



The heart project

Building bridges, joining people

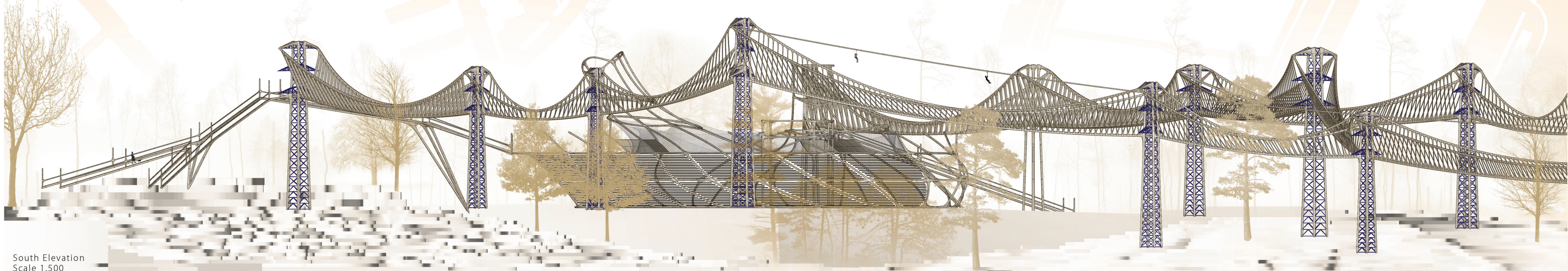
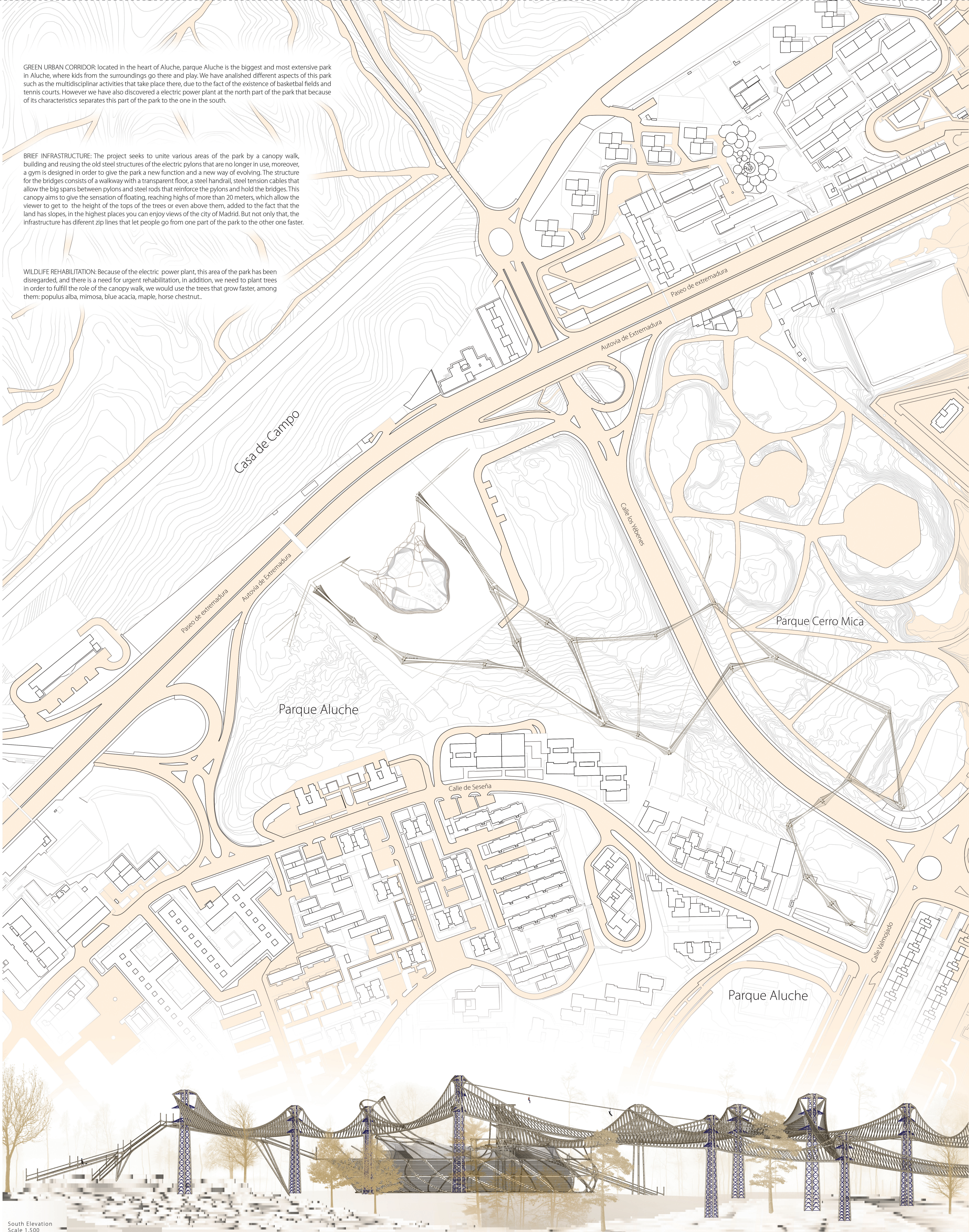
Site Plan
Scale 1:1500

Pablo Diego Pastor
Integrated workshop
Design studio G6 + Technical systems
Professors: Carlos Arroyo & Luis Álvarez

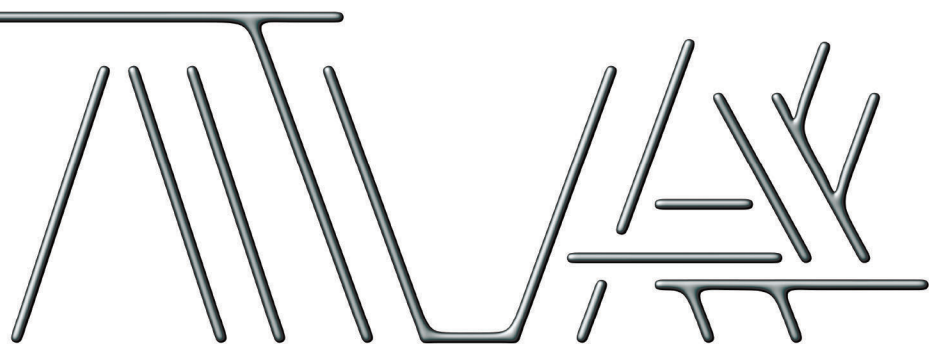
GREEN URBAN CORRIDOR: located in the heart of Aluche, parque Aluche is the biggest and most extensive park in Aluche, where kids from the surroundings go there and play. We have analysed different aspects of this park such as the multidisciplinary activities that take place there, due to the fact of the existence of basketball fields and tennis courts. However we have also discovered a electric power plant at the north part of the park that because of its characteristics separates this part of the park to the one in the south.

BRIEF INFRASTRUCTURE: The project seeks to unite various areas of the park by a canopy walk, building and reusing the old steel structures of the electric pylons that are no longer in use, moreover, a gym is designed in order to give the park a new function and a new way of evolving. The structure for the bridges consists of a walkway with a transparent floor, a steel handrail, steel tension cables that allow the big spans between pylons and steel rods that reinforce the pylons and hold the bridges. This canopy aims to give the sensation of floating, reaching highs of more than 20 meters, which allow the viewer to get to the height of the tops of the trees or even above them, added to the fact that the land has slopes, in the highest places you can enjoy views of the city of Madrid. But not only that, the infrastructure has diferent zip lines that let people go from one part of the park to the other one faster.

WILDLIFE REHABILITATION: Because of the electric power plant, this area of the park has been disregarded, and there is a need for urgent rehabilitation, in addition, we need to plant trees in order to fulfill the role of the canopy walk, we would use the trees that grow faster, among them: populus alba, mimosa, blue acacia, maple, horse chestnut..



South Elevation
Scale 1:500

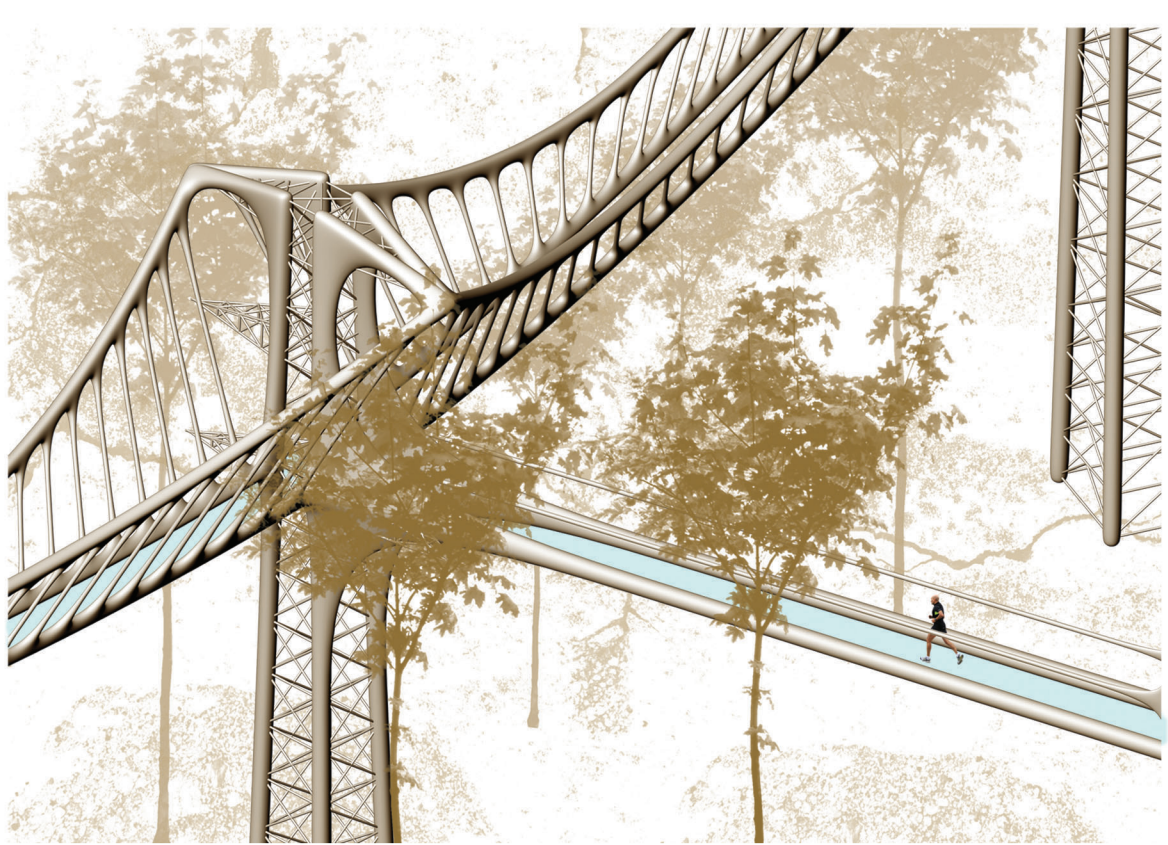
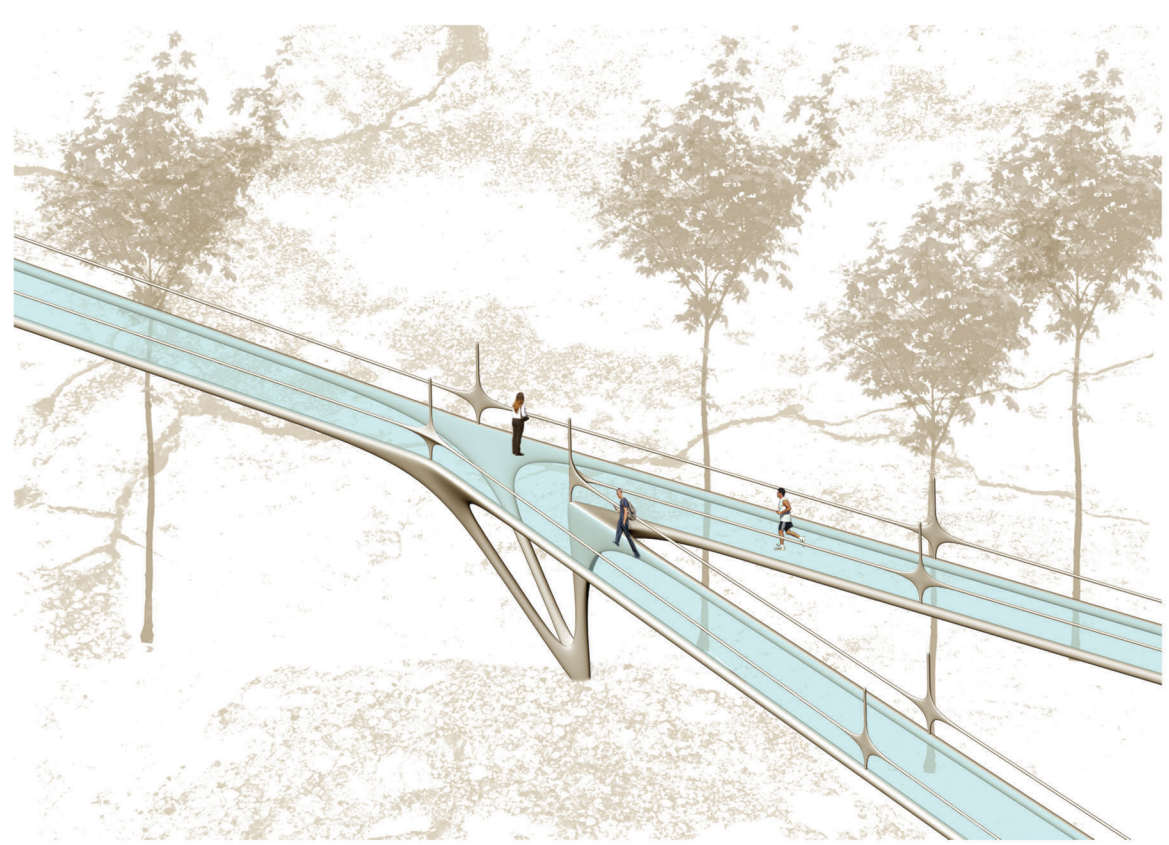
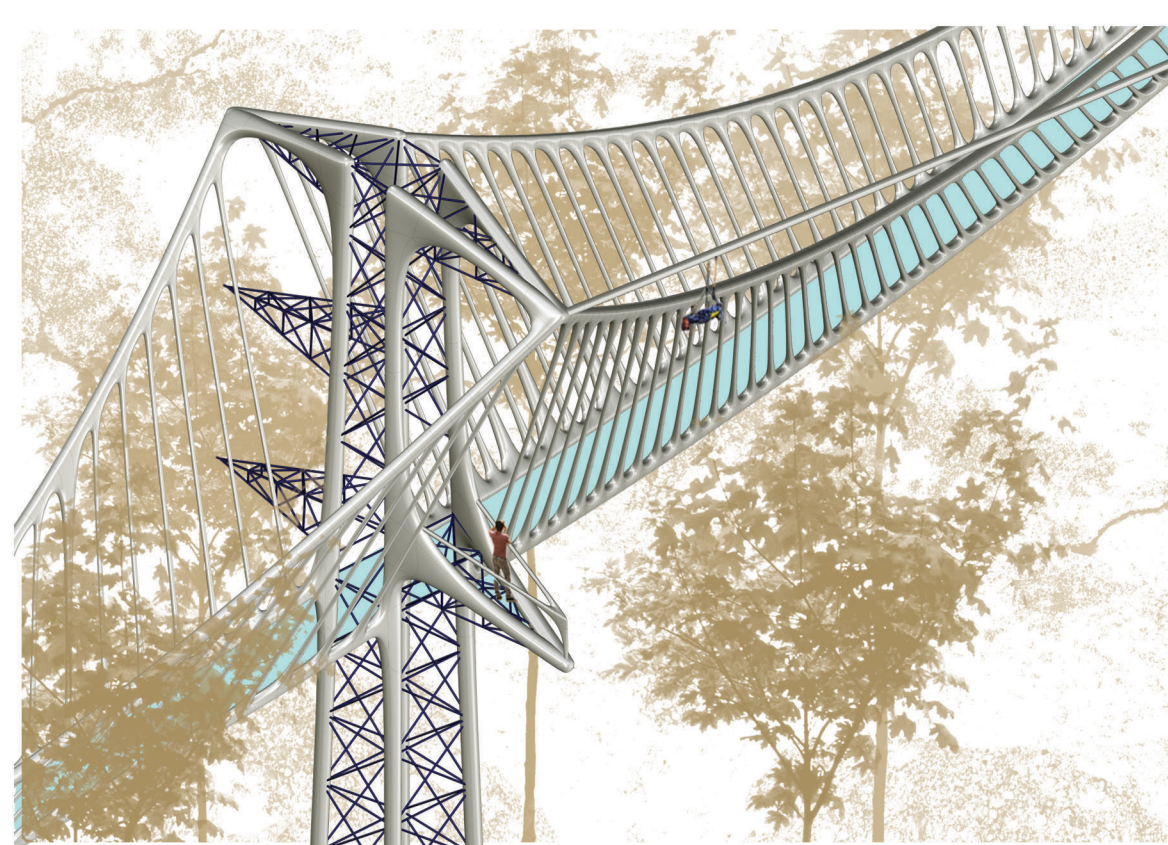
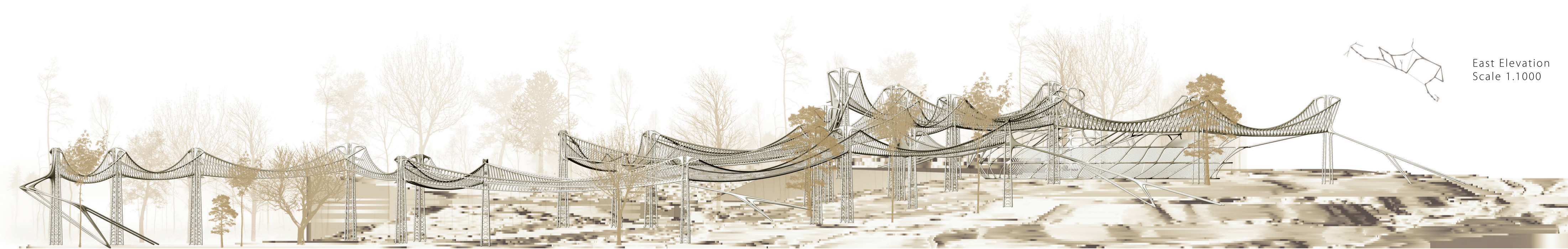
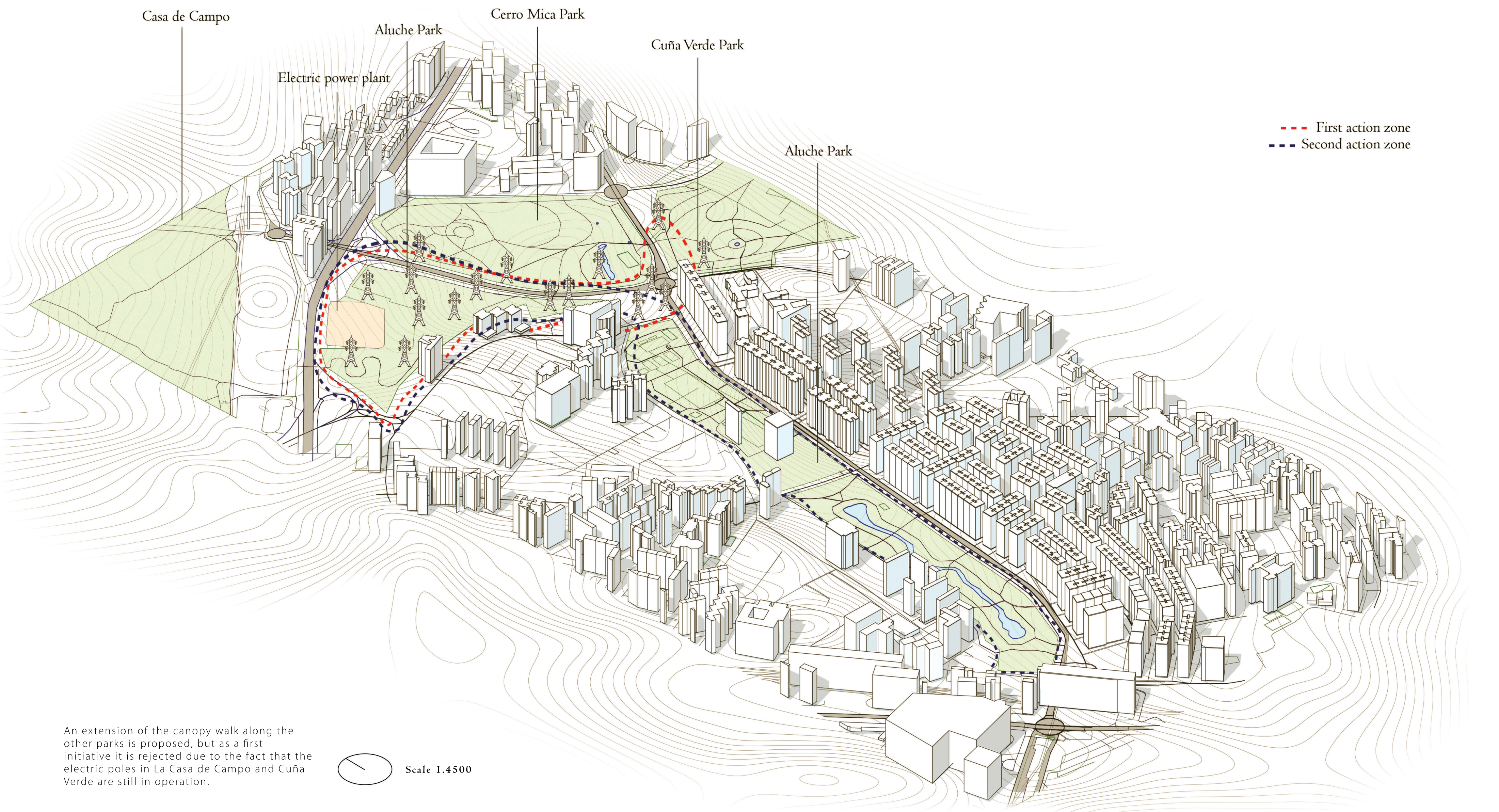


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Analysis

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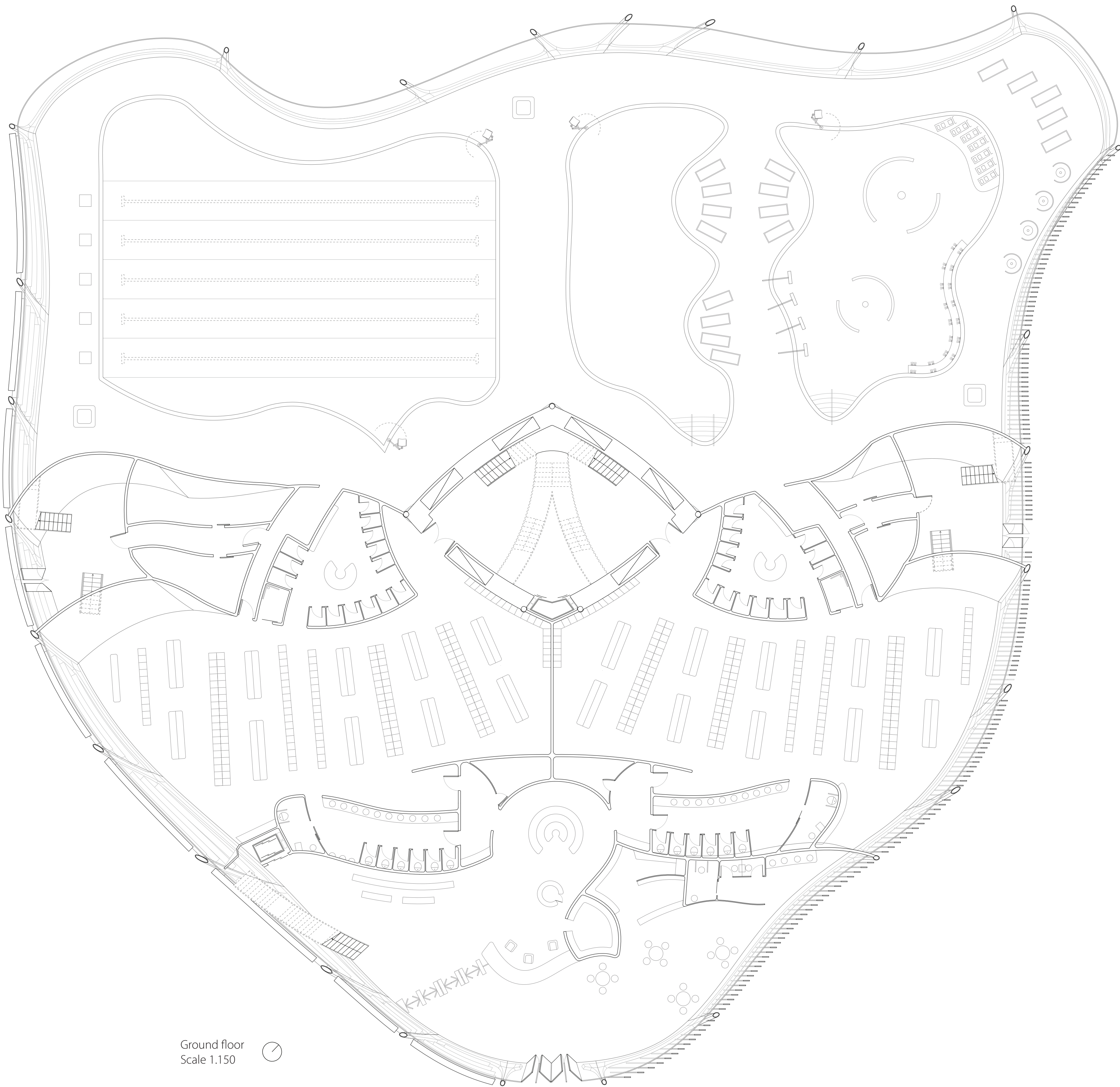


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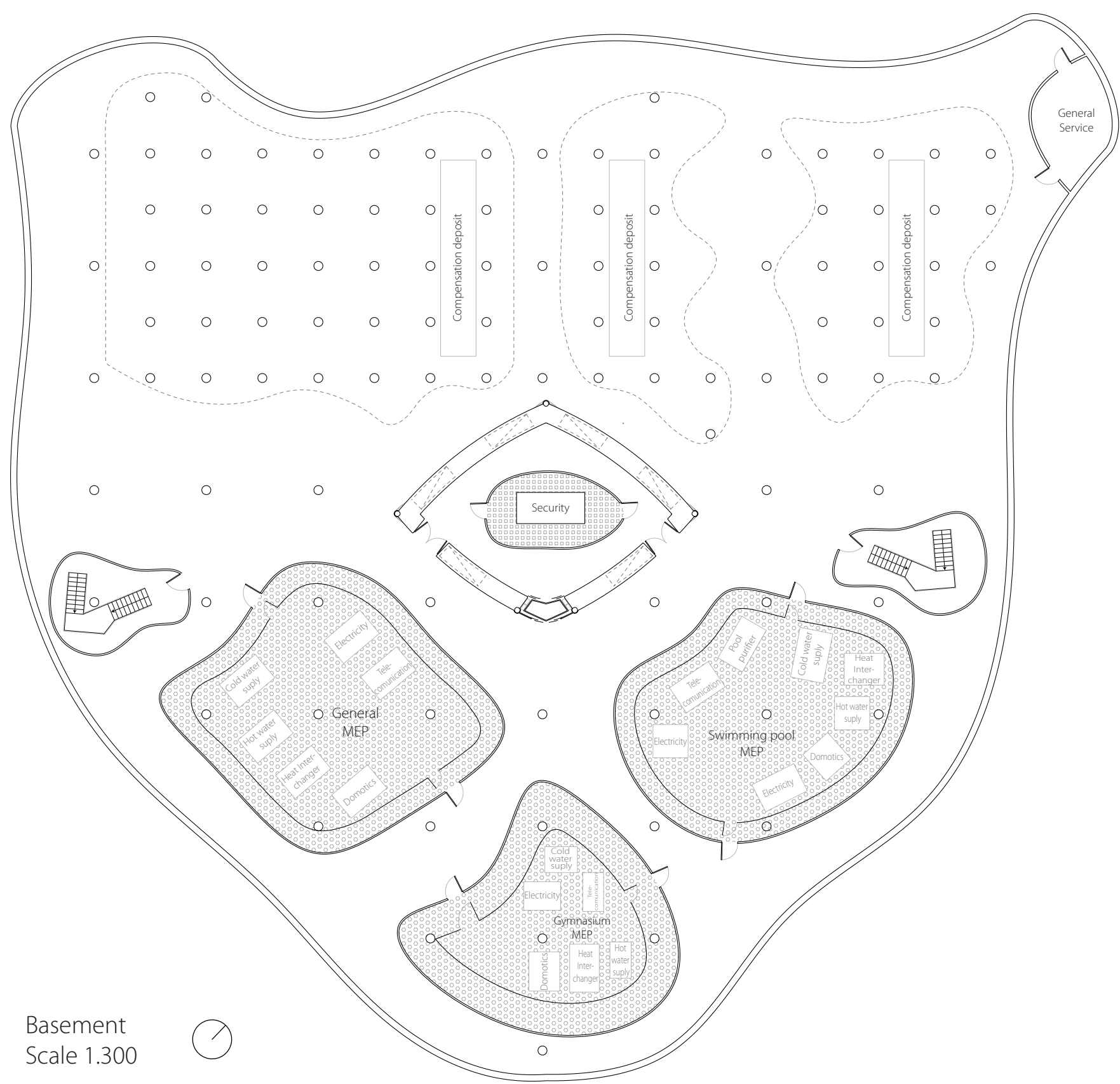
Building bridges, joining people

Ground floor
Basement

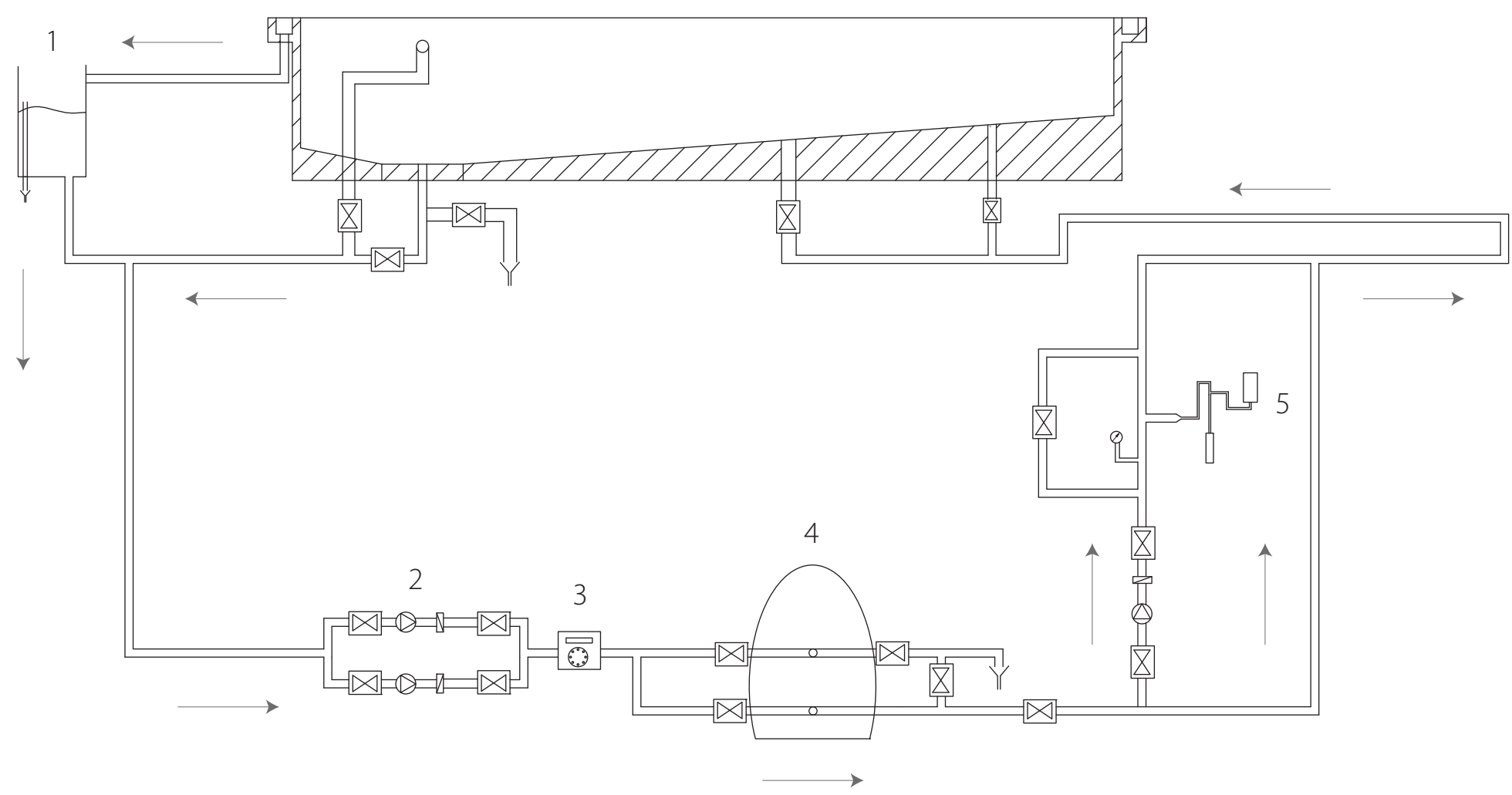
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Ground floor
Scale 1.150



Basement
Scale 1.300



Swimming pool scheme

- Symbols**
- Pump
 - Check tap
 - Non-return tap
 - Drain
 - Pressure switch
 - Heat interchanger

- Elements**
- 1 Compensation deposit
 - 2 Pumping group
 - 3 Ionizer
 - 4 Filter
 - 5 Ozonizer

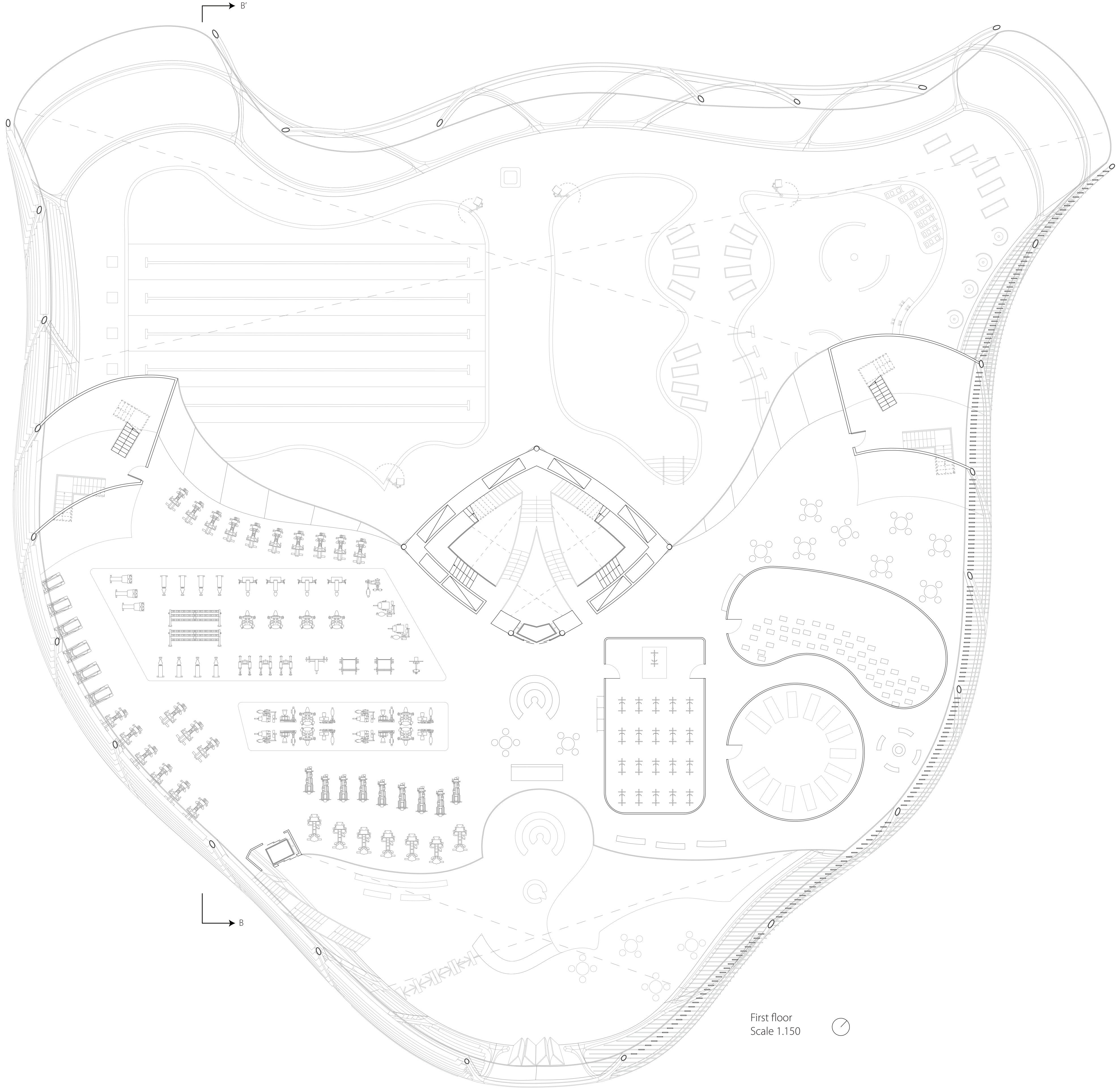


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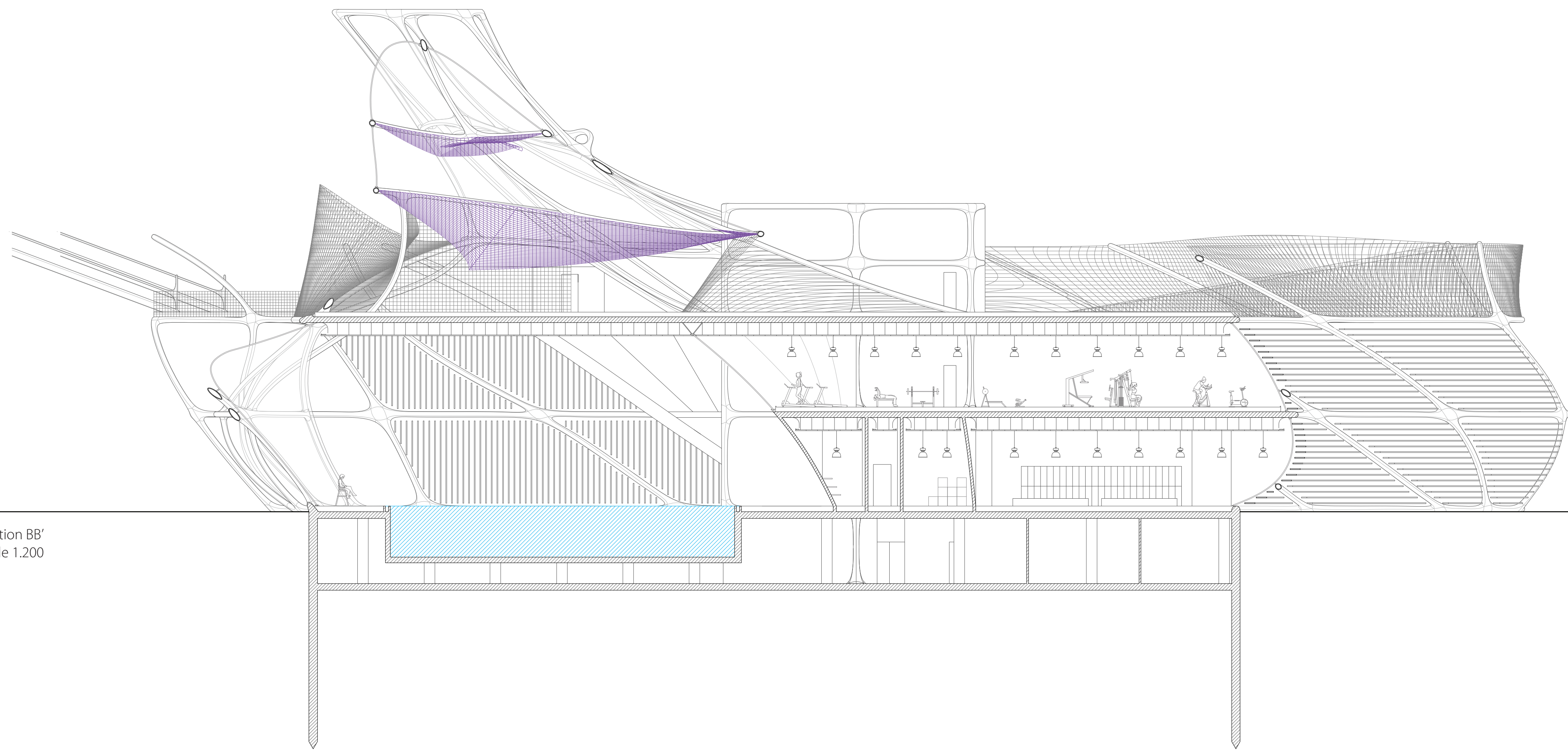
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First floor
Section

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First floor
Scale 1.150



Section BB'
Scale 1.200

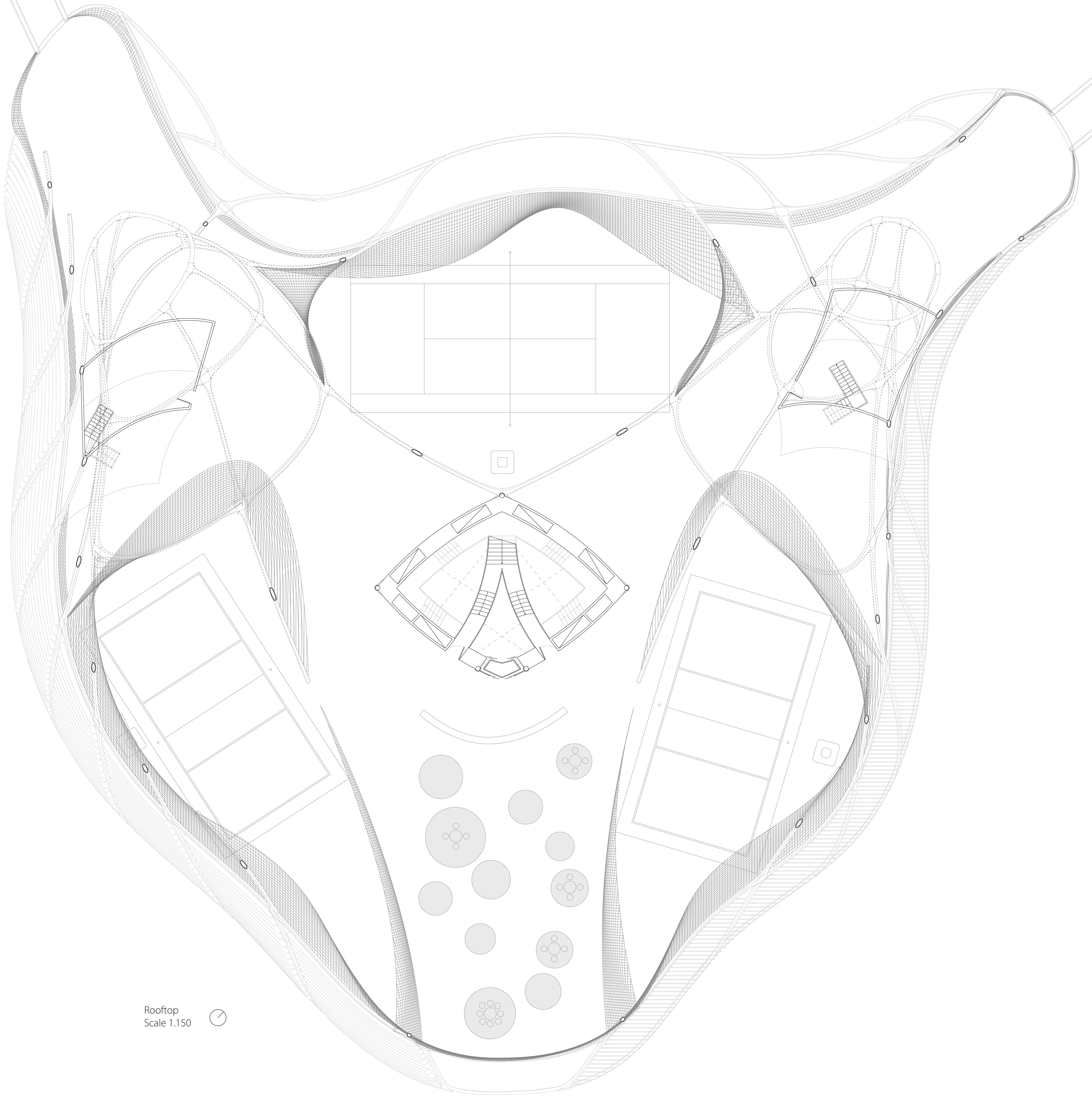


The heart project

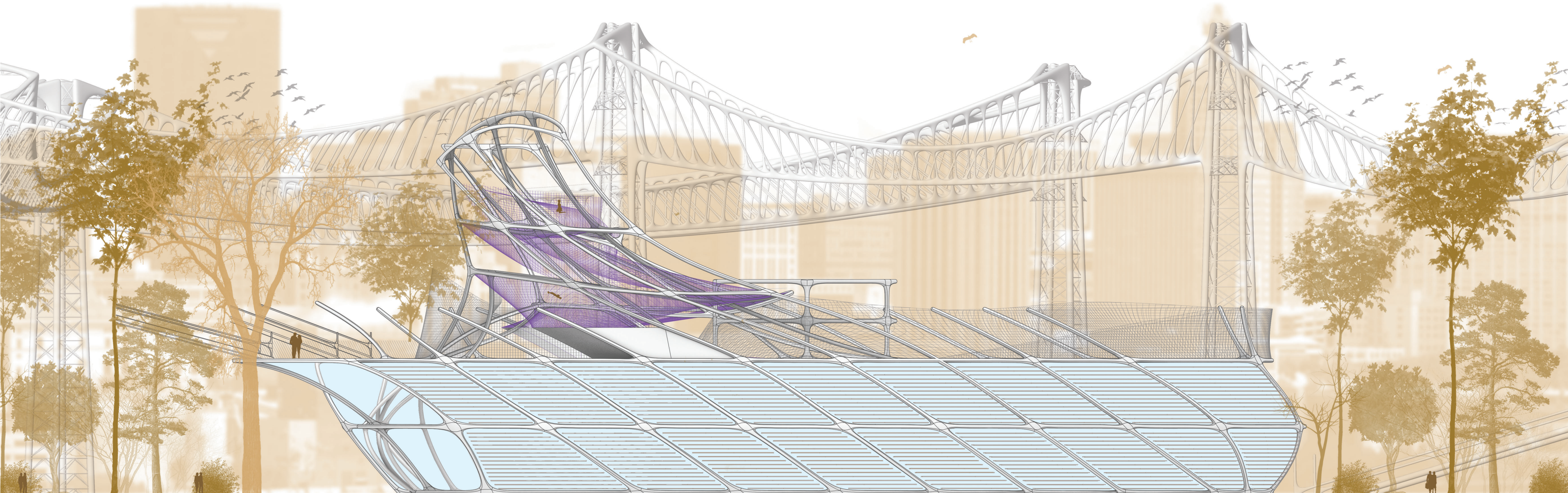
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Rooftop
Side view

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Rooftop
Scale 1.150



Side View (South - West)
Scale 1.200

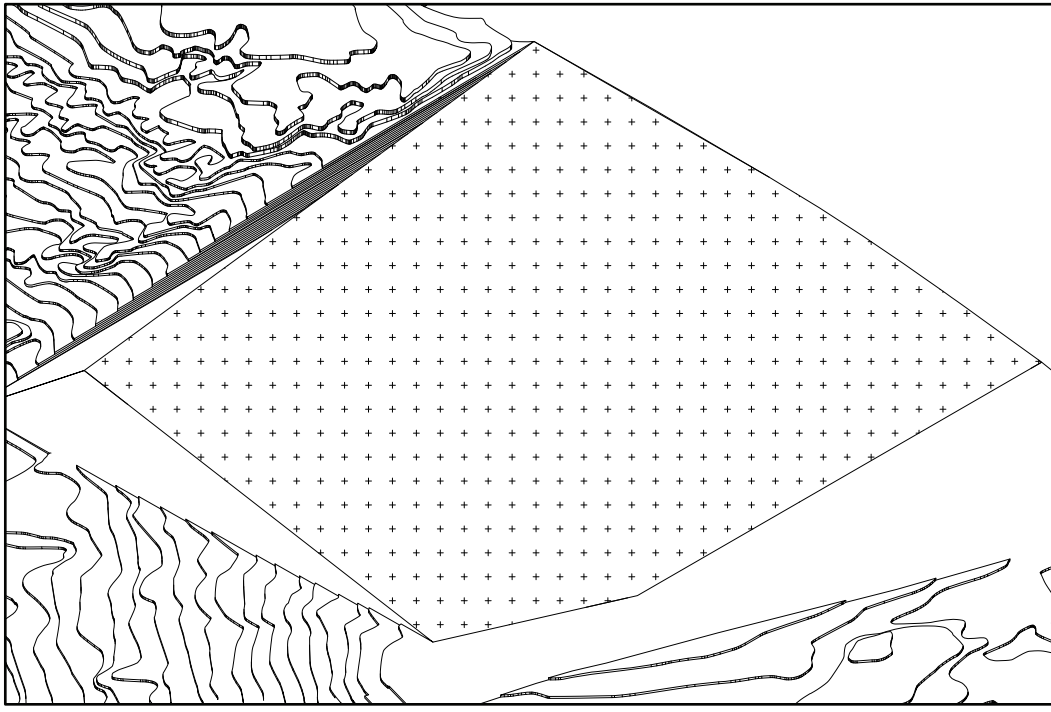


The heart project

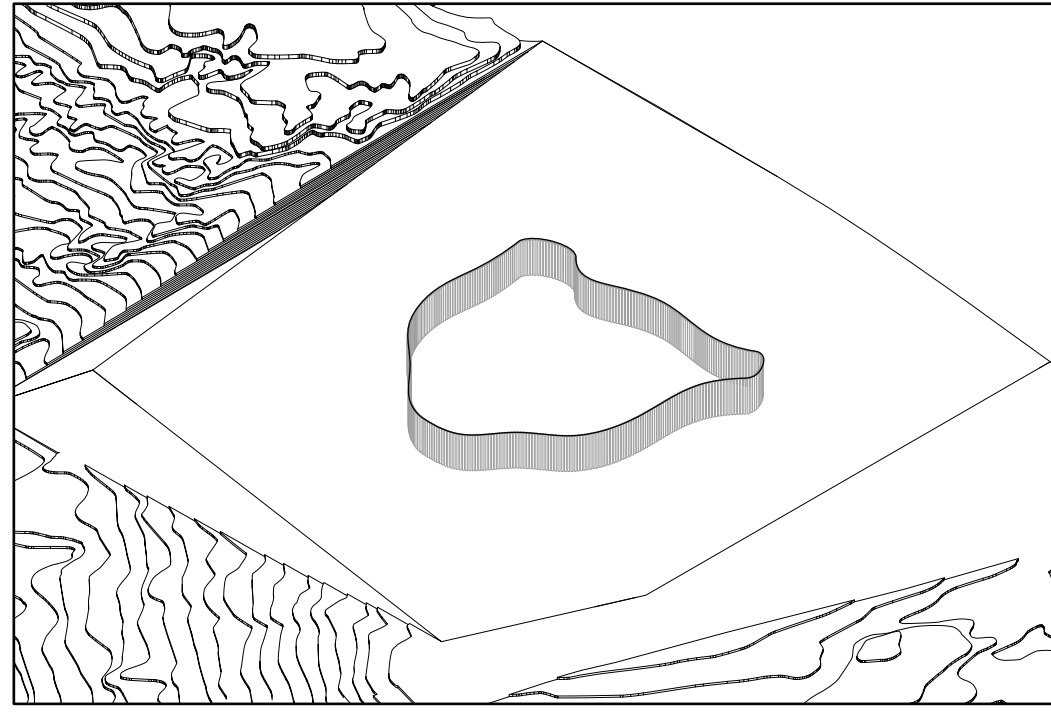
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Construction process

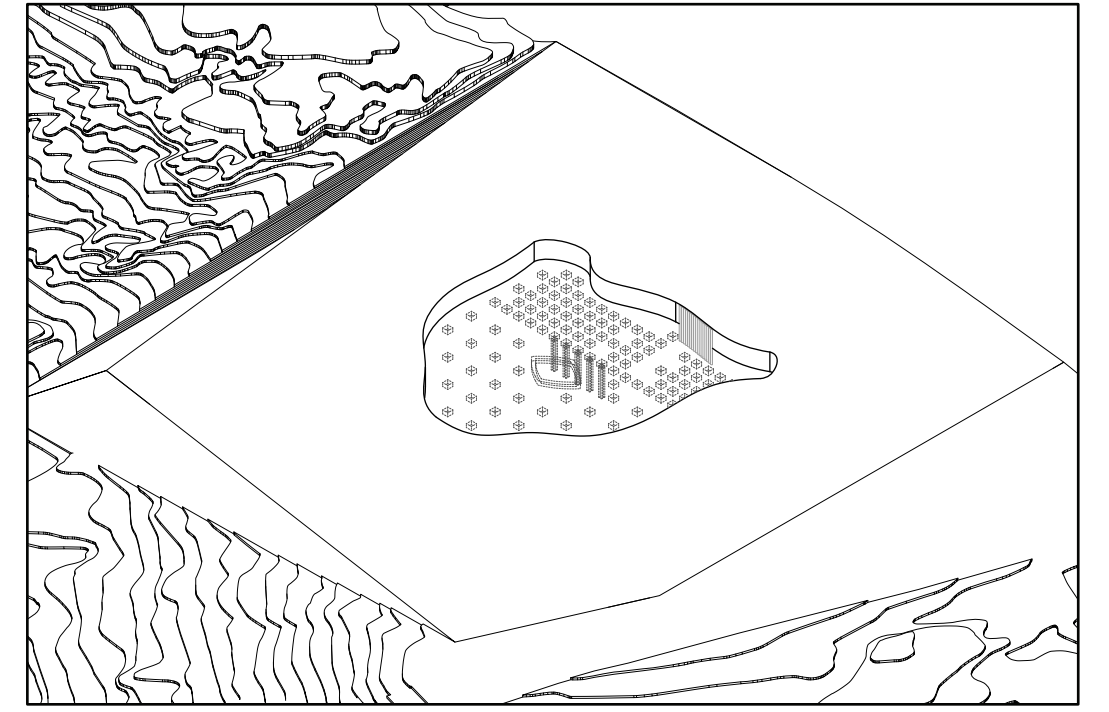
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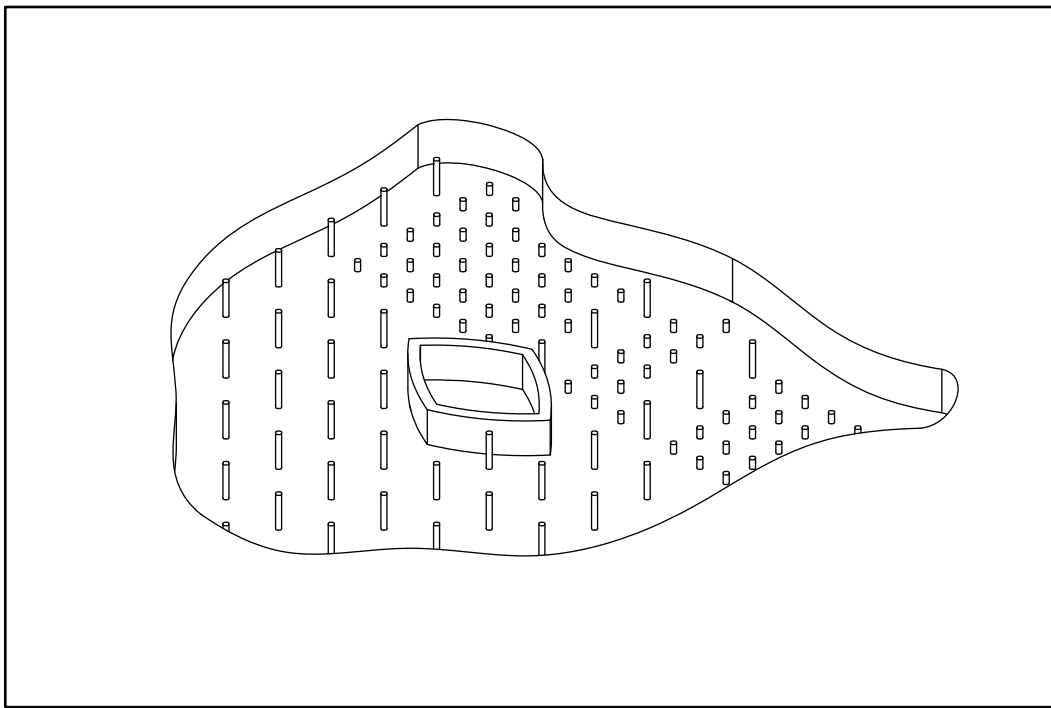
1 Weeding and soil preparation : getting ready the ground so that when the machines come, the plot won't be full of plants and weeds.



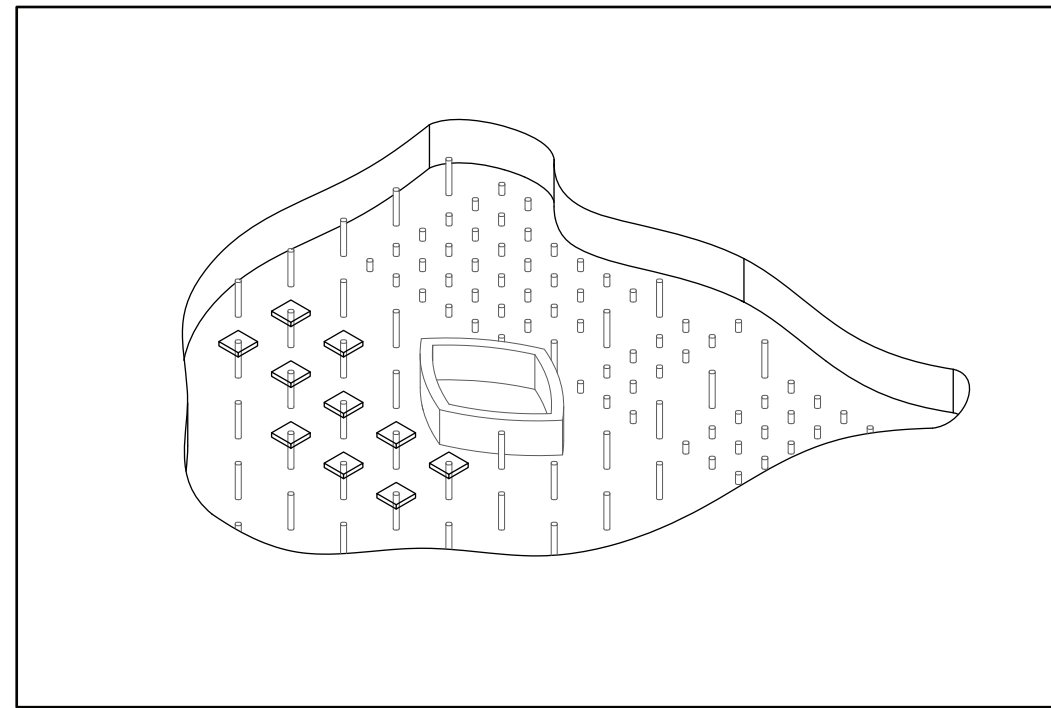
2 Insertion of piles to create the retaining wall to start the excavation of the project.



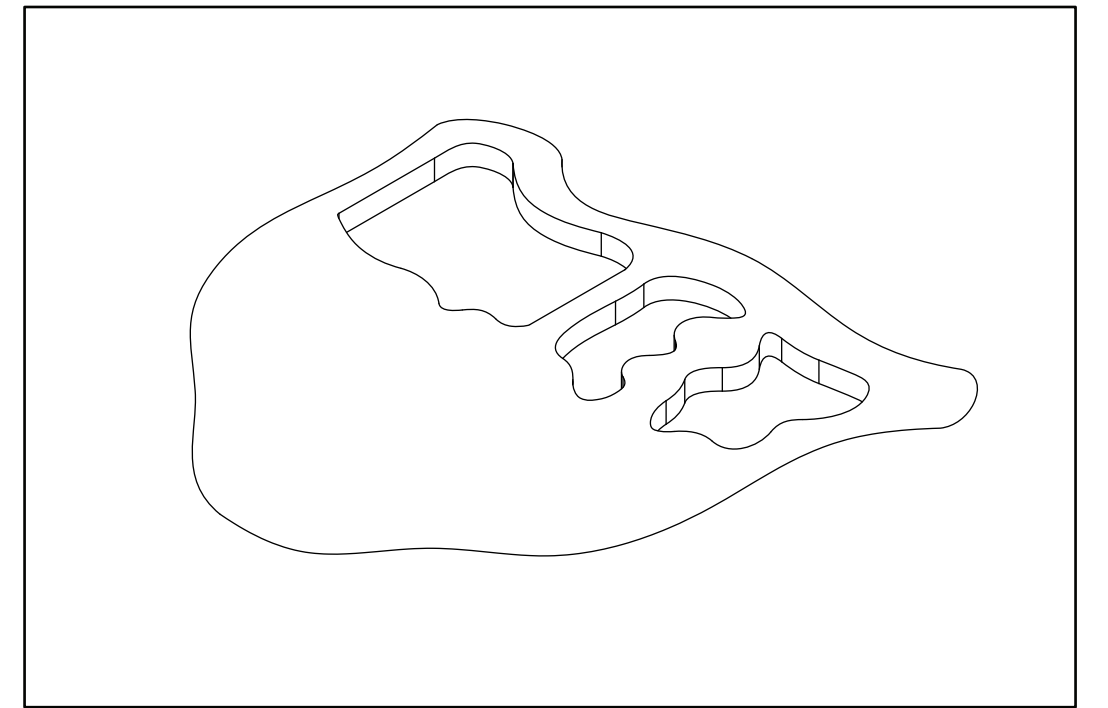
3 Excavation of the foundation , placement of the concrete in the foundation space and the micro piles (4 per foundation). Strip footing for the concrete core.



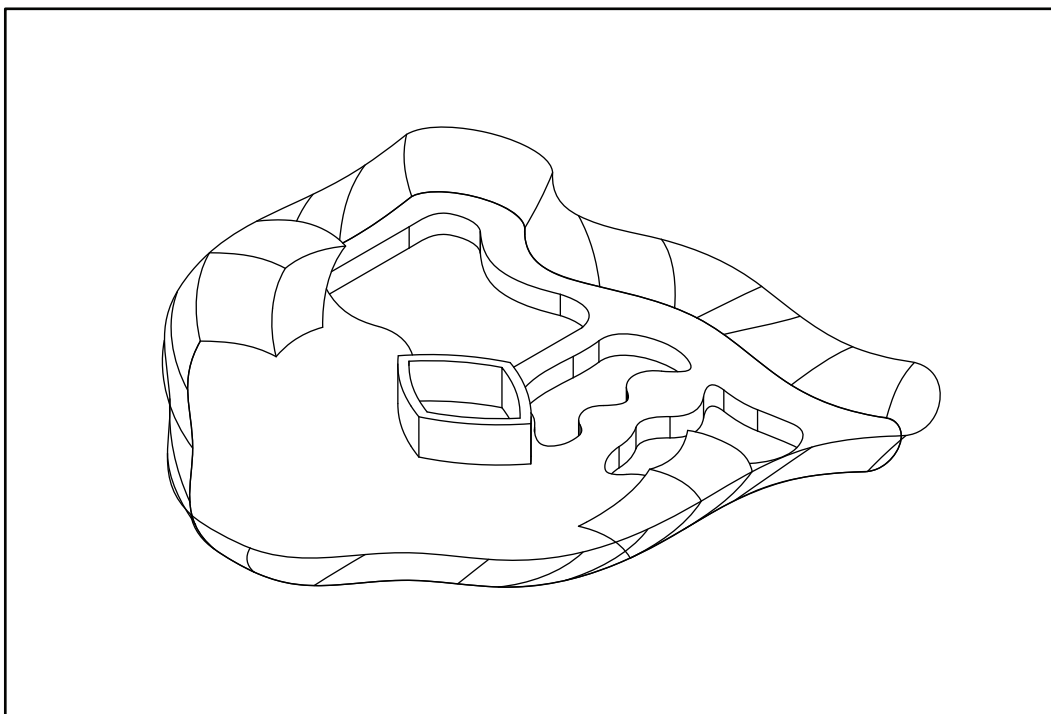
4 Construction of the circular pillars, smaller in the area that supports the pools, with a more dense area due to the weight of the water.



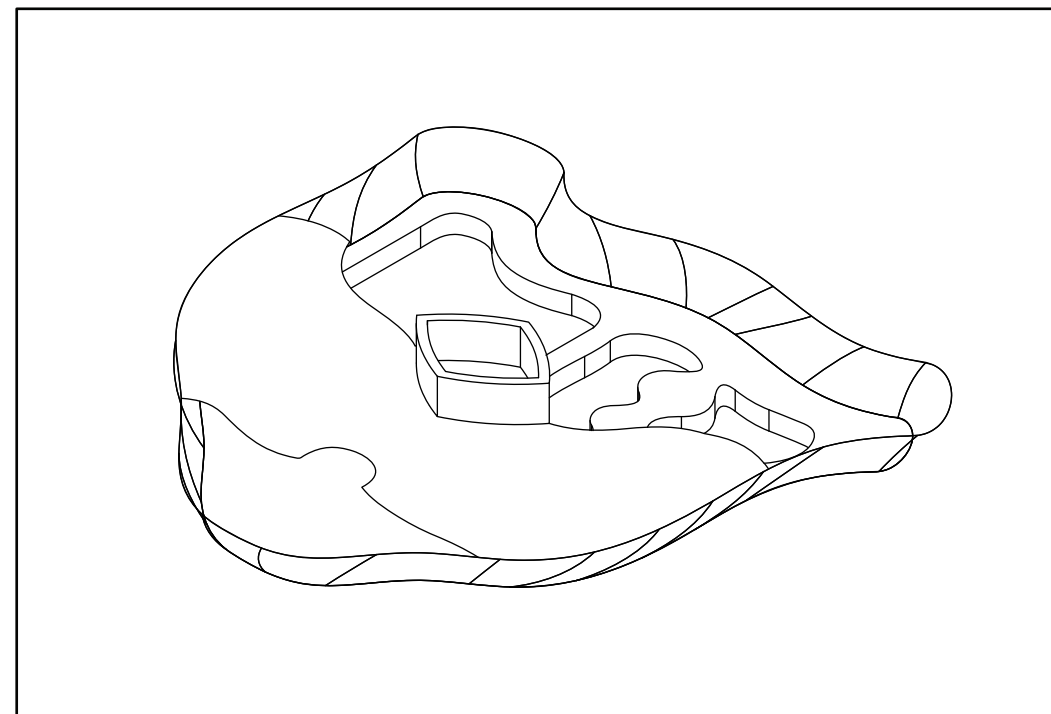
5 Capital at the top of the columns in the waffle slab to avoid punching.



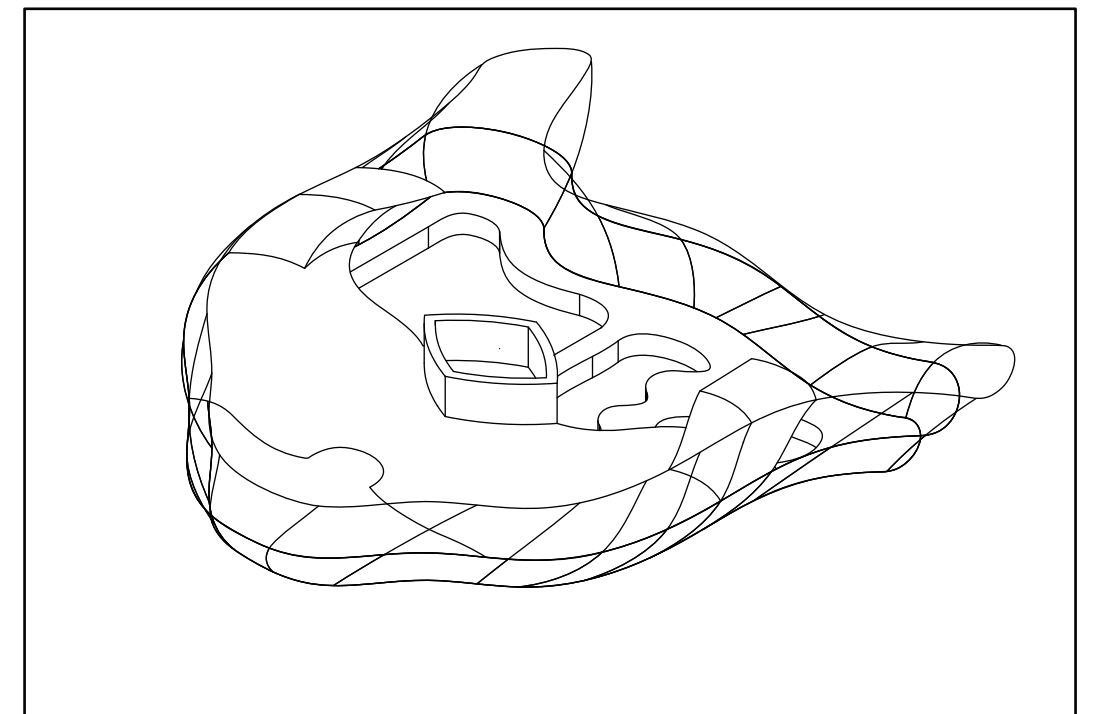
6 Waffle slab with a massive capital for the swimming pools.



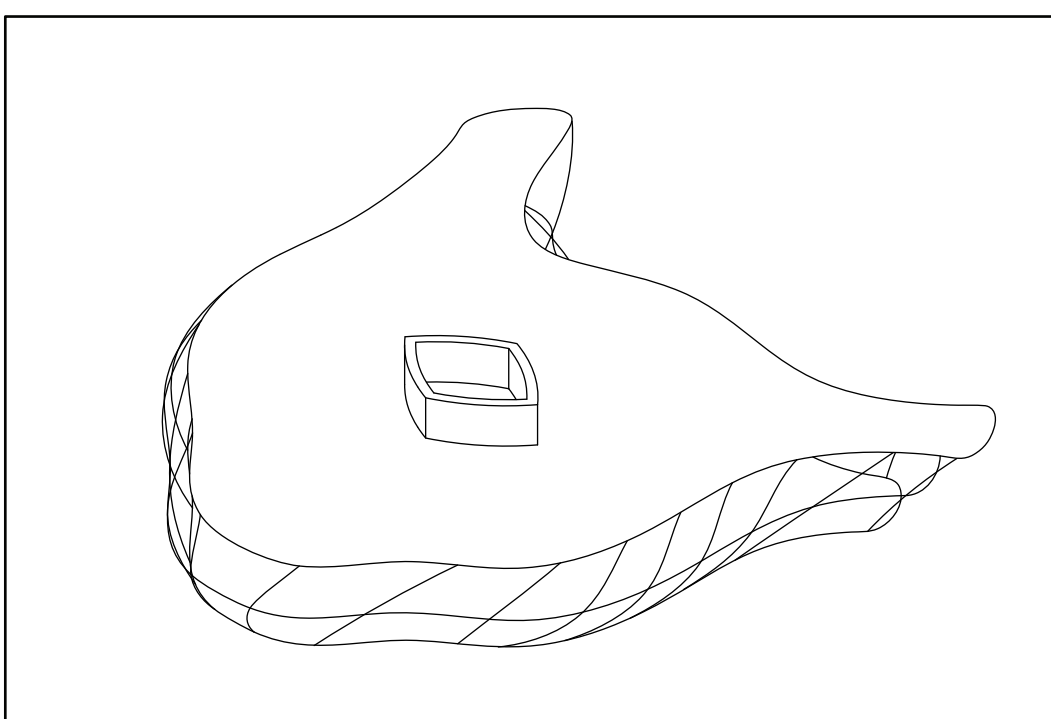
7 Concrete core, walls for the staircases and steel mesh of the ground floor.



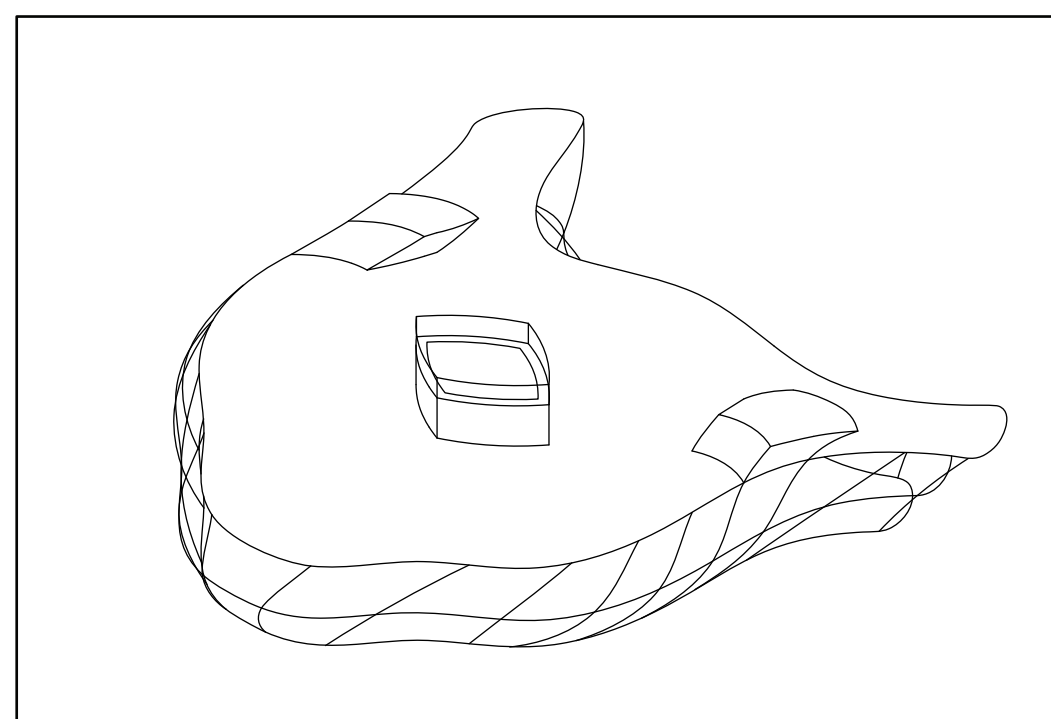
8 Prestressed concrete slab of the first floor.



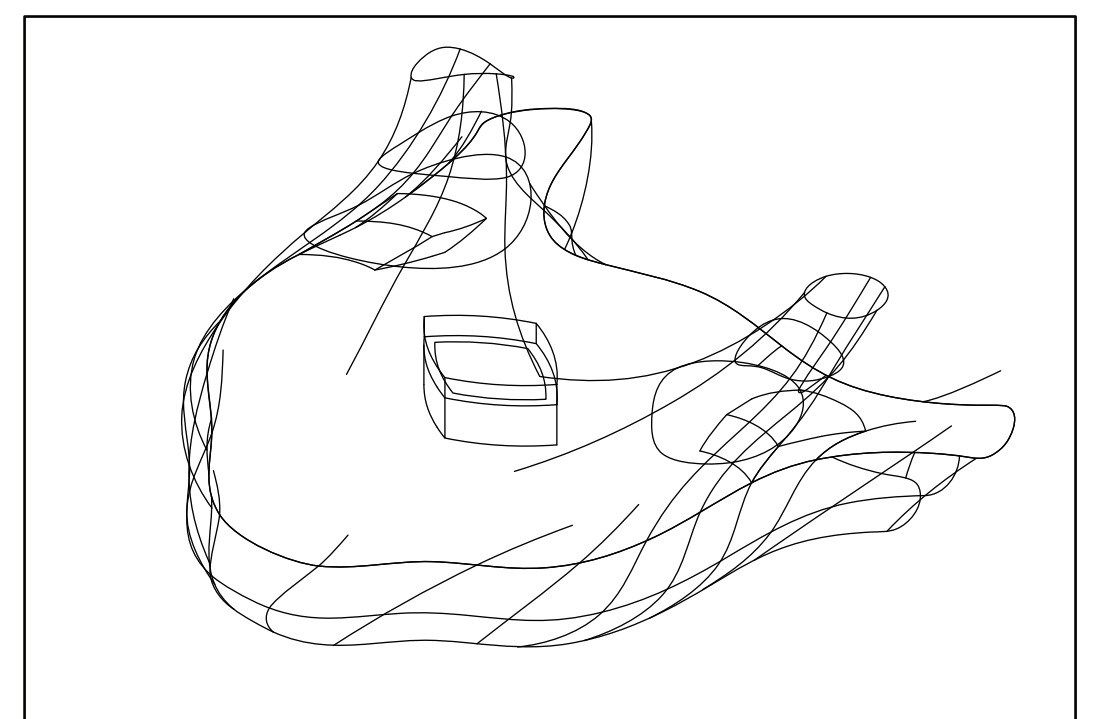
9 Concrete core of the first floor and walls of the staircases of the first floor.



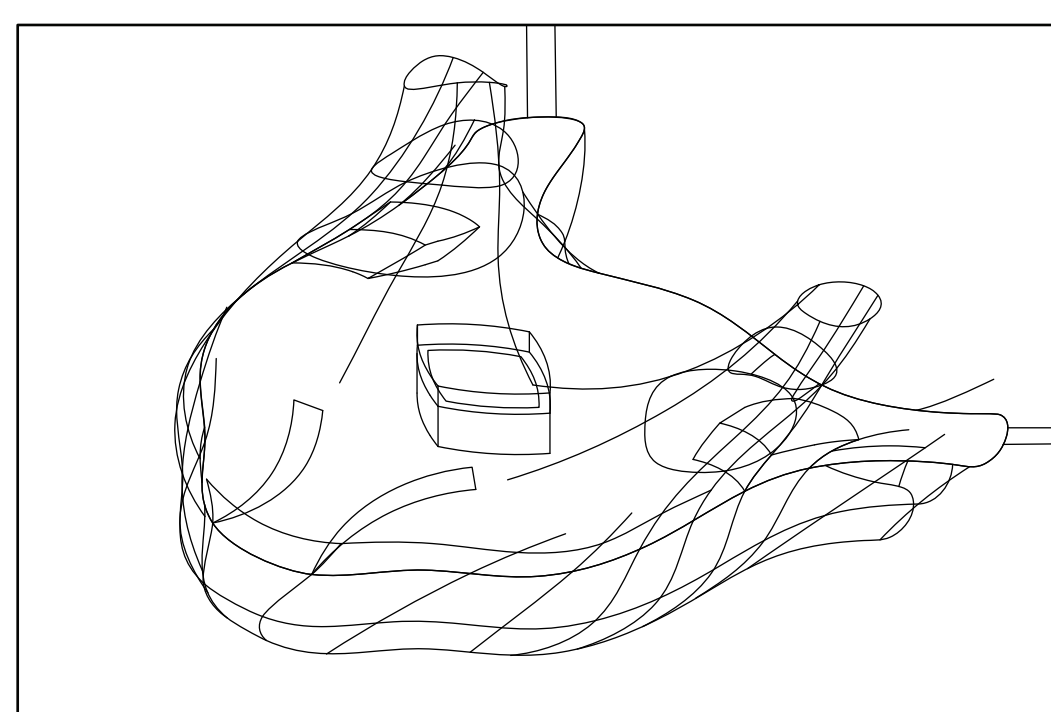
10 Prestressed concrete slab of the rooftop and concrete core



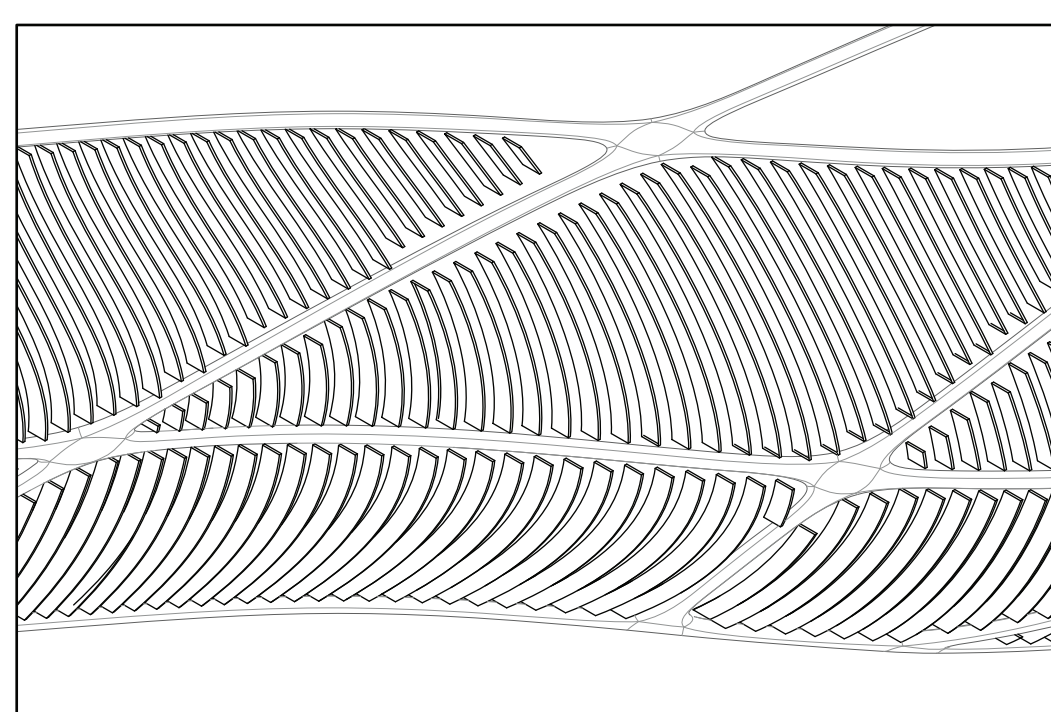
11 Walls of the staircases in the rooftop and upper level of the core where part of the MEP are located



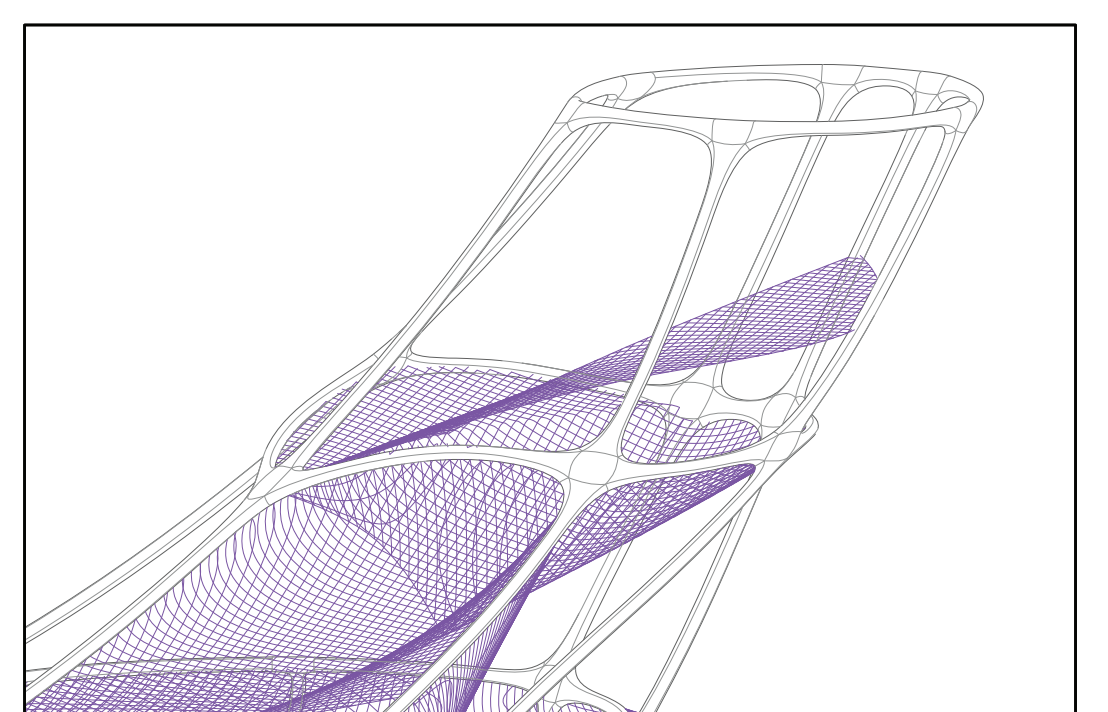
12 Final part of the steel structure with the "arteries" included



13 Joining with the bridges and placement of the meshes in the rooftop



14 Placement of the glulam louvers and glazing facade



15 Placement of the mesh at the top of the building (Arteries)

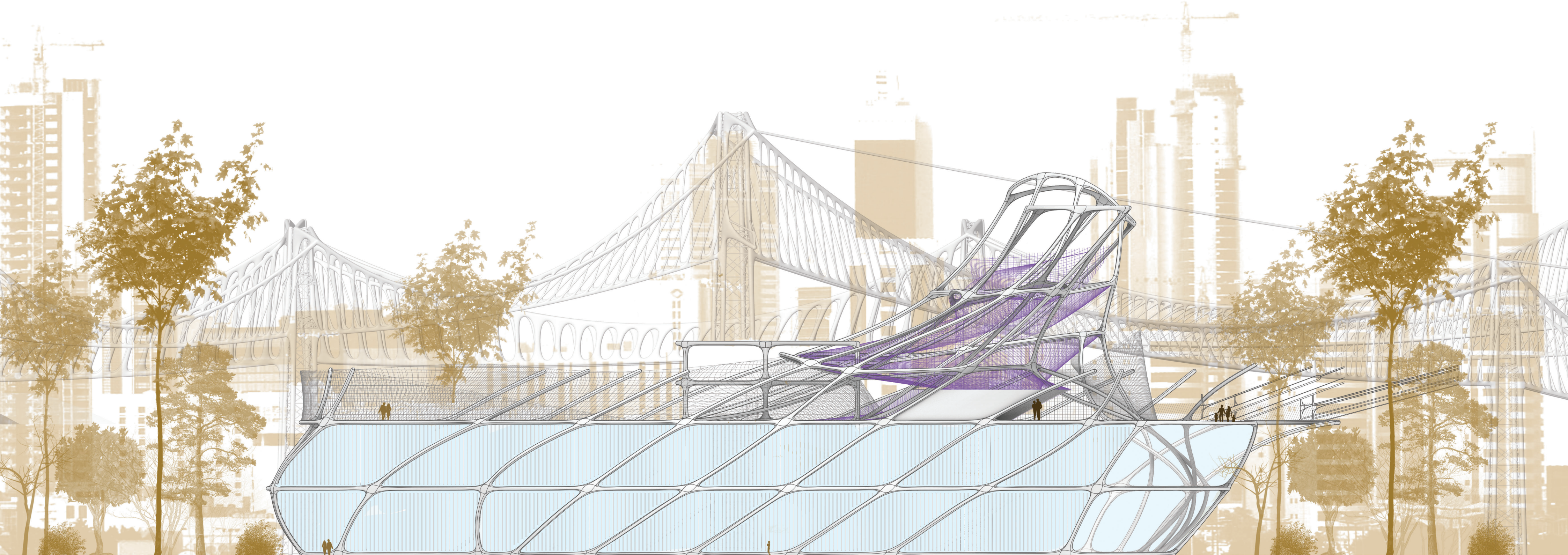
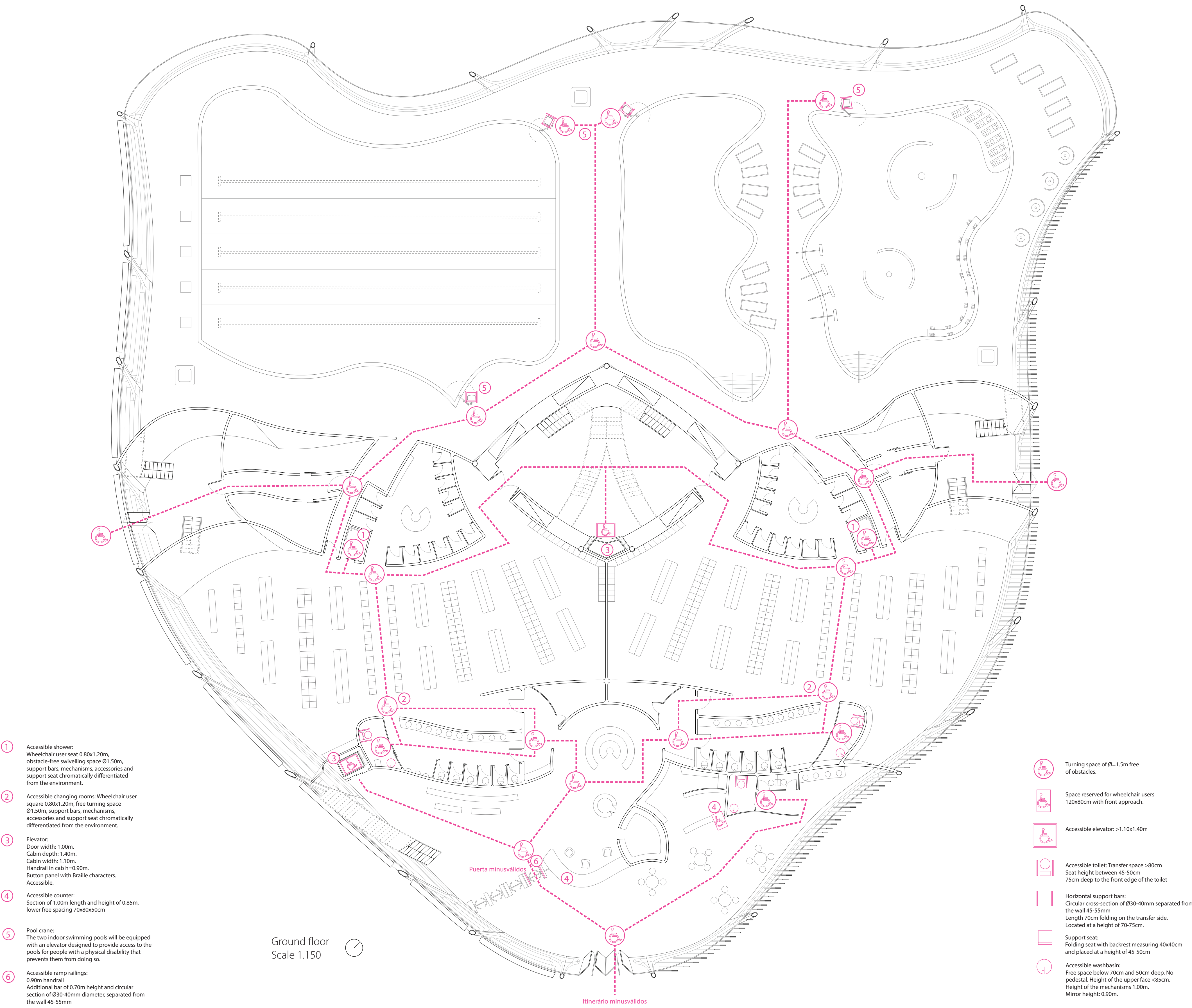


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Ground floor Accessibility
Side view

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Side view (North-east)
Scale 1.200

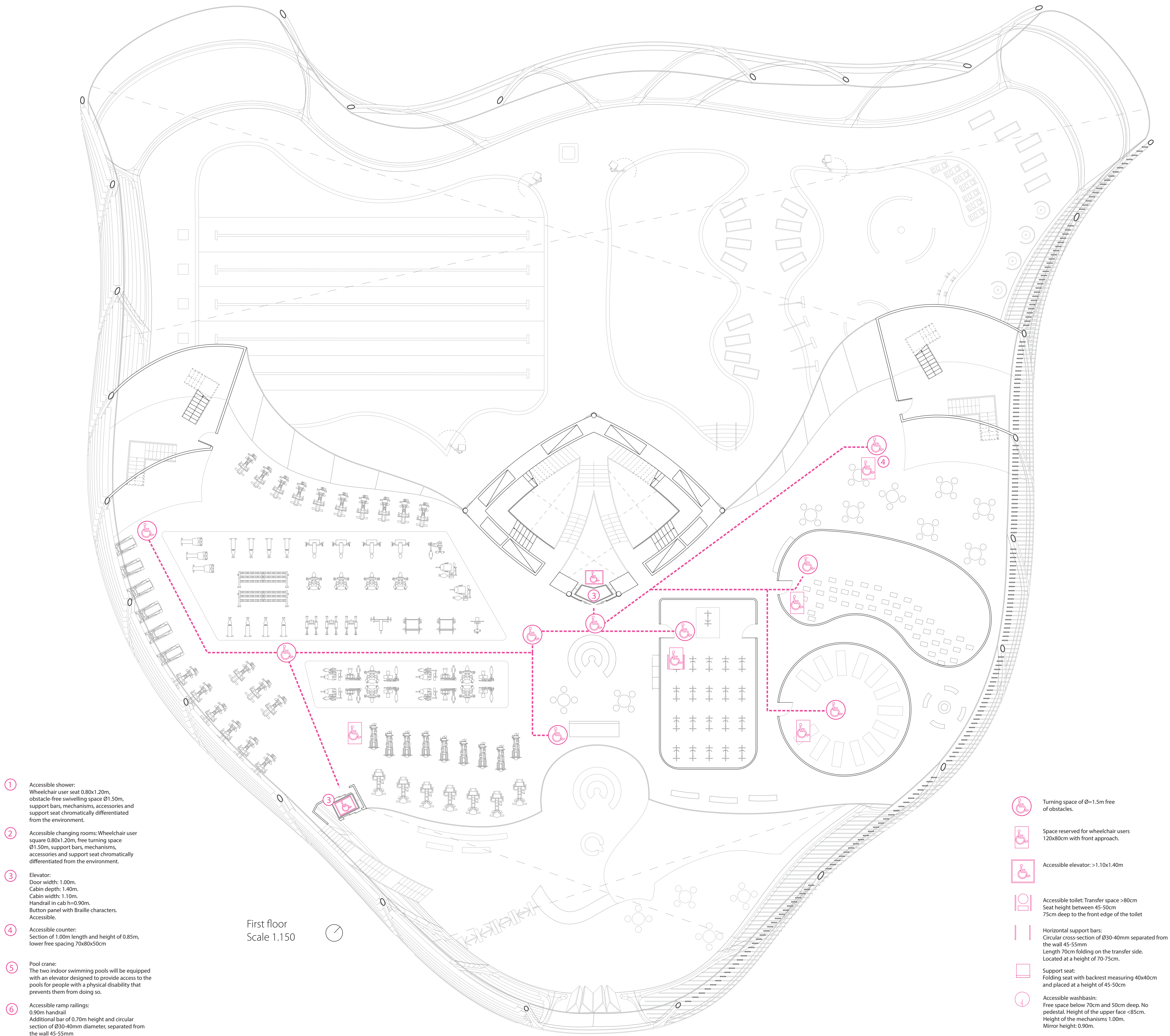


The heart project

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First floor Accessibility
Back view

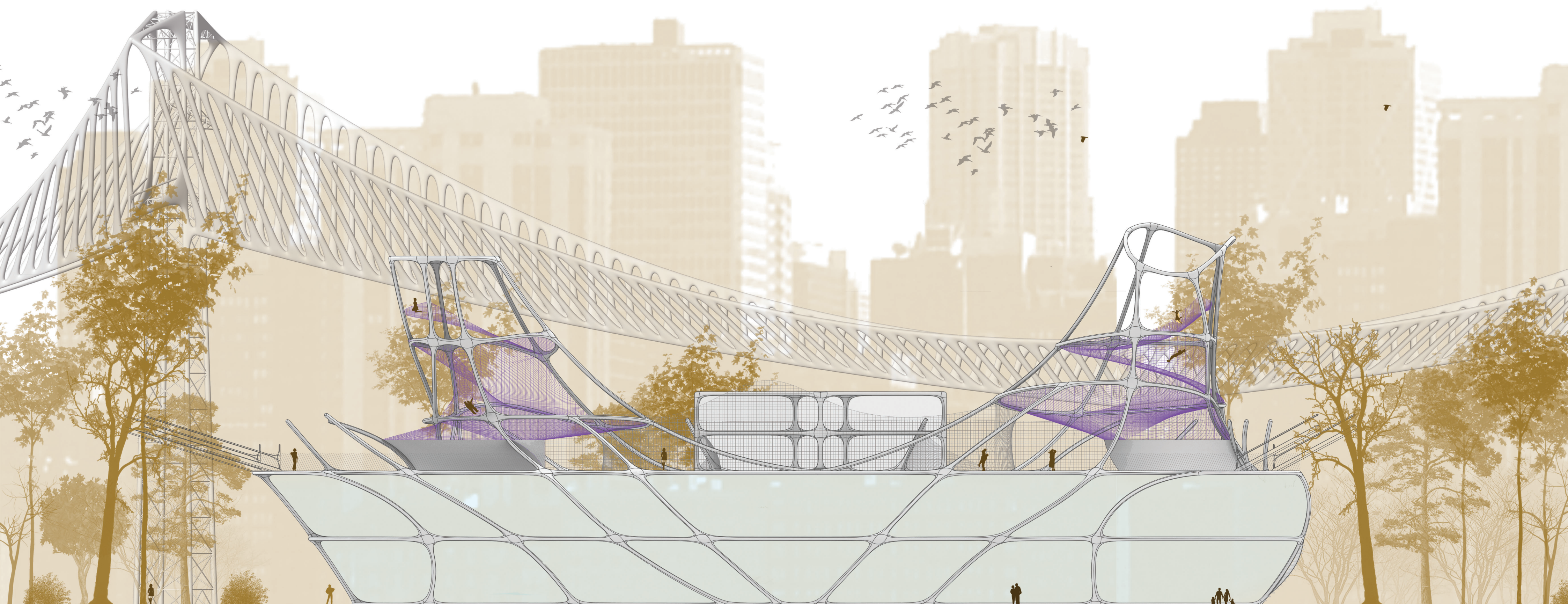
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- 1 Accessible shower:
Wheelchair user seat 0.80x1.20m,
obstacle-free swivelling space Ø1.50m,
support bars, mechanisms, accessories and
support seat chromatically differentiated
from the environment.
- 2 Accessible changing rooms: Wheelchair user
square 0.80x1.20m, free turning space
Ø1.50m, support bars, mechanisms,
accessories and support seat chromatically
differentiated from the environment.
- 3 Elevator:
Door width: 1.00m.
Cabin depth: 1.40m.
Cabin width: 1.10m.
Handrail in cab h=0.90m.
Button panel with Braille characters.
Accessible.
- 4 Accessible counter:
Section of 1.00m length and height of 0.85m,
lower free spacing 70x80x50cm
- 5 Pool crane:
The two indoor swimming pools will be equipped
with an elevator designed to provide access to the
pools for people with a physical disability that
prevents them from doing so.
- 6 Accessible ramp railings:
0.90m handrail
Additional bar of 0.70m height and circular
section of Ø30-40mm diameter, separated from
the wall 45-55mm

First floor
Scale 1.150

- Turning space of Ø=1.5m free
of obstacles.
- Space reserved for wheelchair users
120x80cm with front approach.
- Accessible elevator: >1.10x1.40m
- Accessible toilet: Transfer space >80cm
Seat height between 45-50cm
75cm deep to the front edge of the toilet
- Horizontal support bars:
Circular cross-section of Ø30-40mm separated from
the wall 45-55mm
Length 70cm folding on the transfer side.
Located at a height of 70-75cm.
- Support seat:
Folding seat with backrest measuring 40x40cm
and placed at a height of 45-50cm
- Accessible washbasin:
Free space below 70cm and 50cm deep. No
pedestal. Height of the upper face <85cm.
Height of the mechanisms 1.00m.
Mirror height: 0.90m.



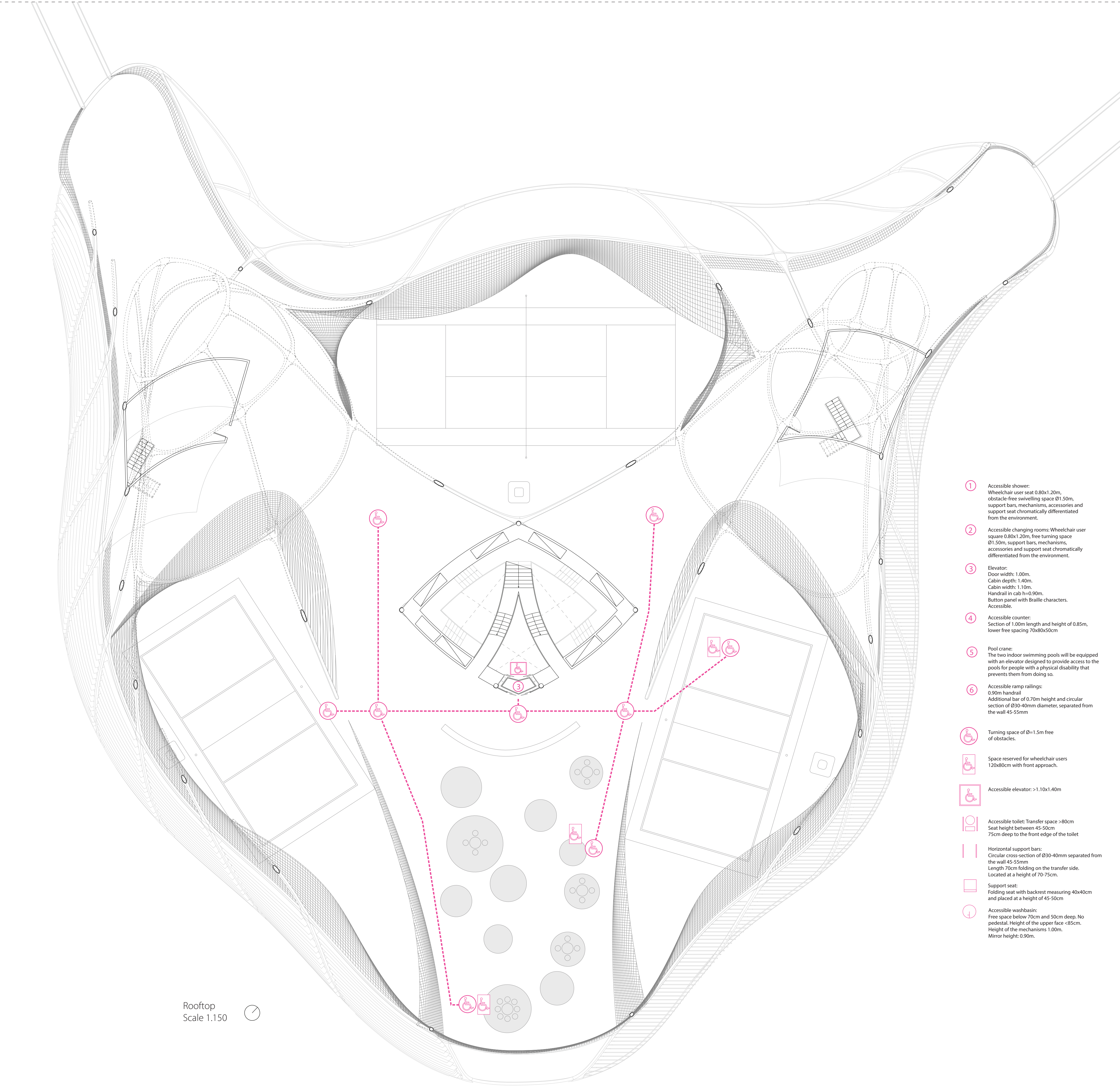


The heart project

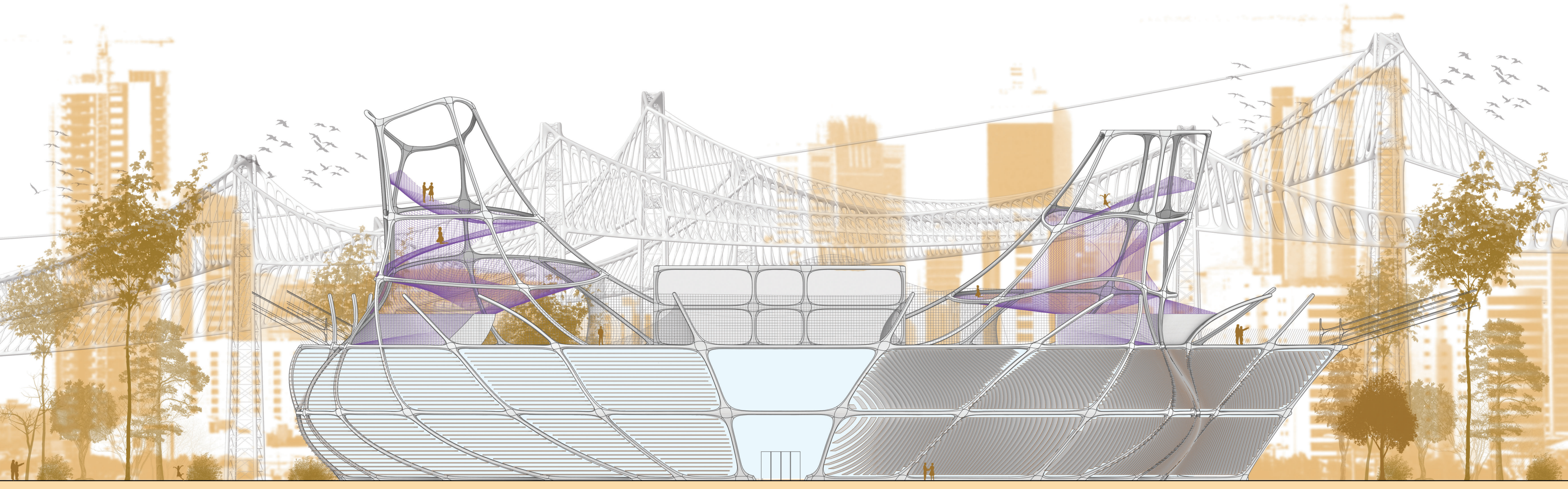
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Rooftop Accessibility
Front elevation

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square 0.80x1.20m, free turning space
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 - 3 Elevator:
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the wall 45-55mm
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120x80cm with front approach.
 - Accessible elevator: >1.10x1.40m
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 - Accessible washbasin:
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pedestal. Height of the upper face <85cm.
Height of the mechanisms 1.00m.
Mirror height: 0.90m.



Front elevation (South-east)
Scale 1.200

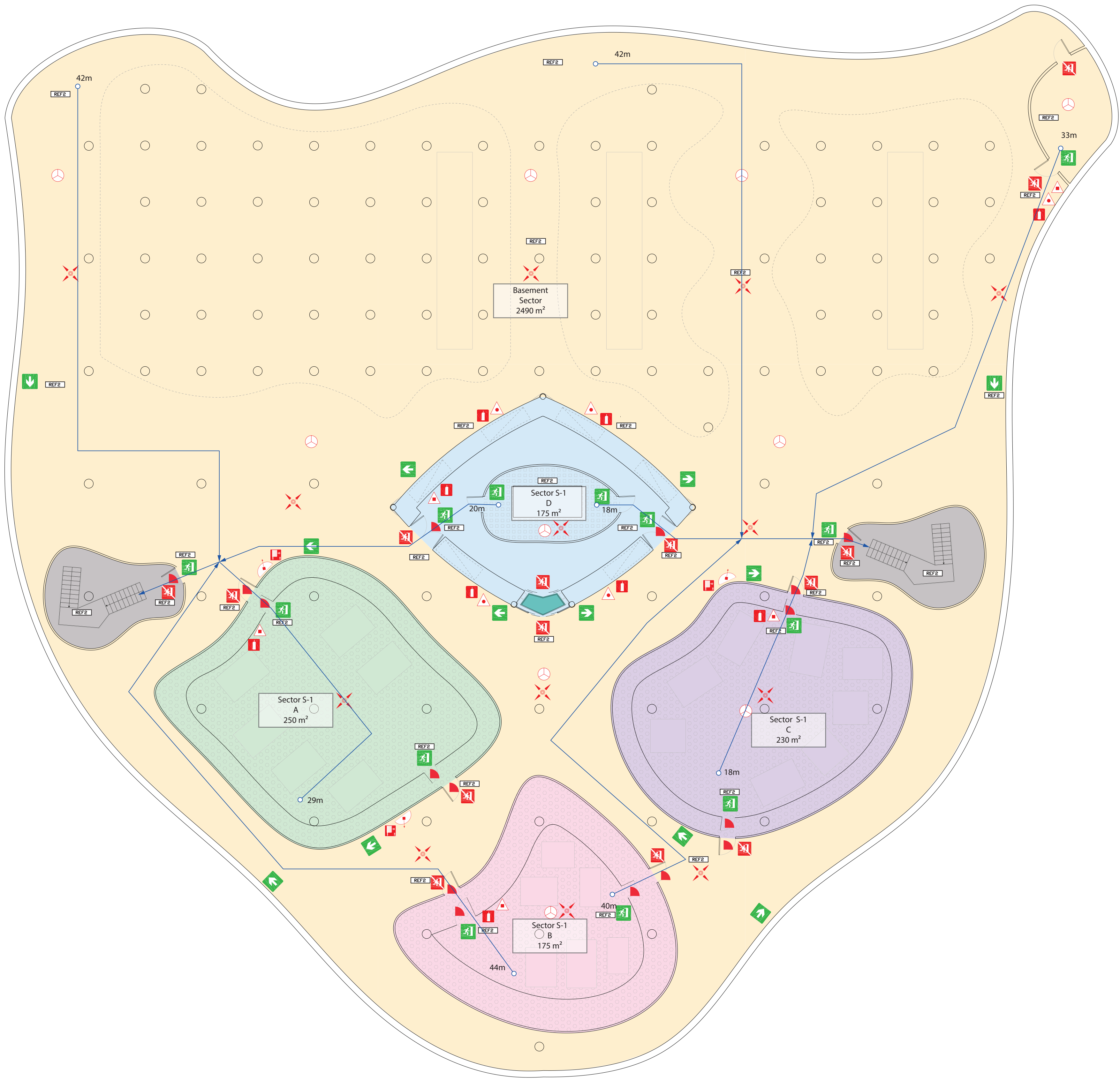


The heart project

Building bridges, joining people

Life safety
Basement

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	Fire extinguisher CO2 89B 5kg	Placed on a vertical wall, with a bottom side at most 1.20 m above the ground.		Equipped fire hydrant	It shall be placed in a visible place on the wall		Emergency lighting HYDRA N5	Emergency lighting HYDRA N5		No Exit	It shall be placed in a visible place above the doors		Access & changing room sector. 2.495m²		Sector S-1 B 175 m²
	Fire extinguisher 21A-113B	Placed on a vertical wall, with a bottom side at most 1.20 m above the ground.		Dry column	Placed on a vertical wall, with the lower side located at a maximum of 1.50 m above the ground.		Sprinkler head	Placed on the ceiling		Do not use in case of emergency	It will be placed in a visible place on the wall, next to the elevator.		SPA/ Pool sector 1.662m²		Sector S-1 C 230 m²
	Fire extinguisher	It shall be placed in a visible place on the wall		Columna Seca	It shall be placed in a visible place on the wall		Exit	It shall be placed in a visible place above the doors		Door FR 90 min			Rooftop sector 2.500m²		Evacuation stairs
	Equipped fire hydrant 25m	Placed on a vertical wall, with the lower side located at a maximum of 1.50 m above the ground.		Smoke Detector	Placed on the ceiling		Emergency exit	It shall be placed in a visible place above the doors		Evacuation route			Basement sector 2.490 m²		Elevator/Lift
	Equipped fire hydrant 15m	Placed on a vertical wall, with the lower side located at a maximum of 1.50 m above the ground.		Audible-luminous warning device	It shall be placed in a visible place on the wall		Direction of travel emergency	It shall be placed in a visible place on the wall		Shelter for the handicapped			Sector S-1 A 250 m²		

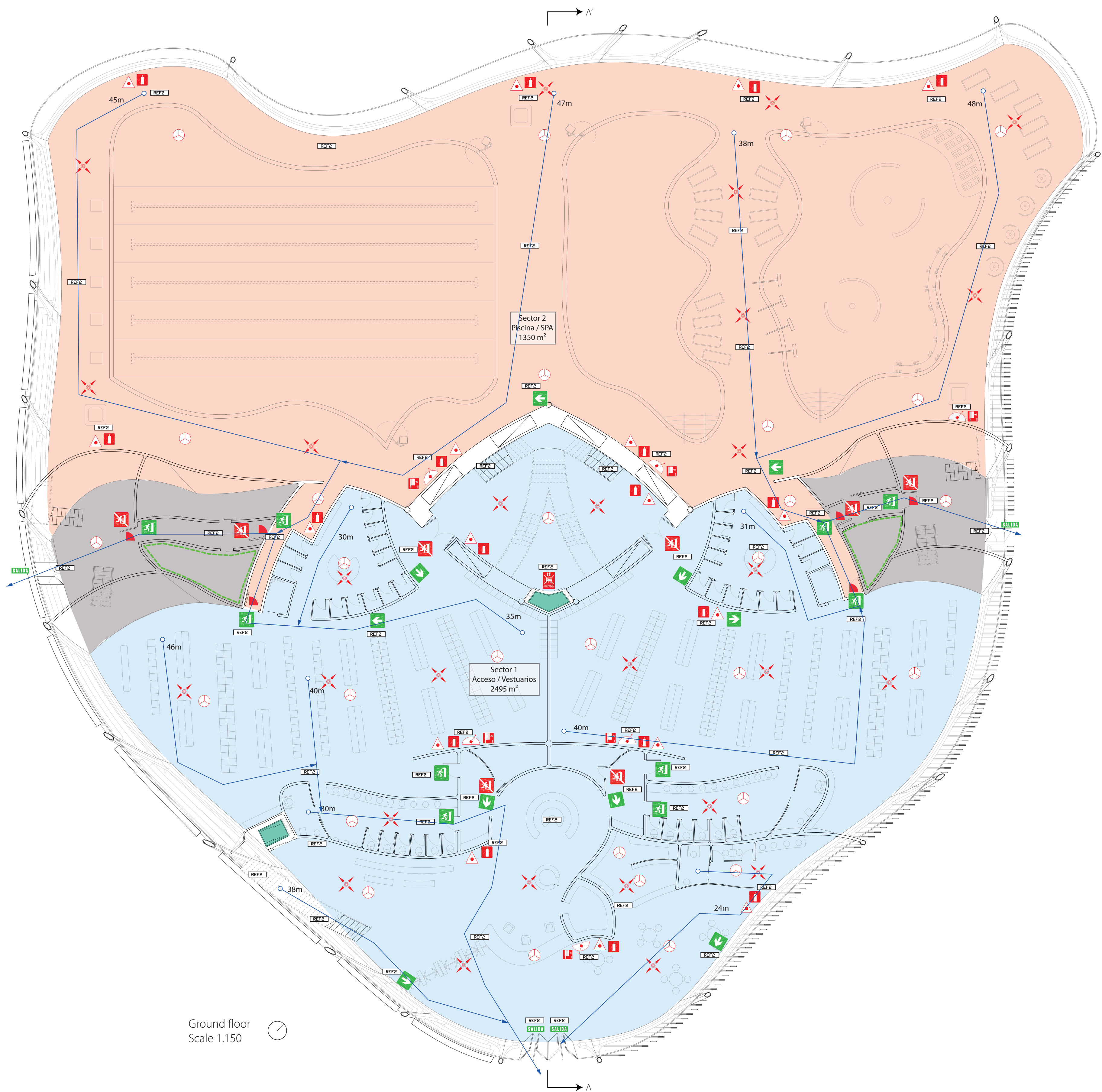


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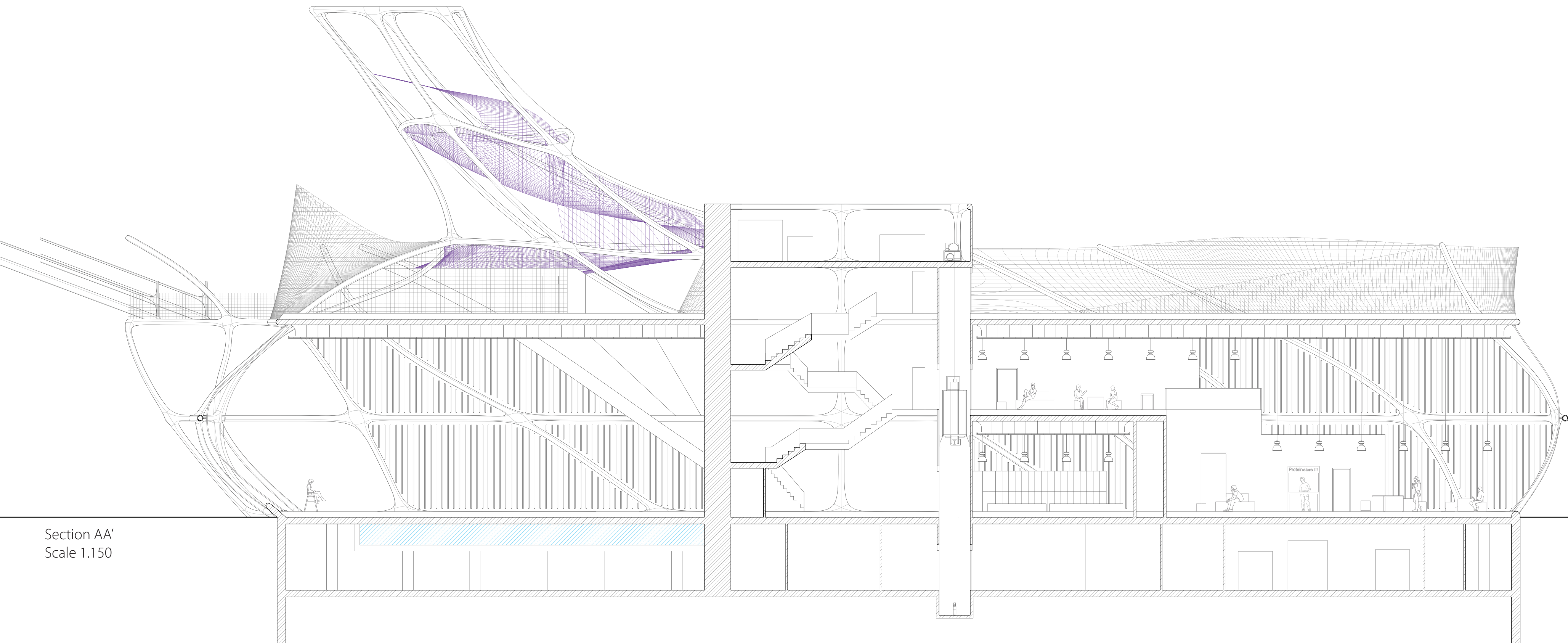
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Lifesafety Ground floor Section

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	Fire extinguisher CO2 89B 5Kg	Placed on a vertical wall, with a bottom side at most 1.20 m above the ground.		Equipped fire hydrant	It shall be placed in a visible place on the wall		Emergency lighting HYDRA N5	Emergency lighting HYDRA N5		No Exit	It shall be placed in a visible place above the doors		Access & changing room sector. 2.495m²		Sector S-1 B 175 m²
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	Equipped fire hydrant 15m	Placed on a vertical wall, with the lower side located at a maximum of 1.50 m above the ground.		Audible-luminous warning device	It shall be placed in a visible place on the wall		Direction of travel emergence	It shall be placed in a visible place on the wall		Shelter for the handicapped			Sector S-1 A 250 m²		



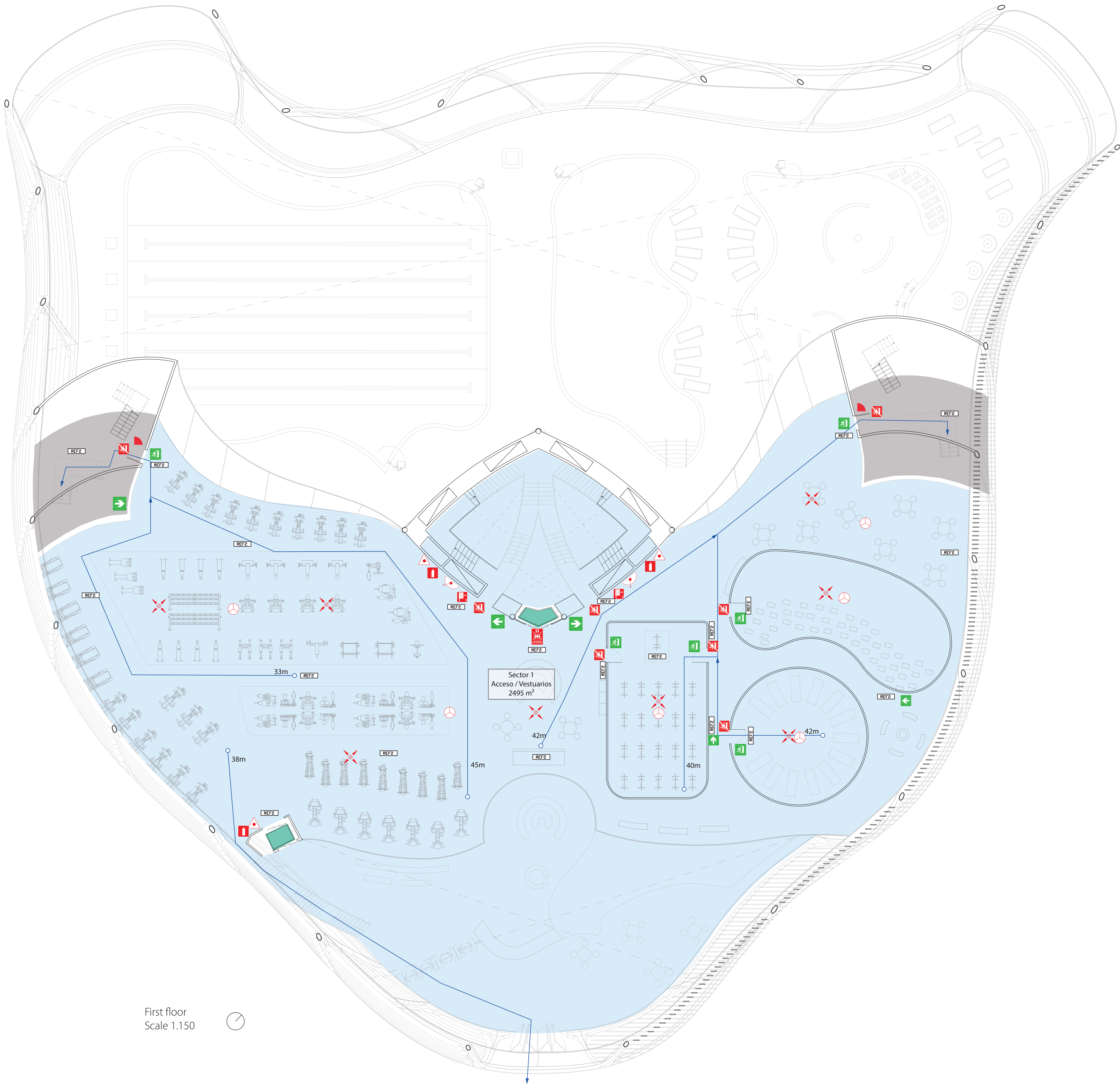


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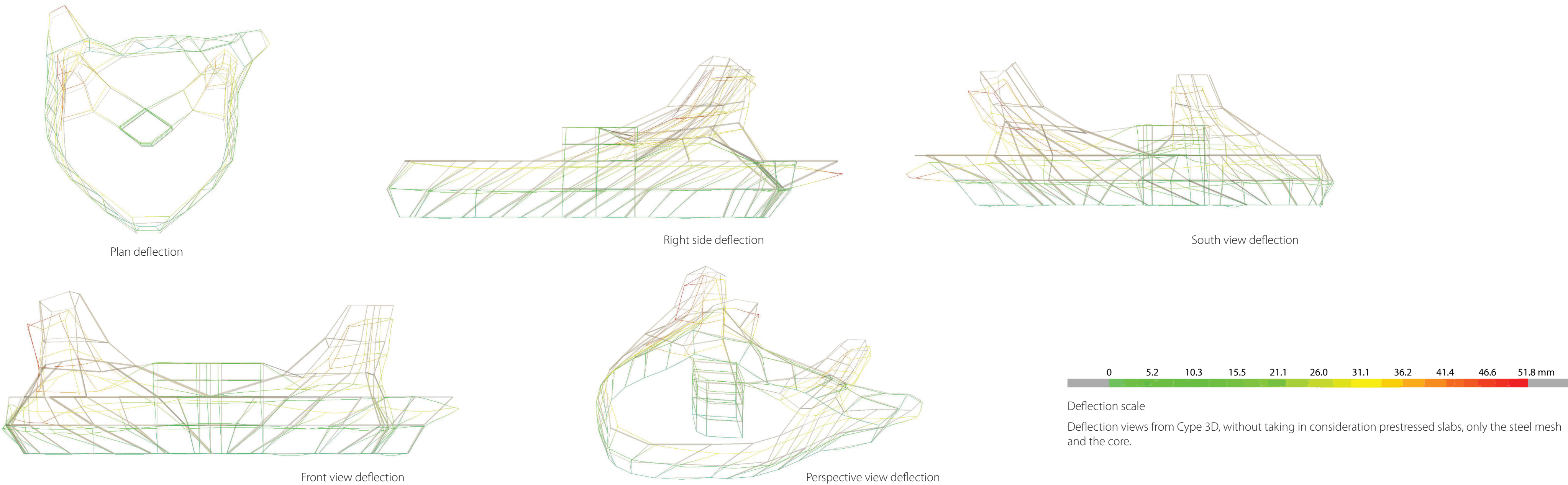
Life safety First floor
Structure deflection diagram

Pablo Diego Pastor
Integrated workshop
Design studio G6 + Technical systems
Professors: Carlos Arroyo & Luis Álvarez



	Fire extinguisher CO2 89B 5kg	Placed on a vertical wall, with a bottom side at most 1.20 m above the ground.		Equipped fire hydrant	It shall be placed in a visible place on the wall		Emergency lighting HYDRANS	Emergency lighting HYDRANS		No Exit	It shall be placed in a visible place above the doors		Access & changing room sector. 2.495m²		Sector S-1 B 175 m²
	Fire extinguisher 21A-113B	Placed on a vertical wall, with a bottom side at most 1.20 m above the ground.		Dry column	Placed on a vertical wall, with the lower side located at a maximum of 1.50 m above the ground.		Sprinkler head	Placed on the ceiling		Do not use in case of emergency	It will be placed in a visible place on the wall, next to the elevator.		SPA/ Pool sector 1.662m²		Sector S-1C 230 m²
	Fire extinguisher	It shall be placed in a visible place on the wall		Columna Seca	It shall be placed in a visible place on the wall		Exit	It shall be placed in a visible place above the doors		Door FR 90 min			Rooftop sector 2.500m²		Evacuation stairs
	Equipped fire hydrant 25m	Placed on a vertical wall, with the lower side located at a maximum of 1.50 m above the ground.		Smoke Detector	Placed on the ceiling		Emergency exit	It shall be placed in a visible place above the doors		Evacuation route			Basement sector 2.490 m²		Elevator/Lift
	Equipped fire hydrant 13m	Placed on a vertical wall, with the lower side located at a maximum of 1.50 m above the ground.		Audible-luminous warning device	It shall be placed in a visible place on the wall		Direction of travel emergence	It shall be placed in a visible place on the wall		Shelter for the handicapped			Sector S-1 A 250 m²		

Structure deflection



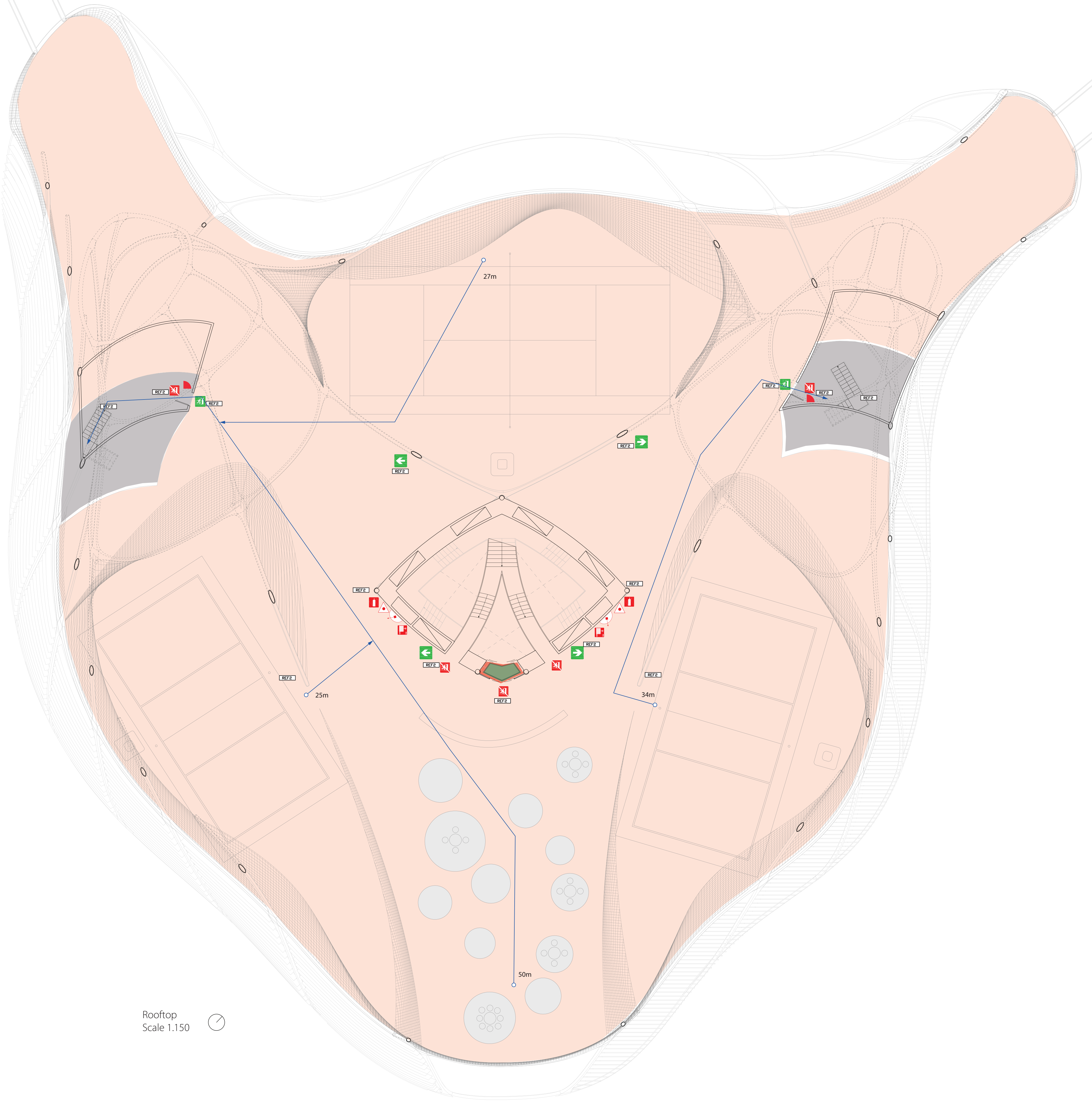


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Life safety
Rooftop

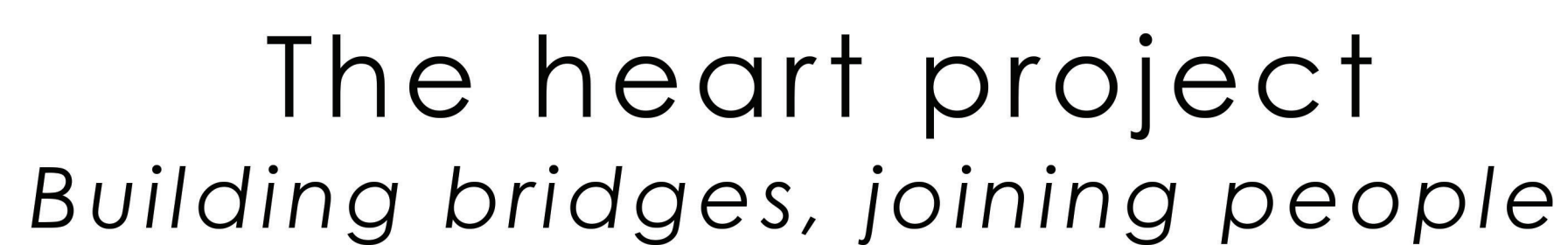
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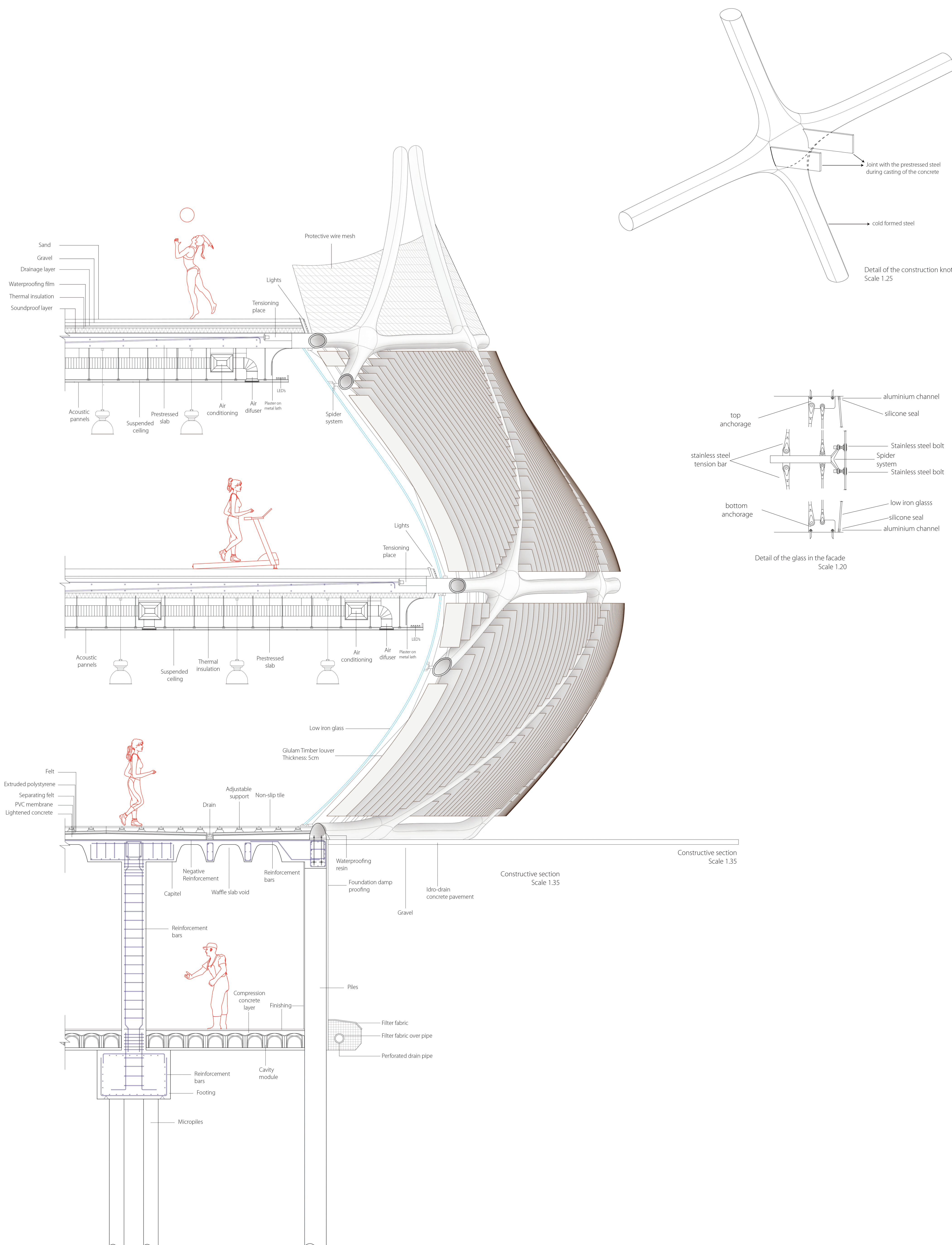
Rooftop
Scale 1.150

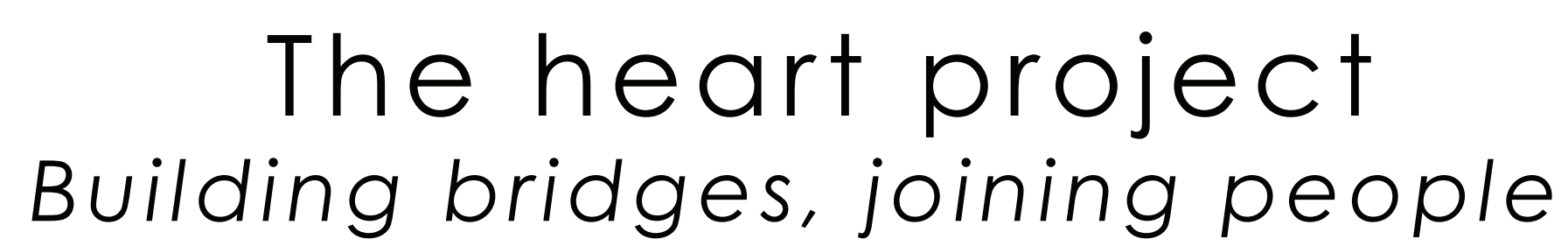


	Fire extinguisher CO2 89B 5Kg	Placed on a vertical wall, with a bottom side at most 1.20 m above the ground.		Equipped fire hydrant	It shall be placed in a visible place on the wall		Emergency lighting HYDRA N5	Emergency lighting HYDRA N5		No Exit	It shall be placed in a visible place above the doors		Access & changing room sector. 2.495m²		Sector S-1 B 175 m²
	Fire extinguisher 21A-113B	Placed on a vertical wall, with a bottom side at most 1.20 m above the ground.		Dry column	Placed on a vertical wall, with the lower side located at a maximum of 1.50 m above the ground.		Sprinkler head	Placed on the ceiling		Do not use in case of emergency	It will be placed in a visible place on the wall, next to the elevator.		SPA/ Pool sector 1.662m²		Sector S-1C 230 m²
	Fire extinguisher	It shall be placed in a visible place on the wall		Columna Seca	It shall be placed in a visible place on the wall		Exit	It shall be placed in a visible place above the doors		Door FR 90 min			Rooftop sector 2.500m²		Evacuation stairs
	Equipped fire hydrant 25m	Placed on a vertical wall, with the lower side located at a maximum of 1.50 m above the ground.		Smoke Detector	Placed on the ceiling		Emergency exit	It shall be placed in a visible place above the doors		Evacuation route			Basement sector 2.490 m²		Elevator/Lift
	Equipped fire hydrant 15m	Placed on a vertical wall, with the lower side located at a maximum of 1.50 m above the ground.		Audible-luminous warning device	It shall be placed in a visible place on the wall		Direction of travel emergence	It shall be placed in a visible place on the wall		Shelter for the handicapped			Sector S-1 A 250 m²		



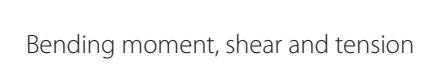
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Structure basement
Footings with micropiles

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Shear

 Tension

■ Bending moment

*Approach to the structural analysis due to the modification of the mesh in order to make the analysis

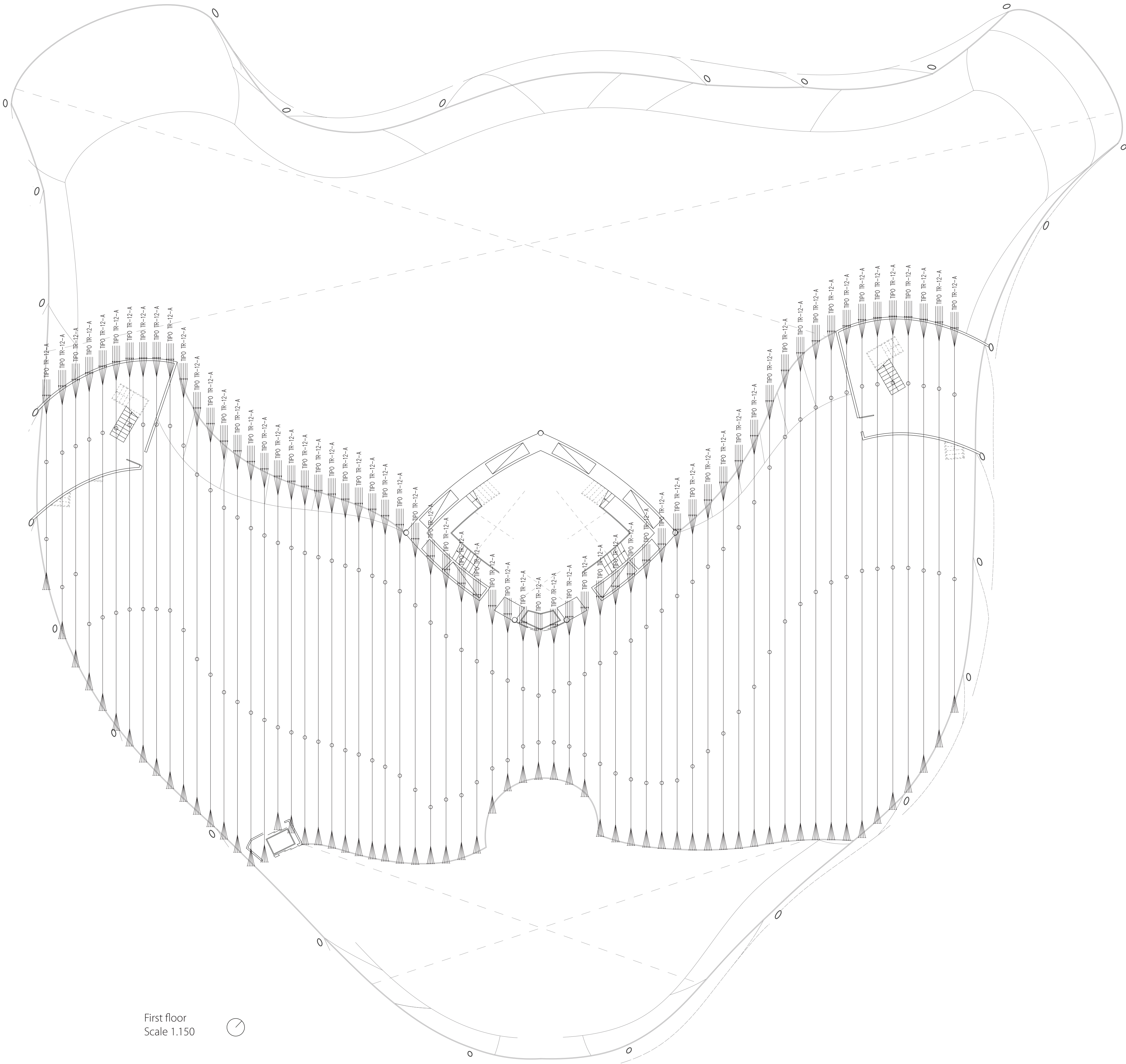


The heart project

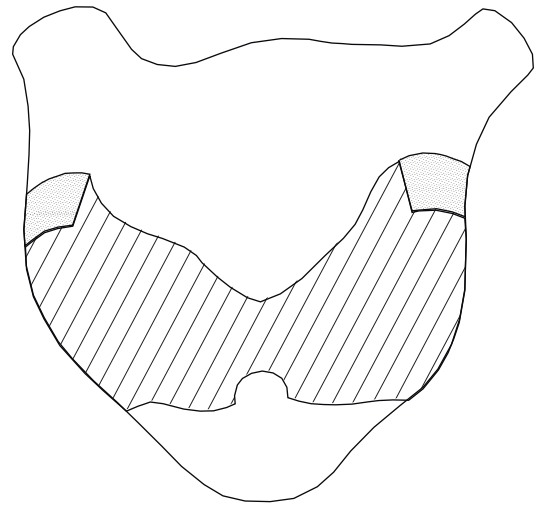
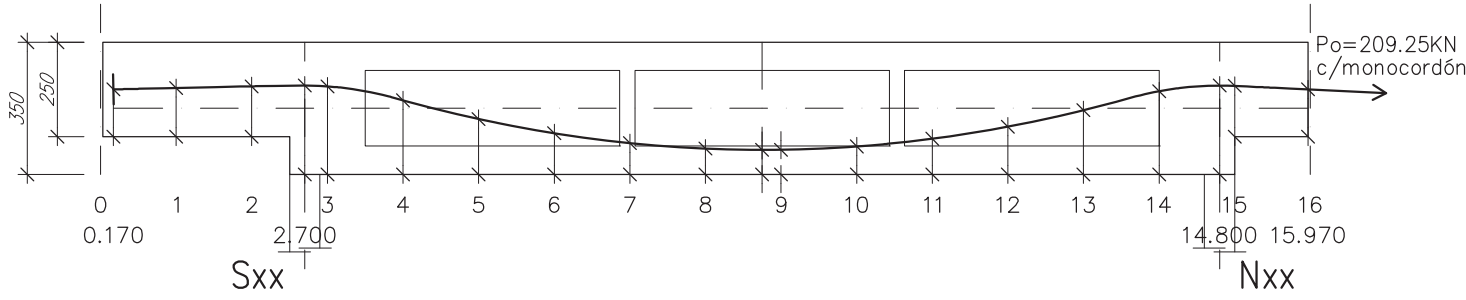
Building bridges, joining people

Structure first floor
Prestressed slab

Pablo Diego Pastor
Integrated workshop
Design studio G6 + Technical systems
Professors: Carlos Arroyo & Luis Álvarez

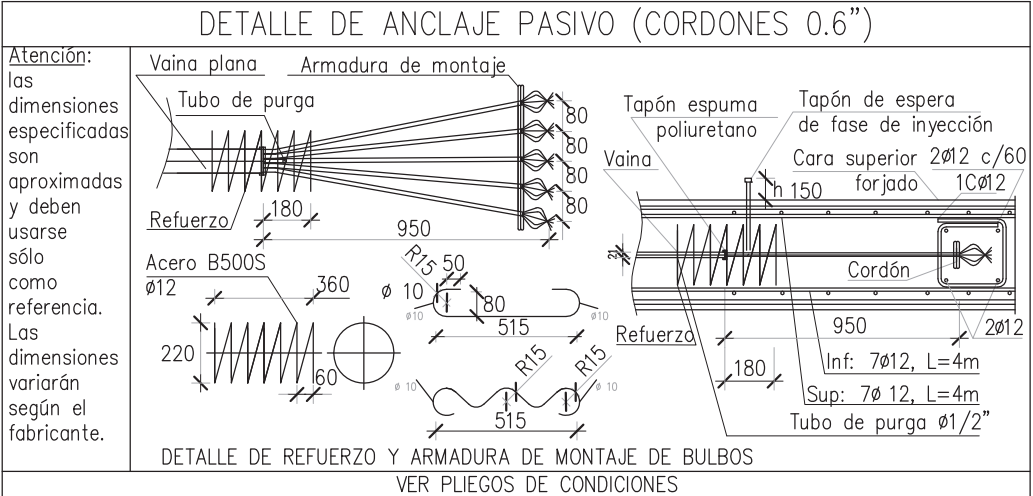
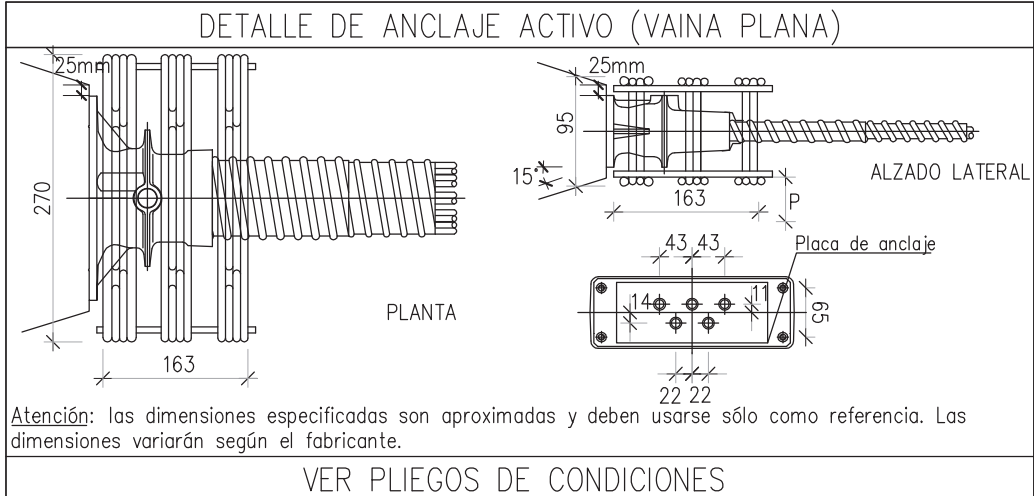


Trazado tipo TR-11-A
E 1/100 horizontal



CARACTERÍSTICAS DEL FORJADO	
ZONA: Gymnasio	
Tipo de forjado:	LOSA ALIGERADA
Canto:	35 cm
Estado de cargas:	
Peso propio:	6.80 kN/m ²
Cargas permanentes:	3.50 kN/m ²
Sobrecarga de uso:	2.00 kN/m ²
Sobrecarga de nieve:	0.00 kN/m ²
TOTAL:	12.30 kN/m ²
Carga concentrada	2.00 kN
En el plano sólo se representan los refuerzos	
Armadura básica de la losa:	
Armadura básica superior:	#108c/20
Armadura básica inferior:	#1010c/20

CARACTERÍSTICAS DEL FORJADO	
ZONA: Relanos de escalera	
Tipo de forjado:	LOSA
Canto:	35 cm
Estado de cargas:	
Peso propio:	8.75 kN/m ²
Cargas permanentes:	3.50 kN/m ²
Sobrecarga de uso:	3.00 kN/m ²
Sobrecarga de nieve:	0.00 kN/m ²
TOTAL:	15.25 kN/m ²
Carga concentrada	2.00 kN
En el plano sólo se representan los refuerzos	
Armadura básica de la losa:	
Armadura básica superior:	#108c/20
Armadura básica inferior:	#1010c/20



NOTAS REFERENTES AL POSTESADO DE TENDONES ADHERENTES	
ORDEN DE TESADO:	
- Resistencia mínima del hormigón antes de proceder al postesado de 24.5N/mm ²	
- Tesar secuencialmente los tendones.	
- Doblar las esperas de las ventanas de tesado.	
- Hormigonar ventanas de tesado previa verificación de contraflecha y posterior inyección de mortero.	
MATERIALES:	
- Acero según UNE 10138-3	
- Cemento para la inyección CEM I clase 42.5	
- Coeficiente de rozamiento angular asumido $\mu=0.22$	
- Coeficiente de rozamiento recto asumido $\mu=0.0025$	
- La lechada de inyección deberá de cumplir con las especificaciones del artículo 35.4 de la EHE-08	
y especificaciones de los plegos.	
- Relación A/C de la lechada ≤ 0.44	
- El tipo de vaina deberá de aprobarse por la DF en obra.	

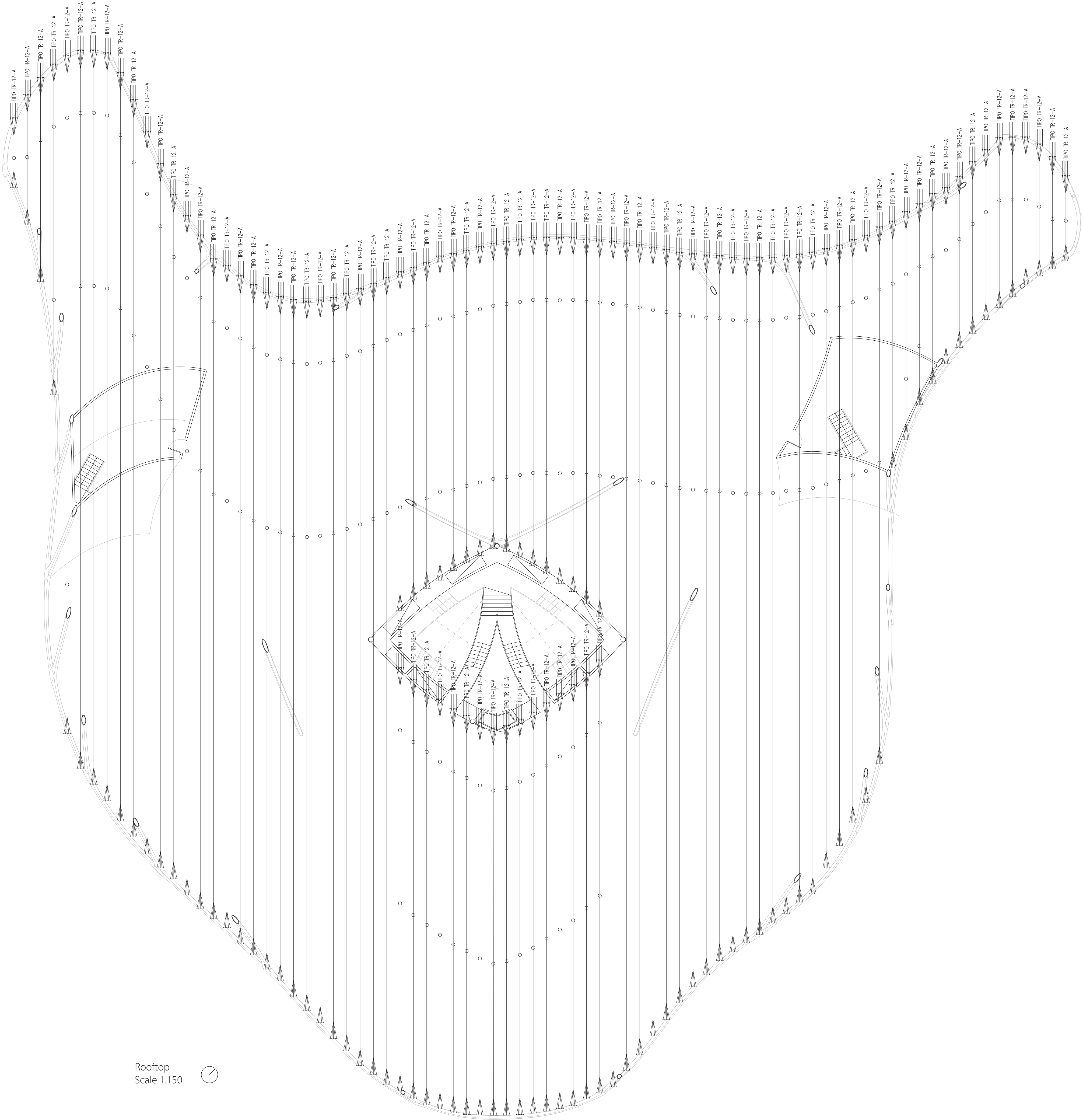


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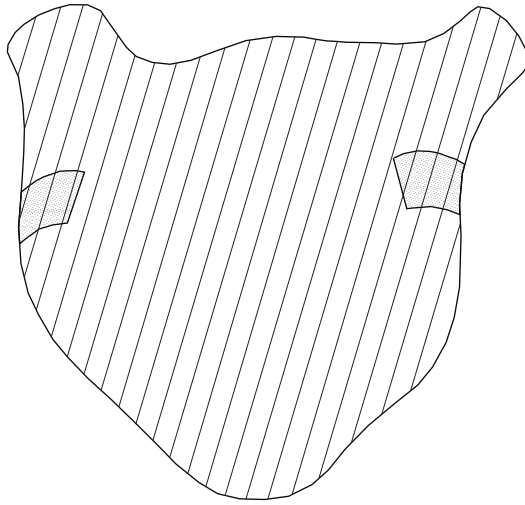
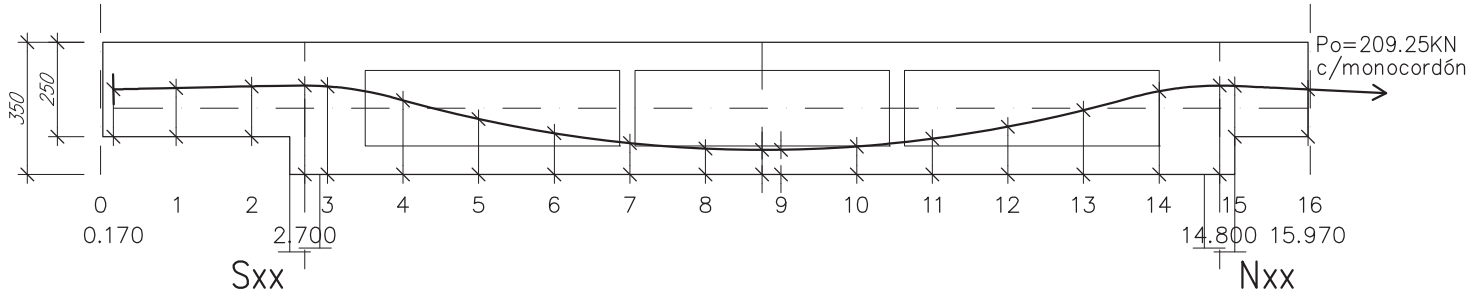
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Structure rooftop
Prestressed slab

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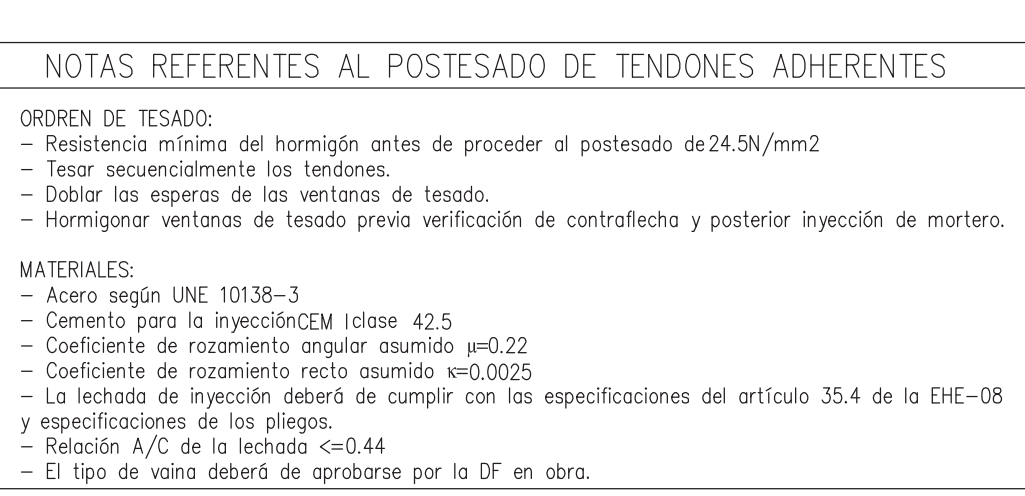
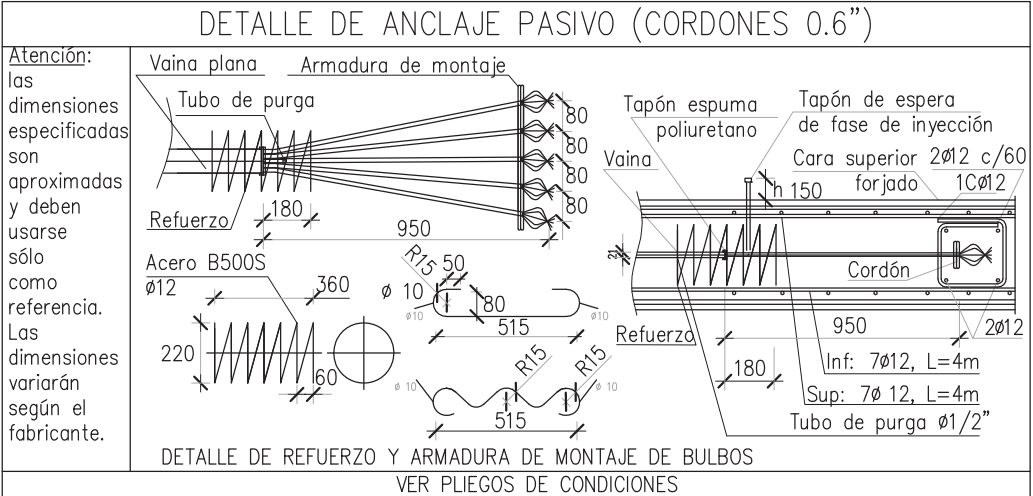
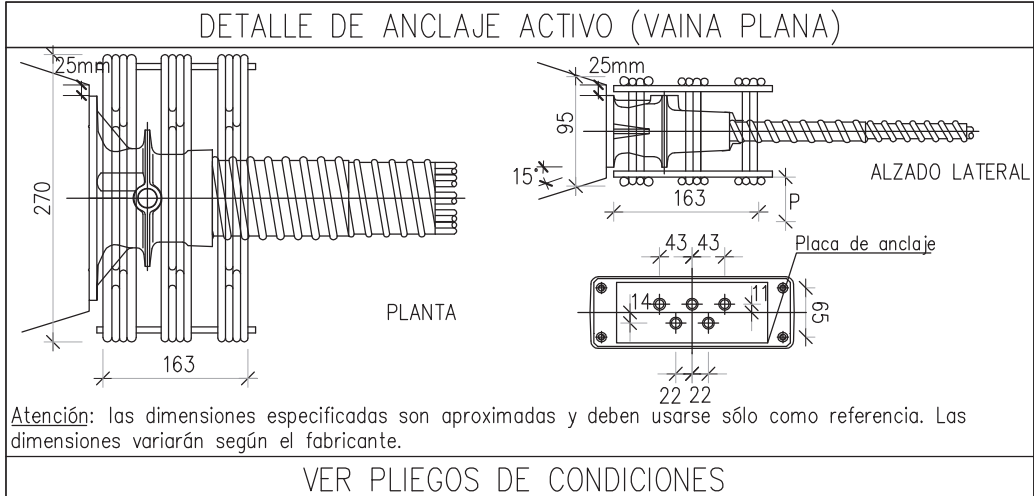


Trazado tipo TR-11-A
E 1/100 horizontal



CARACTERÍSTICAS DEL FORJADO	
ZONA: Cubierta	
Tipo de forjado:	LOSA ALIGERADA
Canto:	35 cm
Estado de cargas:	
Peso propio:	6.80 kN/m²
Cargas permanentes:	3.50 kN/m²
Sobrecarga de uso:	2.00 kN/m²
Sobrecarga de nieve:	0.00 kN/m²
TOTAL:	12.30 kN/m²
Carga concentrada	2.00 kN
En el plano sólo se representan los refuerzos	
Armadura básica de la losa:	
Armadura básica superior:	#108c/20
Armadura básica inferior:	#1010c/20

CARACTERÍSTICAS DEL FORJADO	
ZONA: Rellanos de escalera	
Tipo de forjado:	LOSA
Canto:	35 cm
Estado de cargas:	
Peso propio:	8.75 kN/m²
Cargas permanentes:	3.50 kN/m²
Sobrecarga de uso:	3.00 kN/m²
Sobrecarga de nieve:	0.00 kN/m²
TOTAL:	15.25 kN/m²
Carga concentrada	2.00 kN
En el plano sólo se representan los refuerzos	
Armadura básica de la losa:	
Armadura básica superior:	#108c/20
Armadura básica inferior:	#1010c/20



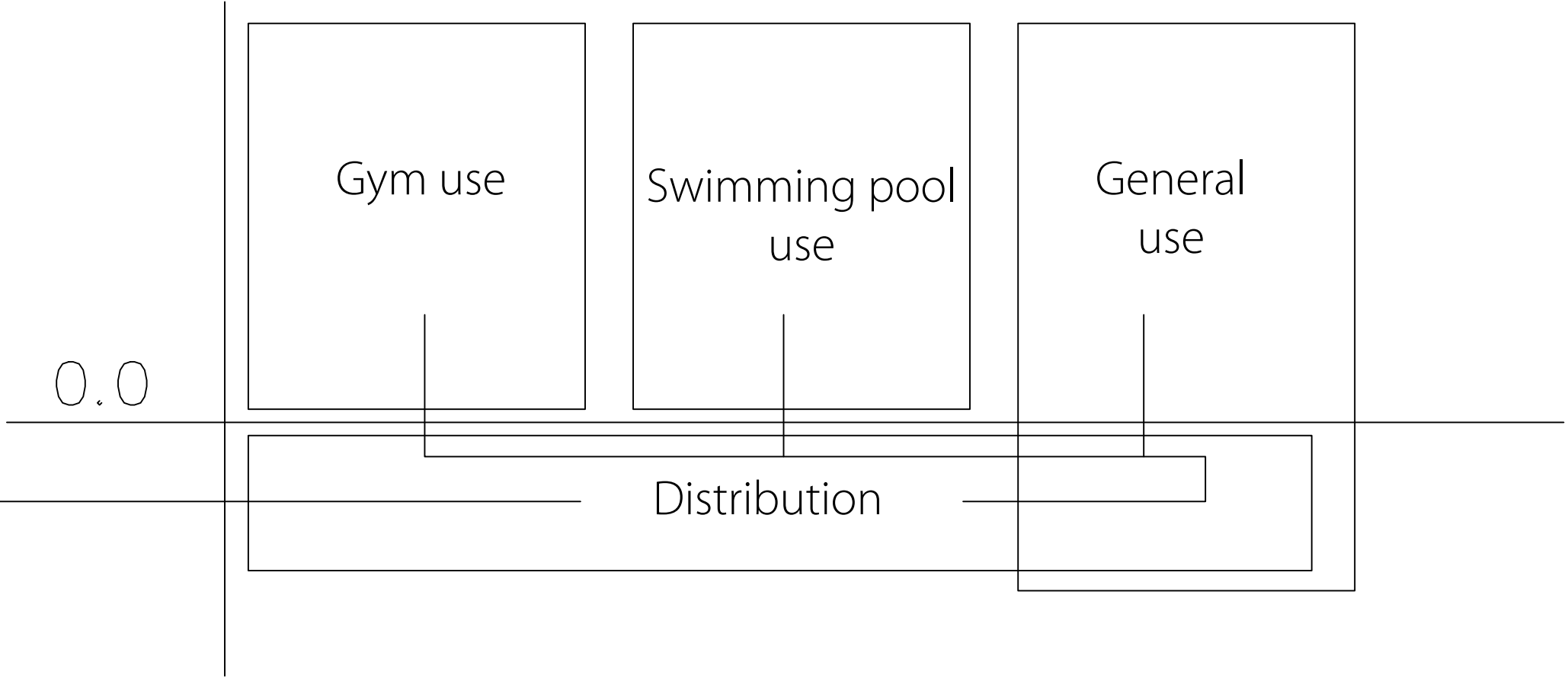
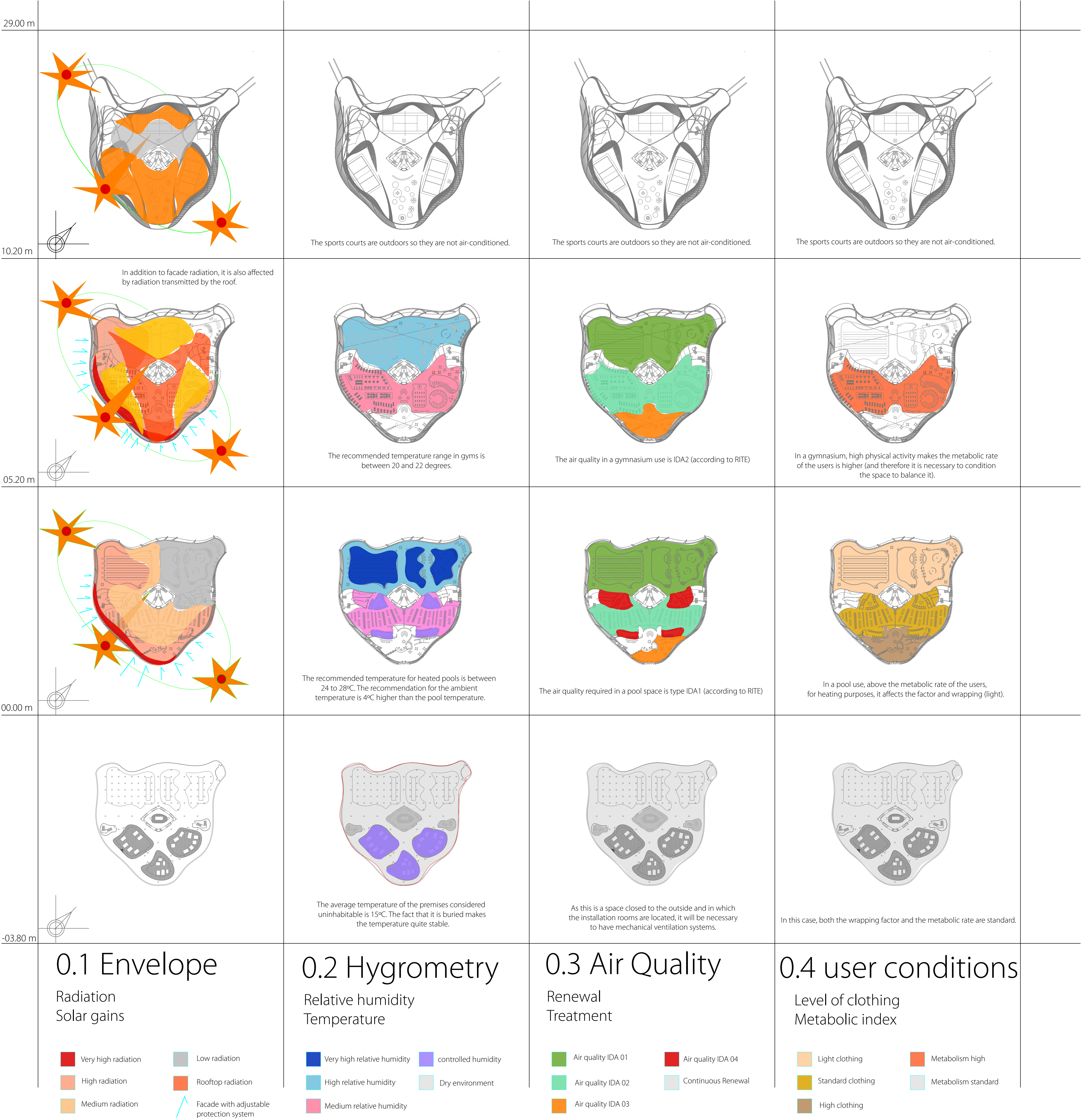


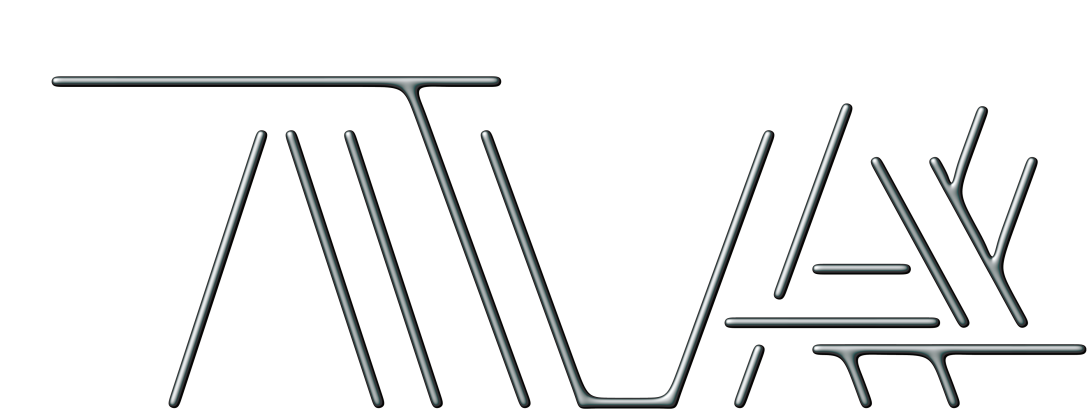
The heart project

Building bridges, joining people

MEP schema

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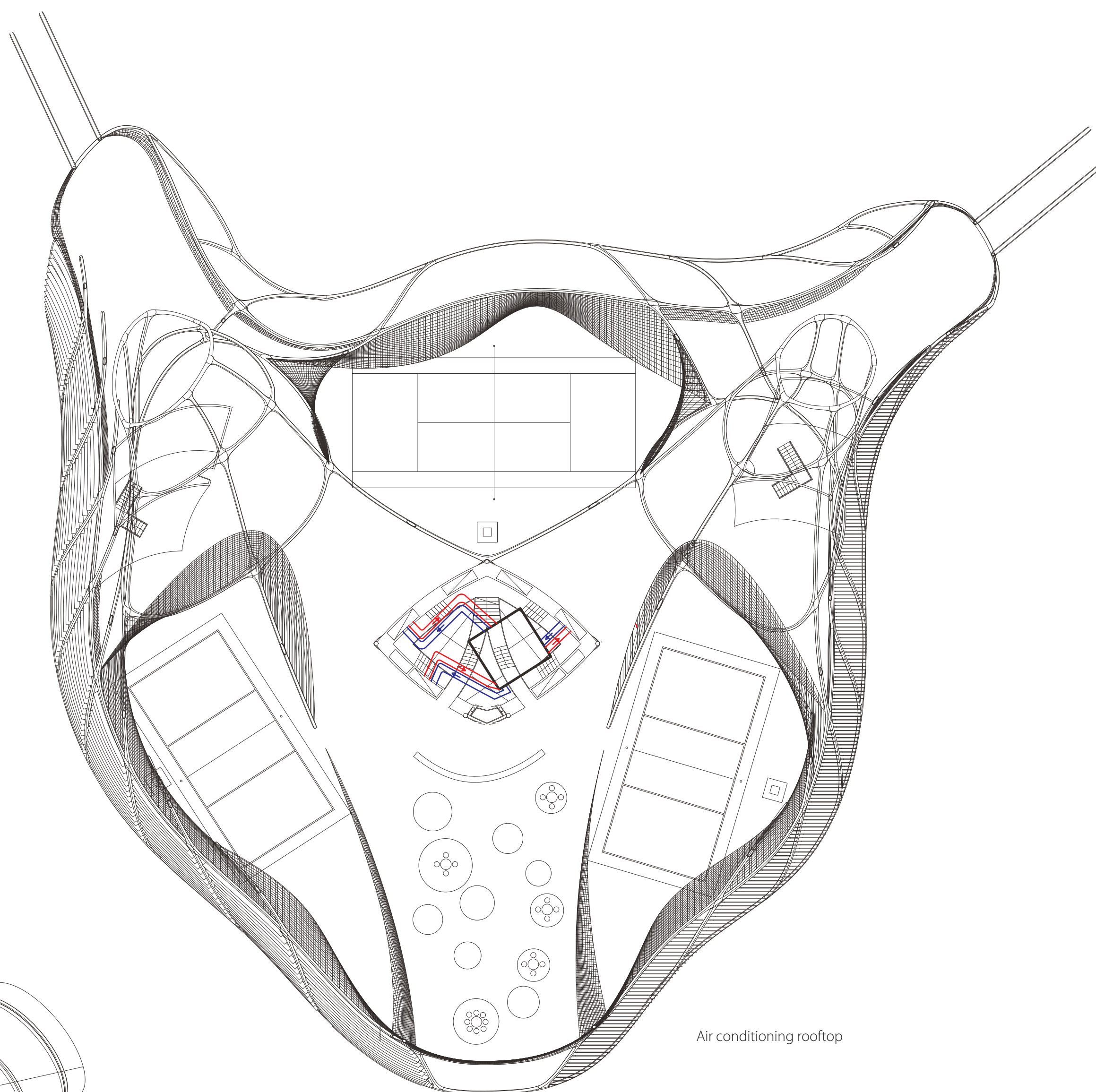


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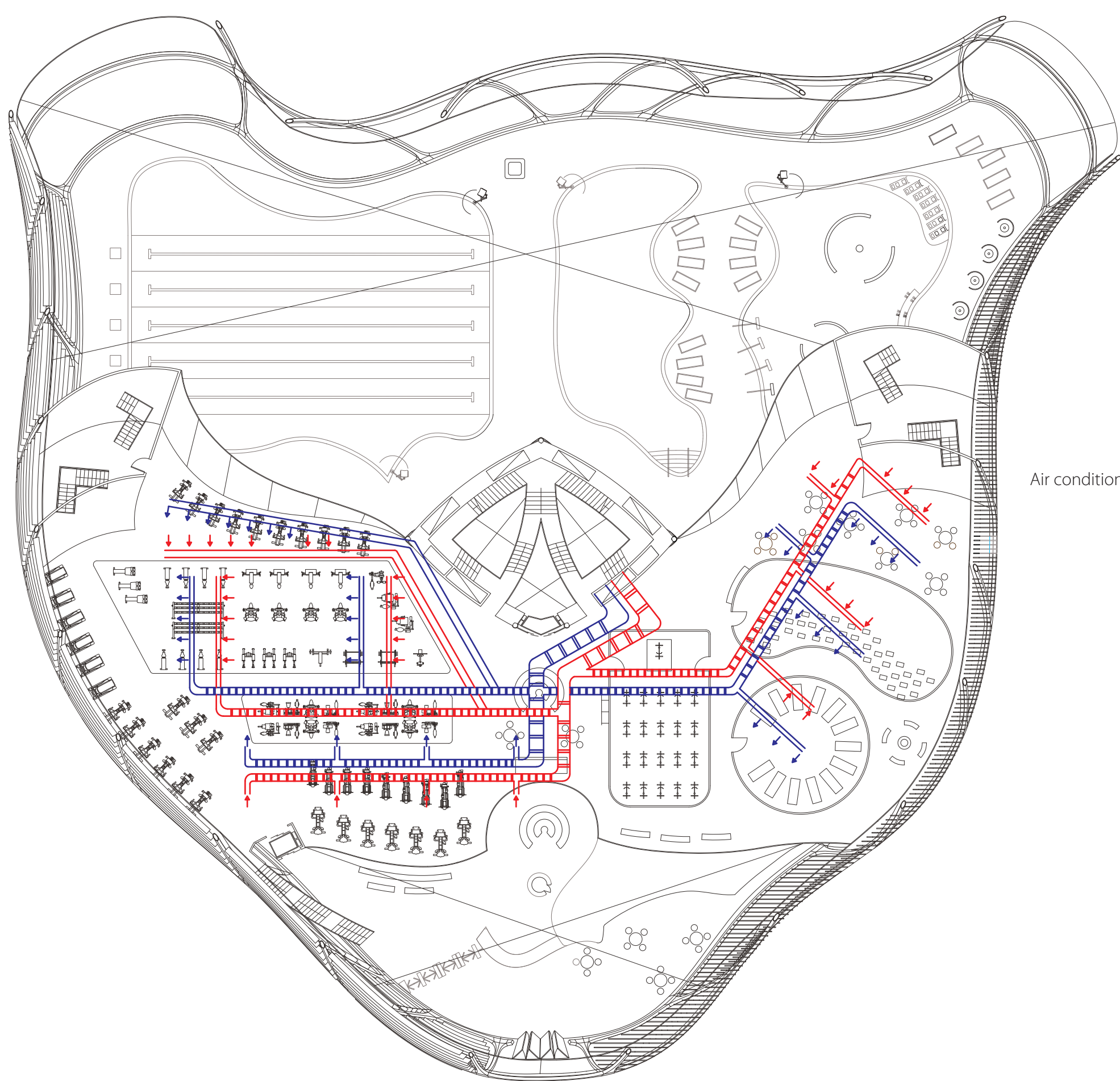
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Air conditioning

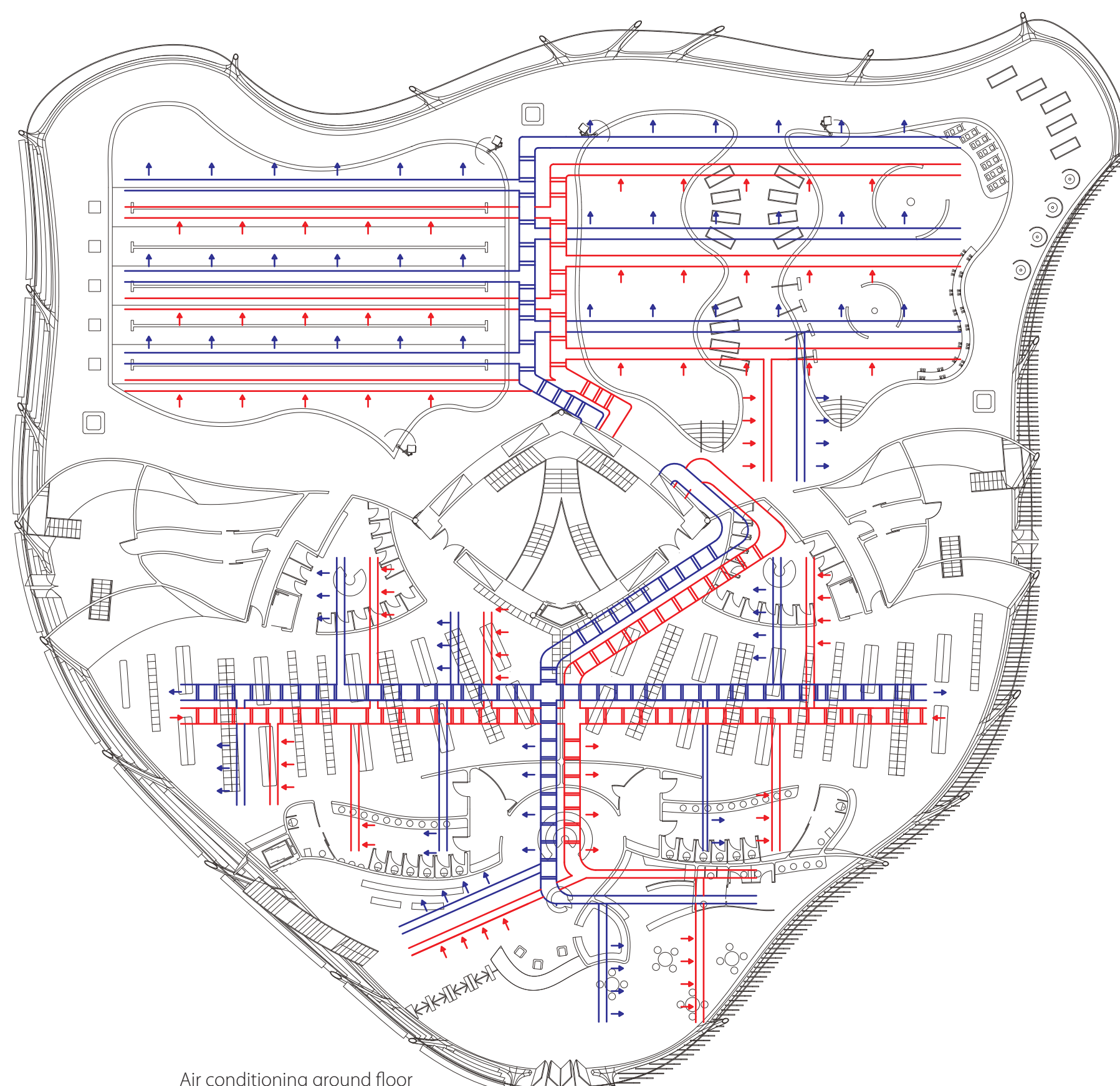
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Air conditioning rooftop



Air conditioning first floor



Air conditioning ground floor

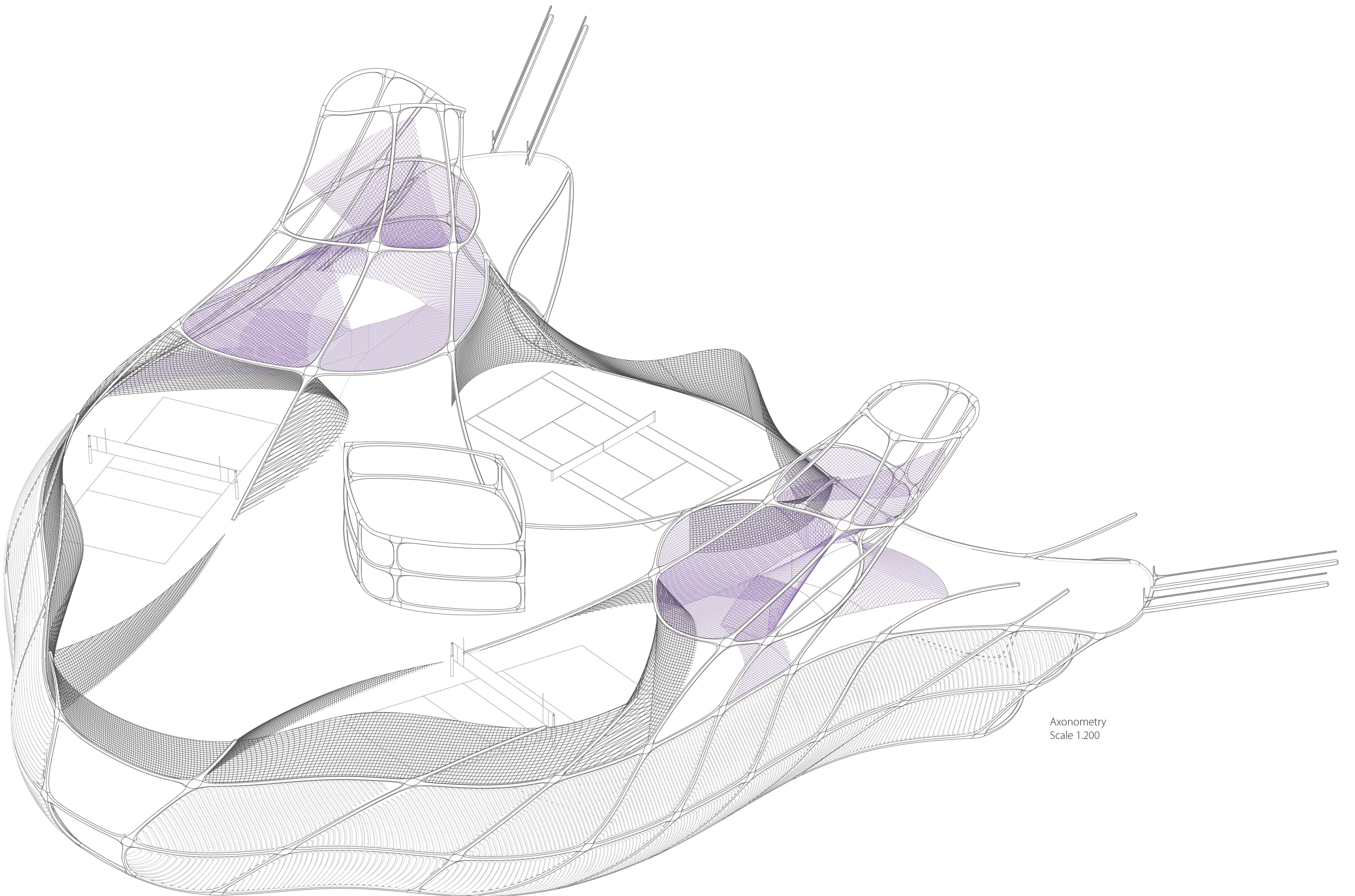
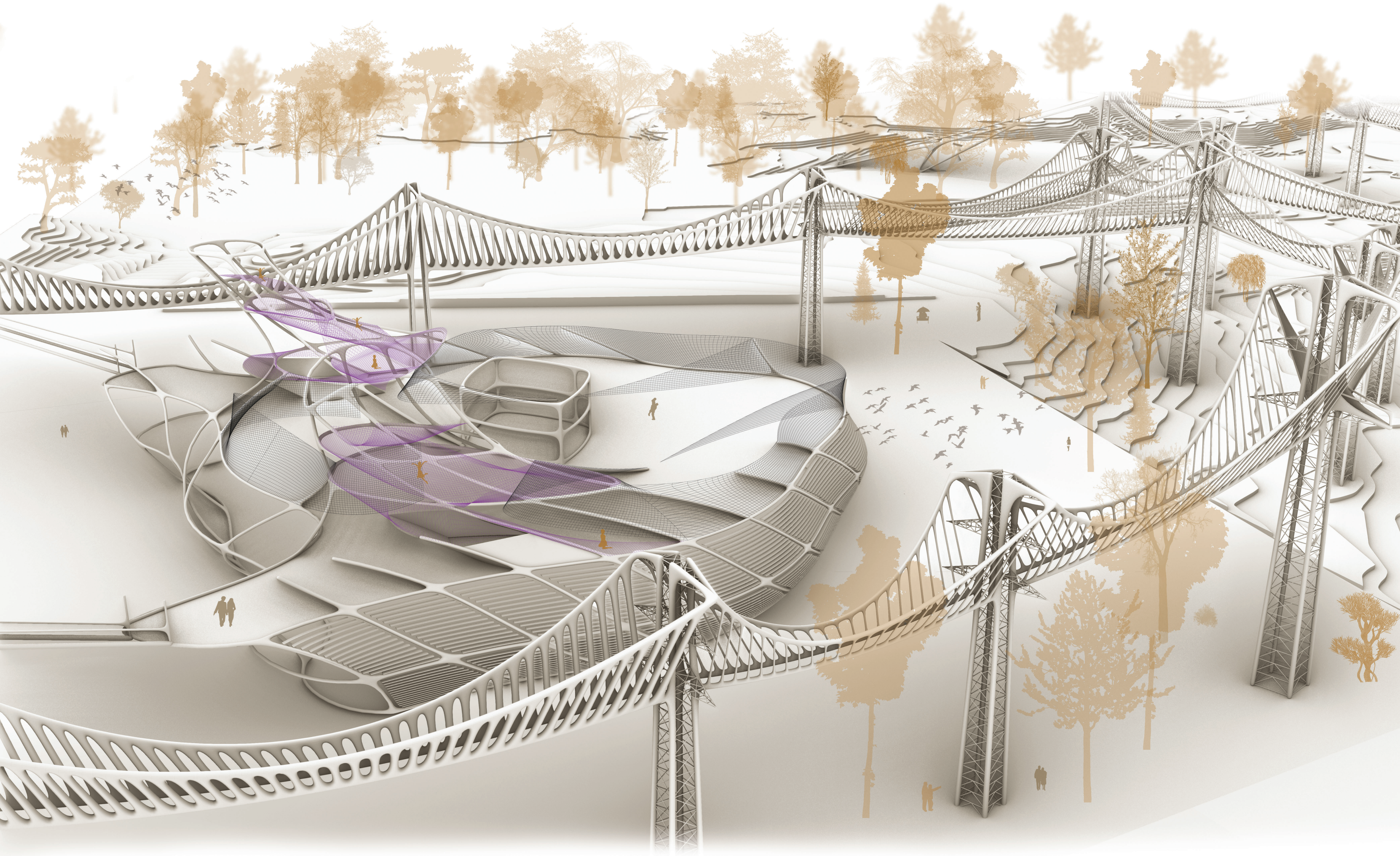


The heart project

Building bridges, joining people

Axometry
View of the project

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Axometry
Scale 1:200