

# Playing with light | The intecture of daylight and sports

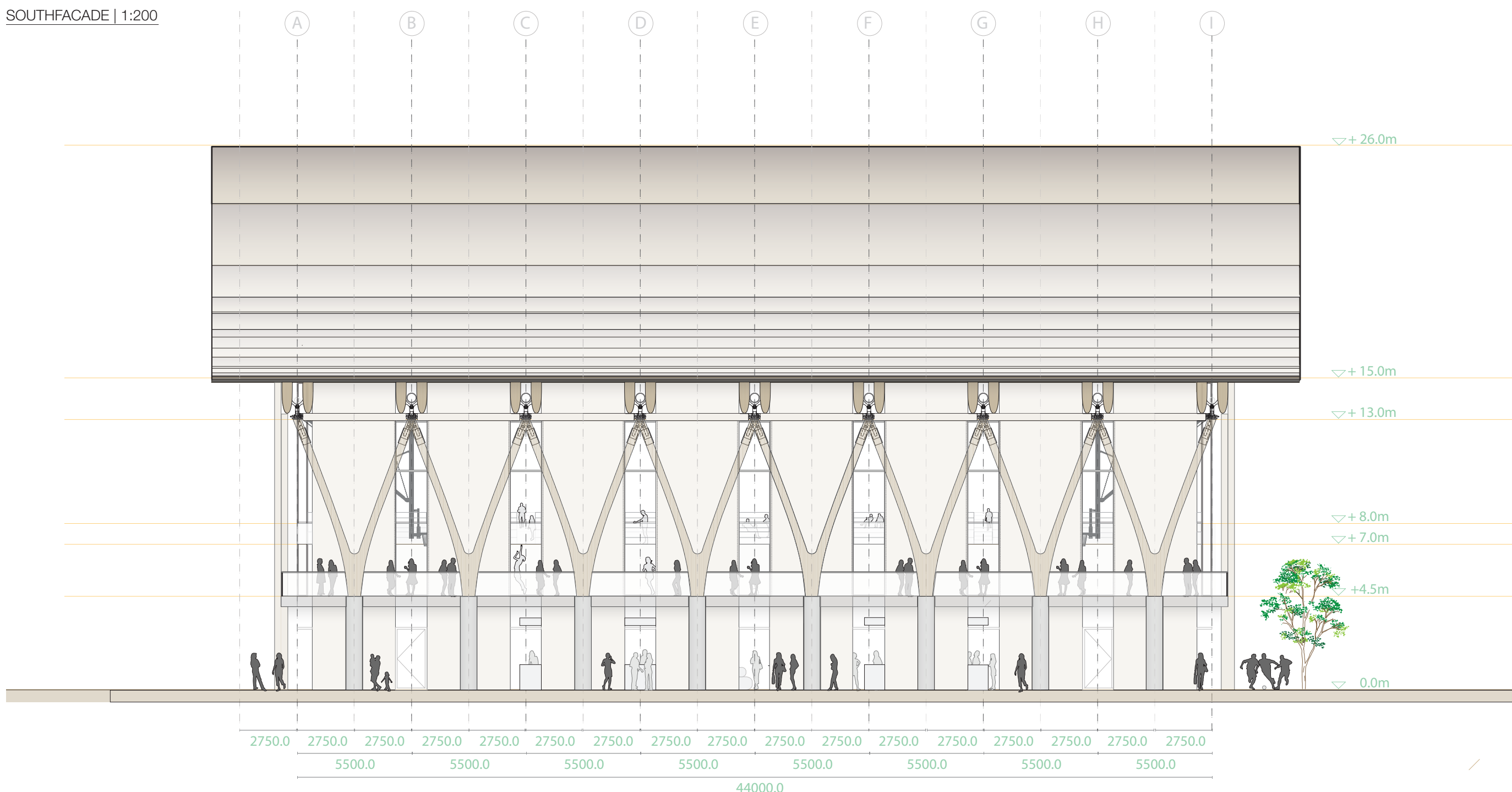
P5 Presentation - 29th of June 2018 - Olly Veugelers

My design gives a wider use of a sports complex. It becomes a new center for urban life at the Marine area of Amsterdam, providing the perfect setting for large sports competitions, events and meetings. With my design I would like to attract a wider audience than just athletes and show how daylight can be an integral part of the design of a sports complex. With my design I want to show you my approach of designing a new sports complex for the Marine area whereby daylight plays a main role in it. In contemporay society where sports plays a central role nowadays

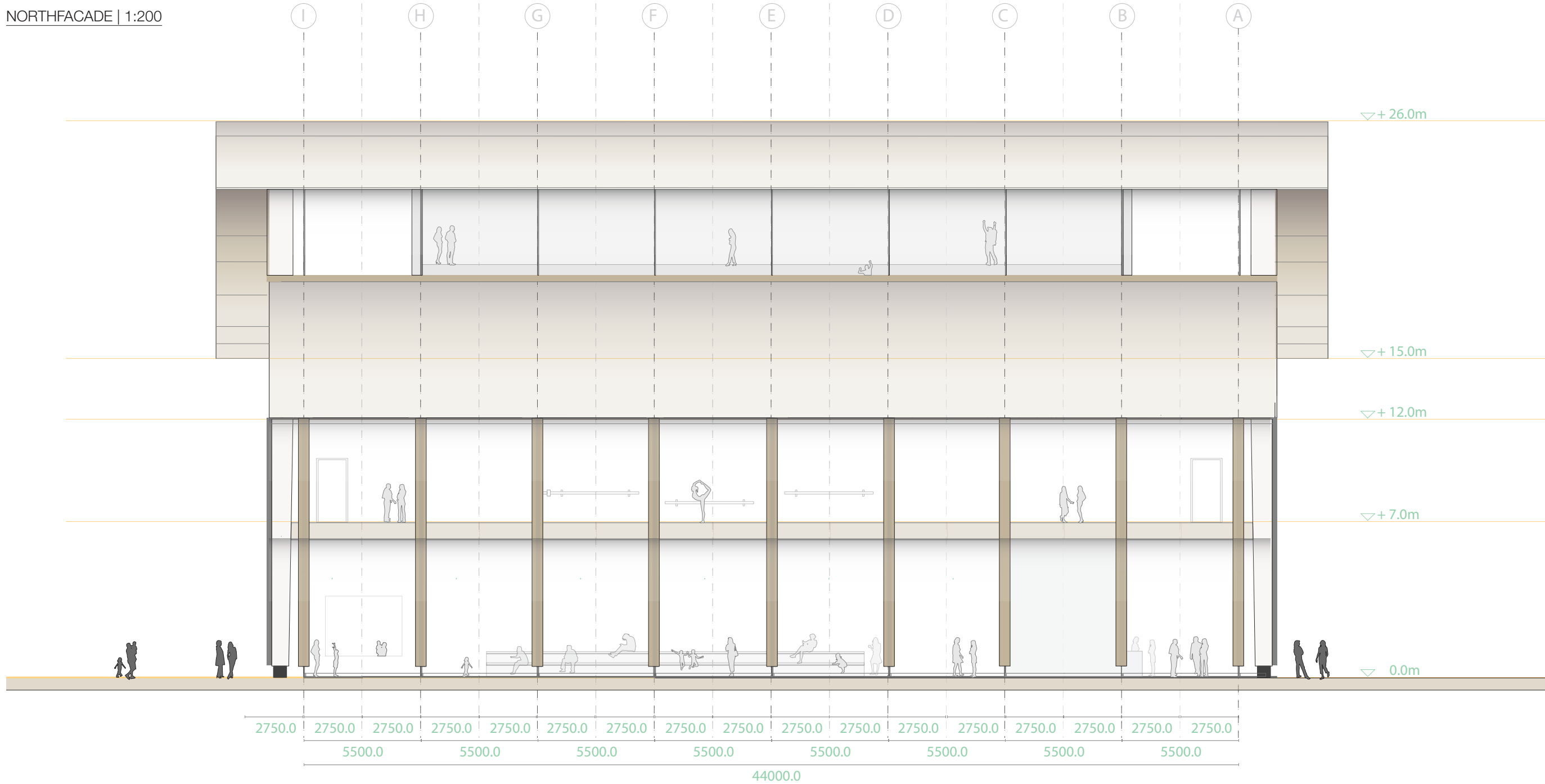
I think we need to have as well more creative approaches towards designing sports buildings, instead of designing secluded boxes outside cities. Where churches were often a central meeting place in the past, nowadays I think this is the case for sports buildings. Therefore, I believe that sports buildings may also be beautiful and monumental buildings with pleasing indoor environments. So I want to show with my design that we have to approach the design of sports buildings in a more creative way and also make them beautiful!



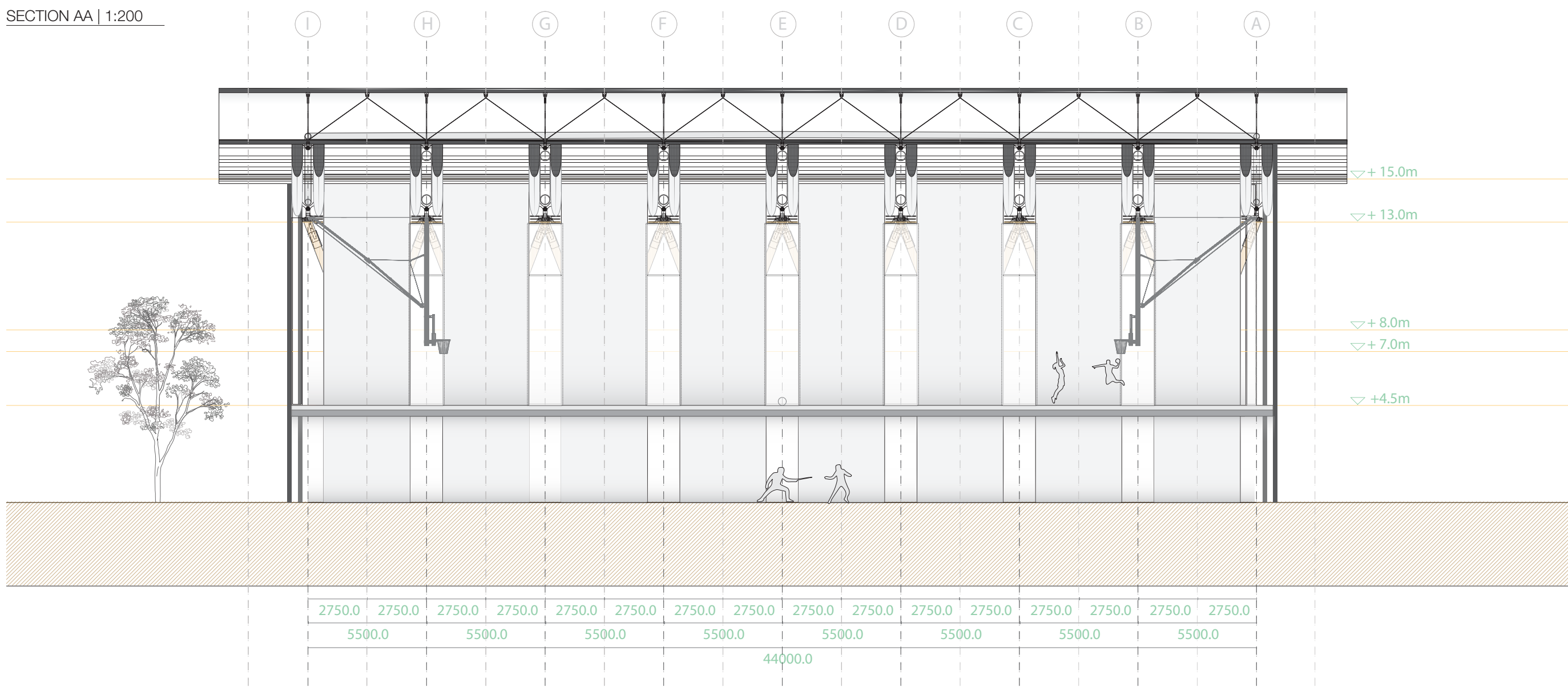
SOUTHFAÇADE | 1:200



NORTHFAÇADE | 1:200



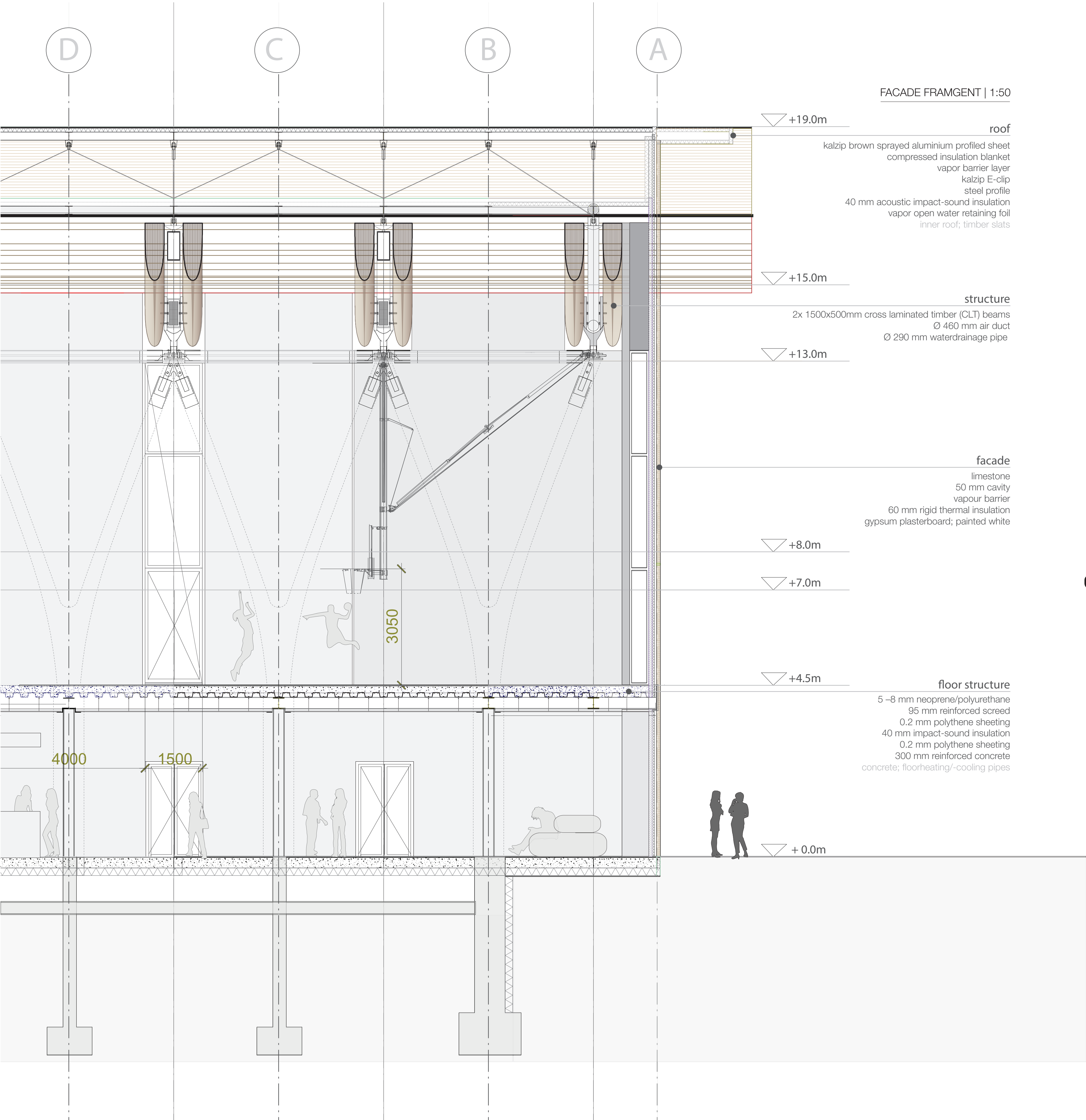
SECTION AA | 1:200



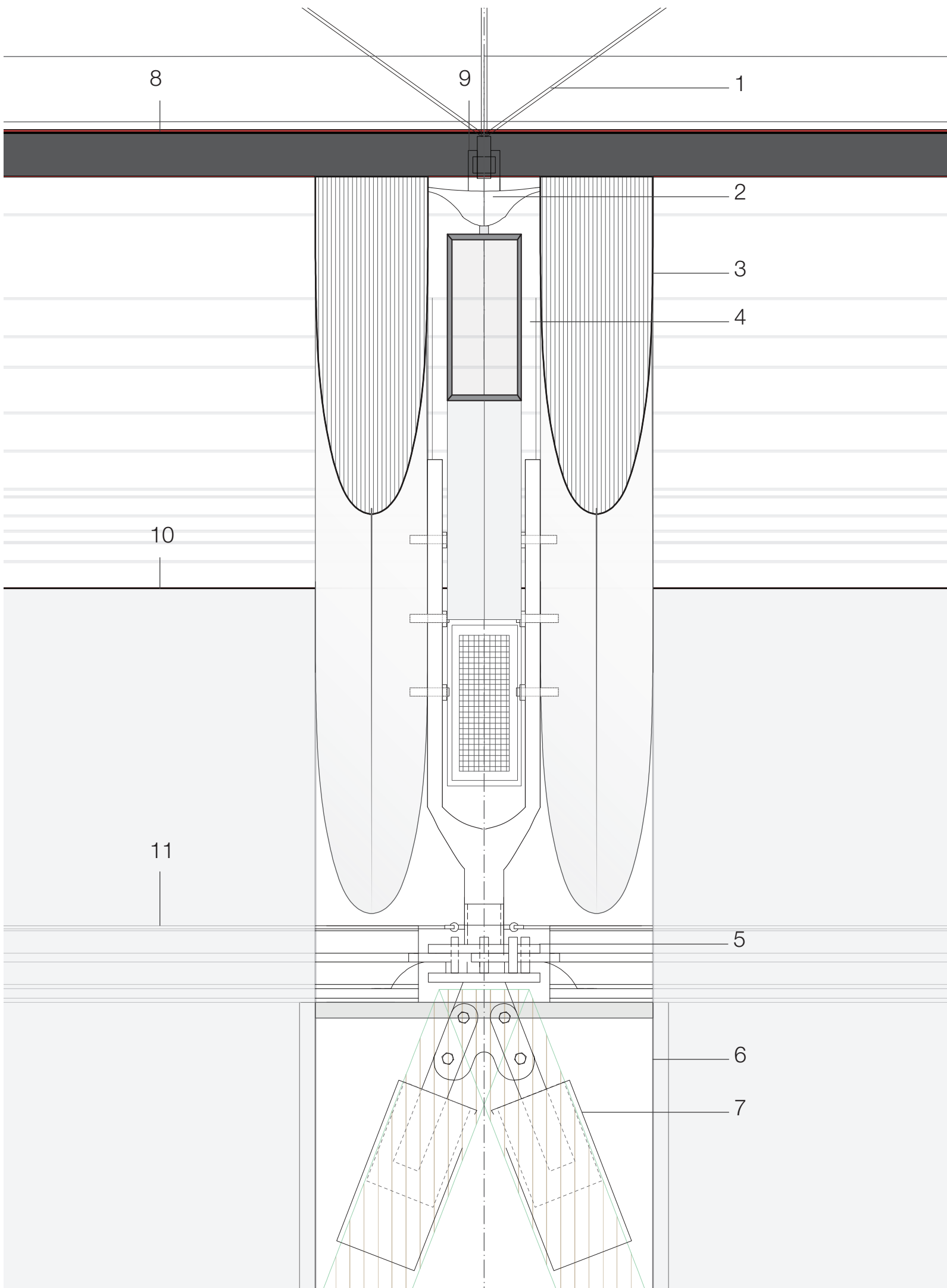


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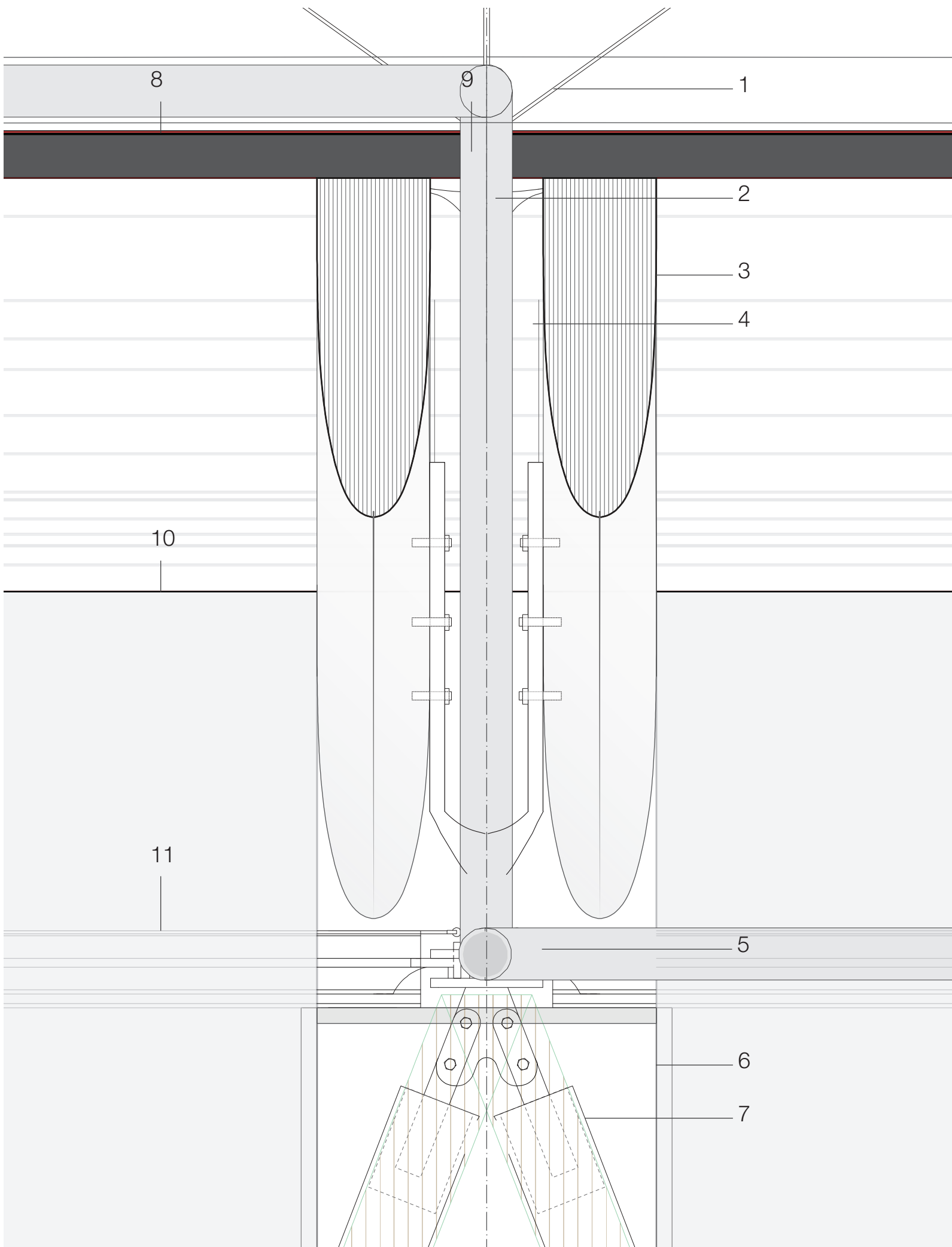
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- DETAIL AIR DUCTS - 1:20**
- Ø 15 mm diagonal steel cable
  - Ø 175 mm, 60 mm galvanized steel tubes
  - 2x 1500x500mm cross laminated timber (CLT) beams
  - Ø 460 mm air duct
  - Ø 290 mm horizontal waterdrainage pipe; descending at an angle of 3° towards vertical pipes at grid lines A and I
  - thermal glazing:
    - 2x 10 mm laminated safety glass
    - + 16 mm cavity
    - + 2x 10 mm laminated safety glass
  - Ø 340 mm timber beam 8.90 m long and 250/210 mm steel I-sections inserted as node connections
  - inner roof; timber slats
  - Ø 290 mm vertical waterdrainage pipe; descending at an angle of 3° towards vertical pipes at grid lines A and I
  - facade elements | limestone
  - Ø 340 mm timber beam 4.90 m long and 250/210 mm steel I-sections inserted as node connections



- DETAIL WATERDRAINAGE - 1:20**
- Ø 15 mm diagonal steel cable
  - Ø 175 mm, 60 mm galvanized steel tubes
  - 2x 1500x500mm cross laminated timber (CLT) beams
  - Ø 290 mm horizontal waterdrainage pipe; descending at an angle of 3° towards vertical pipes at grid lines A and I
  - thermal glazing:
    - 2x 10 mm laminated safety glass
    - + 16 mm cavity
    - + 2x 10 mm laminated safety glass
  - Ø 340 mm timber beam 8.90 m long and 250/210 mm steel I-sections inserted as node connections
  - inner roof; timber slats
  - Ø 290 mm vertical waterdrainage pipe; descending at an angle of 3° towards vertical pipes at grid lines A and I
  - facade elements | limestone
  - Ø 340 mm timber beam 4.90 m long and 250/210 mm steel I-sections inserted as node connections

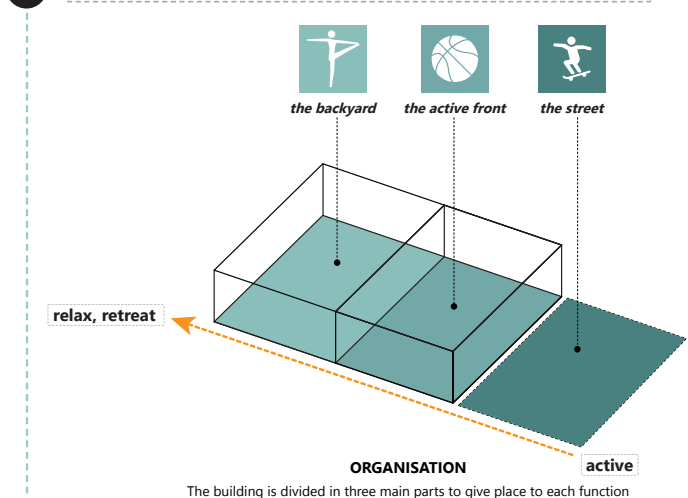




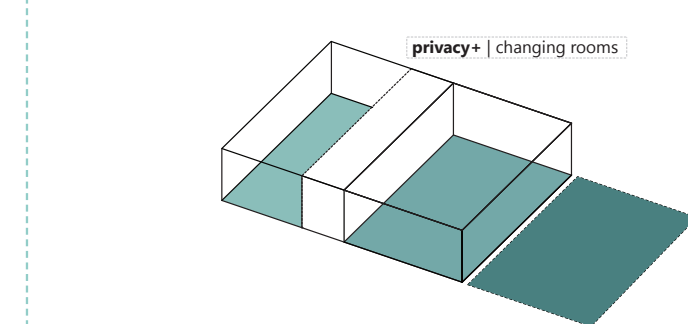
CONCEPT

from research towards design

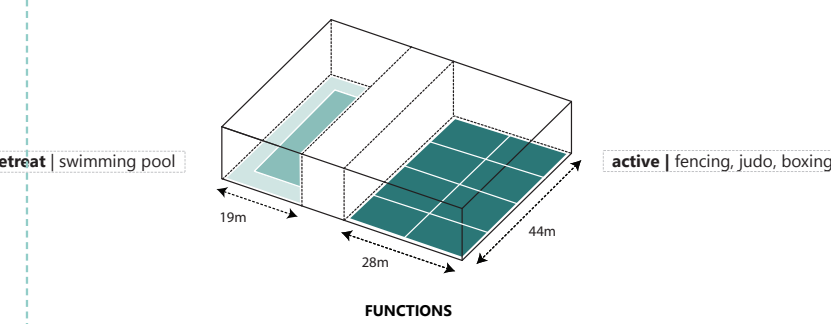
1. ORGANISATION | in relation with type of sports



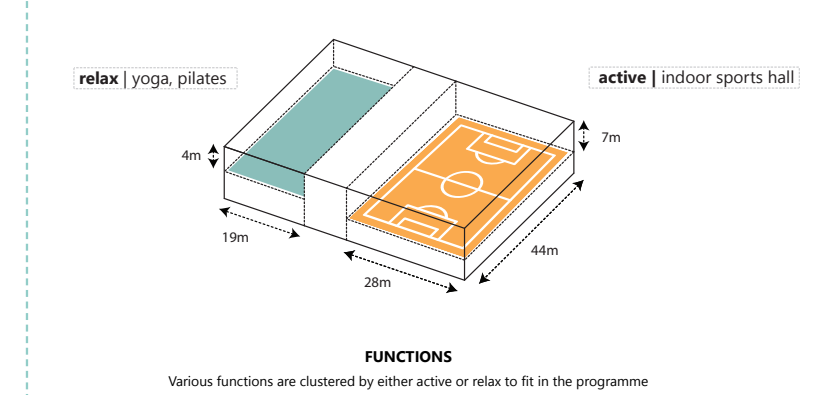
2. ORGANISATION | functions with highest privacy range



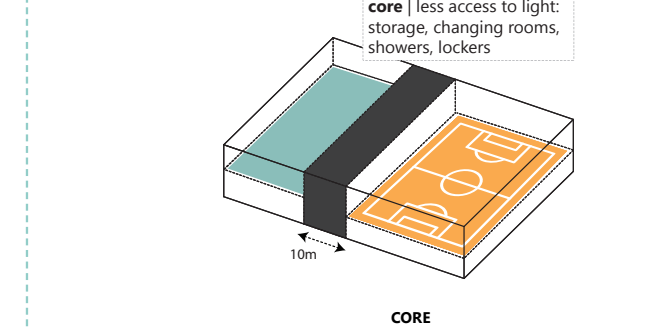
3. FUNCTIONS | from active to relax / retreat



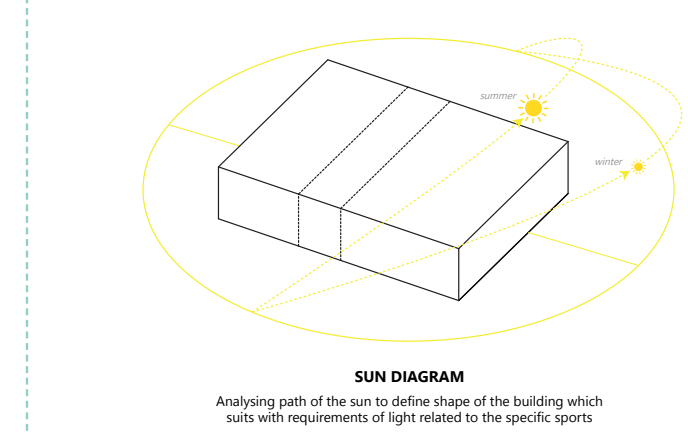
4. FUNCTIONS | from active to relax / retreat



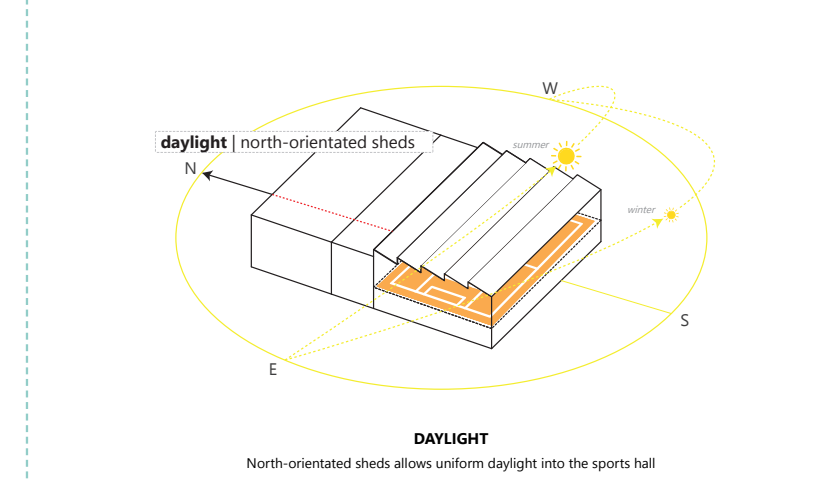
5. CORE | less access to light



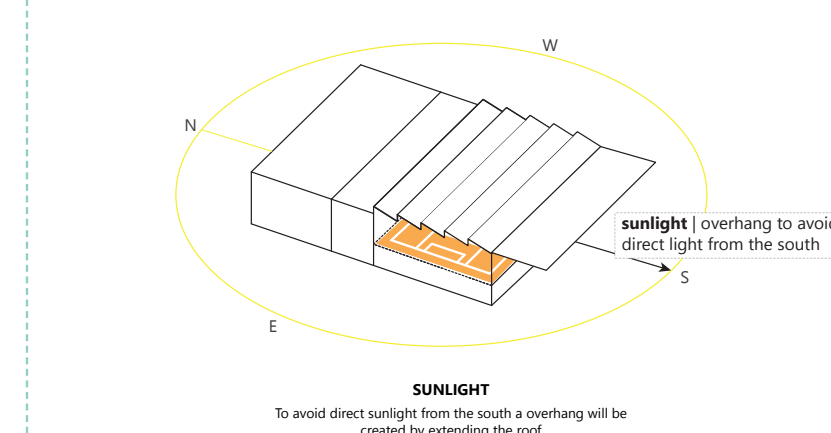
6. SUN DIAGRAM | defining exterior shape through sun path



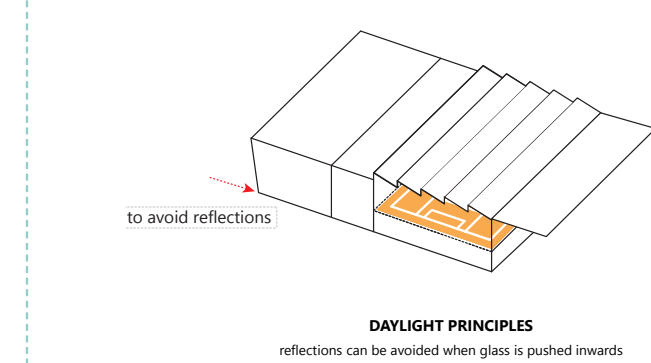
7. DAYLIGHT | north-orientated sheds



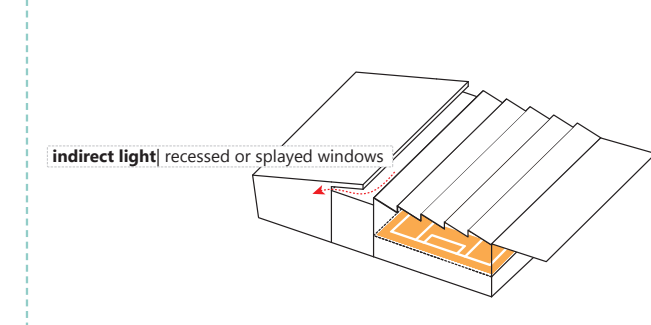
8. DAYLIGHT | to avoid direct sunlight



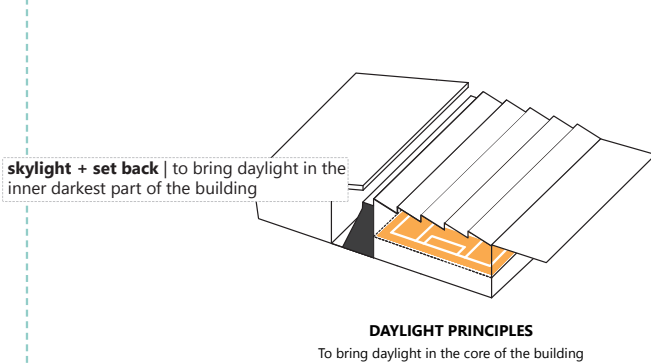
9. DAYLIGHT | to avoid reflections



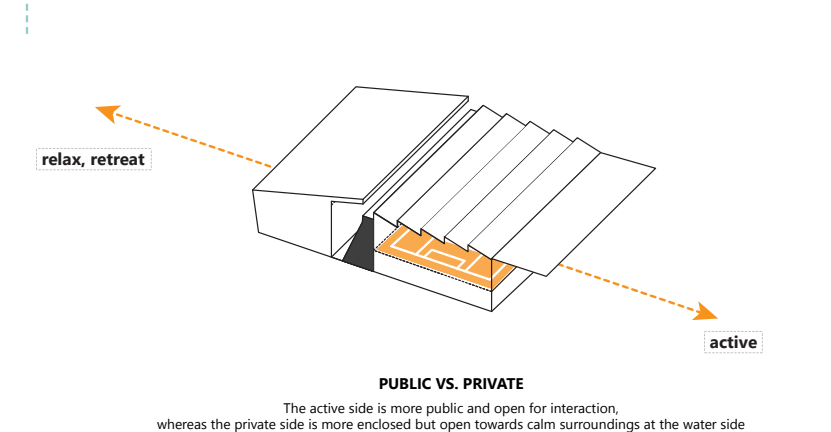
10. DAYLIGHT | to avoid sharp contrasts



11. DAYLIGHT | to avoid darkness in core of the building

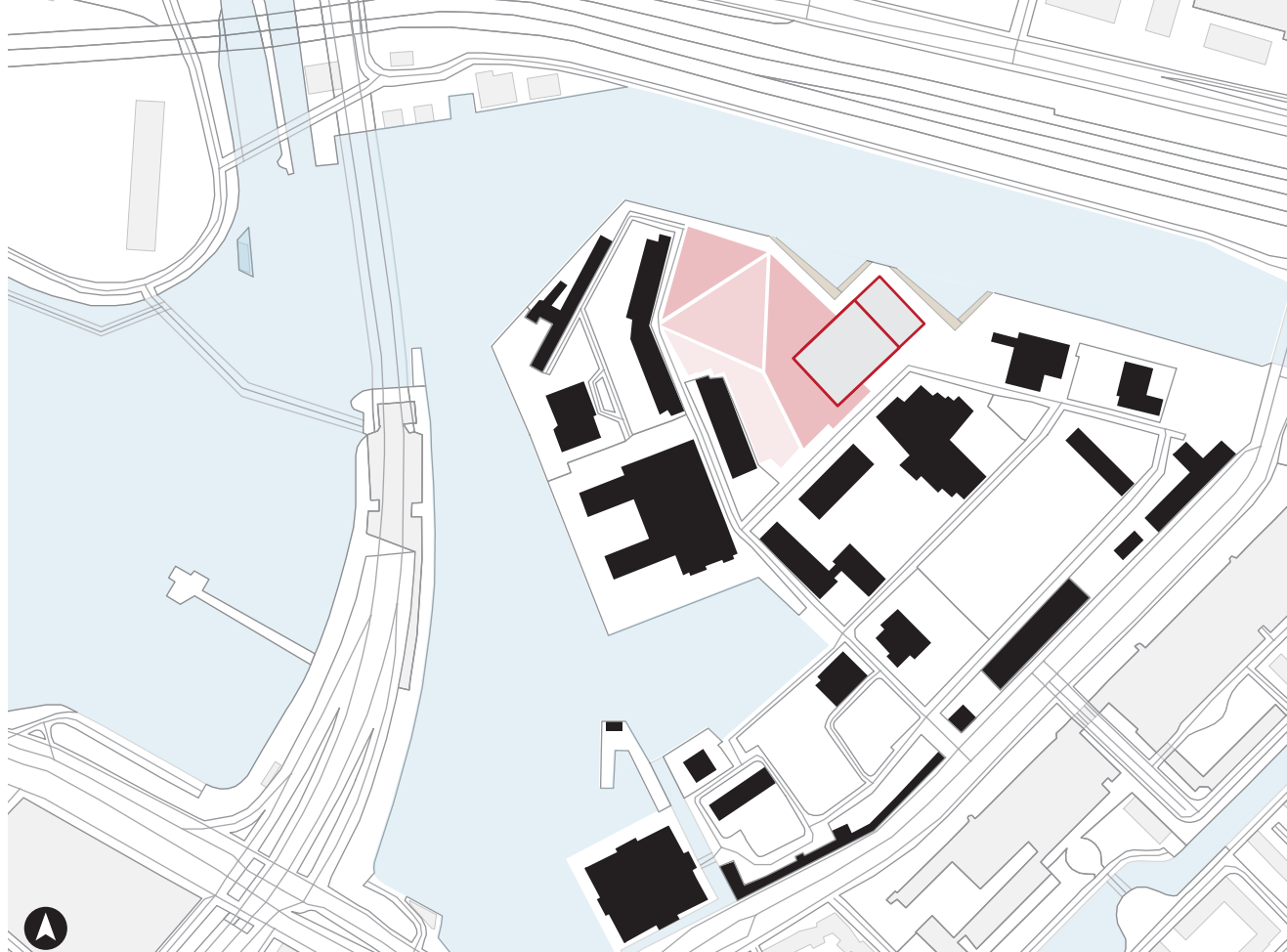


12. EMBEDDING | from public towards private



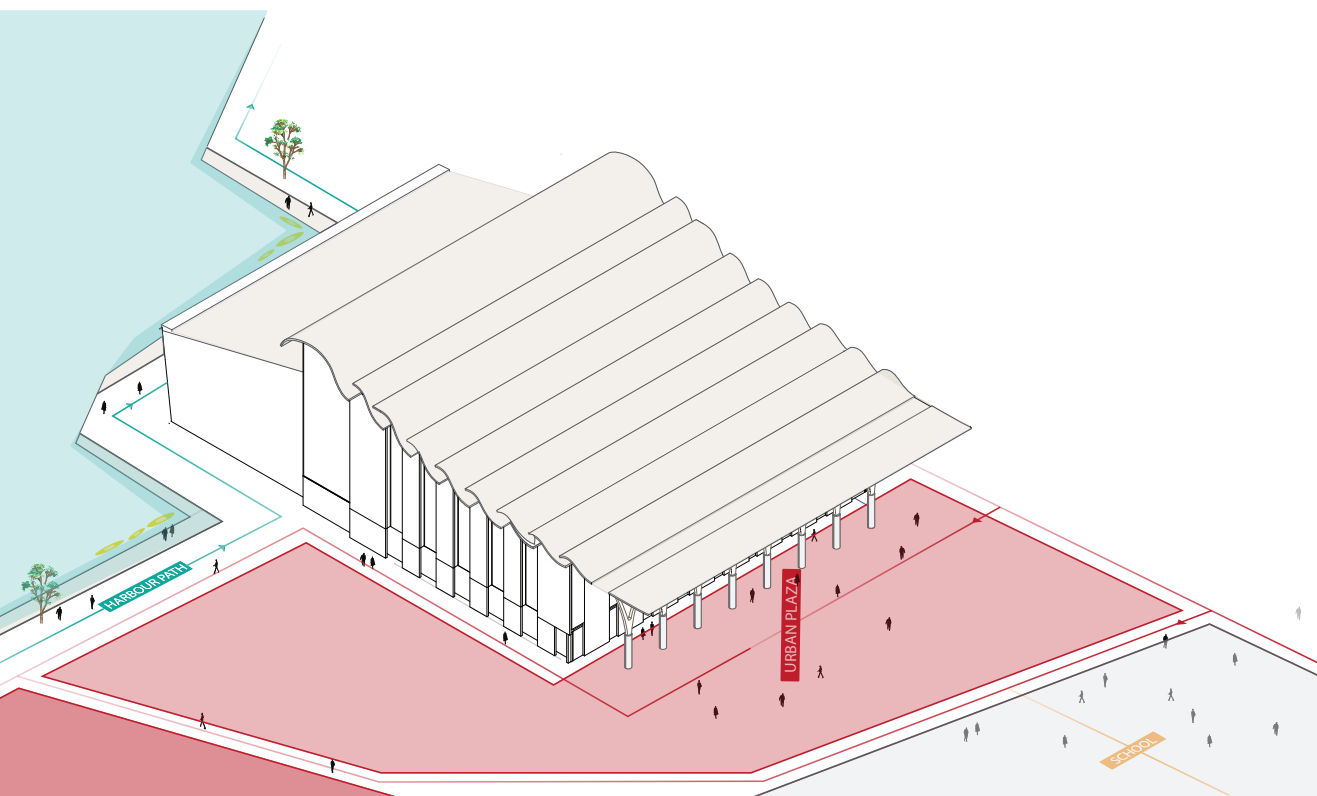
SITUATIONAL DRAWING - 1:5000

Marine area - Amsterdam



PROGRAM

organisation of the program



DAYLIGHT PRINCIPLES

integration of daylight within the design

RESEARCH

Recessed splayed or/and rounded jambs help in softening brightness contrasts

DESIGN

using the principle of vaults to bring in diffuse light with a light textile ceiling

RESEARCH

to bring daylight in the inner darkest part of the building: using the principle of an atria

DESIGN

skylights + inclined climbing wall can deliver daylight deep into the interiors

RESEARCH

By using northern daylight, you avoid the disadvantages of the 'direct' light that with its intensity often has to be controlled by (technical) systems

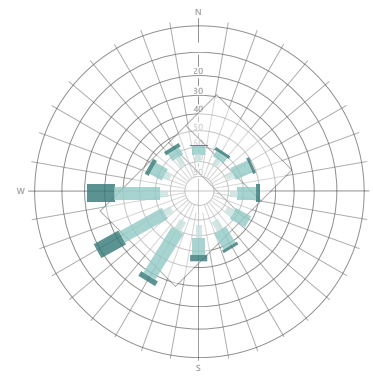
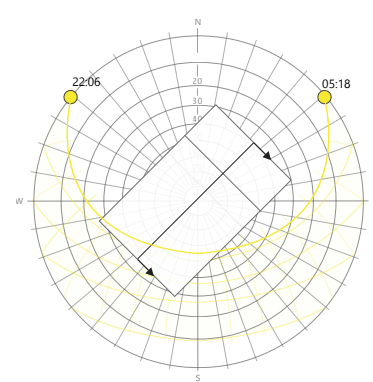
DESIGN

The curved roof that extends from a height of 15 meters to a height of 26 meters upwards consists of 7 identical modules, each of which has been rotated 5 degrees each time in order to achieve as much indirect light from the north to enter the sports hall

CLIMATE PRINCIPLE

Summer situation - 21th June

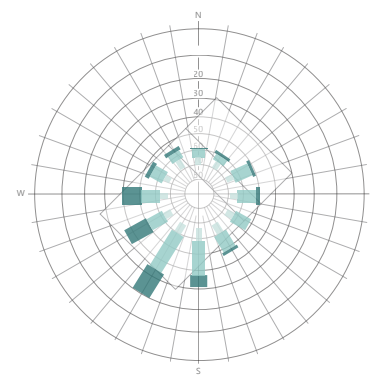
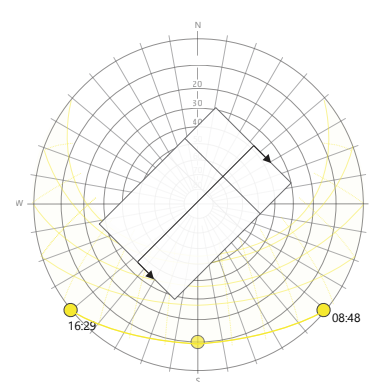
21th June | Amsterdam



CLIMATE PRINCIPLE

Winter situation - 21th December

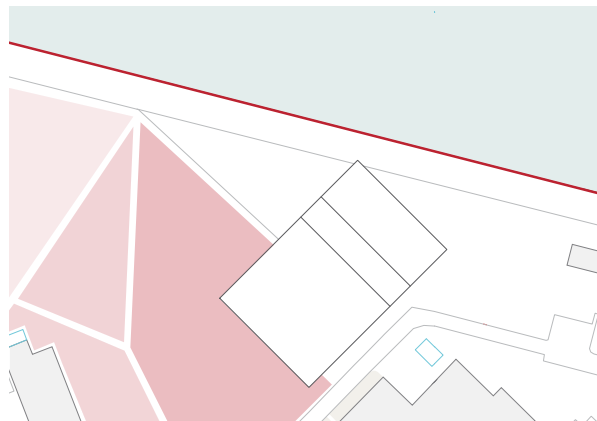
21th December | Amsterdam



diagrams based on source | 1. <https://www.gaisma.com/en/location/amsterdam.html>  
2. <http://www.klimaatinfo.nl/nederland/amsterdam.html>

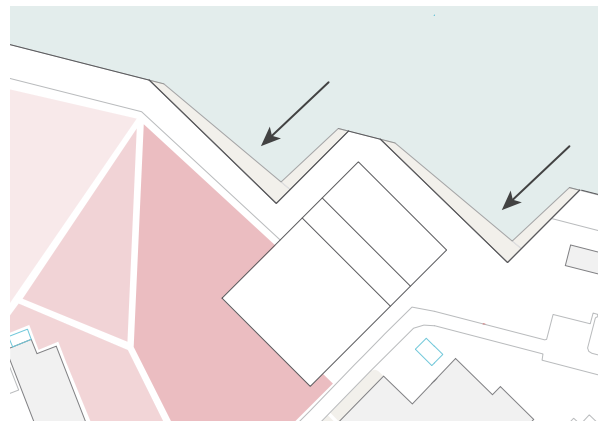
PLAN GROUND LEVEL IN SITU 1:500

Marine area - Amsterdam



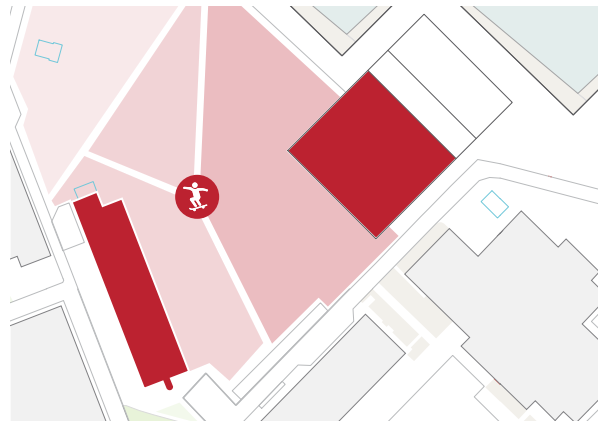
strict border

The marine area is characterized with a strict boundary of land. Since the area at the moment can be merged with Amsterdam it is time to blur the boundary so it gets a better embedding in the whole context



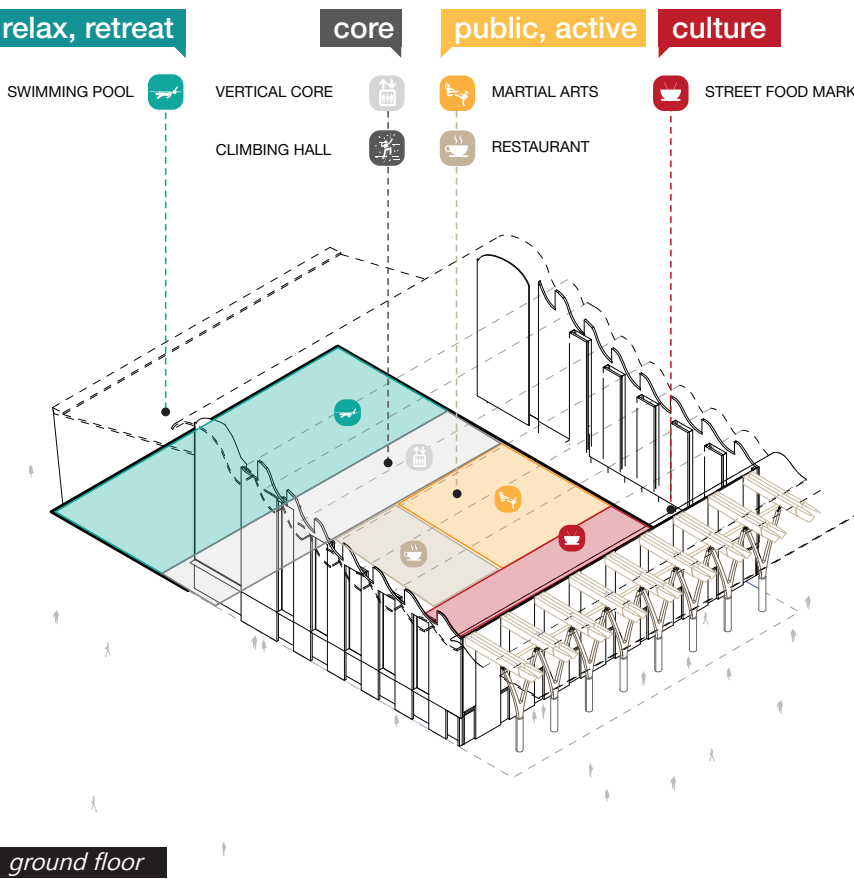
creating inlets

Dissolve the edge + blur the sense of boundary of the land the marine area is recognized by years by by creating inlets in the strict boundary that previously characterized the marine terrain in the coves

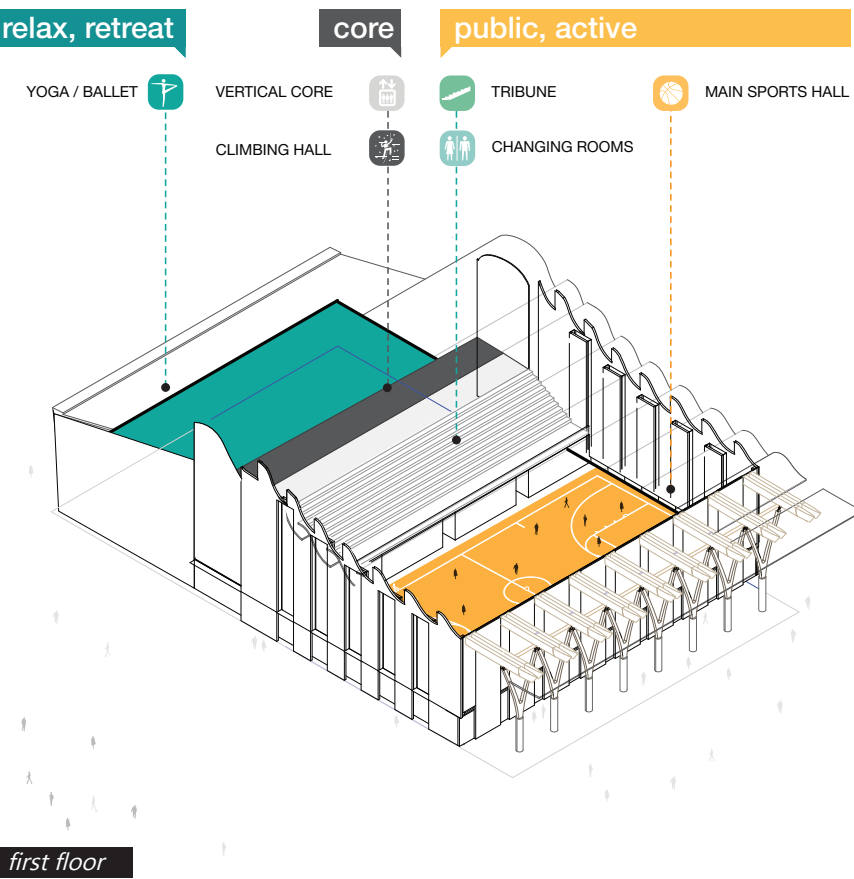


plaza / educational + sports

The new positioning of my design creates an interaction between the sports complex and the school that are connected with the urban plaza.



ground floor



first floor

Summer | 21th June 61.2°



June | Amsterdam

1. Aquifer thermal energy storage (ATES) is the storage and recovery of thermal energy in the subsurface
2. geothermal heat pumps for supplementary heating
3. overhangs and light shelves shadow high summer sun and refract indirect light into the interior
4. principle of atria, connecting to atria: create a cross ventilation and stack effect

ceiling cooling (air)  
textile ceiling of standard ventilation cloth will be used as 'ventilation ducts' - smoother airflow directly through the fabric without any vents

integrated within daylight principle (research) - to soften contrasts: refinement of shapes - vaults

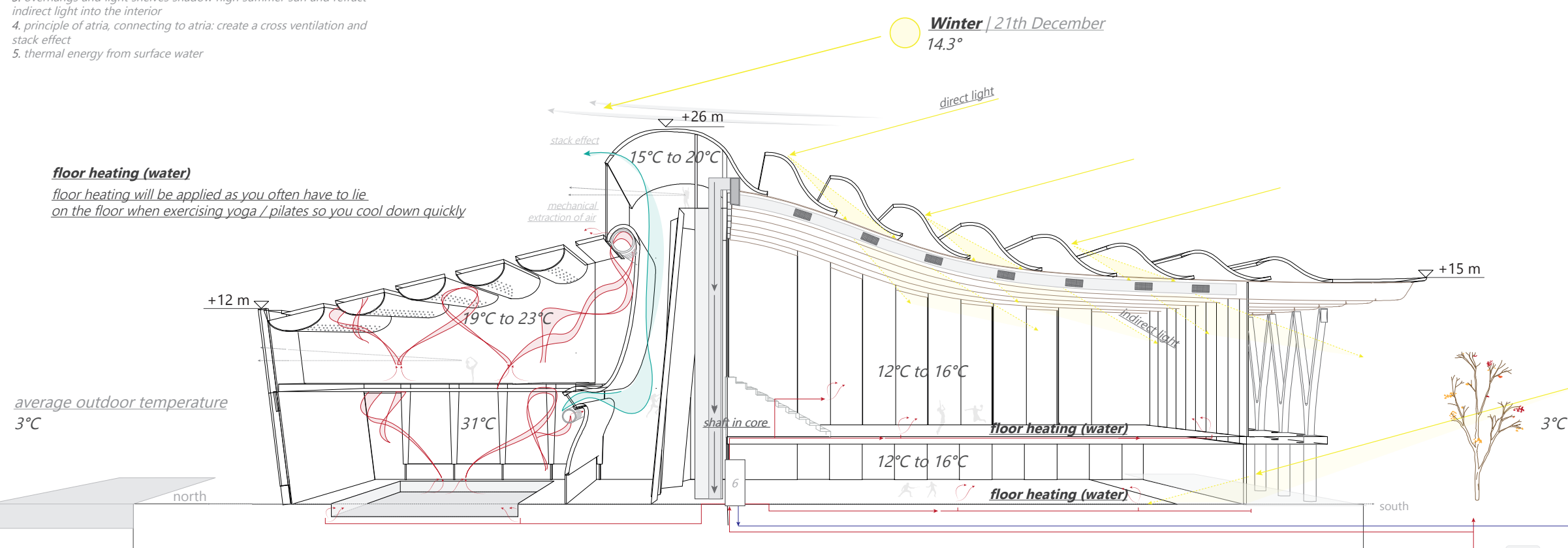
average outdoor temperature 19°C

December | Amsterdam

1. Aquifer thermal energy storage (ATES) is the storage and recovery of thermal energy in the subsurface
2. geothermal heat pump for supplementary heating
3. overhangs and light shelves shadow high summer sun and refract indirect light into the interior
4. principle of atria, connecting to atria: create a cross ventilation and stack effect
5. thermal energy from surface water

floor heating (water)  
floor heating will be applied as you often have to lie on the floor when exercising yoga / pilates so you cool down quickly

average outdoor temperature 3°C



2 WKO

2 WKO

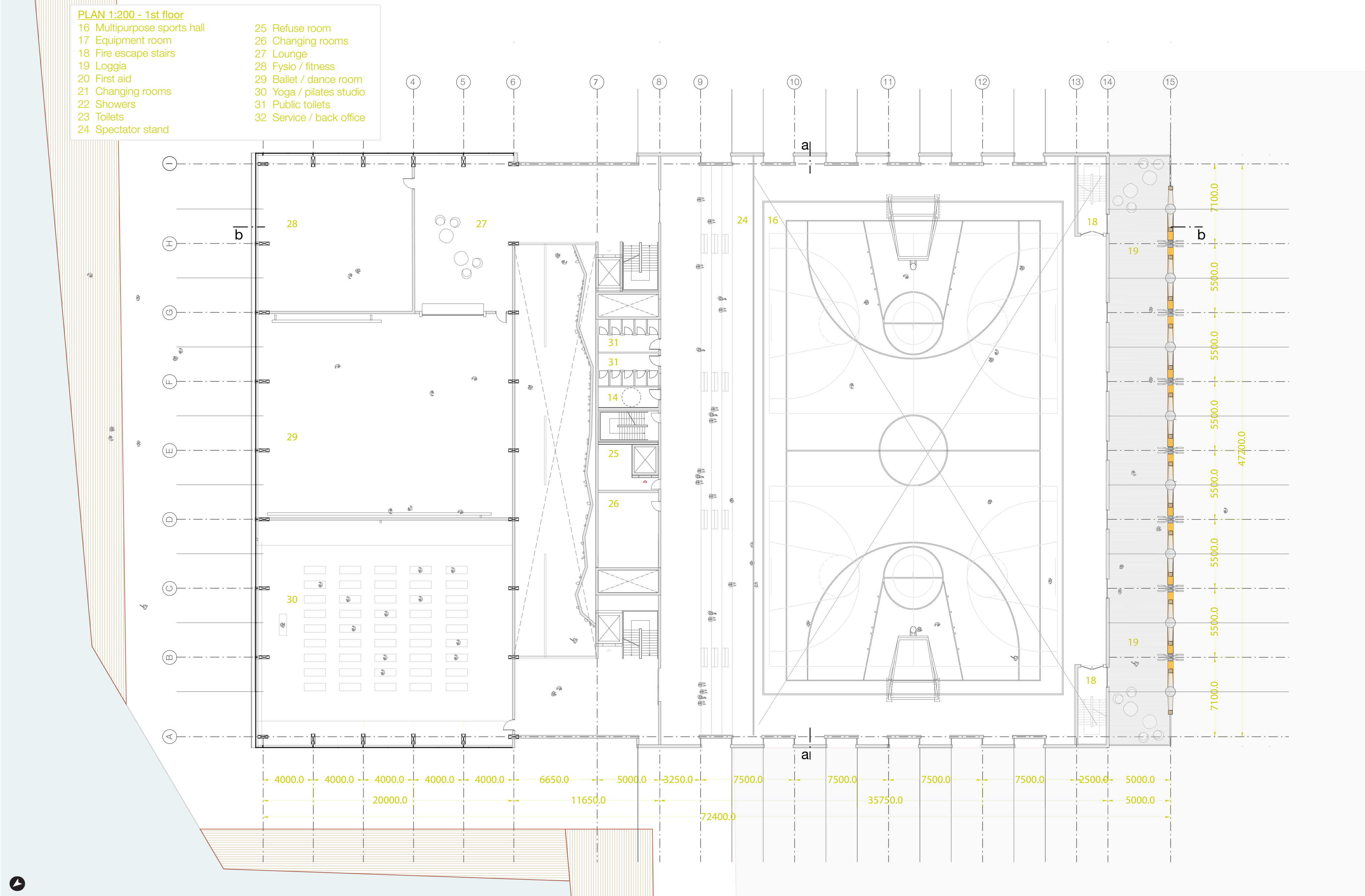


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## FLOORPLANS - 1:200

first floor - 1:200



## FLOORPLANS - 1:200

ground floor - 1:200

