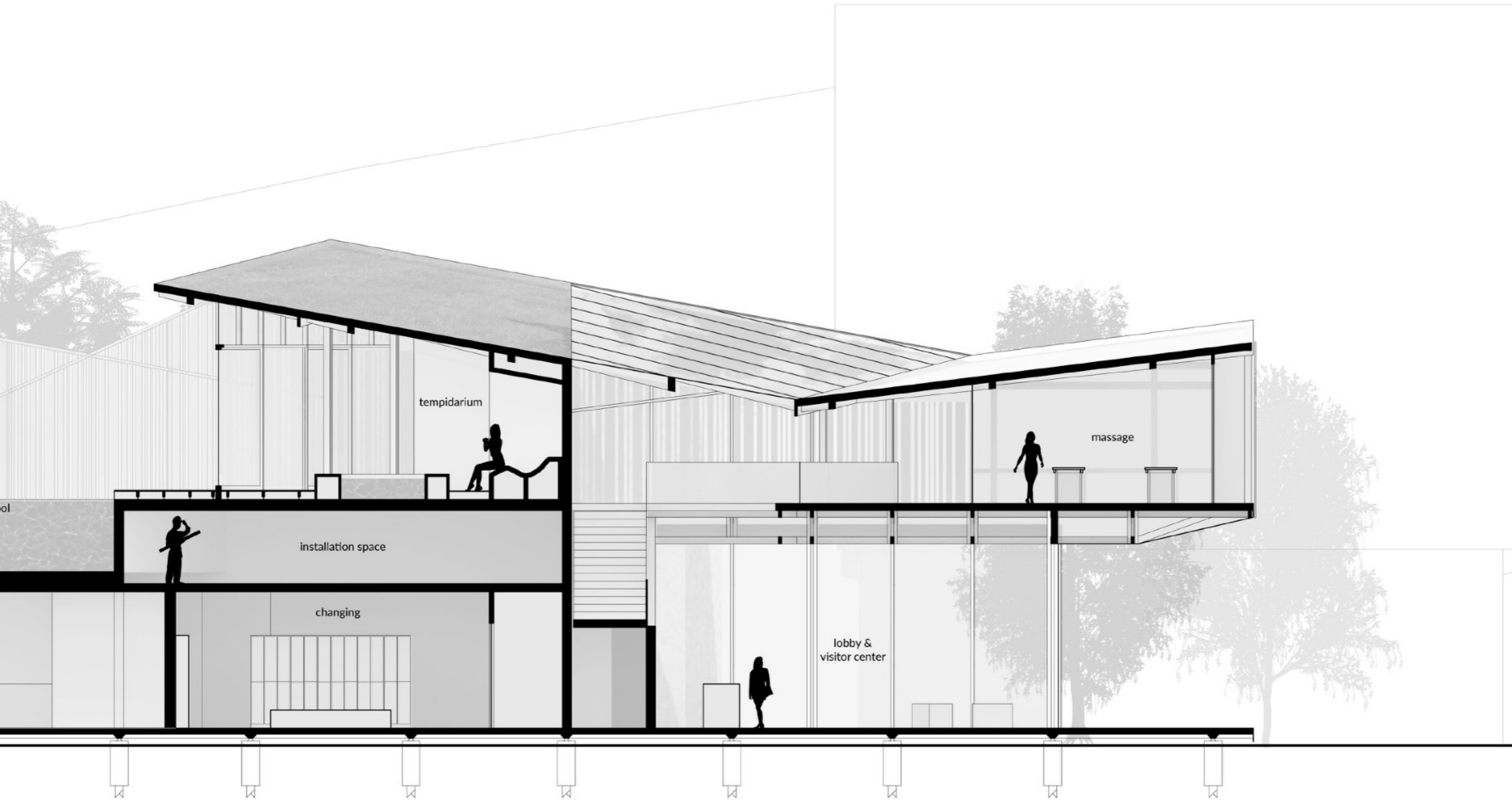
aurant

bar

kitchen



POOLS



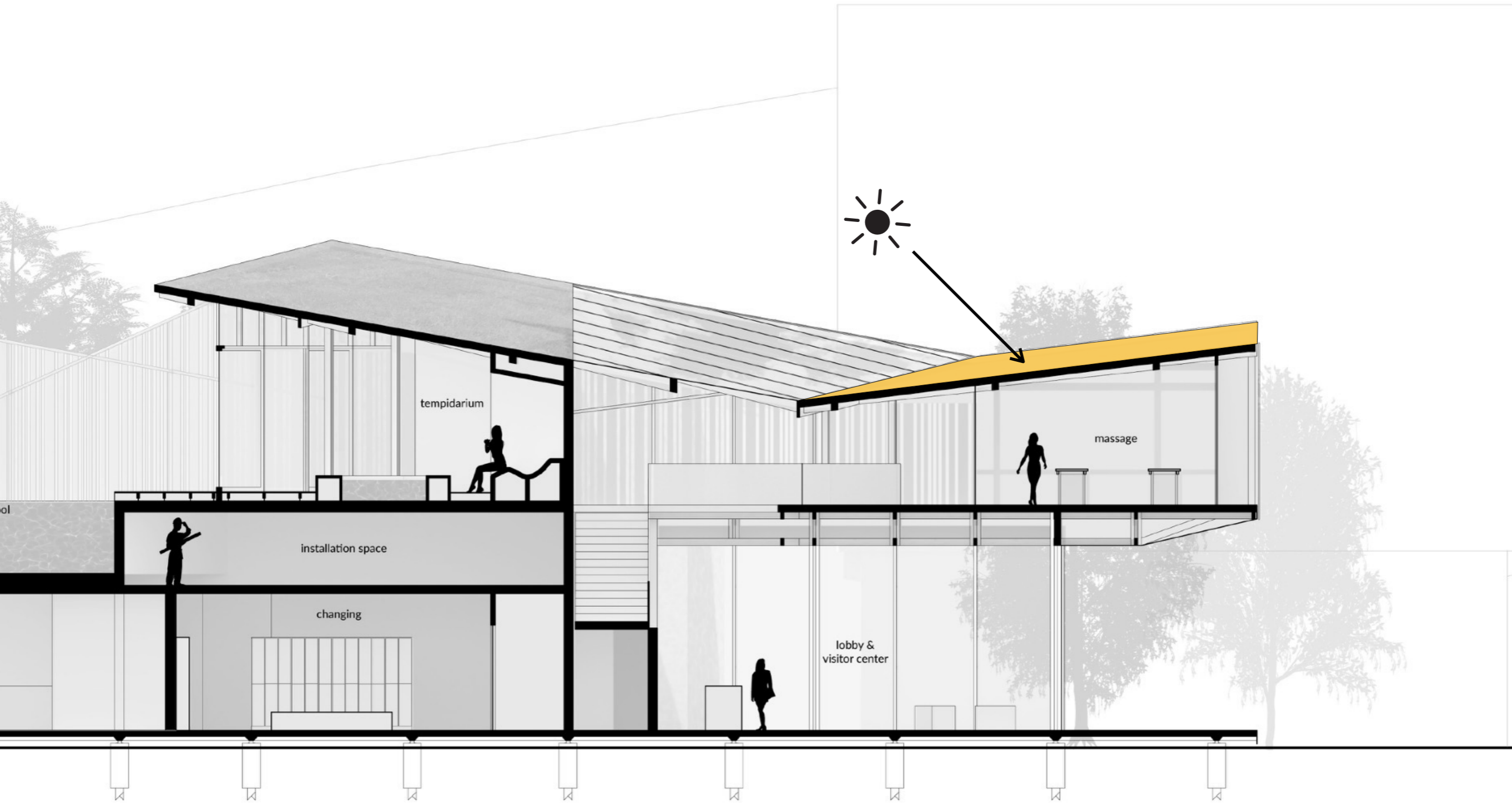
tempidarium

massage

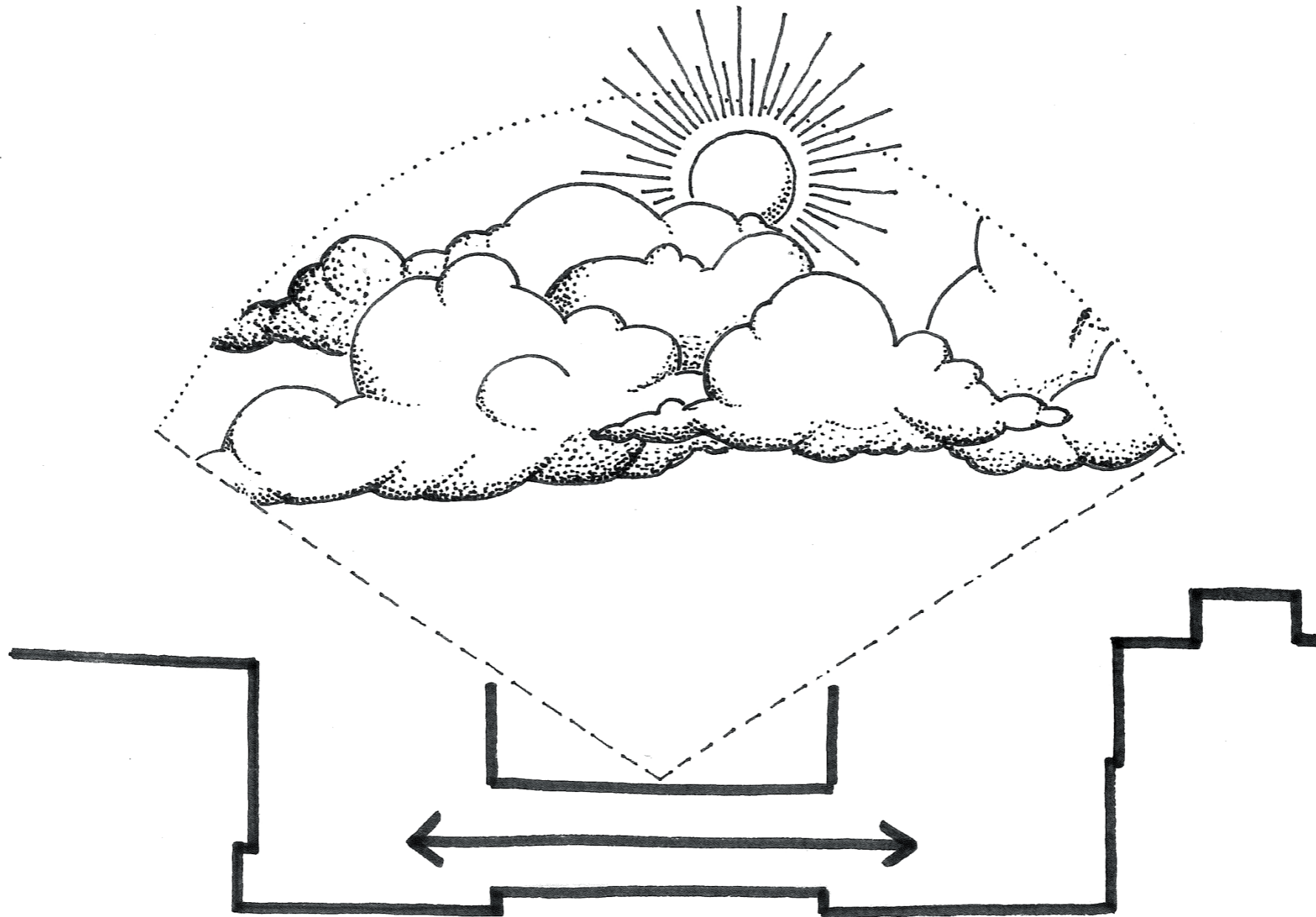
installation space

changing

lobby &
visitor center



PV CELLS

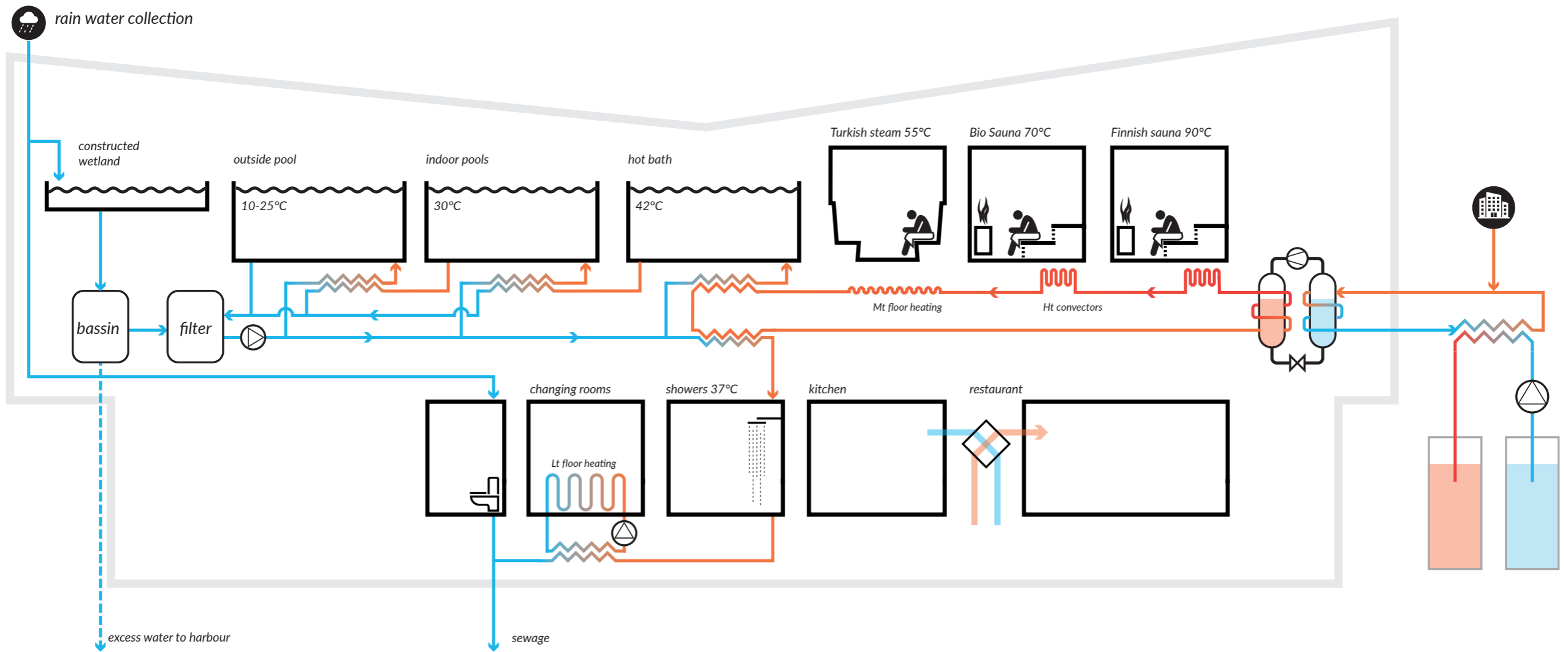


MICROCOSM

elevated spa directed towards the sky

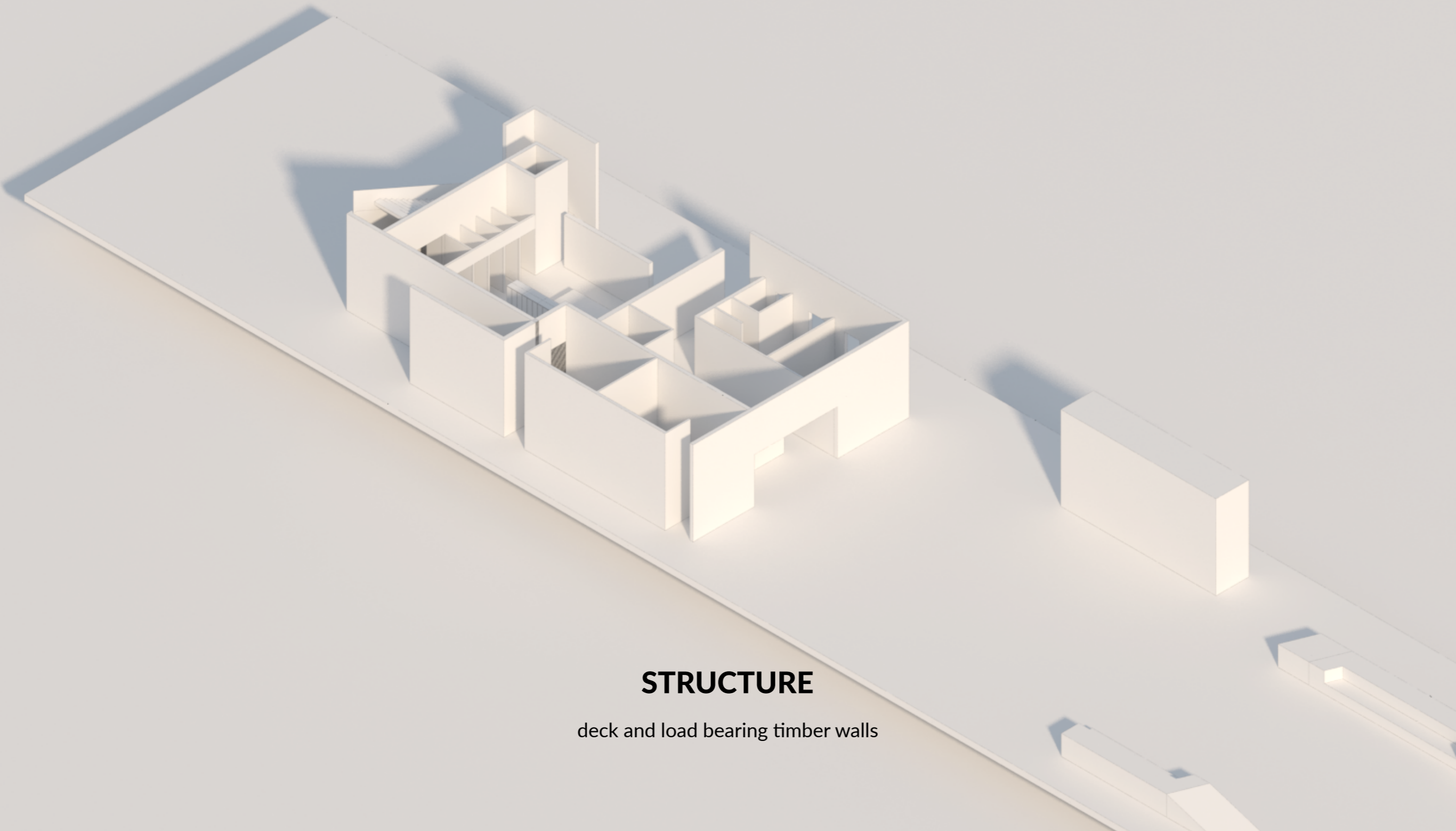
PART III

A NATURAL BALANCE



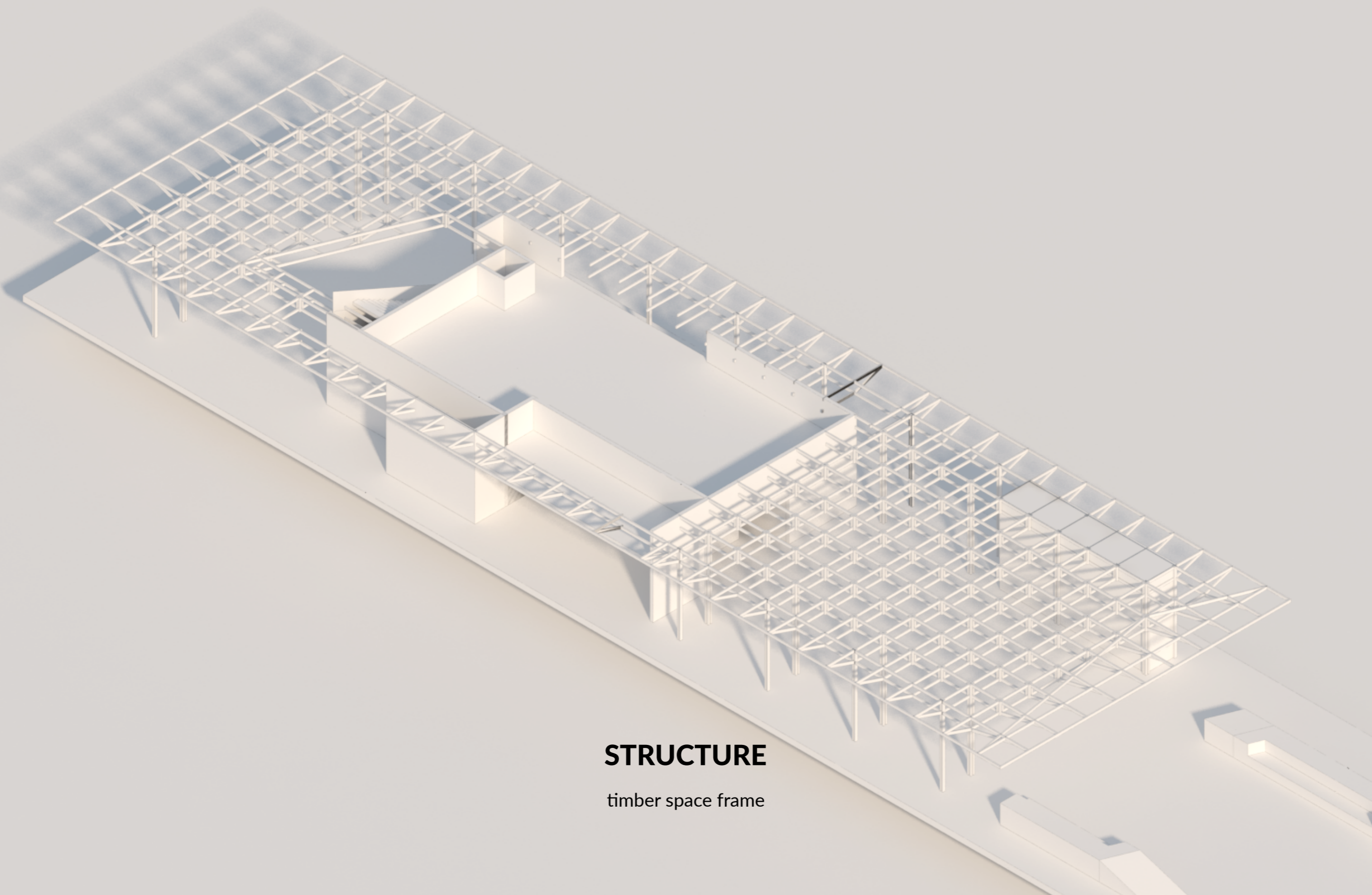
INTERNAL ENERGY FLOWS

from the warmest sauna to the coldest pool



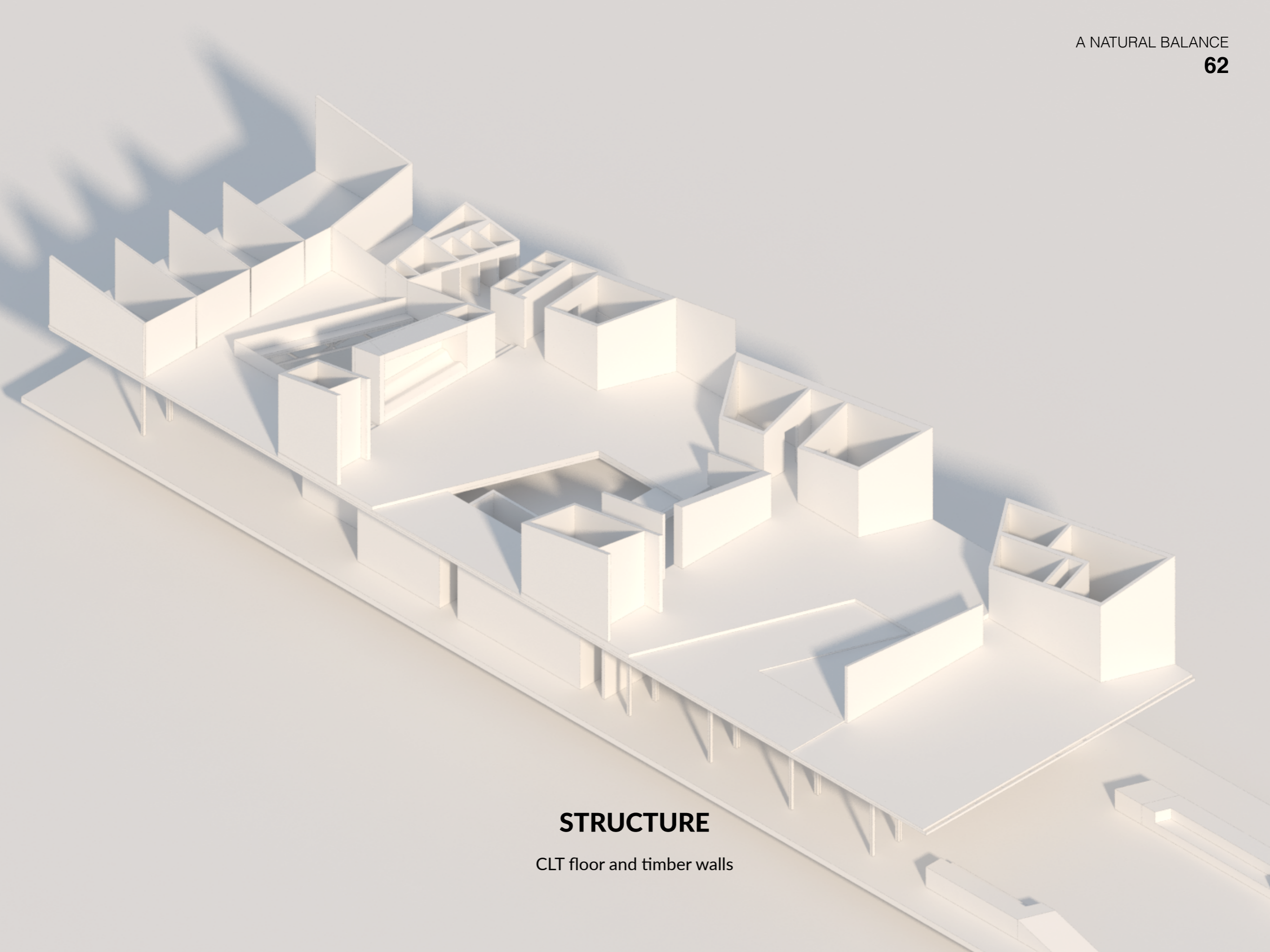
STRUCTURE

deck and load bearing timber walls



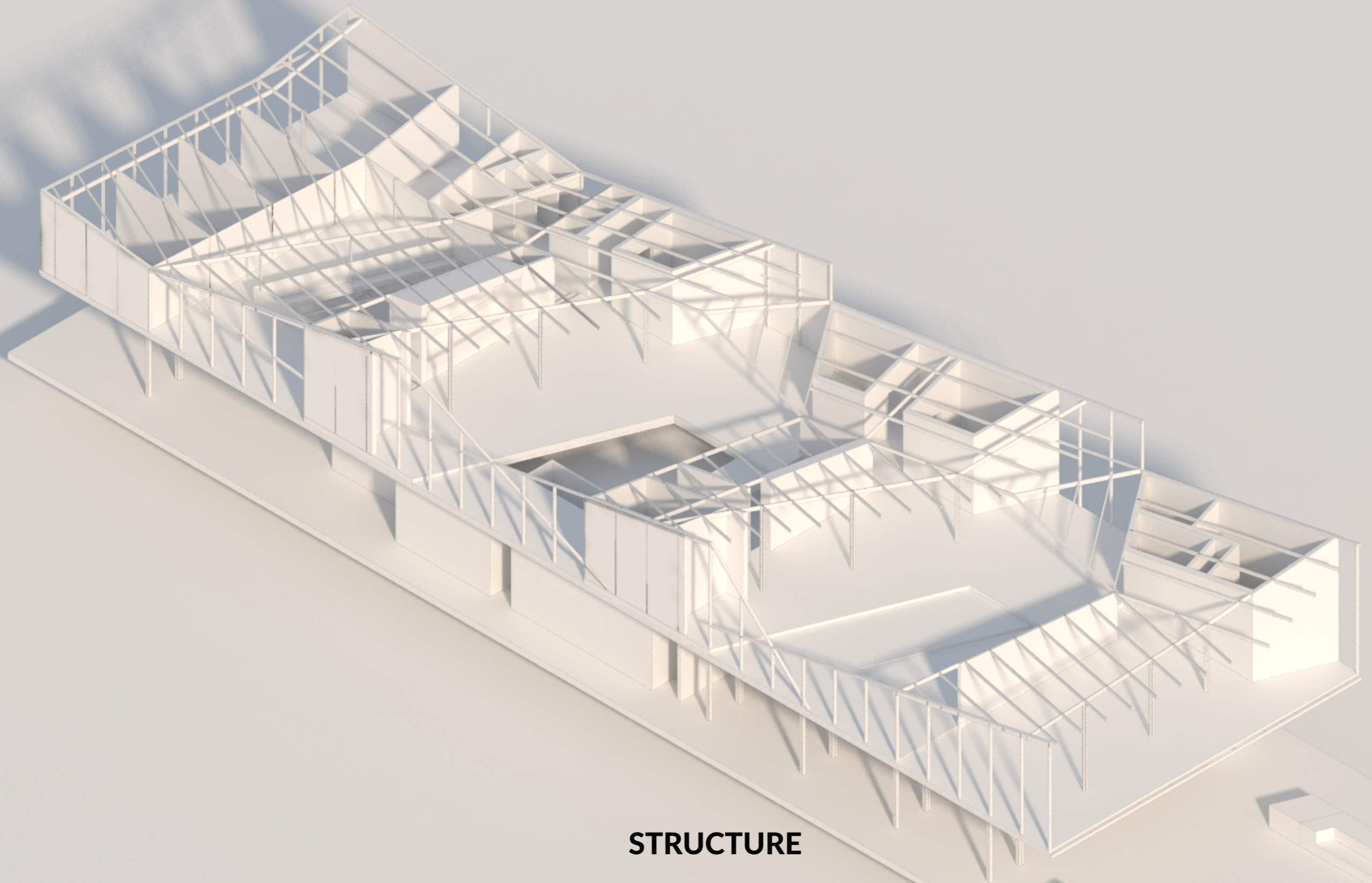
STRUCTURE

timber space frame



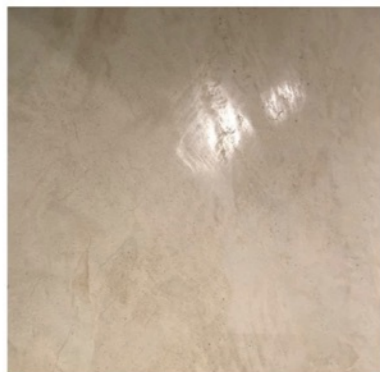
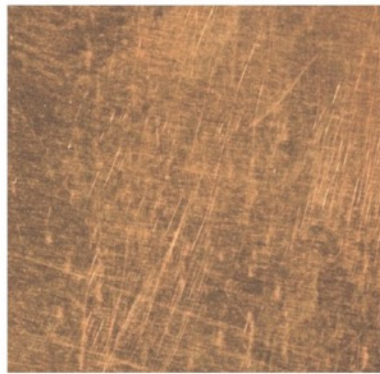
STRUCTURE

CLT floor and timber walls



STRUCTURE

timber beams and columns



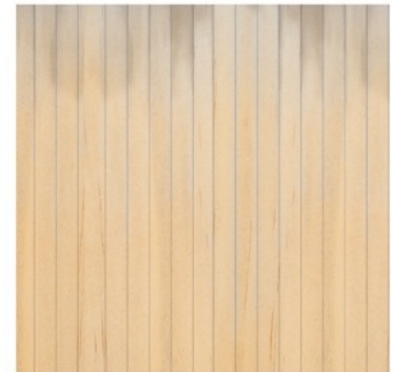
ELEMENTS



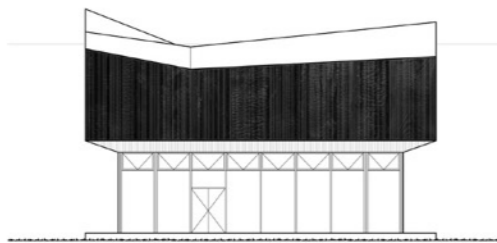
INTERIOR



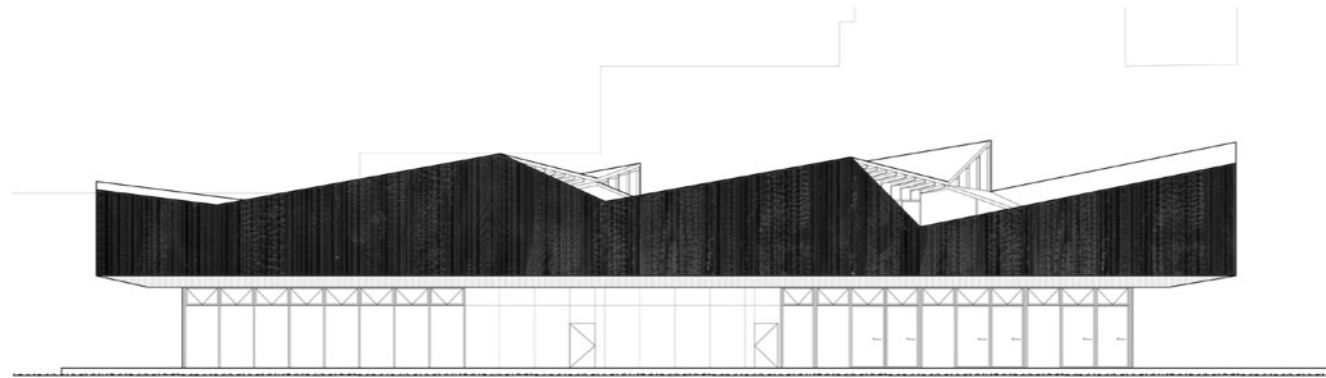
PATIO



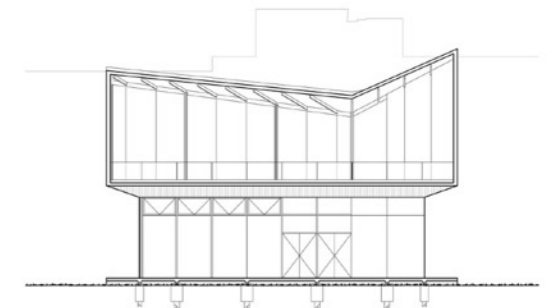
FACADE



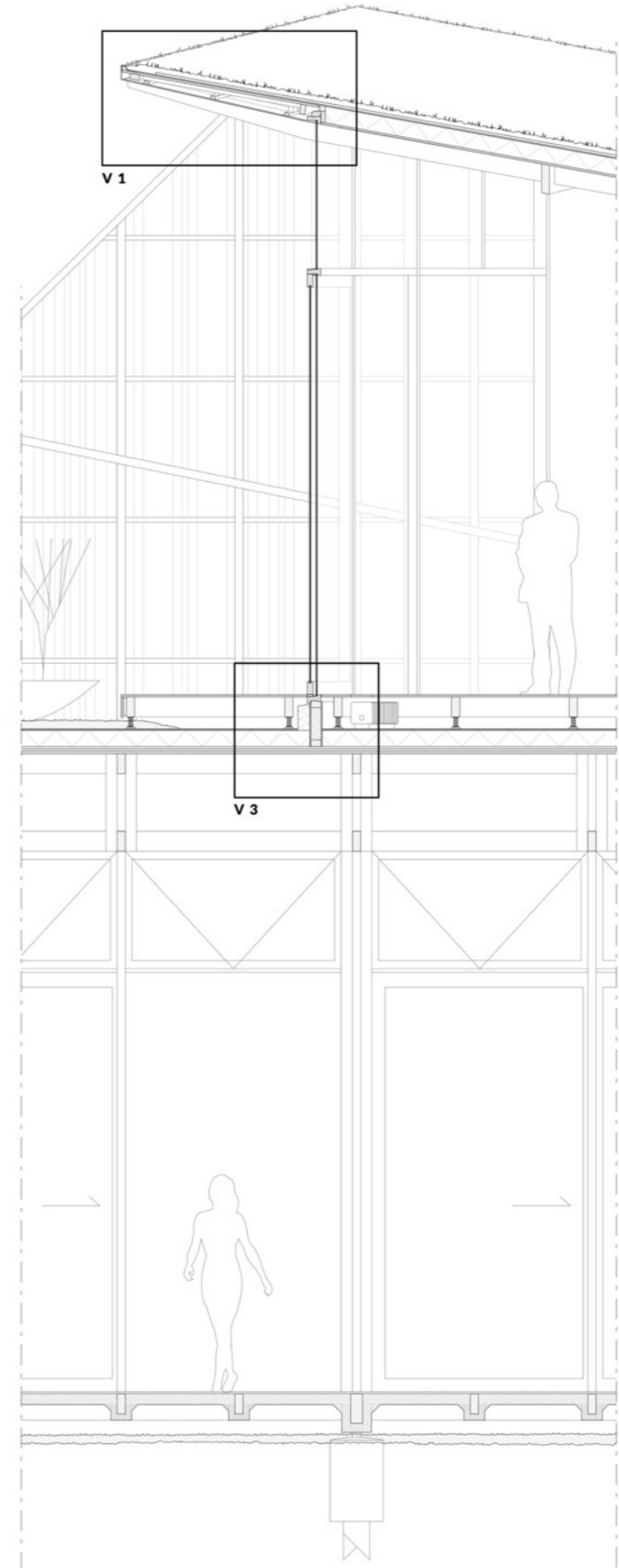
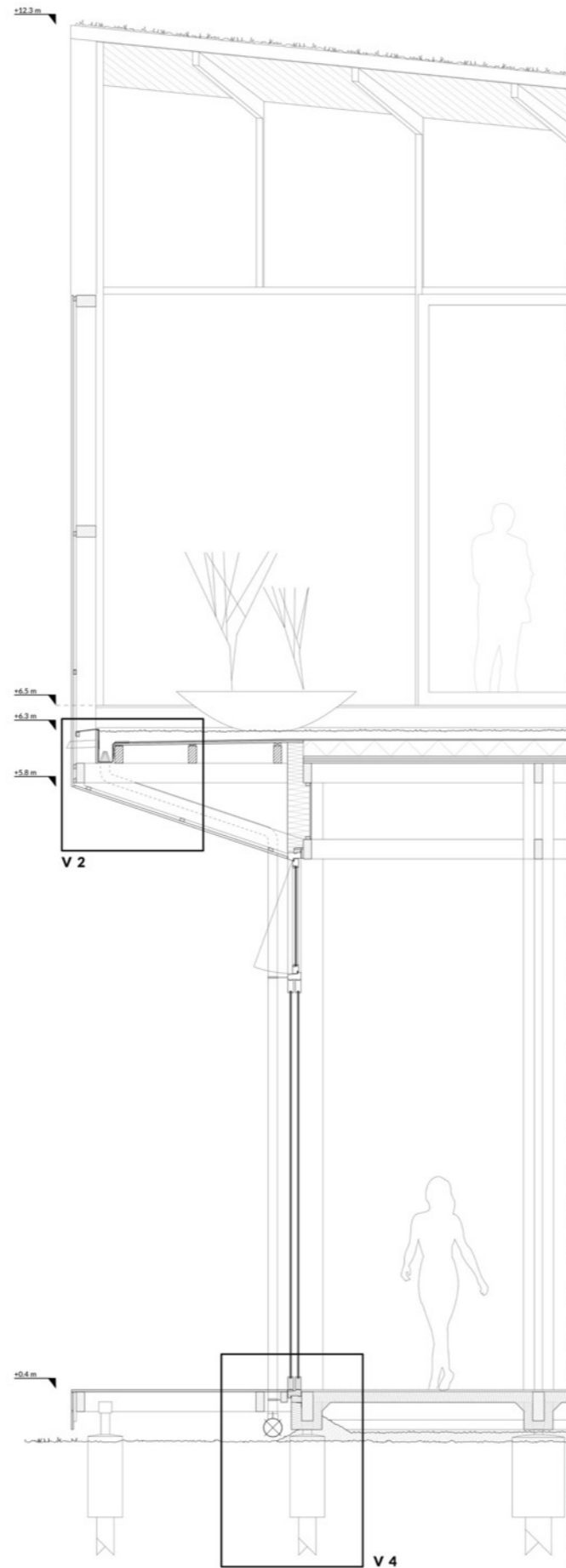
NORTH ELEVATION
1:200



WEST ELEVATION
1:200



SOUTH ELEVATION
1:200



PART IV

TIME AND PLACE



HARBOR BATHS



ATRIUM



TEMPIDARIUM



CALDARIUM



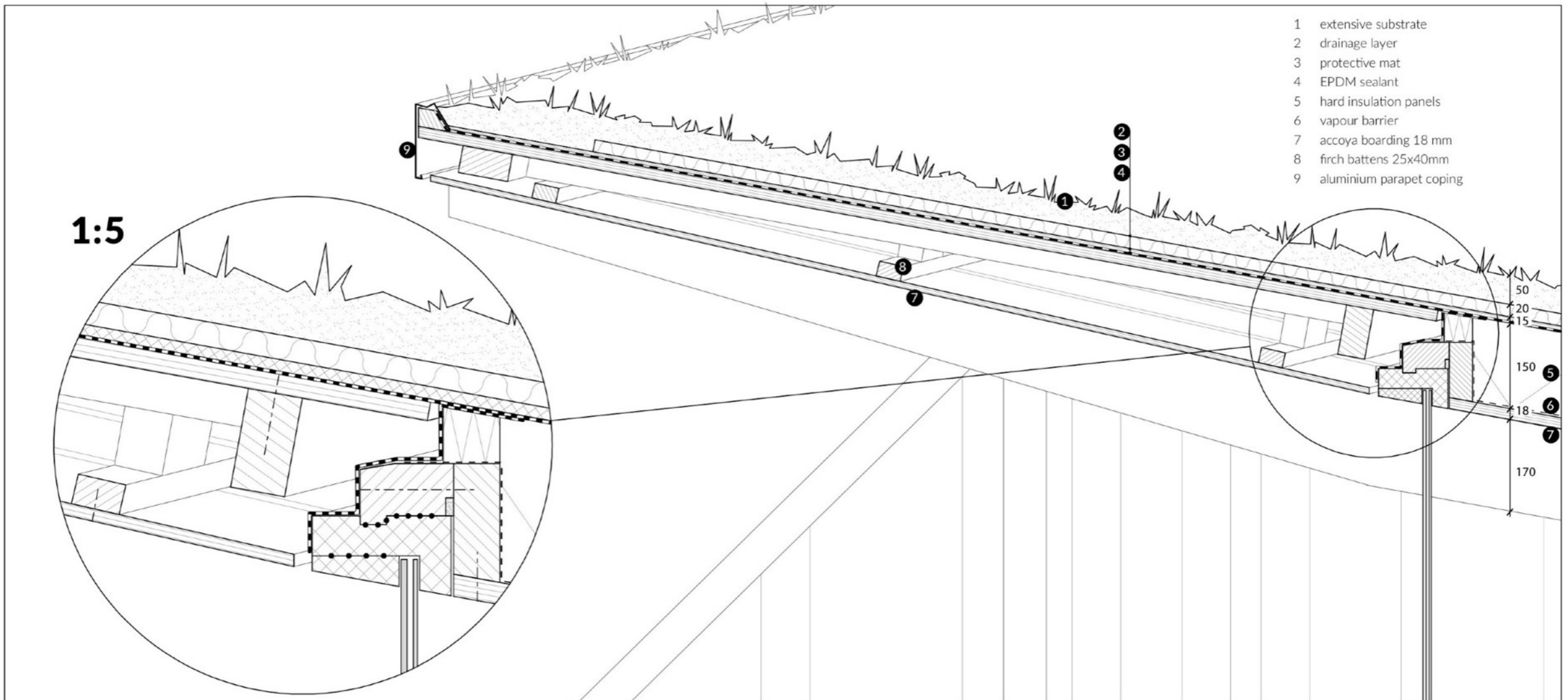
PATIO



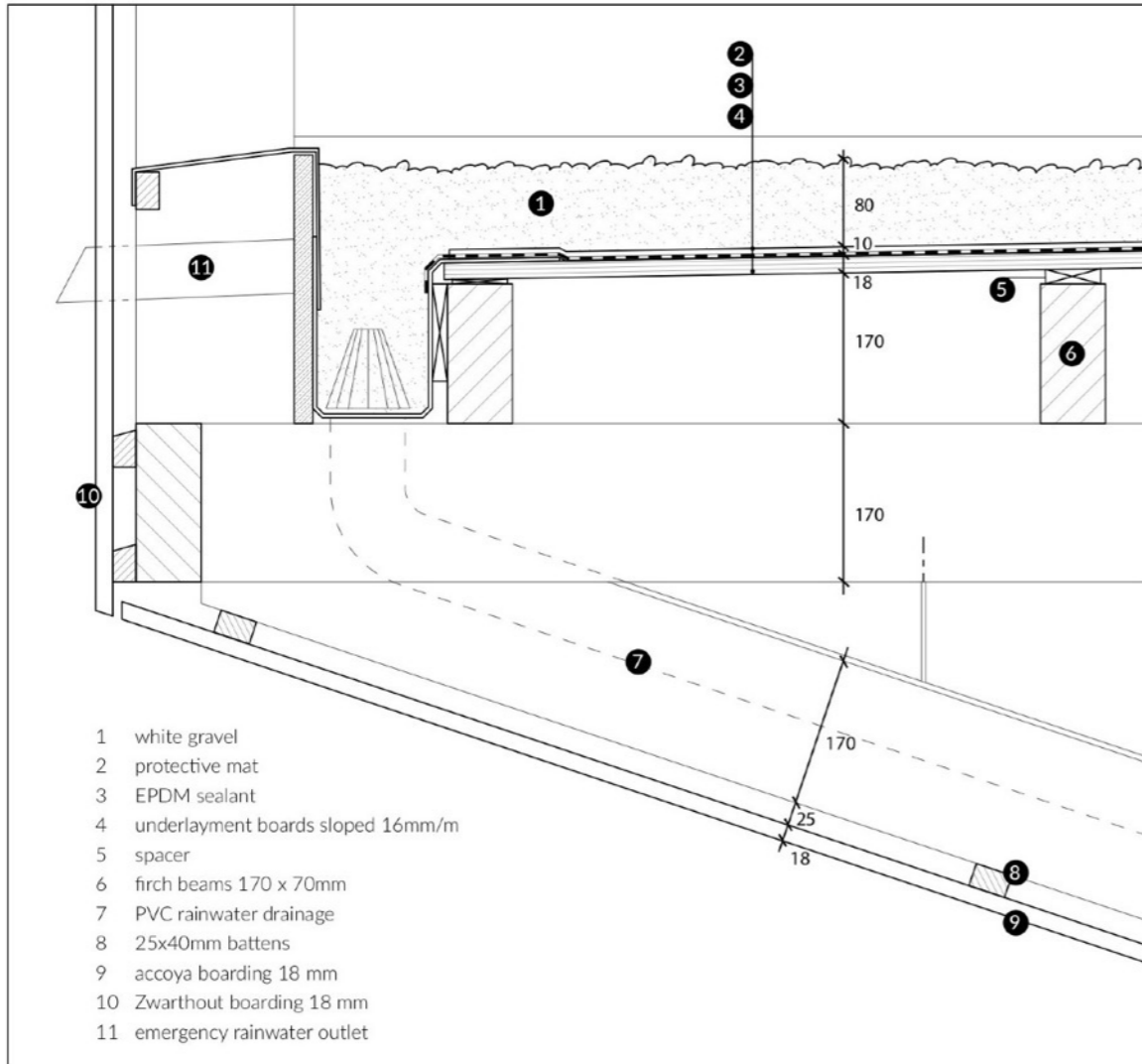
SOLARIUM



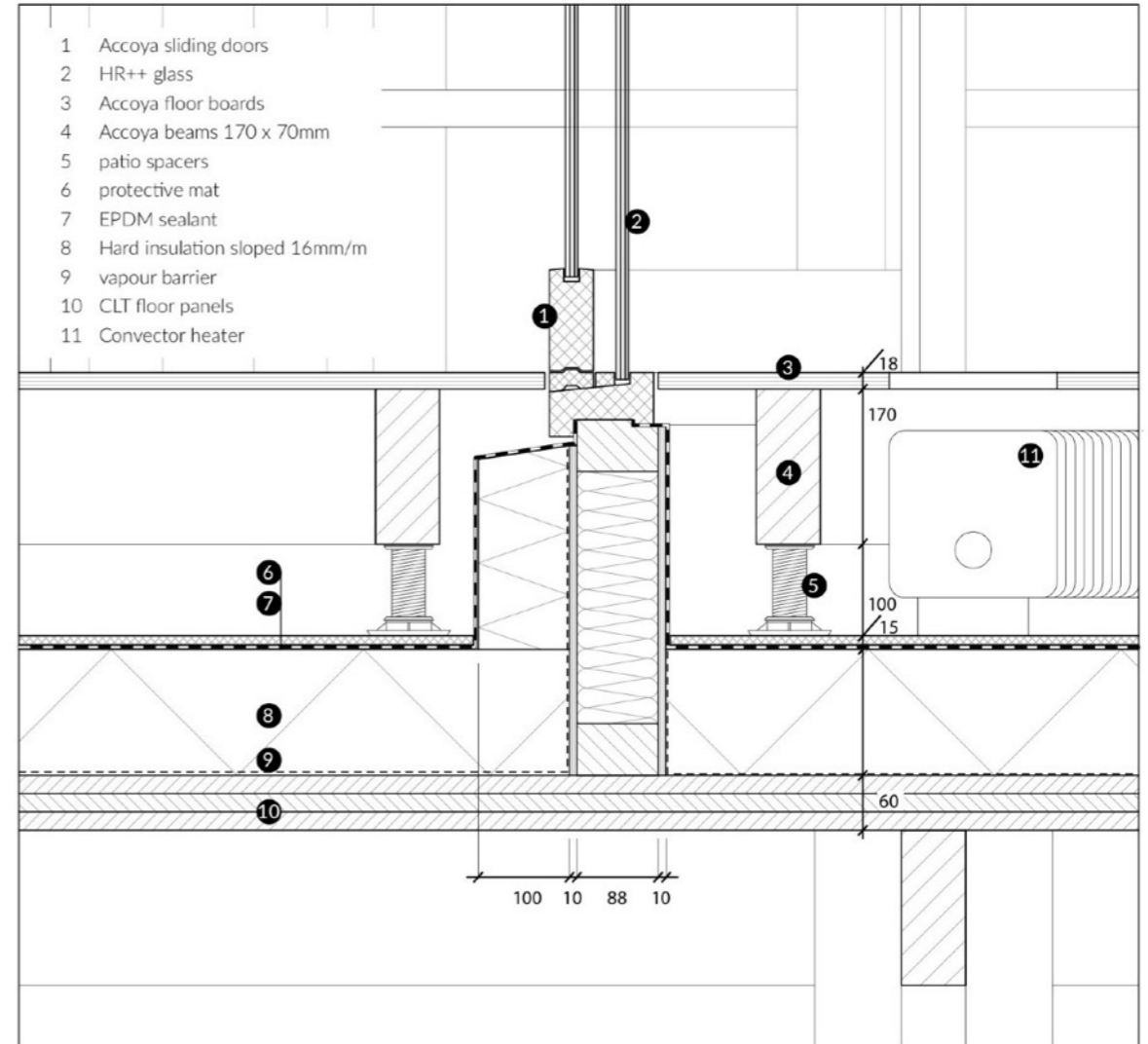
FIN



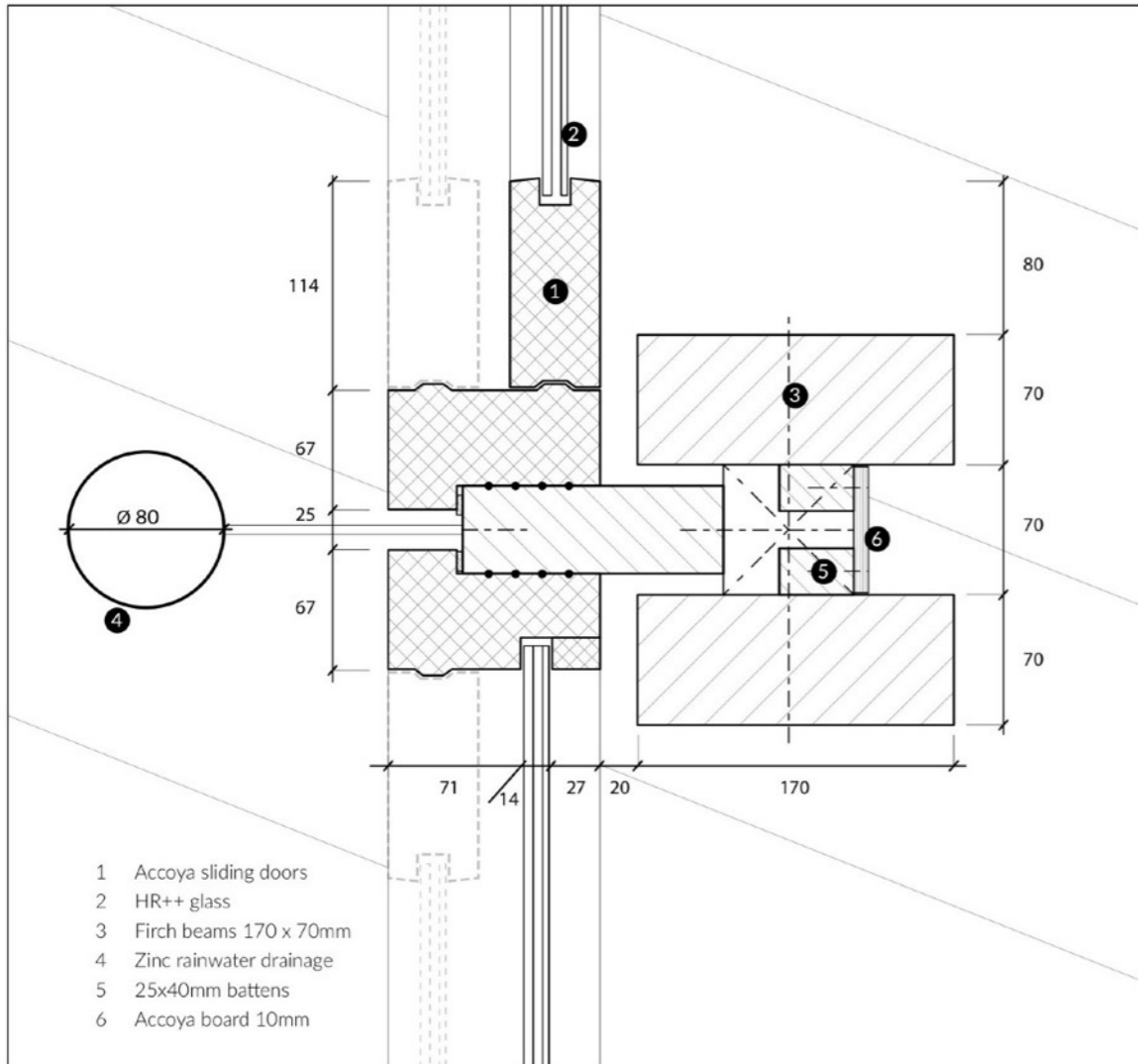
DETAIL V 1



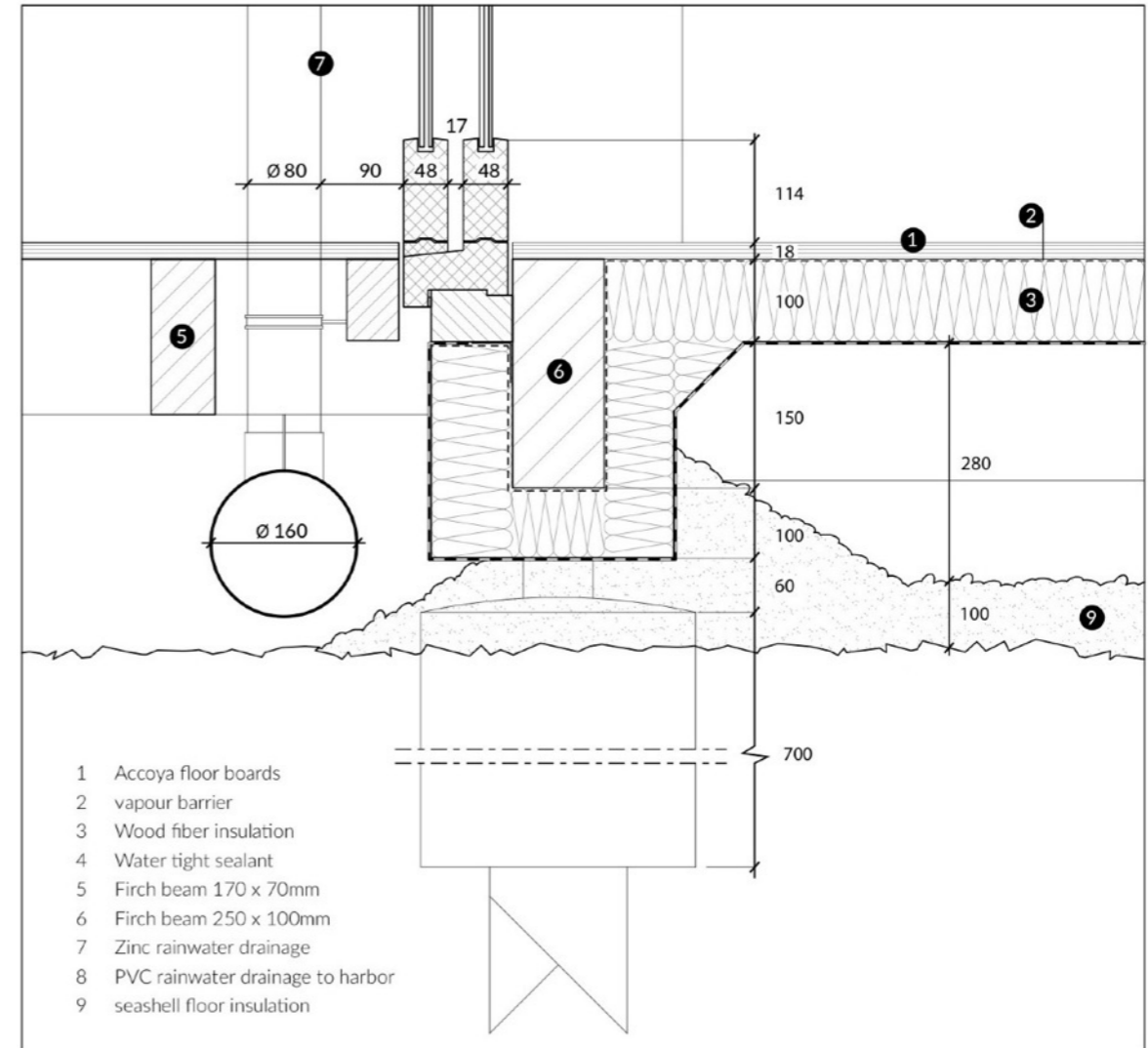
DETAIL V2



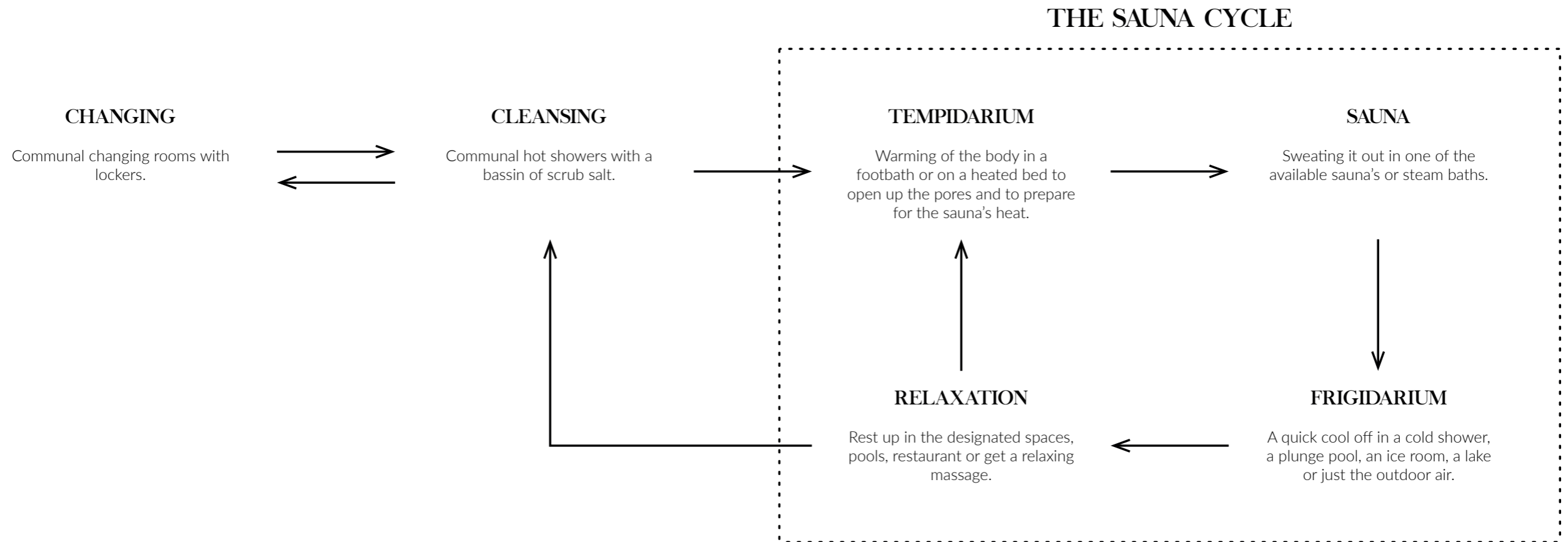
DETAIL V3



DETAIL H 1



DETAIL V 4

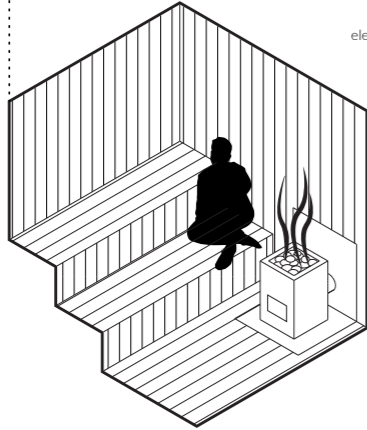


THE SAUNA CYCLE

typical time path for a spa visit

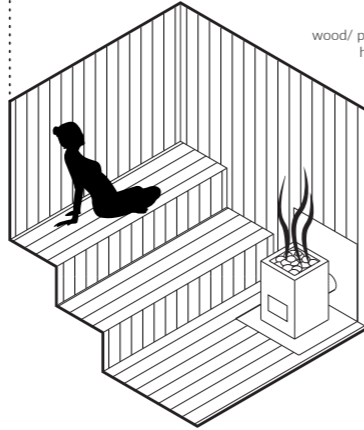
FINNISH SAUNA

80 - 120 °C
10 - 40% humidity
wood/ pallets/ electrical oven



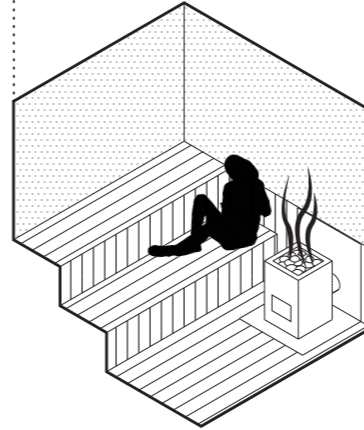
BIO SAUNA

50 - 60 °C
60 - 70% humidity
electrical oven & steam generator



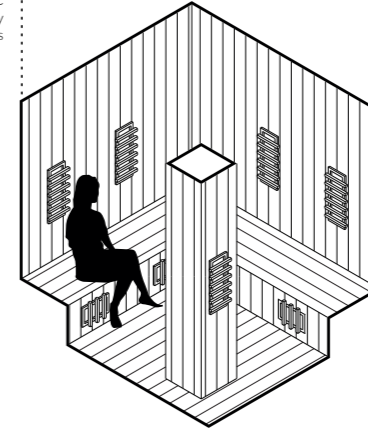
AROMATIC / HERBAL SAUNA

60 - 70 °C
20 - 30% humidity
wood/ pallets/ electrical oven
herbal oils or aromatic materials such as saltstone, clay or charcoal



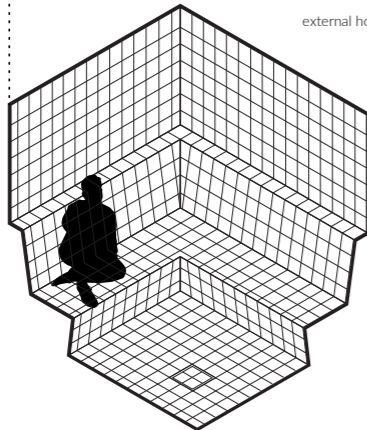
INFRARED SAUNA

40 - 50 °C
50% humidity
electric IR lights



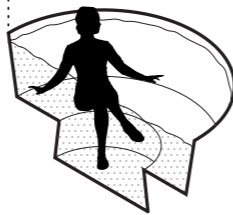
TURKISH STEAM BATH

50 - 55 °C
98 % humidity
electric steam generator
optional: cold showers



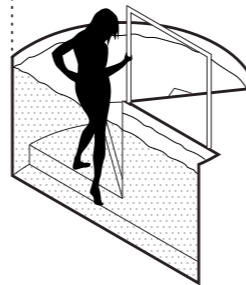
WHIRLPOOL

35 - 40 °C
external hot water supply, filter & heat exchanger



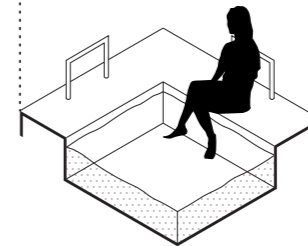
COLD WATER PLUNGE

5 °C
external cold water supply, filter & heat exchanger



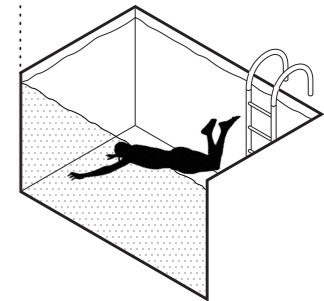
FOOT BATH

35 - 40 °C
external hot water supply, filter & heat exchanger



SWIMMING POOL

25 - 42 °C
external hot water supply, filter & heat exchanger



SAUNA'S & BATHS

a typological overview