

PARIS 2024

A cyclist's reinterpretation of movement at
the Olympic Games



P2

Emma Chris Avramiea
Robotic Lab+ ExploreLab

DESIGN DEVELOPMENT

number of users
coaches/colleagues
cooling area closed
triathlon
ultra-cycling
networking local teams
team/racing strategy

number of users, floors height

total surface

visual porosity

13%
25%
55%
100%
80%



function activity

coaches/colleagues
cooling area closed
triathlon
ultra-cycling
networking local teams
team/racing strategy

height of function

2.25
1.15
2.72

I. CONTEXT

II. ANALYSIS AND URBAN STRATEGY

III. POSITION - ARCHITECTURAL STRATEGY

IV. MATERIALIZATION

V. STRUCTURAL STABILITY

VI. REFLECTION

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urban sprawl



Urban Development for the Rio Olympics
Source: The Wall Street Journal

temporary



A wide-angle, high-angle photograph of a large, empty stadium under construction. The stadium features multiple tiers of white seating, which are currently unoccupied. The central floor area is a mix of concrete and dirt, with some construction materials and equipment scattered around. The stadium's structure is supported by a network of steel beams and columns. The lighting is bright, highlighting the scale and emptiness of the venue.

white elephants

**The
Guardian**

Rio's Olympic Venues, 6 months on
Source: The Guardian

new physicality



CYCLISTE 13

1	Van Aves	Gap
2	Haesen	258 m
3	Roche	19 m
4	De Gendt	25 m
5	Stuyven	600 m
6	Everspoel	2 m

ELAPSED: 00:40:42 28.8 km

REMAINING: 2.2 km 00:03:05

RCA: 1134 KMH: 48.7 RPM: 98 WATTS: 518 ERG OFF 0% SLOPE: 0.9% -2.0%

MORE VIDEOS

56:57 / 1:18:53

CC BY YouTube

GCN SUBSCRIBE

VIRTUAL TOUR OF FLANDERS LIVESTREAM - LOCKDOWN EDITION



SUBSCRIBE ON YOUTUBE



BY CYCLINGTIPS

APRIL 5, 2020

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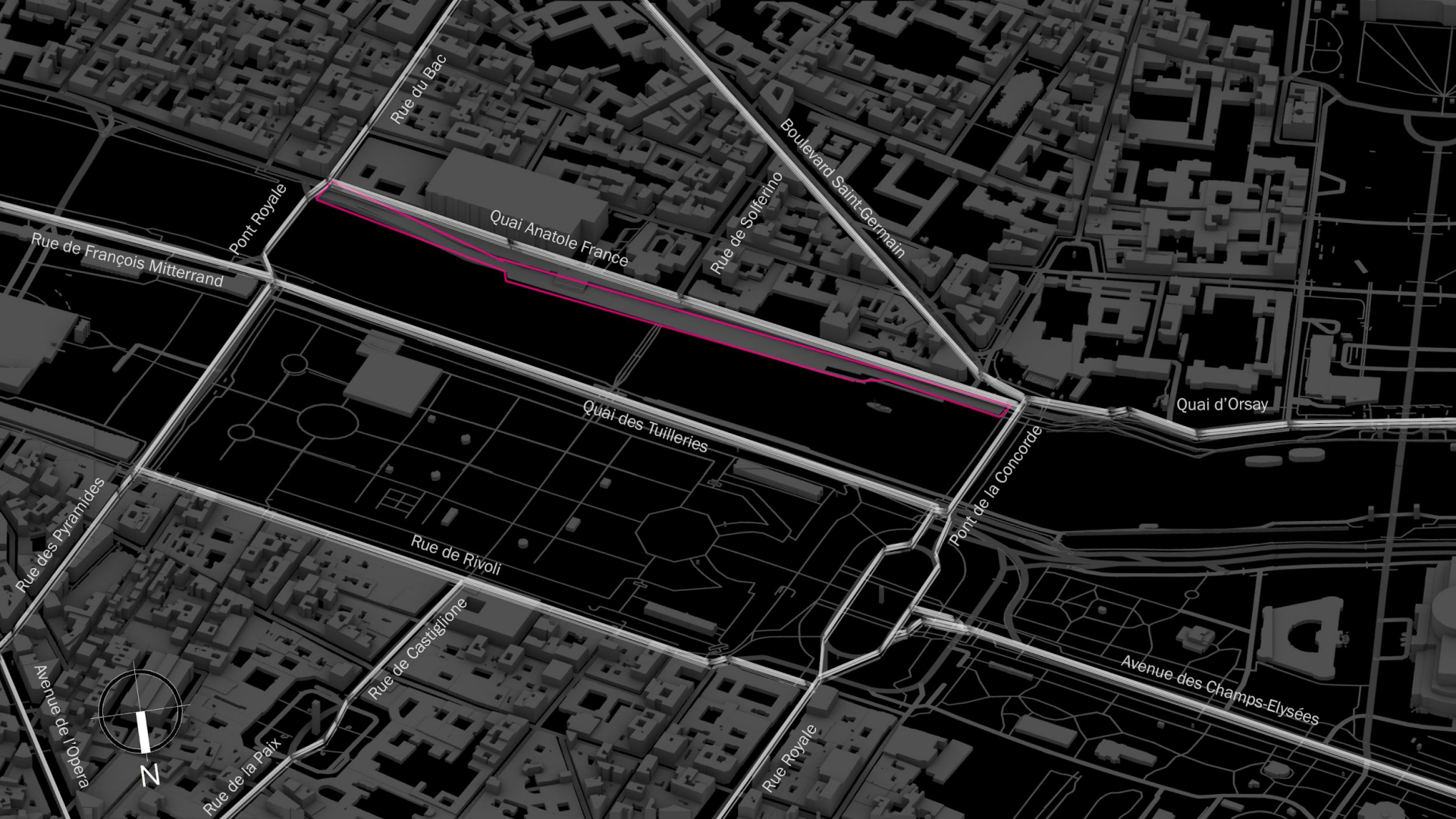
VI. REFLECTION



PARIS 2024 OLYMPIC VENUE MASTER PLAN

Aquatics Centre #1	<ul style="list-style-type: none"> Aquatics (Swimming) Aquatics (Water-polo) 	Parc des Princes	<ul style="list-style-type: none"> Football
Aquatics Centre #2	<ul style="list-style-type: none"> Aquatics (Frisco Swimming) Aquatics (Diving) Aquatics (Water-polo) 	Roland-Garros Stadium	<ul style="list-style-type: none"> Tennis Boxing
Champs-de-Mars Arena	<ul style="list-style-type: none"> Judo Wrestling 	Saint-Quentin-en-Yvelines BFM Stadium	<ul style="list-style-type: none"> Cycling (BMX Race)
Château de Versailles	<ul style="list-style-type: none"> Equestrian (Dressage/Equestrian) Modern Pentathlon 	Saint-Quentin-en-Yvelines Velodrome	<ul style="list-style-type: none"> Cycling (Track) Modern Pentathlon (Fencing)
East Paris Arena	<ul style="list-style-type: none"> Basketball 	Shooting Range	<ul style="list-style-type: none"> Shooting
Eiffel Tower Stadium	<ul style="list-style-type: none"> Volleyball (Beach) 	South Paris Arena #1	<ul style="list-style-type: none"> Handball
Blancourt Hill	<ul style="list-style-type: none"> Cycling (Mountain Bike) 	South Paris Arena #2	<ul style="list-style-type: none"> Table tennis
Grand Palais	<ul style="list-style-type: none"> Fencing Taekwondo 	Stade de France	<ul style="list-style-type: none"> Rugby Handball Chicane (Slalom/Sprint)
Jean-Bouin Stadium	<ul style="list-style-type: none"> Rugby 	Vielleville Stadium	<ul style="list-style-type: none"> Hockey
La Chapelle Arena	<ul style="list-style-type: none"> Badminton 	Zenith Arena	<ul style="list-style-type: none"> Weightlifting
La Défense Arena	<ul style="list-style-type: none"> Gymnastics (Artistic/Rhythmic/Trampoline) 	Bordeaux Stadium	<ul style="list-style-type: none"> Football
Le Bourget Arena	<ul style="list-style-type: none"> Volleyball 	Lille Stadium	<ul style="list-style-type: none"> Football
Le Golf National	<ul style="list-style-type: none"> Golf 	Lyon Stadium	<ul style="list-style-type: none"> Football
Le Pont d'Iéna	<ul style="list-style-type: none"> Roquiatics (Marathon Swimming) Roquiatics (Marathon, Race Walk) Traction Cycling (Road) 	Marseille Marina	<ul style="list-style-type: none"> Sailing
Les Invalides	<ul style="list-style-type: none"> Rowing 	Marseille Stadium	<ul style="list-style-type: none"> Football
Olympic Stadium	<ul style="list-style-type: none"> Rhythmic Ceremonies 	Nantes Stadium	<ul style="list-style-type: none"> Football
		Nice Stadium	<ul style="list-style-type: none"> Football
		Saint-Etienne Stadium	<ul style="list-style-type: none"> Football
		Toulouse Stadium	<ul style="list-style-type: none"> Football





Rue du Bac

Boulevard Saint-Germain

Pont Royal

Rue de François Mitterrand

Quai Anatole France

Rue de Solferino

Quai d'Orsay

Quai des Tuilleries

Pont de la Concorde

Rue de Rivoli

Avenue des Champs-Élysées

Rue des Pyramides

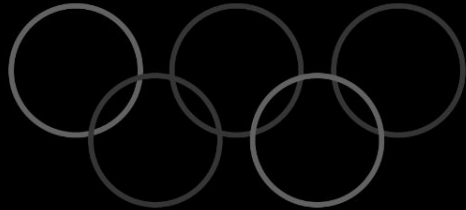
Rue de Castiglione

Rue Royale

Rue de la Paix



Avenue de l'Opéra



UBAN NETWORK



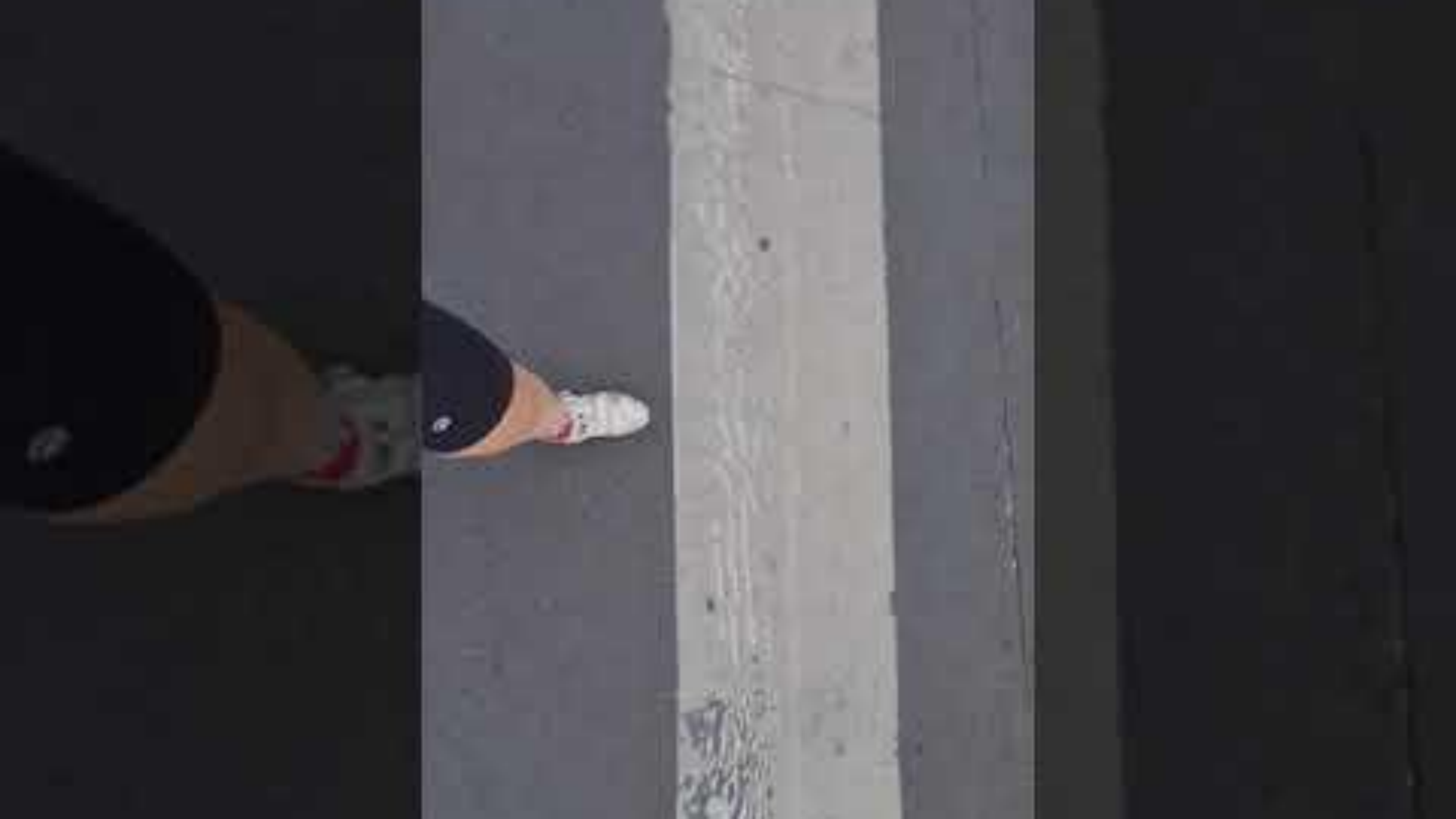
Skating store

Musée d'Orsay



Proposed Cycling
Cycling path





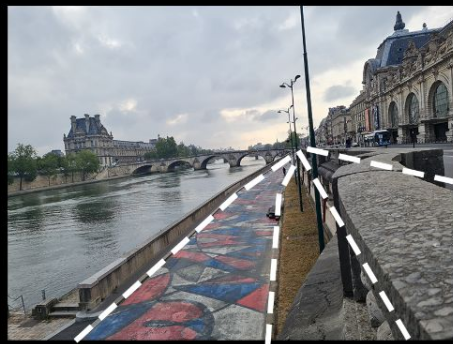




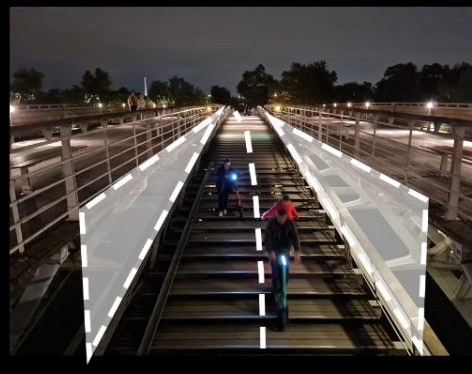




Le quartier
de Paris









ESCALE-BATOBUS
MUSÉE D'ORSAY







I. CONTEXT

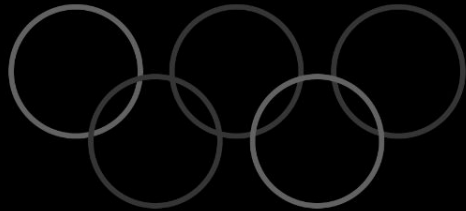
II. ANALYSIS AND URBAN STRATEGY

III. POSITION - ARCHITECTURAL STRATEGY

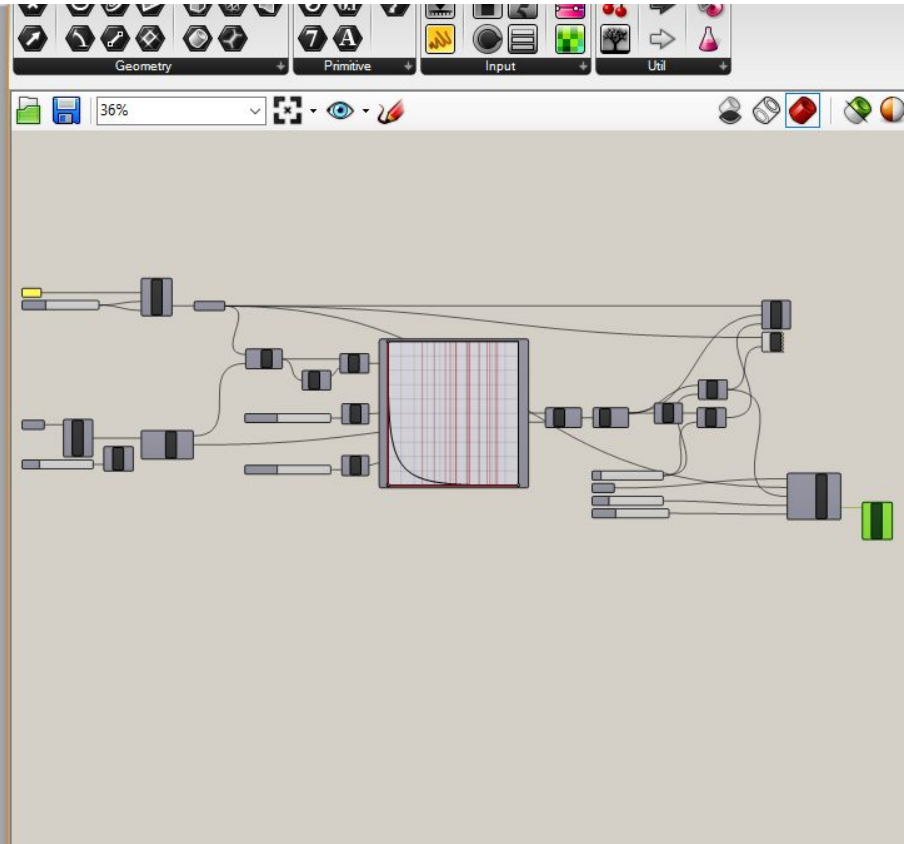
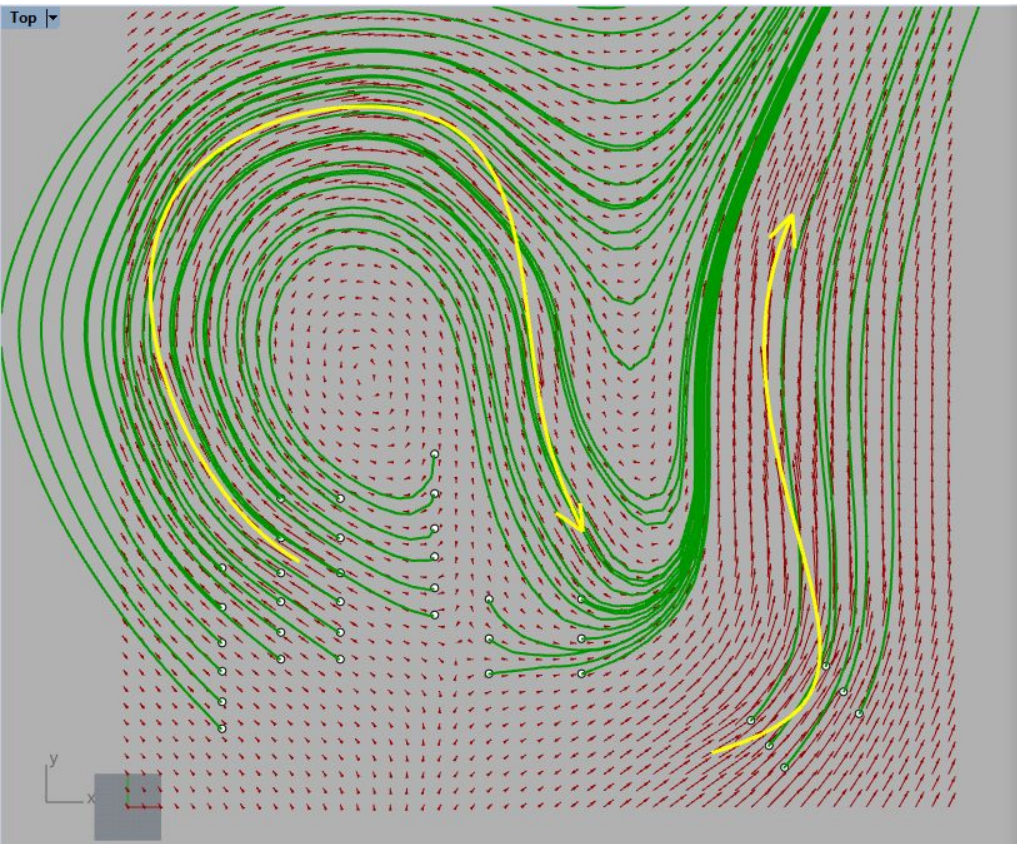
IV. MATERIALIZATION

V. STRUCTURAL STABILITY

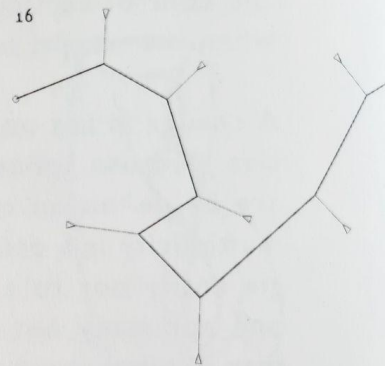
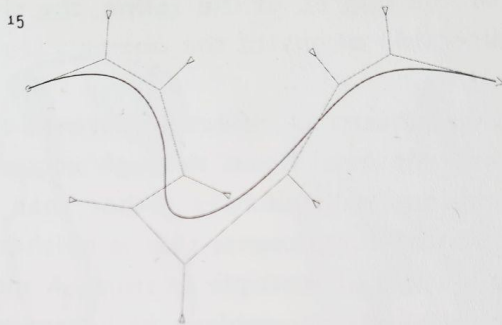
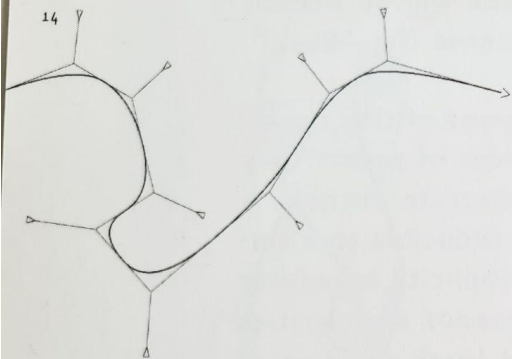
VI. REFLECTION



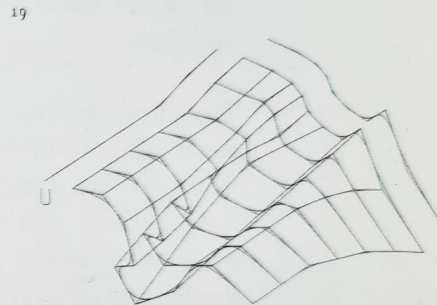
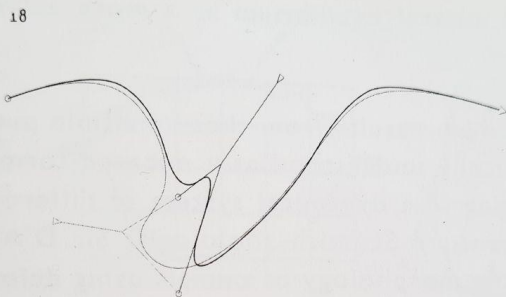
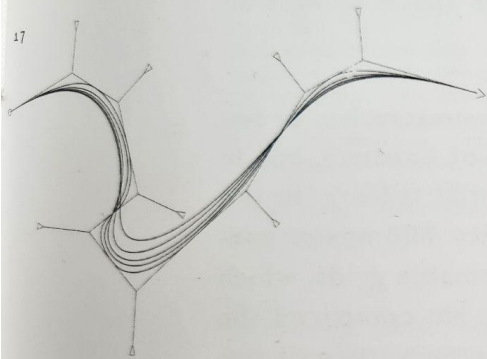
**ARCHITECTURAL
EXPRESSION**



animate form

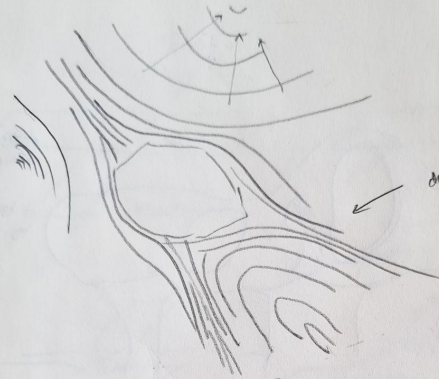


animate form

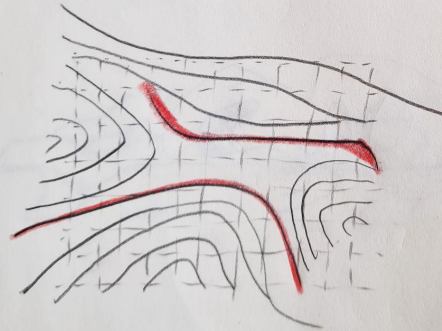


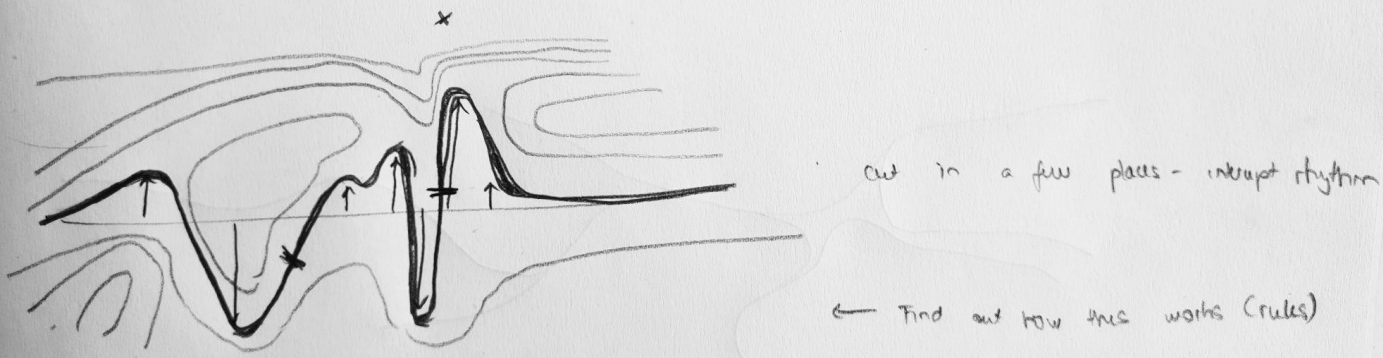
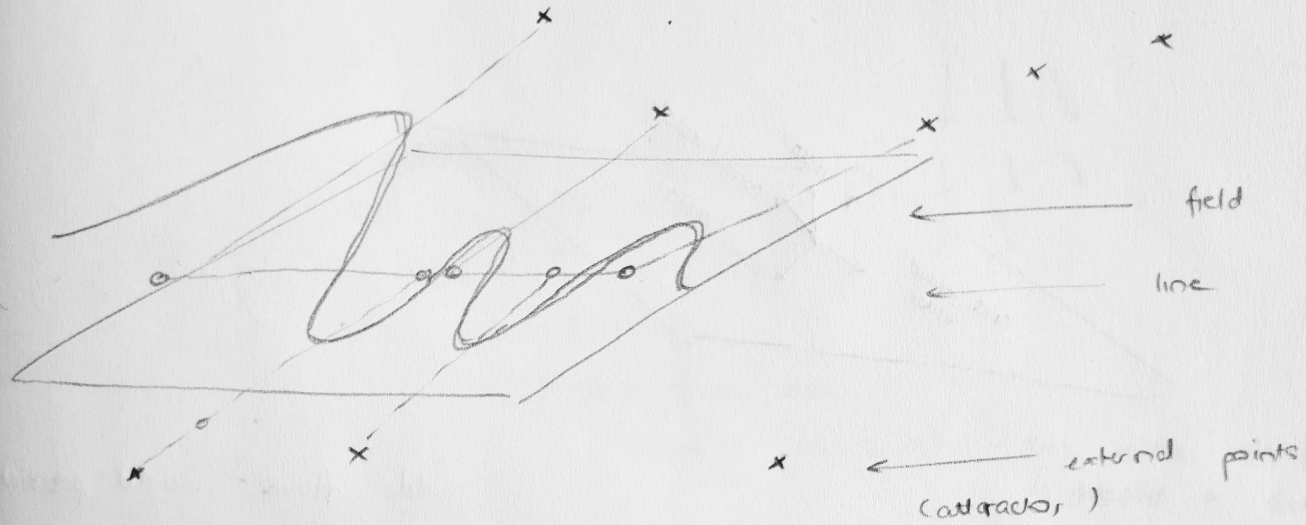
DYNAMIC PHENOMENA

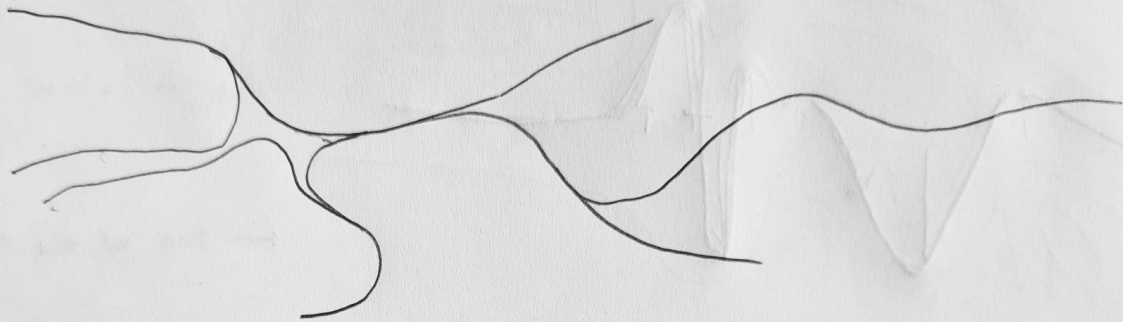
potential - associate with
functions



denser lines = more gradient
higher speed







1st line - shaped by the surroundings

↳ give it a z orientation

2nd : simulate flows on this surface

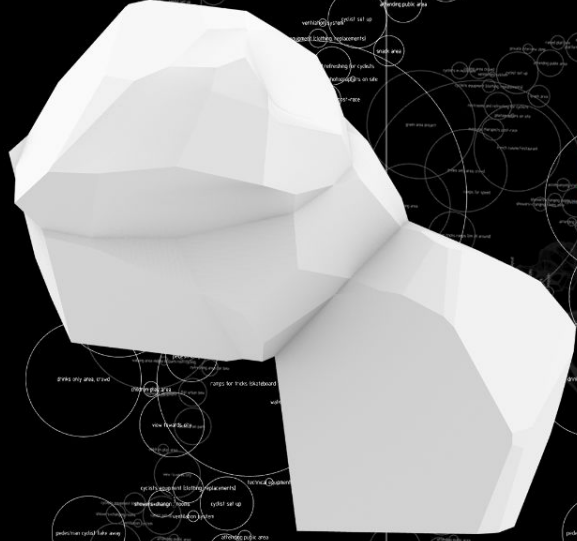
↳ connect / control the speed of the flows

Q: how can you make flows roll ?

↳ maybe create some spiral in narrow areas



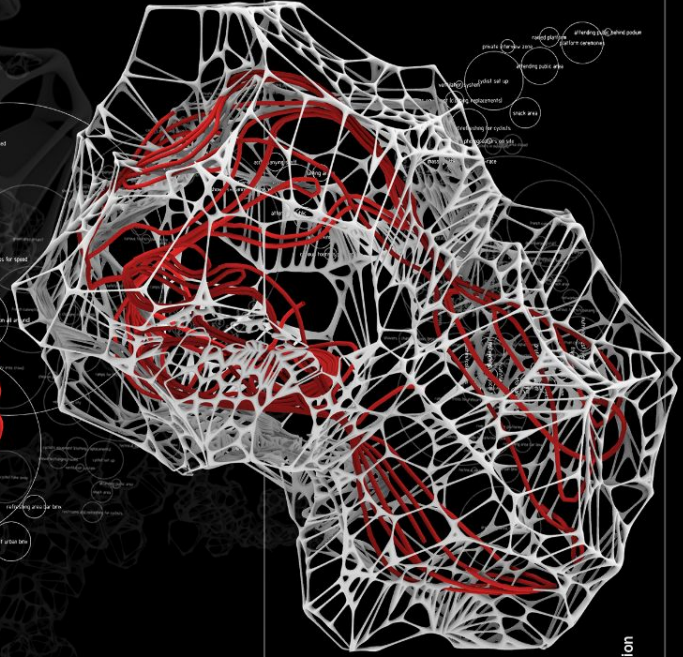
MATERIALIZATION



Base Volume



Compression Regions



Materialization

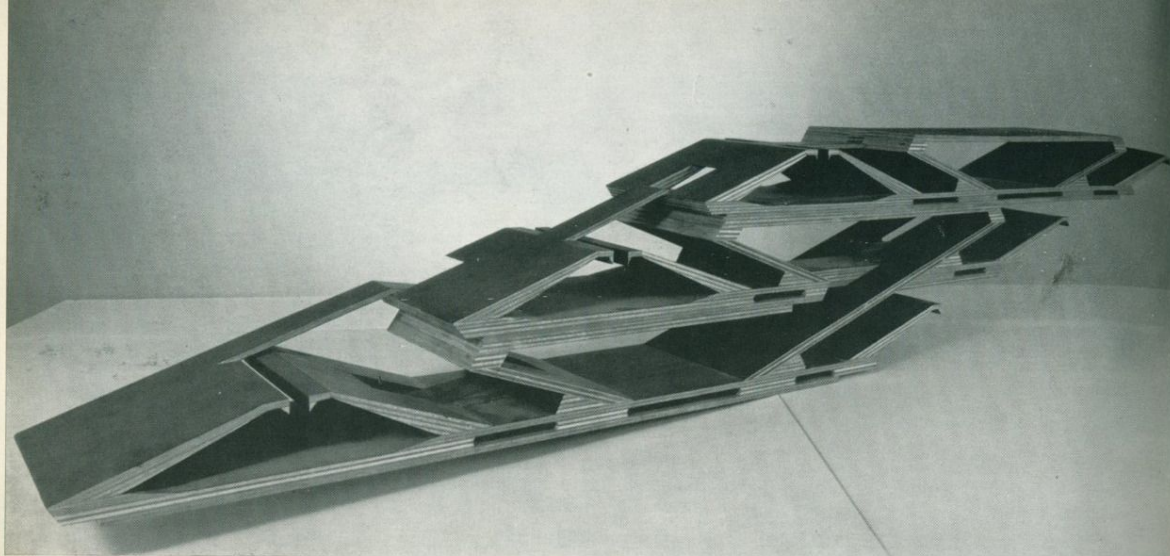
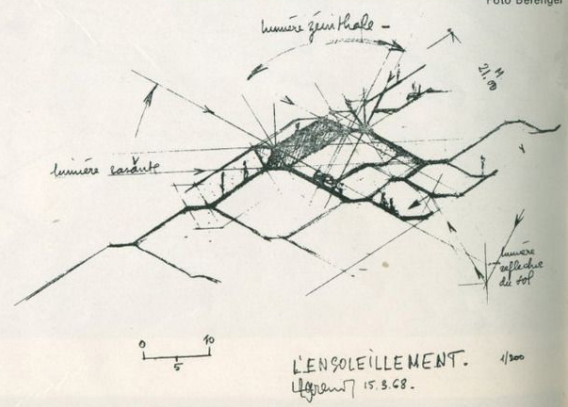
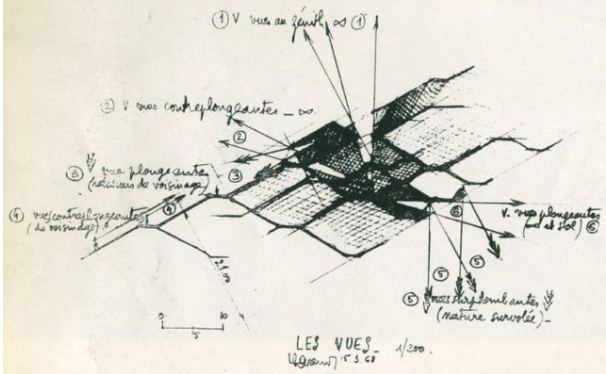
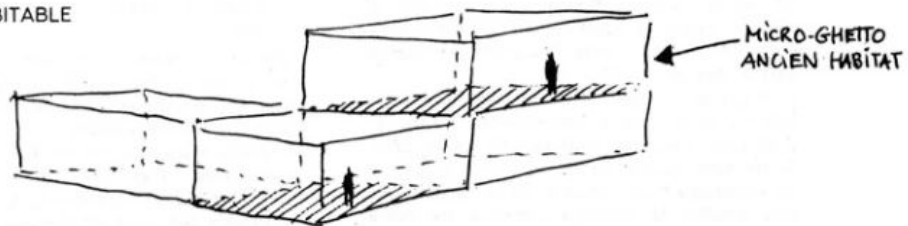


Foto Berenger



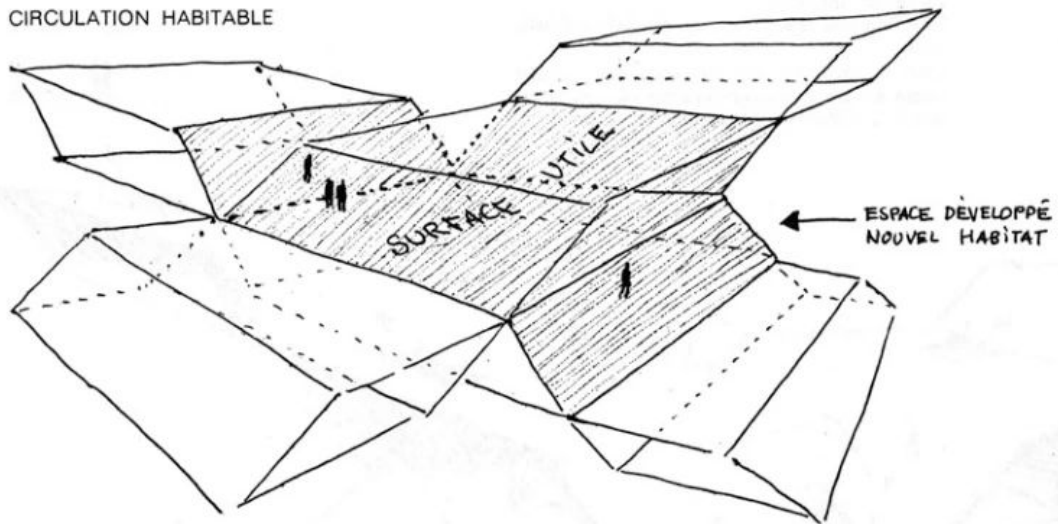
Claude Parent - The oblique function - tilting the ground - challenging verticality - the wall becomes experientiable

STATION HABITABLE



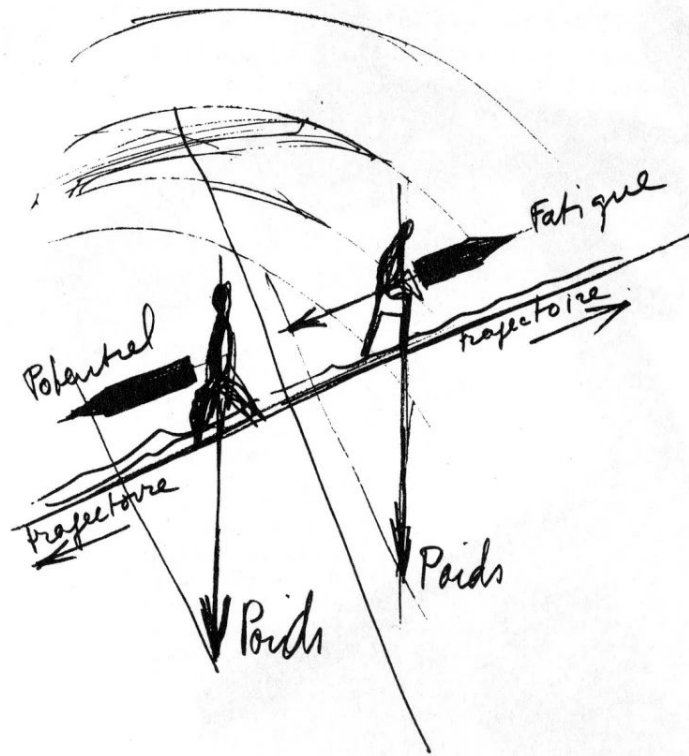
MICRO-GHETTO
ANCIEN HABITAT

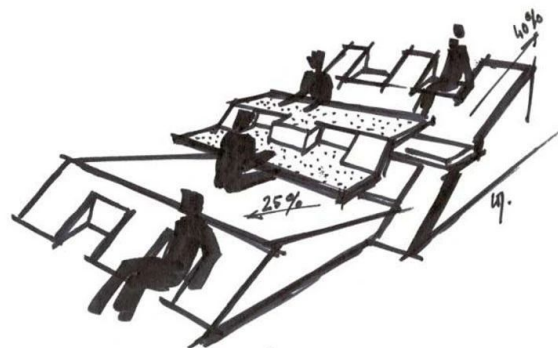
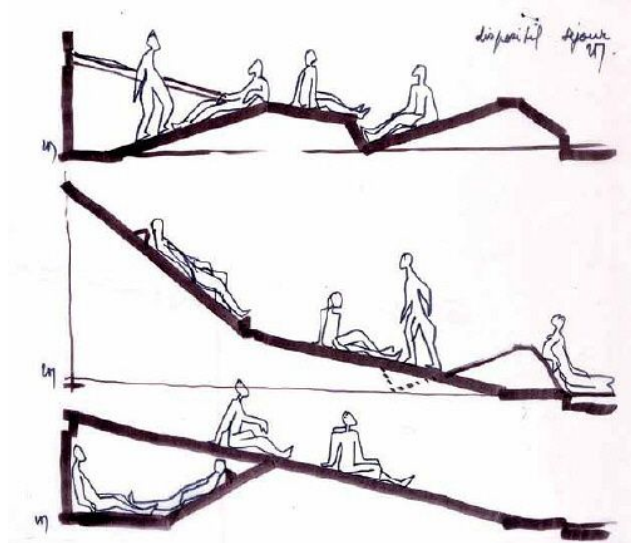
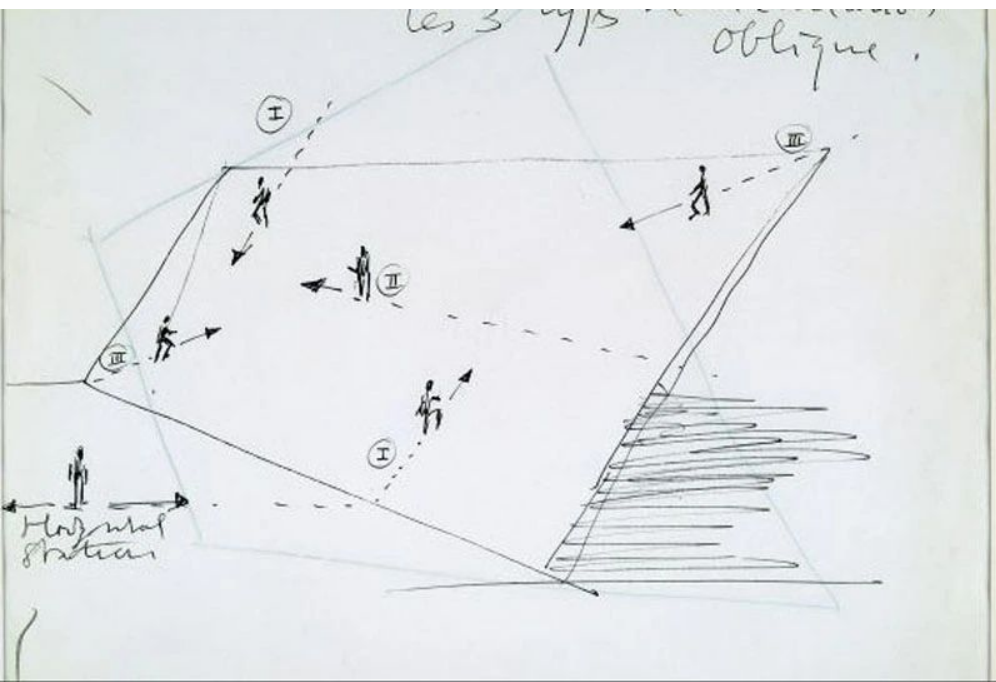
CIRCULATION HABITABLE



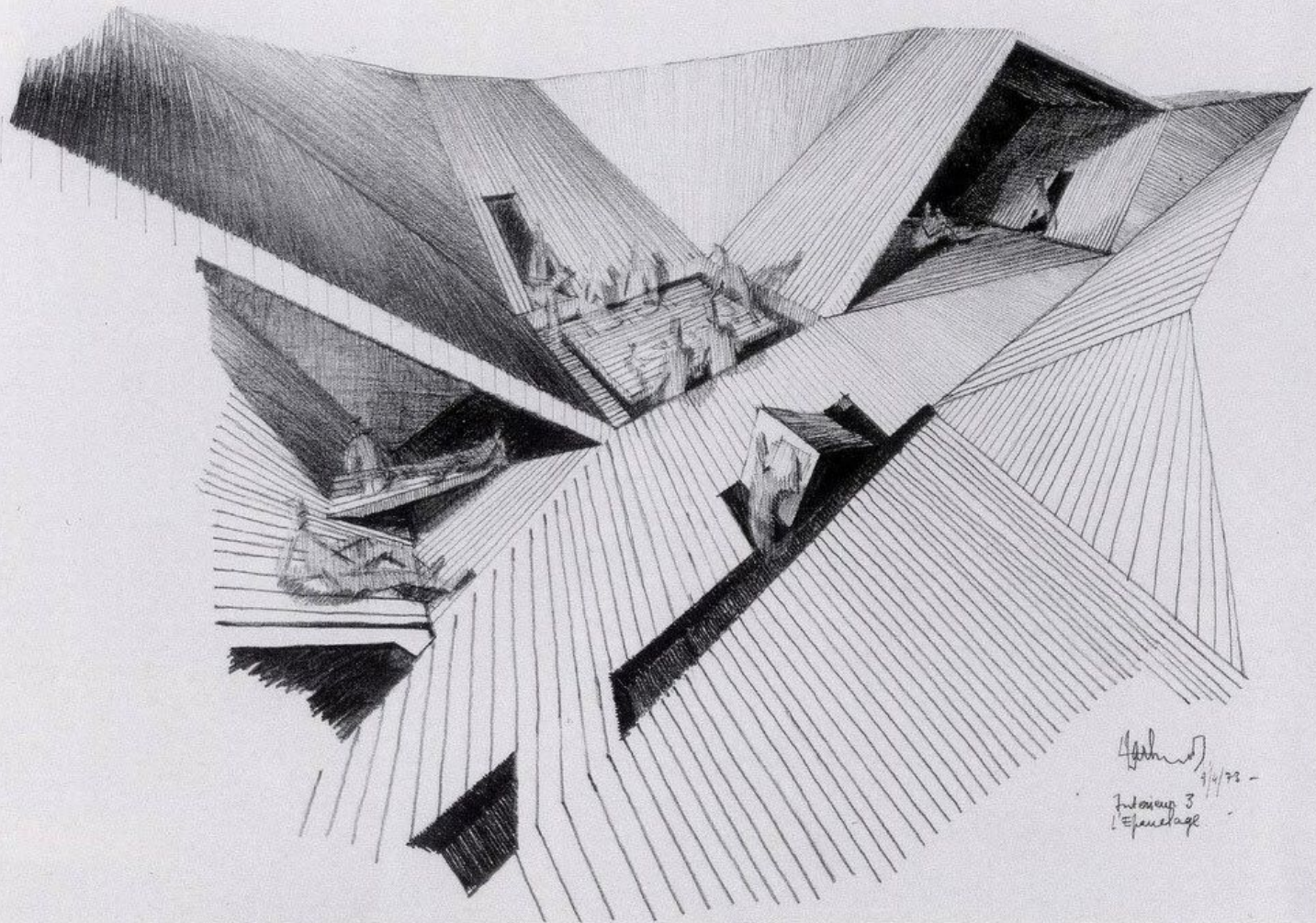
ESPACE DÉVELOPPÉ
NOUVEL HABITAT

SURFACE
UTILE

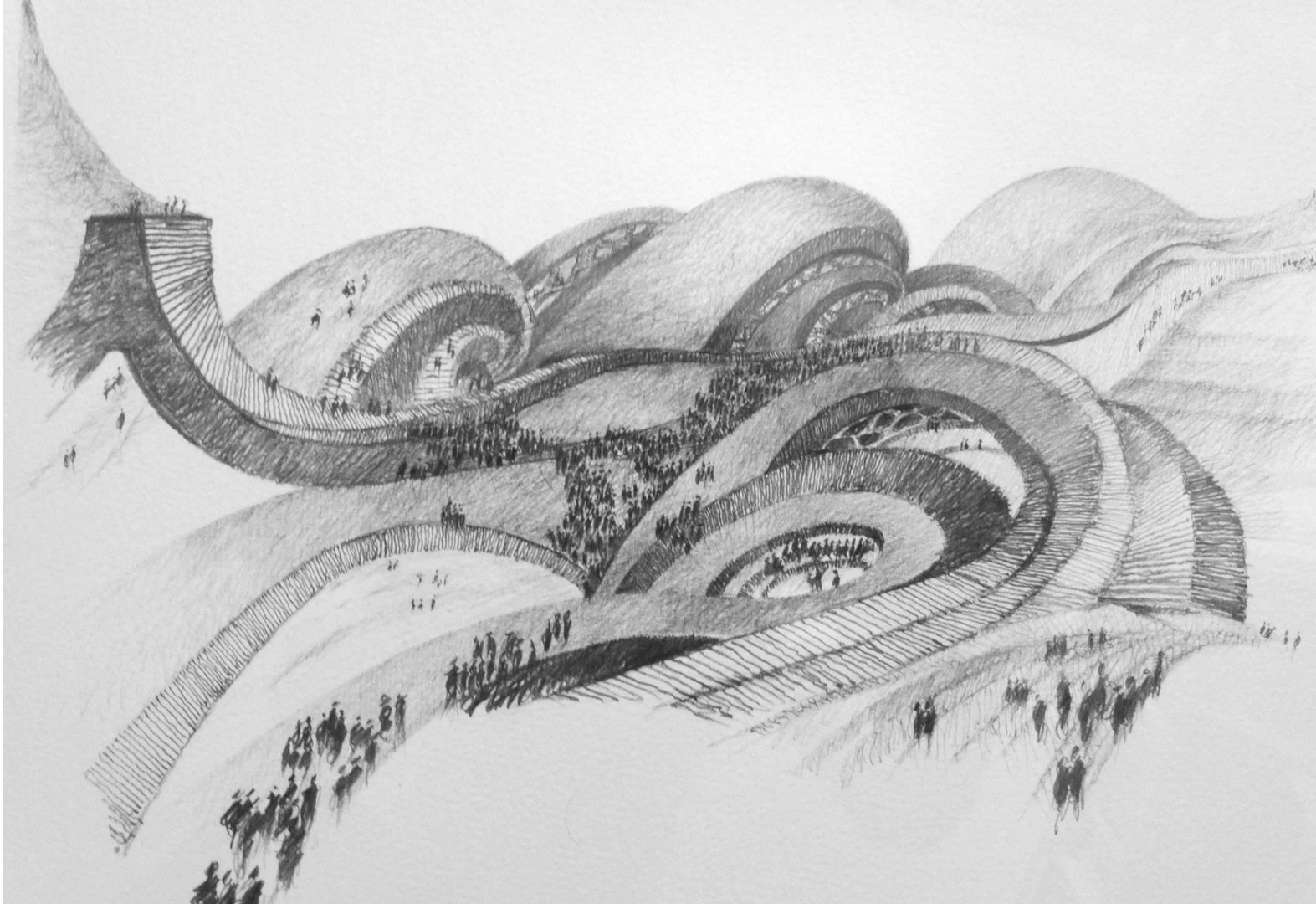




appartement de Claude Parrot à Neuilly ; dispositif de la salle des repas restructuré en 1974 à l'oblique avec table à 2 niveaux



H. Schmidt
9/4/72 -
Interieur 3
Elevation





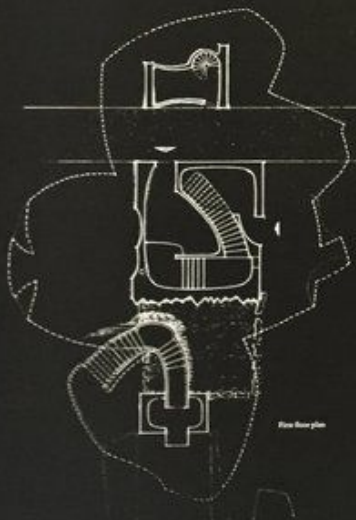
North elevation



West elevation



South elevation



Floor plan



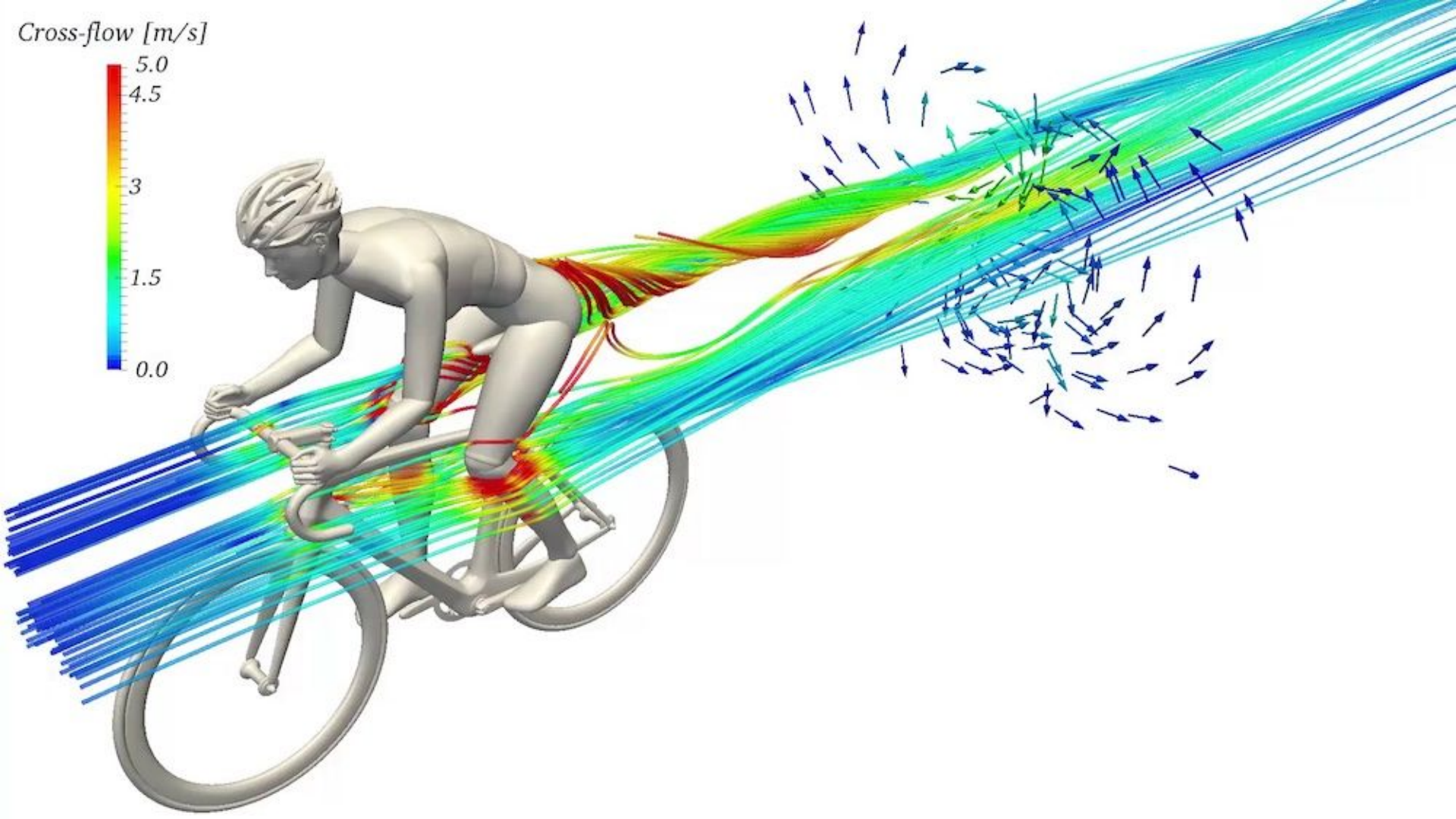
Floor plan



East elevation



Floor plan





dynamic

AEDAS Hengqin International Financial Center

Photo by Terrance Zhang



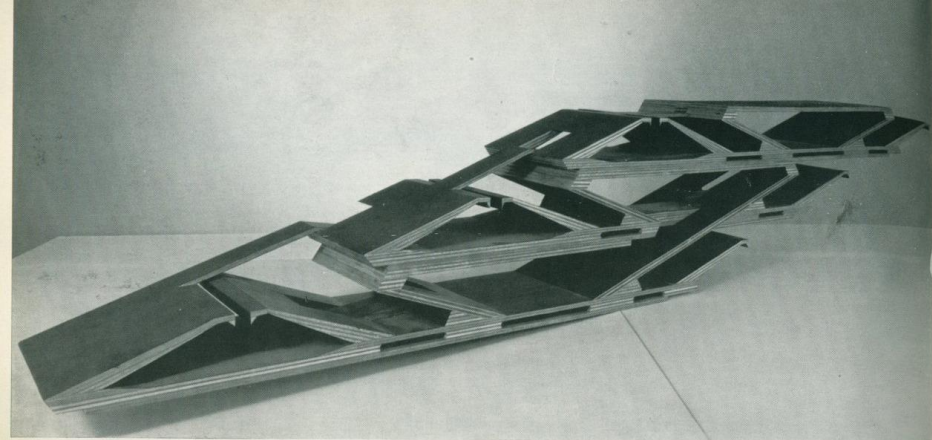
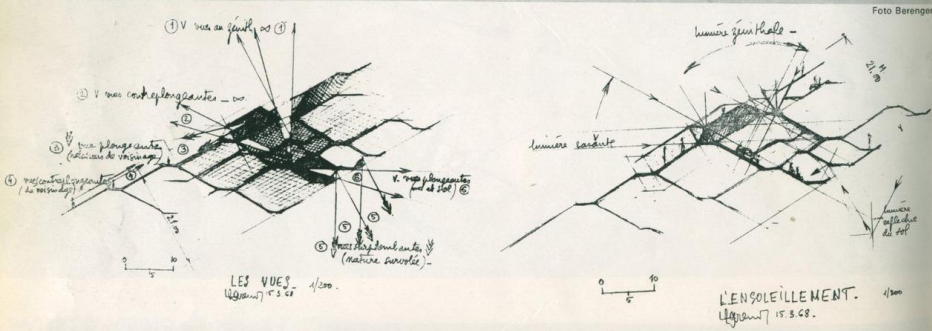
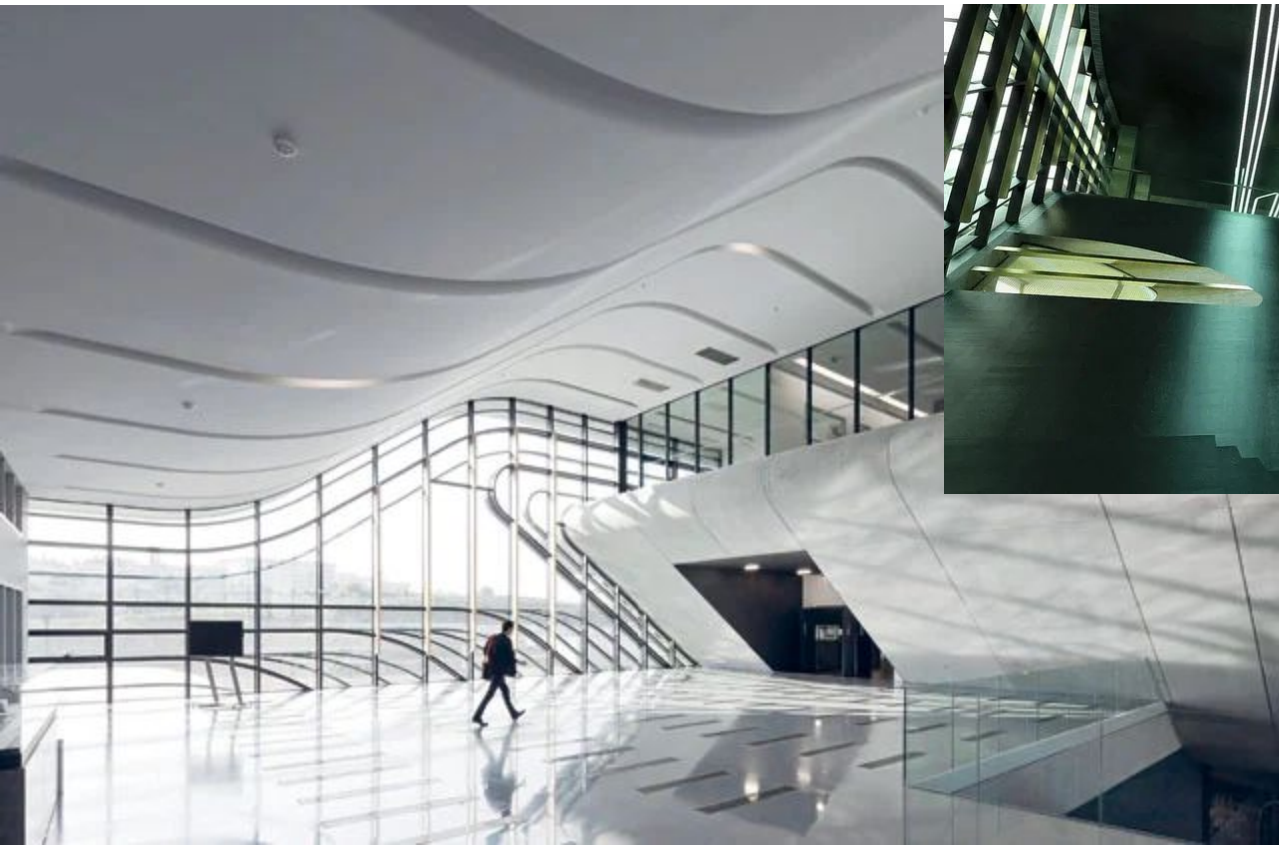


Foto Berenger

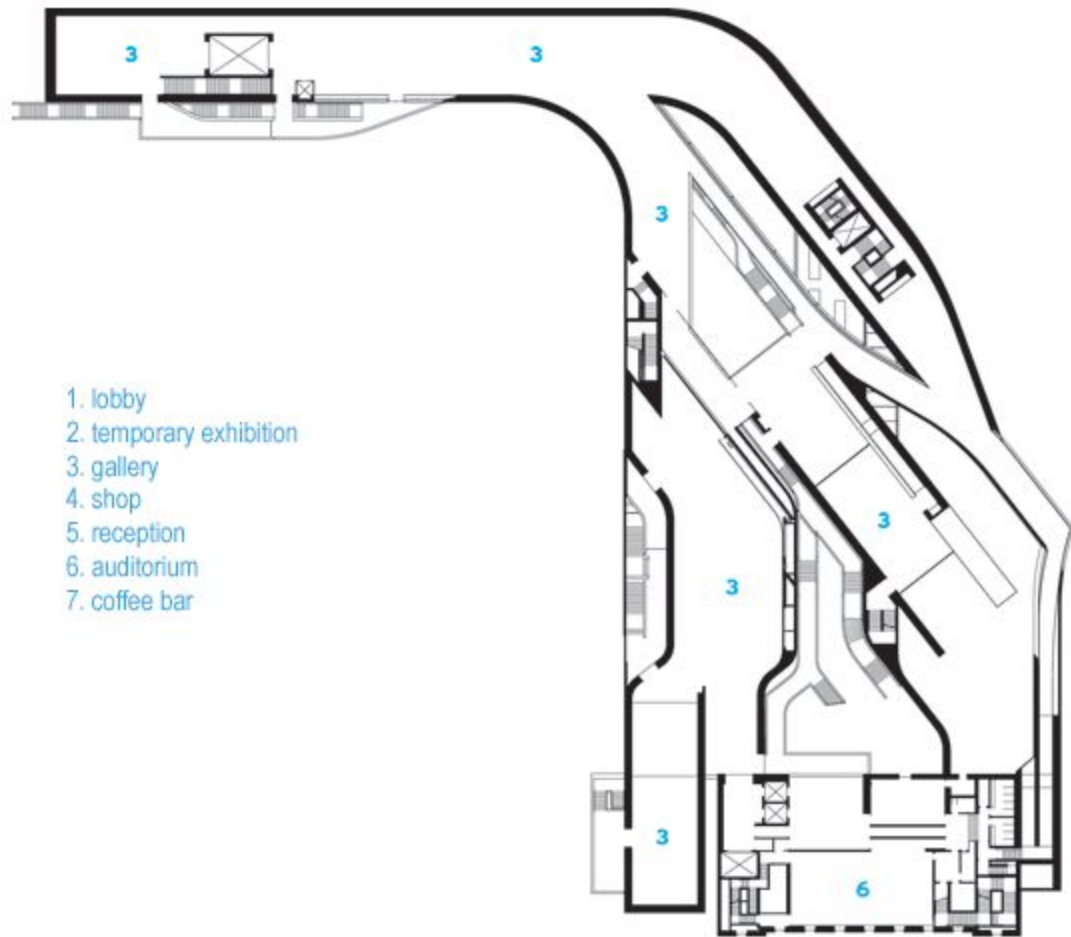


Zaha Hadid - Pierres Vives





Zaha Hadid - Maxxi Museum



1. lobby
2. temporary exhibition
3. gallery
4. shop
5. reception
6. auditorium
7. coffee bar

SECOND FLOOR

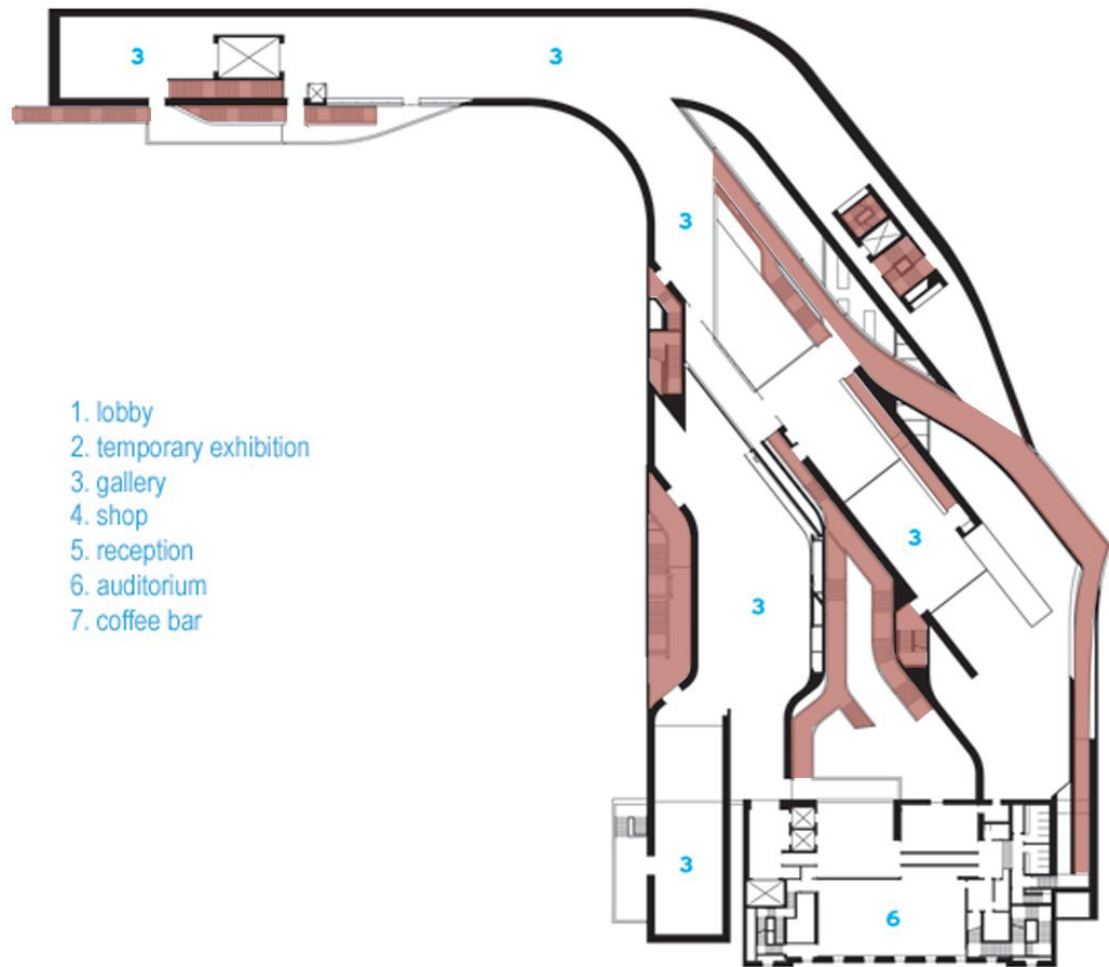
1. lobby
2. temporary exhibition
3. gallery
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5. reception
6. auditorium
7. coffee bar

GROUND FLOOR



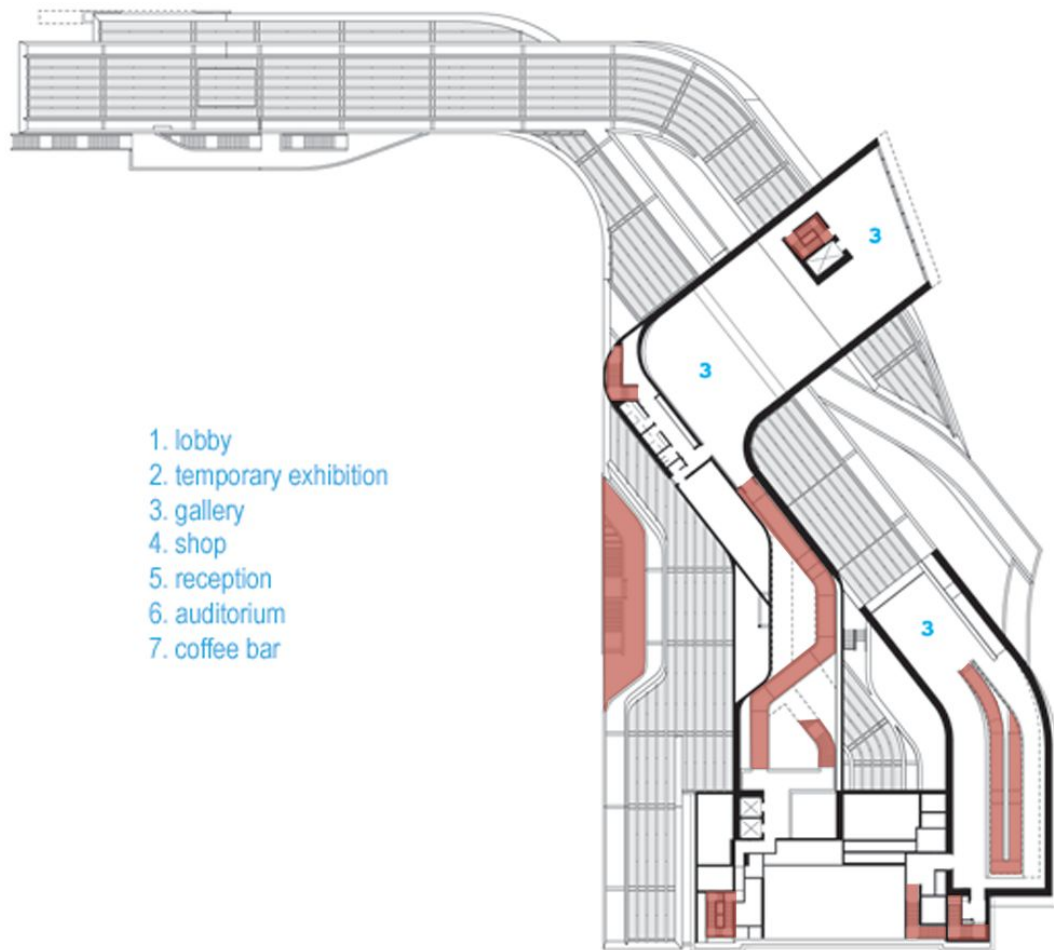
0 30 FT.
9 M.





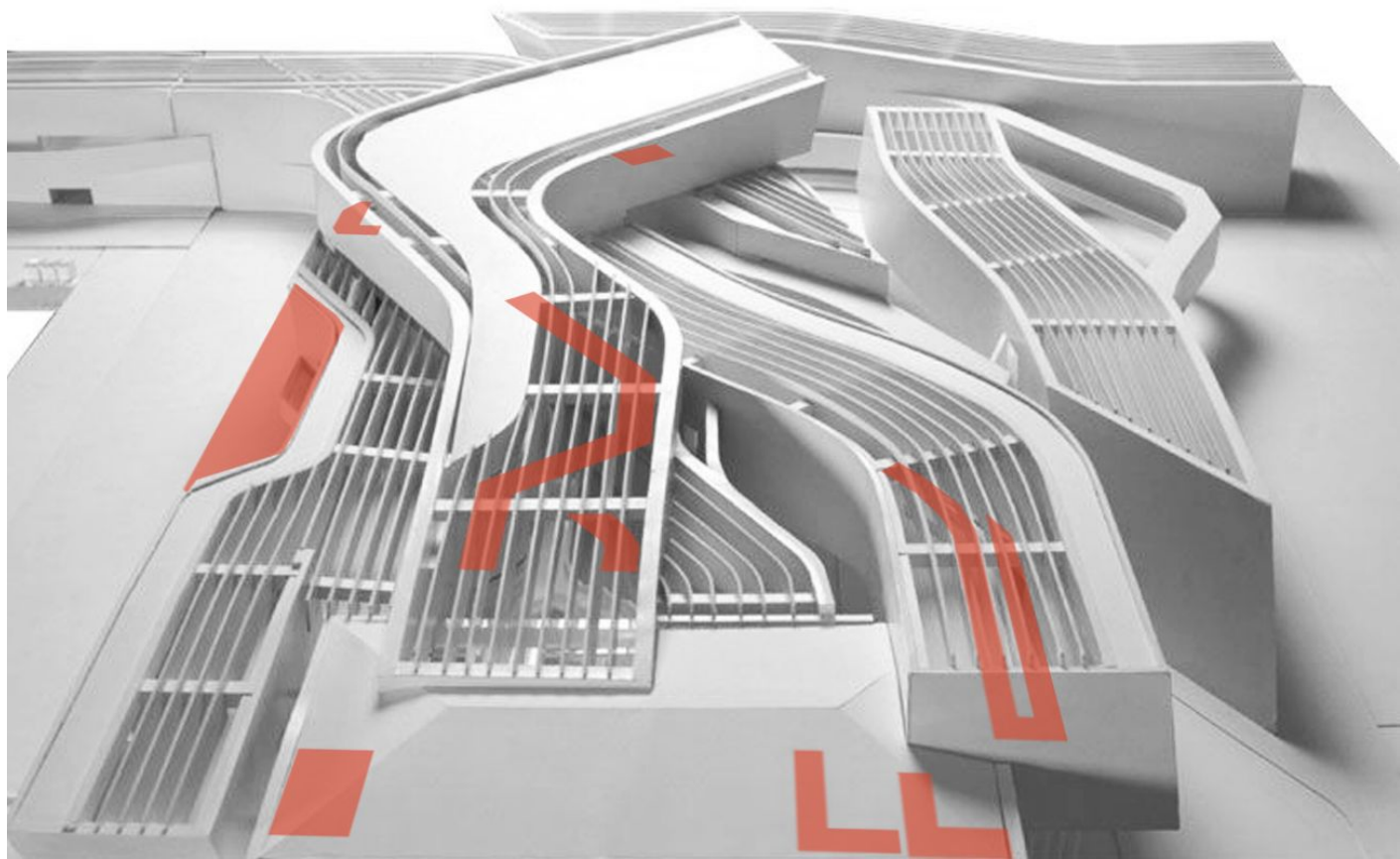
1. lobby
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3. gallery
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5. reception
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7. coffee bar

SECOND FLOOR



1. lobby
2. temporary exhibition
3. gallery
4. shop
5. reception
6. auditorium
7. coffee bar

THIRD FLOOR





Coop Himmelb(l)au - BMW bridge





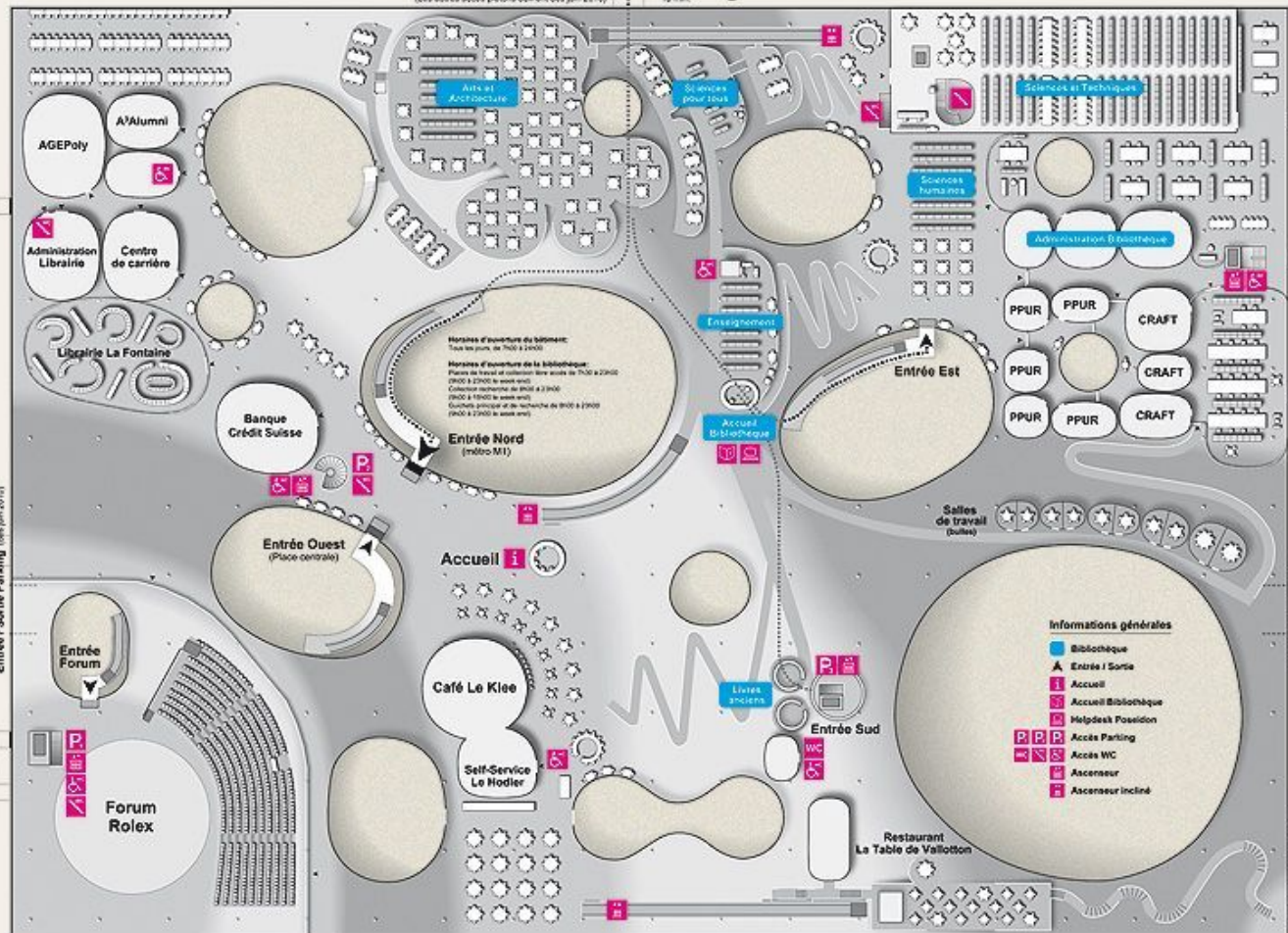


SANAA - Rolex Learning Center

Accès Nord

(Les autres accès peignent ouvert dès juin 2015)

A Métro M1
10 min.



dynamic ground

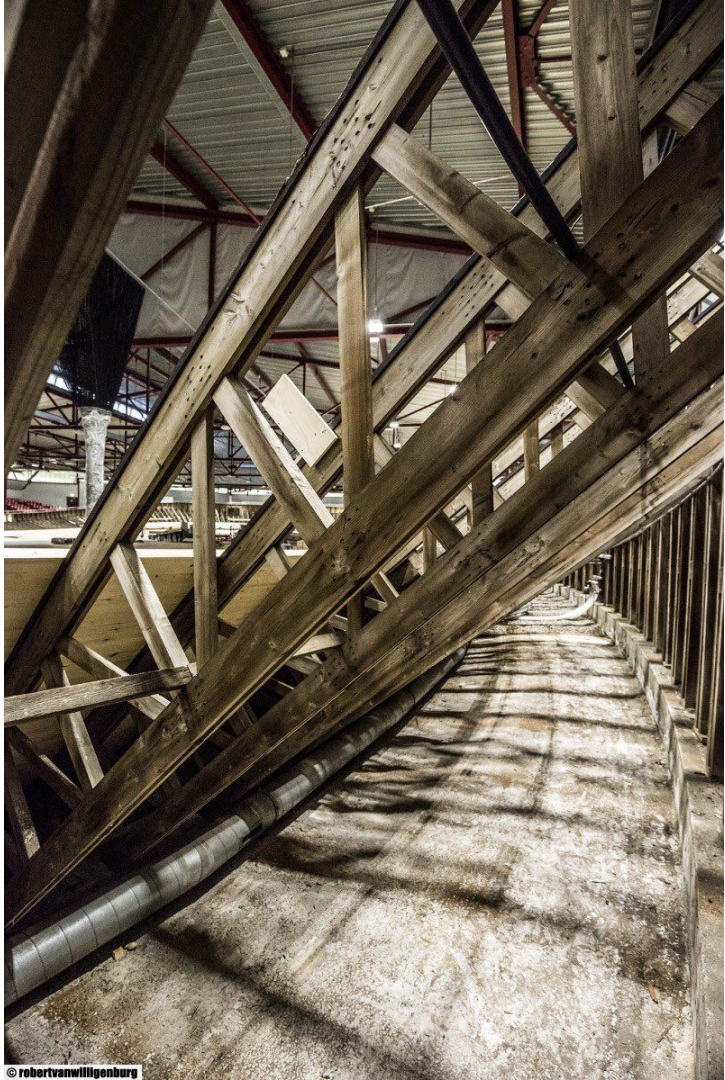


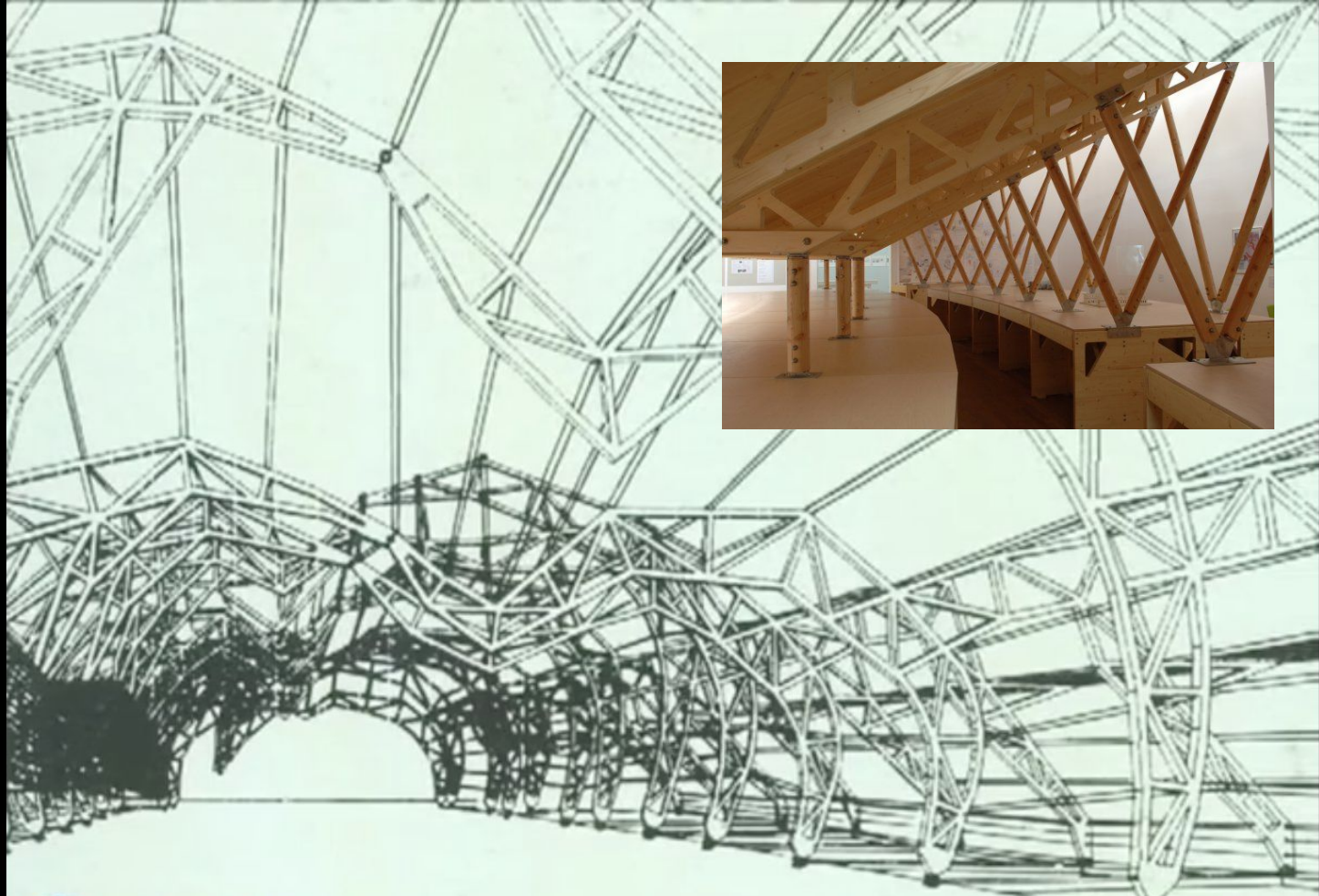




Amsterdam Velodrome







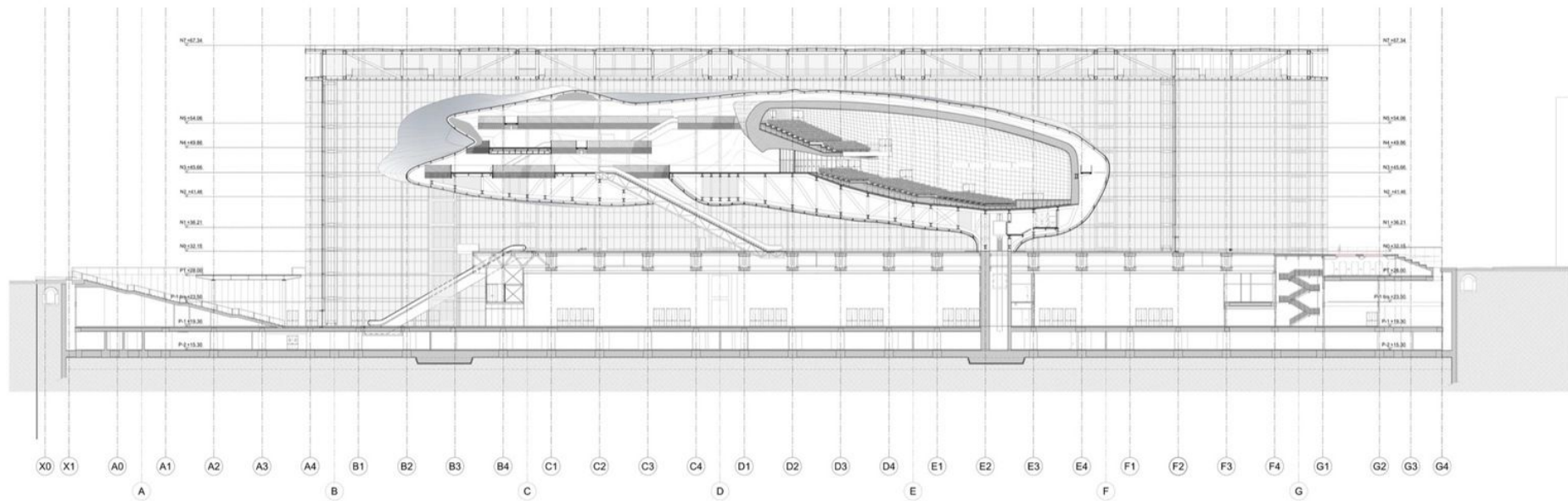
UNIVERSITAT POLITÈCNICA
DE CATALUNYA

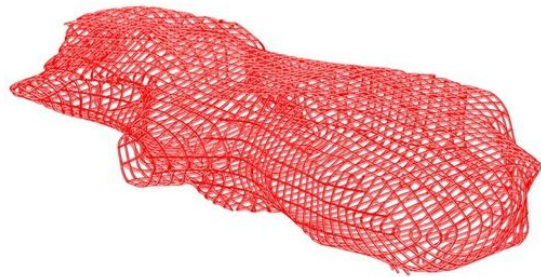
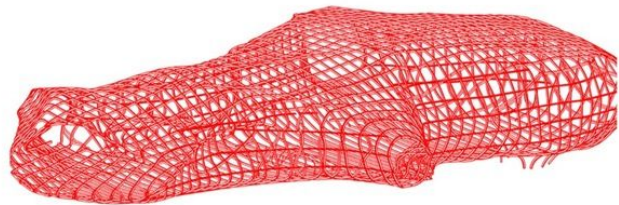
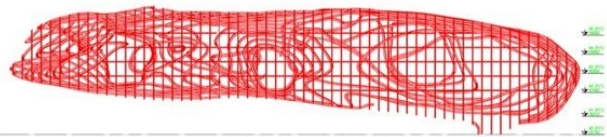
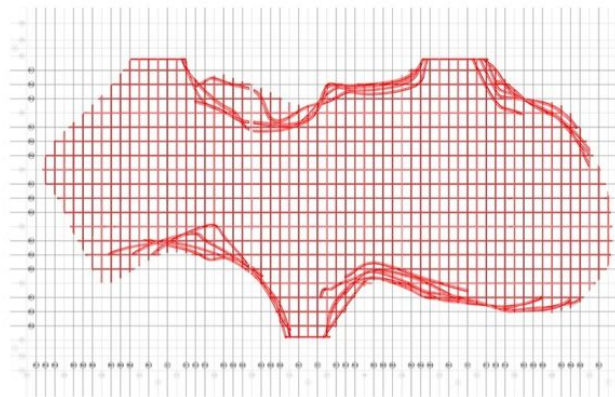
FOA - Yokohama International Airport

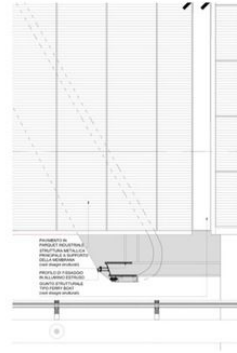
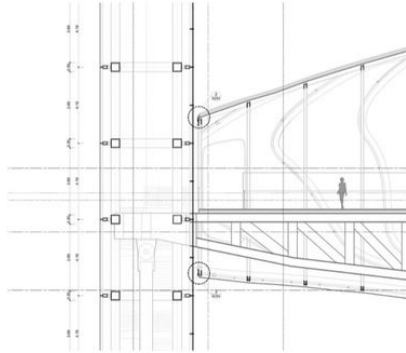
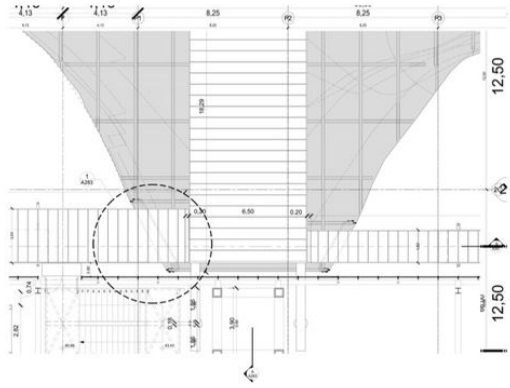
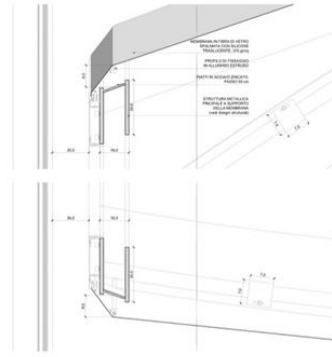
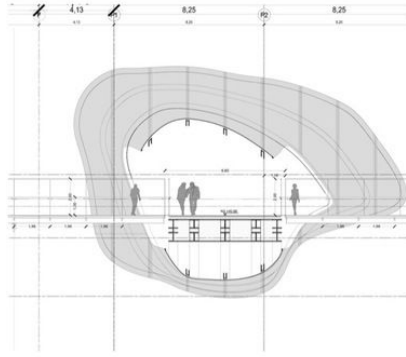
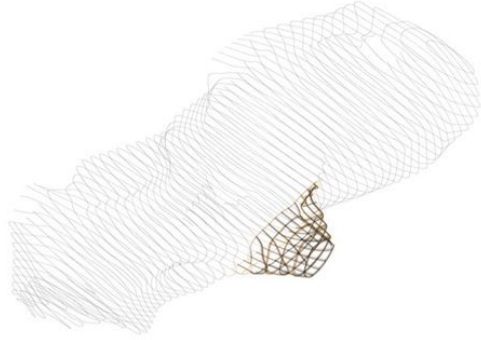


Studio Fuksas - EUR Convention hall - The Cloud









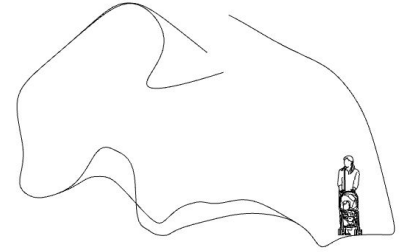
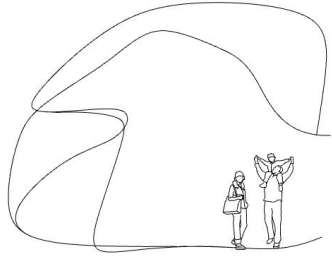
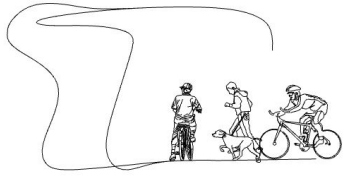


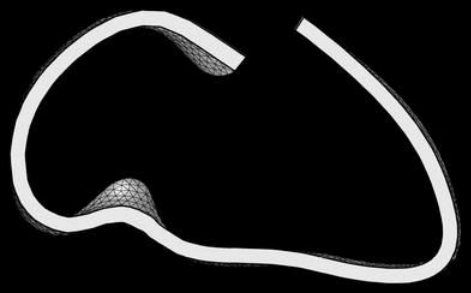


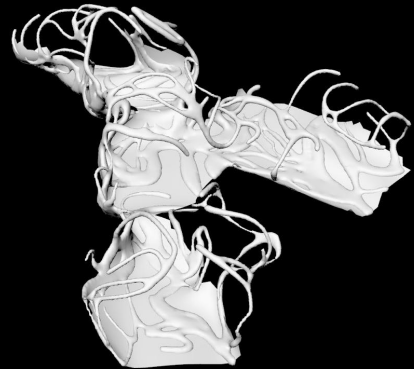
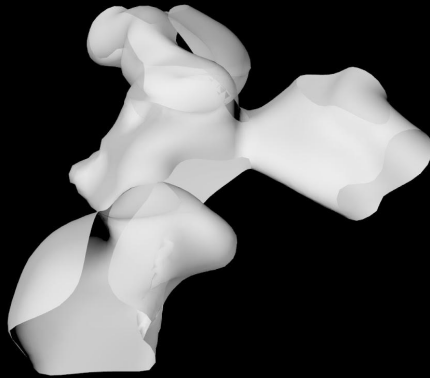


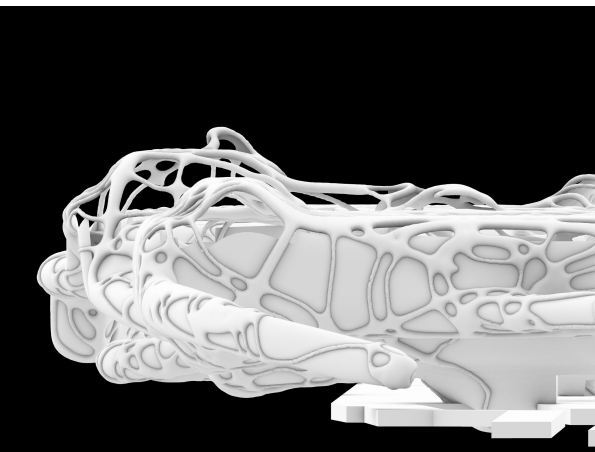




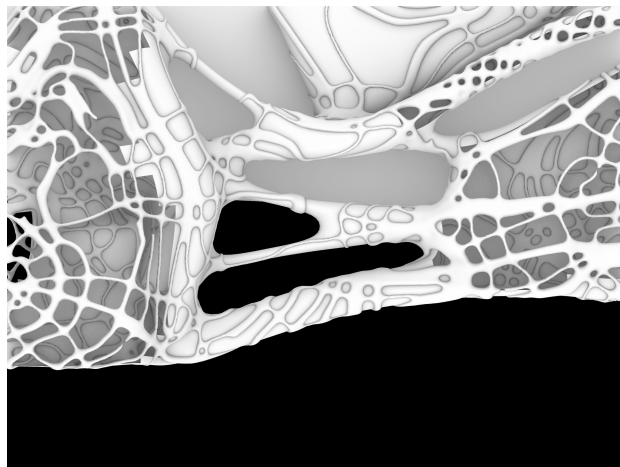




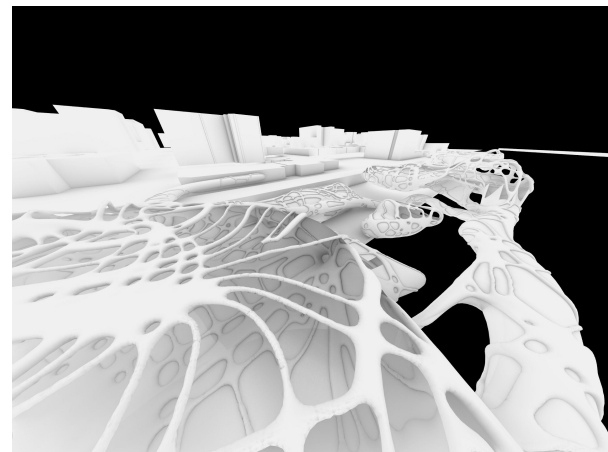




Expressive of Urban Multisensorial Experiences



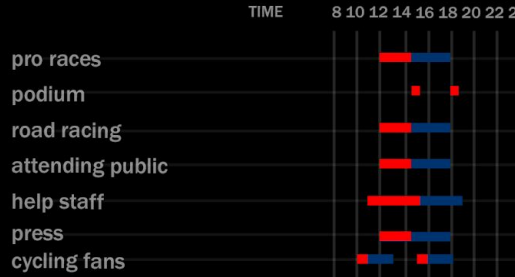
Localized/optimal transition gradient



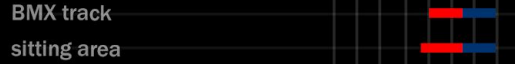
Materially Efficient

Patterns of Materiality and Formal Language

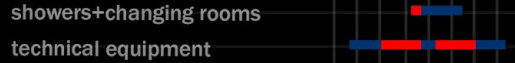
I. ROAD RACING



II. BMX CYCLING



III. TECHNICAL SPACES



IV. AMATEUR CYCLISTS



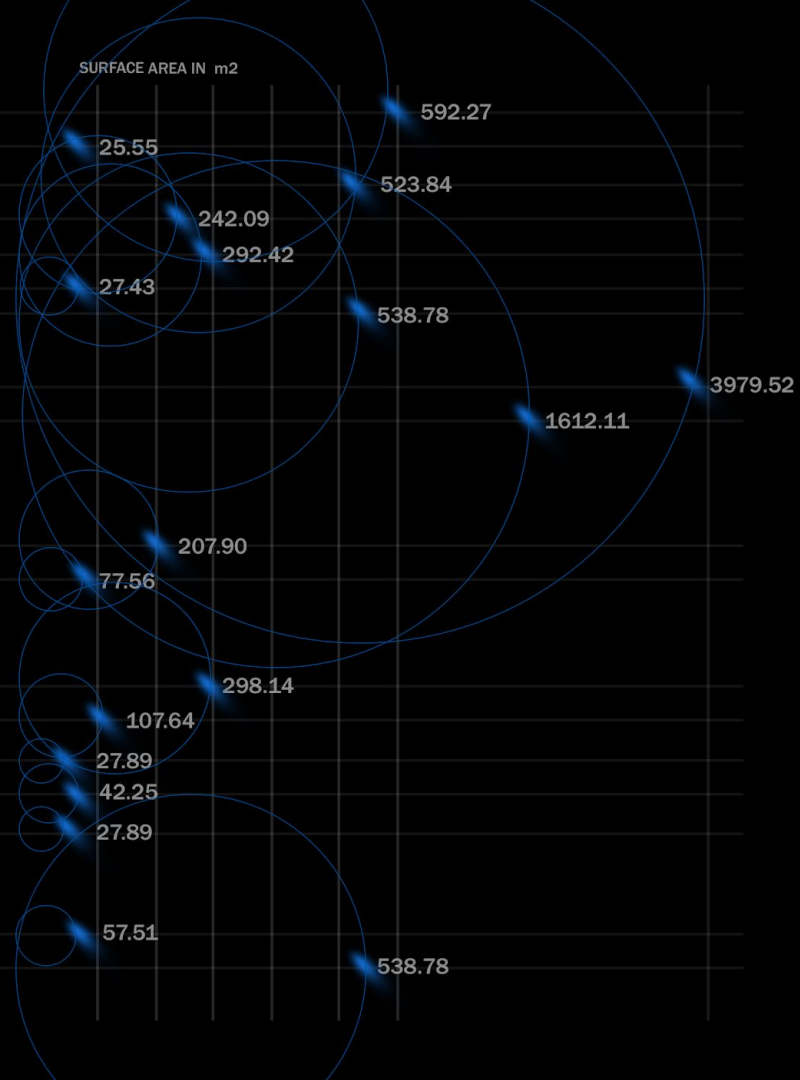
V. PUBLIC



TIME 8 10 12 14 16 18 20 22 24

min max

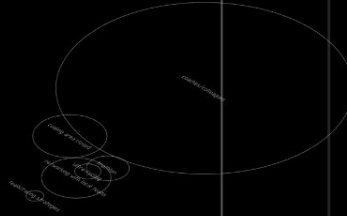
SURFACE AREA IN m²



PARAMETERS FAMILY EVOLUTION

surface per user

coaches/colleagues 2
cooling area closed 0.5
triathlon 1
ultra-cycling 3.5
networking local teams 1
team/racing strategies 1



number of users. floors height

20
200
15
30
7
30



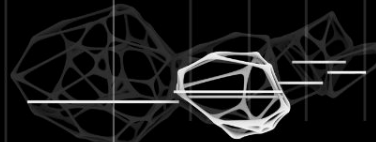
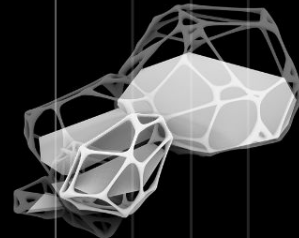
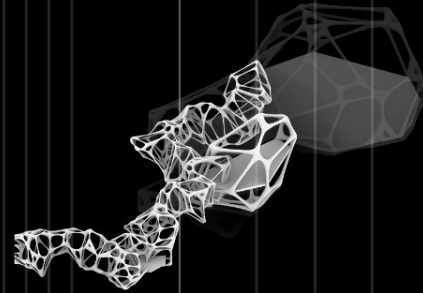
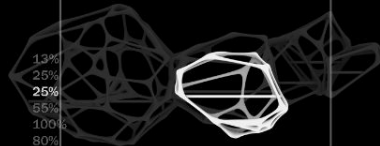
total surface

40
100
15
105
7
30



visual porosity

13%
25%
25%
55%
100%
80%



city proximity spots

Not relevant
Waterfront
Waterfront
Waterfront
Rue de Solferino
Rue de Solferino

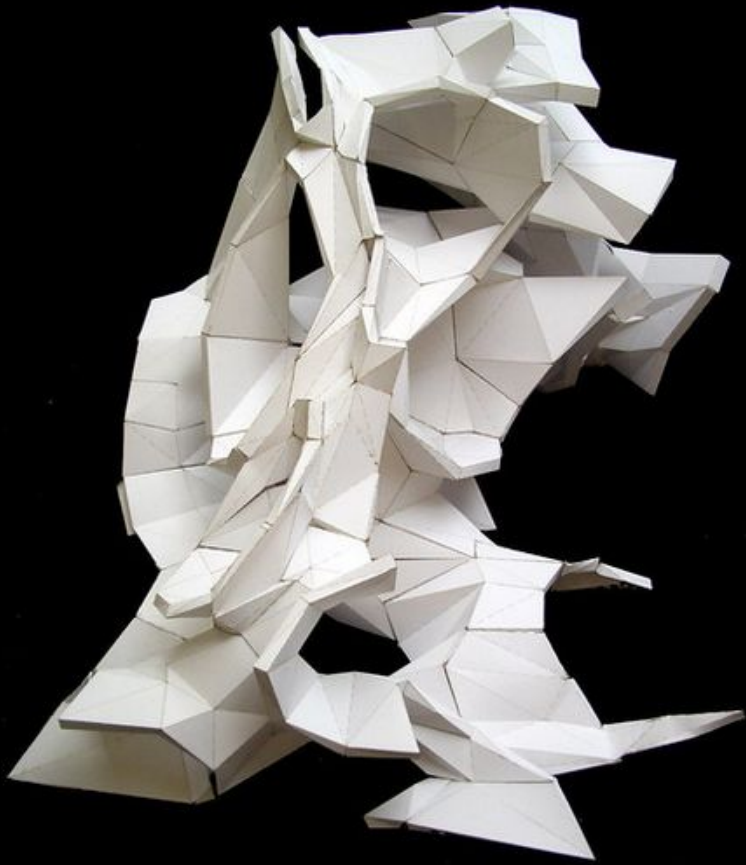
stress level

function activity

coaches/colleagues
cooling area closed
triathlon
ultra-cycling
networking local teams
team/racing strategies

height of function

1.17
2.25
2.25
4.95
9
7.2



Circulation - design this process manually - establish the rules - different kinds of users different speeds

- ↳ integrate it with a controlled internal environment
- ↳ 3D dimensionality of the path connected to the one of the structure ←
- ↳ design the verticals based on how the pathway is ascending inside the space
- ↳ interaction with the pathing → make a study of how other projects interact with the entry - DECIDE FOR AN APPROACH

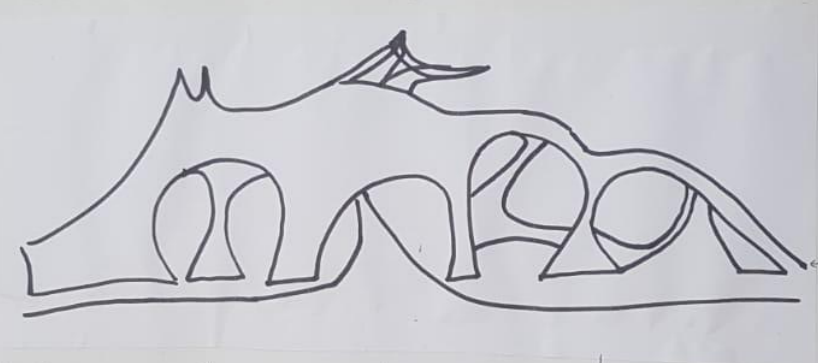
↳ from 2d flat surfaces to 3d integrated surface

Roofing - where do people need to go - how to get there

1. Point out functions
 2. k. m more interconnected way (inside, outside thickness)
 3. Diff in thicknesses → add here on a firing post how people would use the space (maybe add some furniture)
 4. Material
- Elevation
 Overview - Fragment - 4 - further, decay, water, why relationship

- urban sector
 - small section
 - plan of the building

URBAN LOCATION BUILDING
 ↓
 FRAGMENT
 ↓



Context, bridge plan, surroundings, positive volume (negative + positive space)
 ↳ understanding of use of space

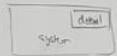
Context - frame for the bridge

design all this by hand and then use verticals? before space (sketch them)

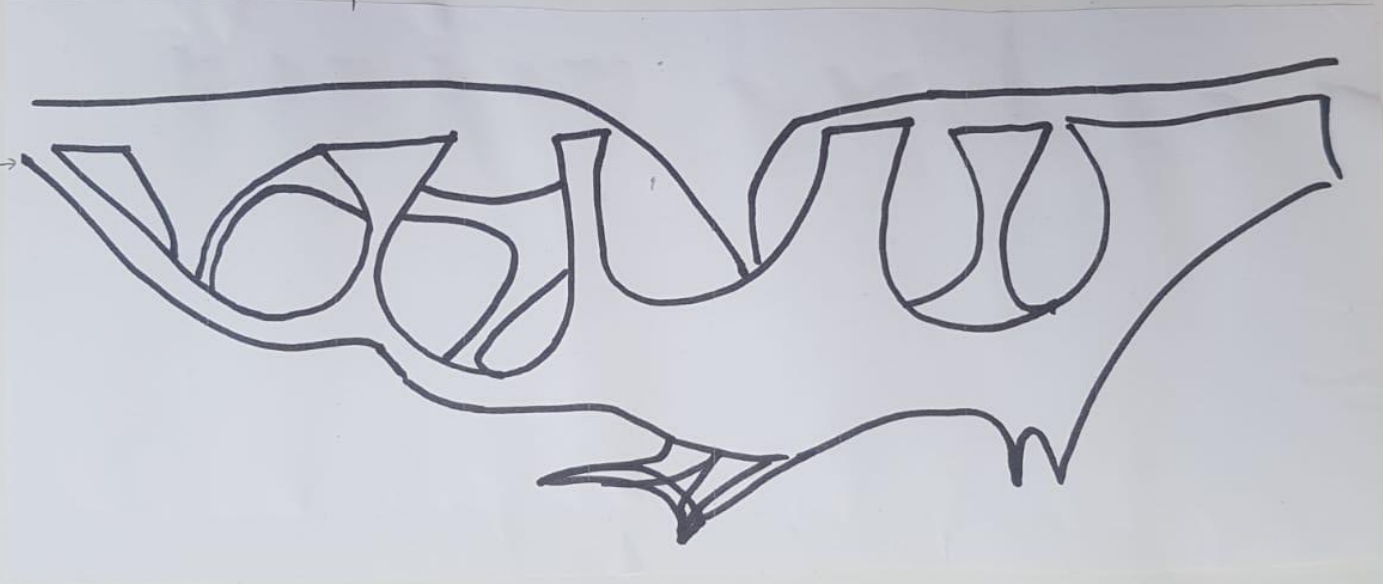
Structure & program 3 Dimensionality
 - make a selection of vertical joints based on requirements (climate - views mainly)
 shadow

Materiality - make a render that comprises materials as well (download escape for this)
 - small section through a habitat which shows the thickness of the materials + details being explored (wood planks, joints, screws, system with ETFE)

Main drawings: section (horizontal) - relation between city and water
 segment for detailing



Program
 - simplify this as well as create functions together with circulation



→ imagine this as ramp

design all this by hand and then use software? define spaces (stretch them)

↑ context - frame for the bridge

↑ surroundings position volume (negative - positive space)

↑ use of space

urban section
small section
plan of the building
↑
URBAN
LOCATION
BUILDING
↑
FRAGMENT

4. material
3. Diff in thickness → add here on a tiny part how people would use the space (maybe add some furniture)

Elevation - Fragment - 4 - function, decay, water, city relationship

Routing - where do people need to go -

↳ from 2d flat surface to 3d

↳ interaction with the existing →

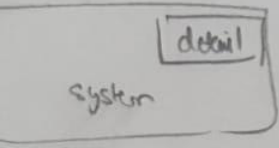
Structure & program 3 Dimensionality

Materiality - material

ation (transversal) - relation between city and water

shadow mainly

segment for detailing



↓ going from one version to the other would be particularly defined by the circulation

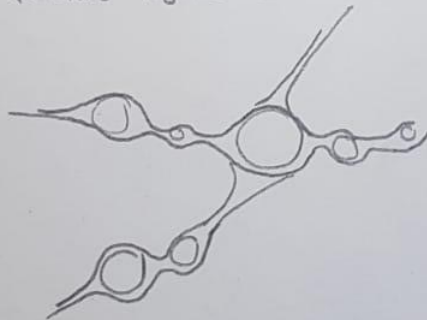
↓ this circulation can be defined at a level in between → pass from one to the other

Dimensionality

Section of Voronoi facets based
elements (climatic - views
shadow mainly)

Program

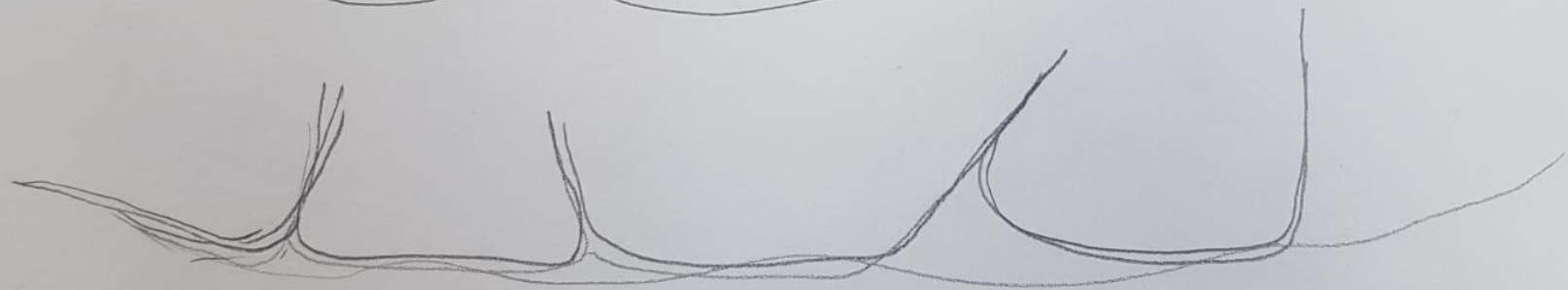
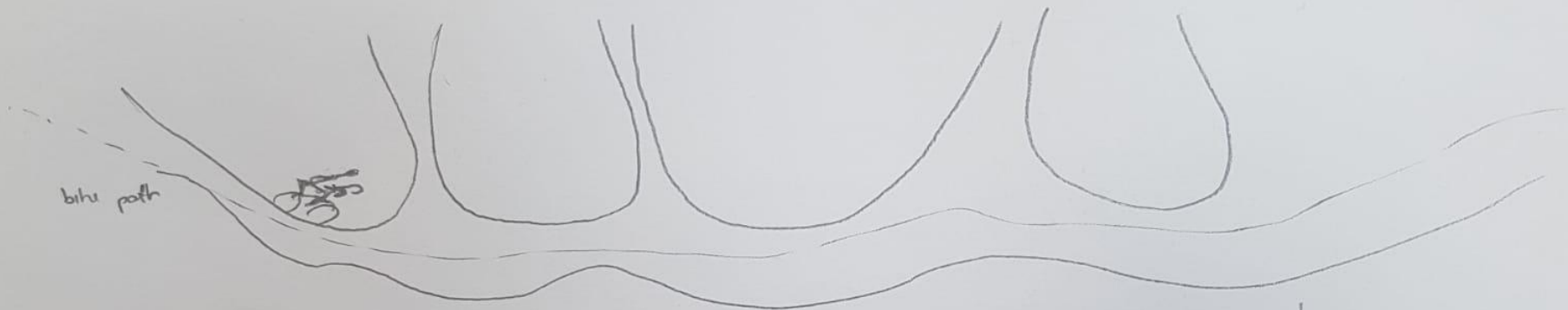
- simplify this as well as create
functions together with circulation



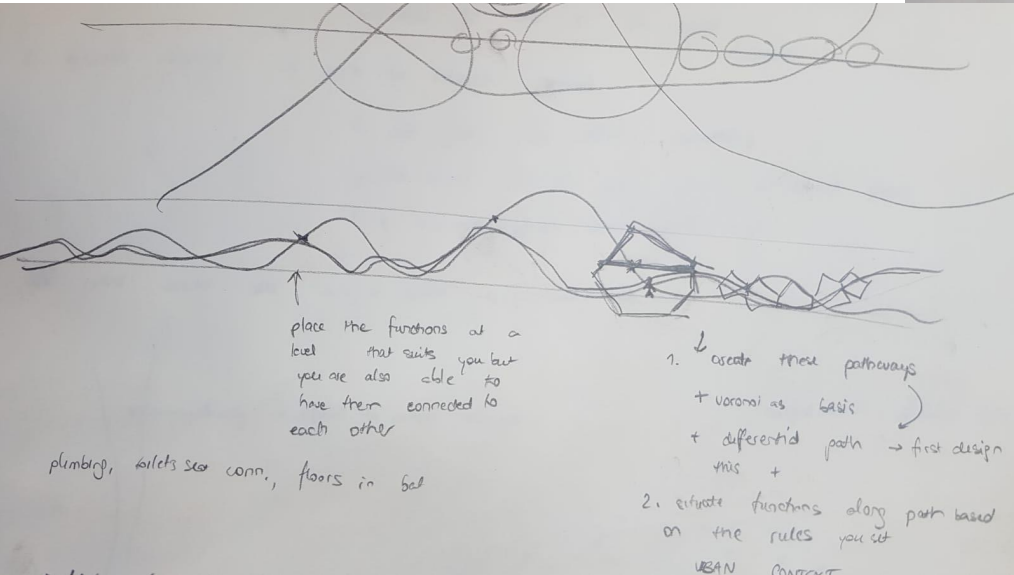
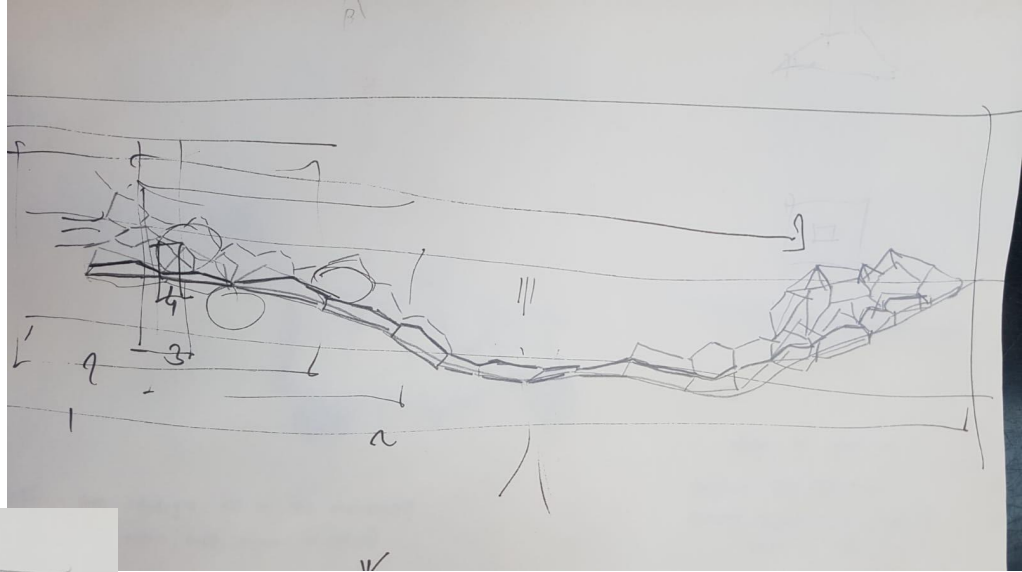
- relation to the city - how does it
connect to the ground
- make a big scheme of functions
(Voronoi's)

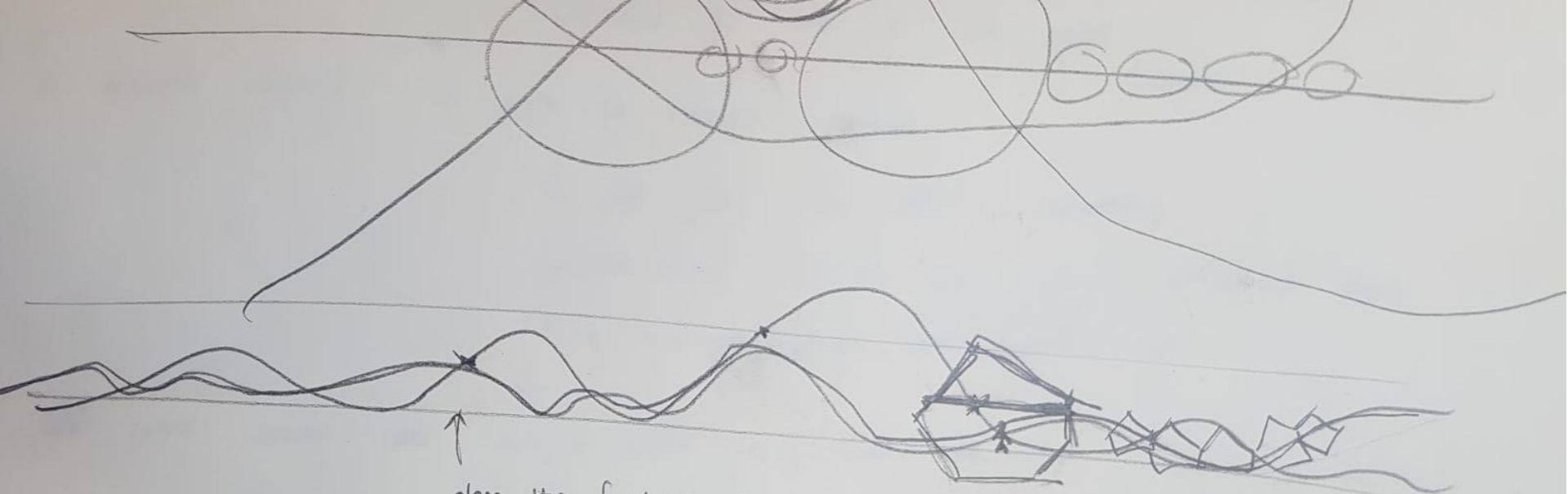
Materiality - make a render that
(download escape for)

- small section through a
of the materials + details
(wood planks, joints, screws)



circulation + multiple structures





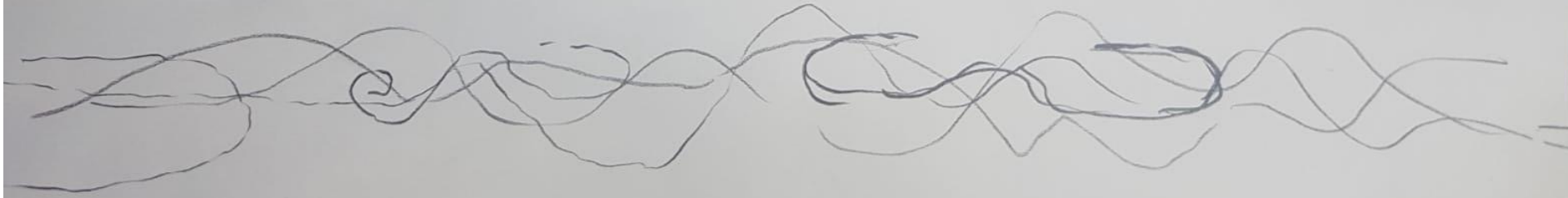
place the functions at a level that suits you but you are also able to have them connected to each other

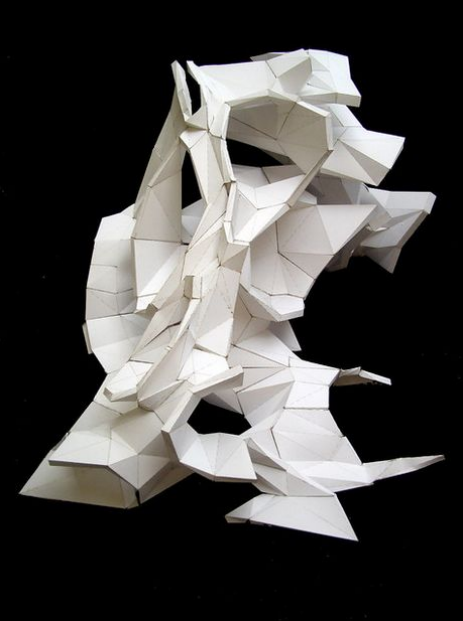
plumbing, toilets sewer conn., floors in bal

1. ↓ create these pathways
+ voronoi as basis
+ differential path → first design
this +

2. estimate functions along path based on the rules you set

URBAN CONTEXT

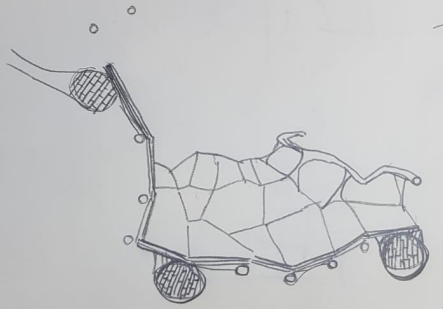
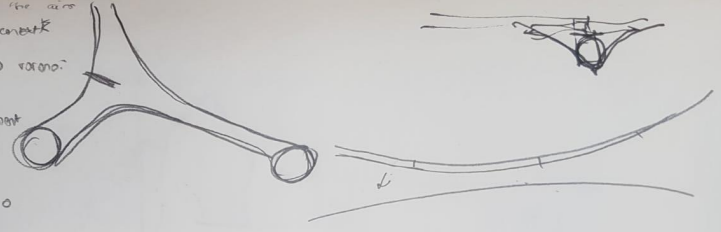




-how str. contributes to the user
(dynamism) within the context

-the benefit of the 3D volume:

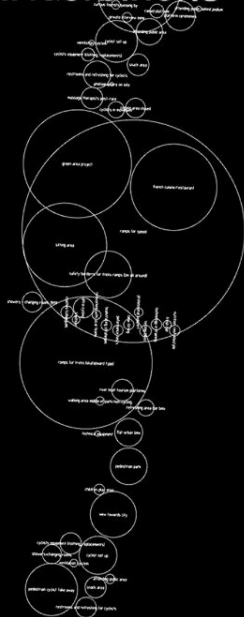
structure
↳ willing to experiment
expressive culture



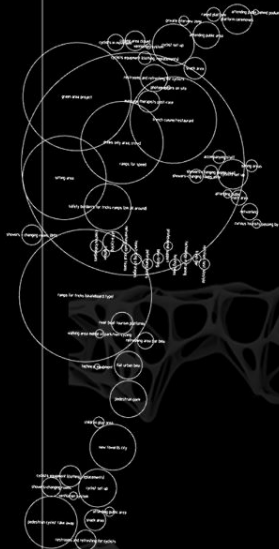
Section - ~~steps~~ including all in the environment

slides to put on
Gargline - clear pous - A4
drawed surfaces over line 51

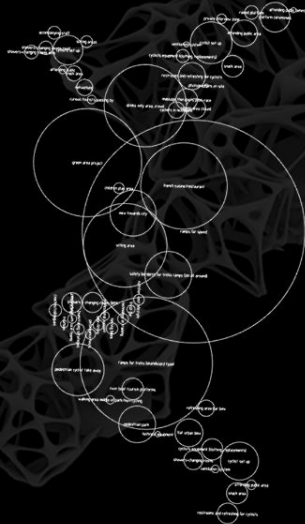
PROGRAM CONFIGURATIONS



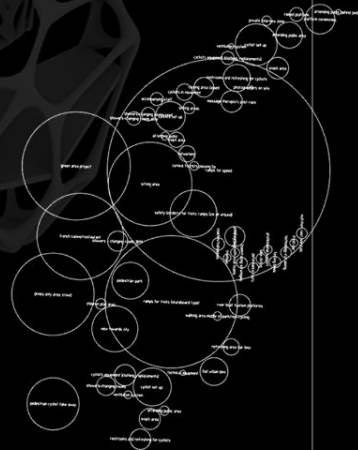
v1_racing to leisure gradient



v2_river suspension



v3_racing nuclea polarization

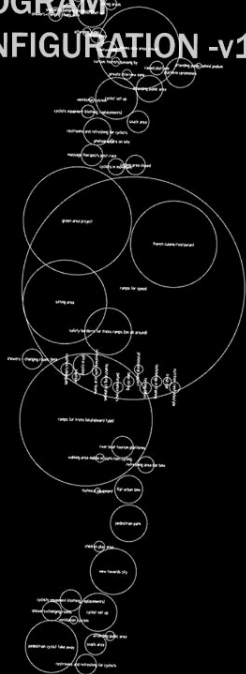


v4_racing nuclea polarization



v5_radiant stacked intensities

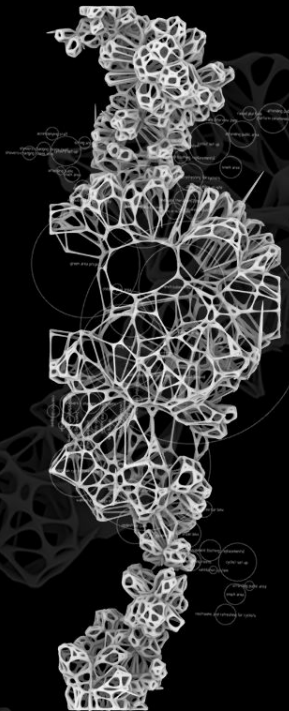
PROGRAM CONFIGURATION -v1



full configuration



visitors cluster



amateurs cluster



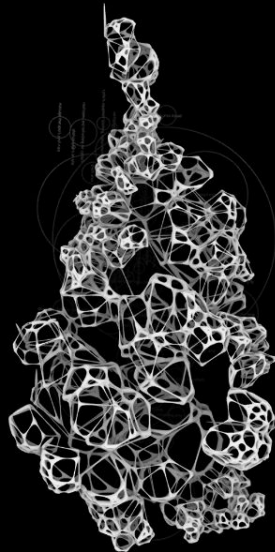
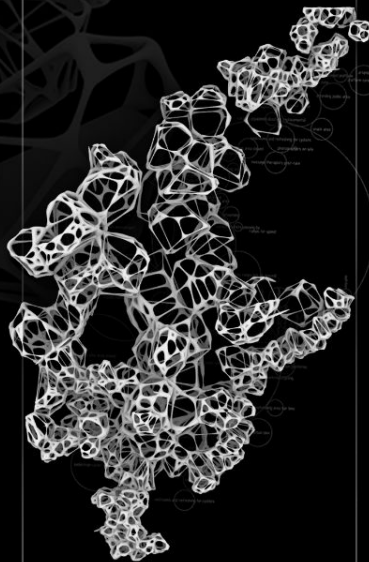
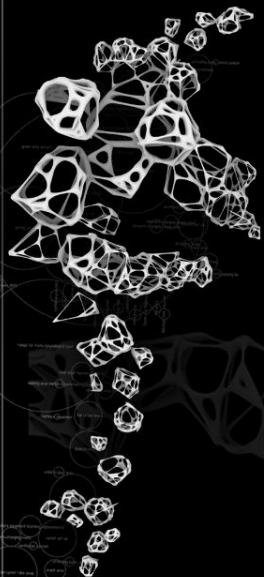
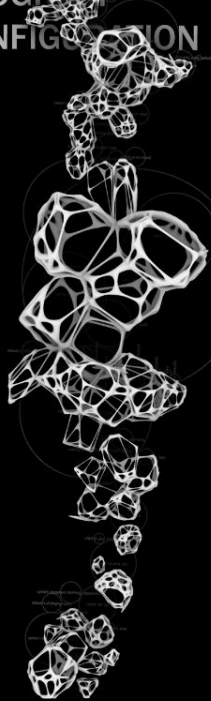
bmx



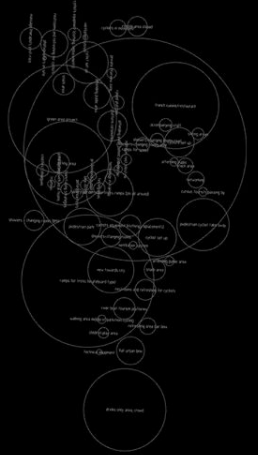
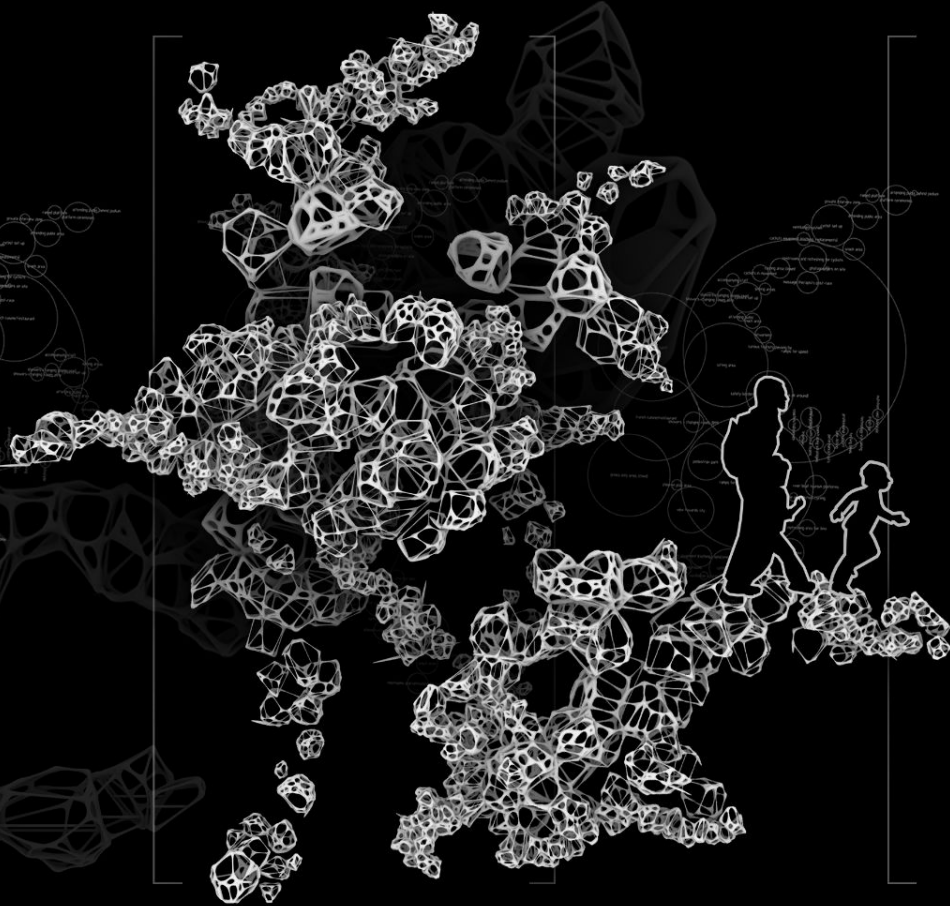
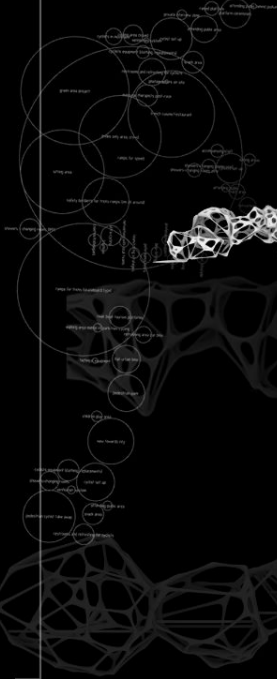
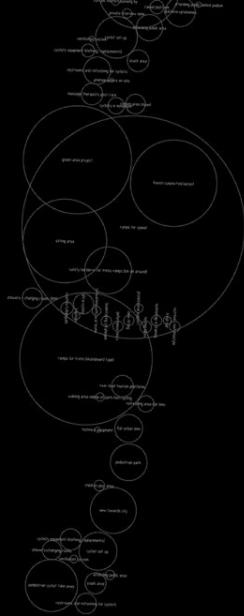
workshops

pro

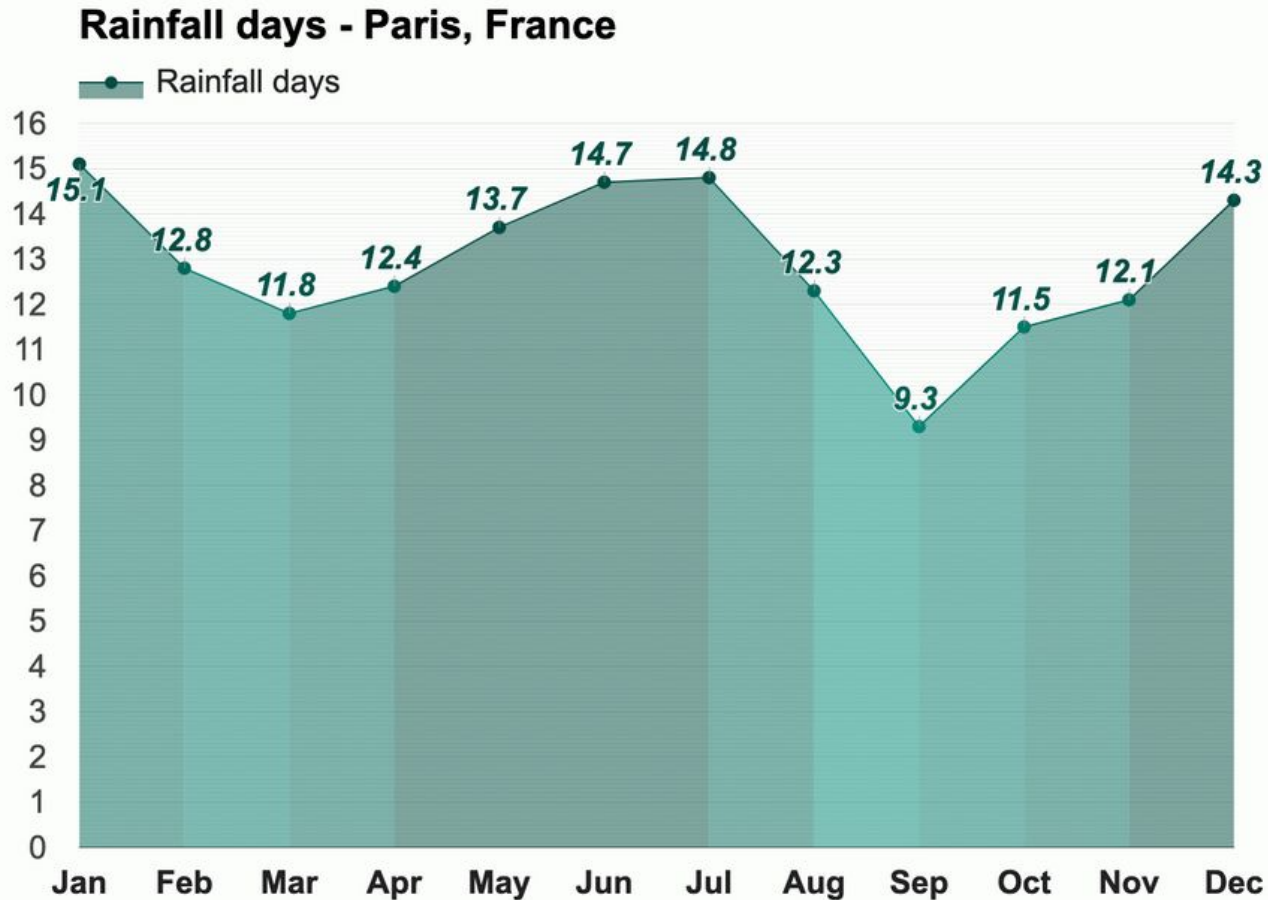
PROGRAM
CONFIGURATION



PROGRAM CONFIGURATION

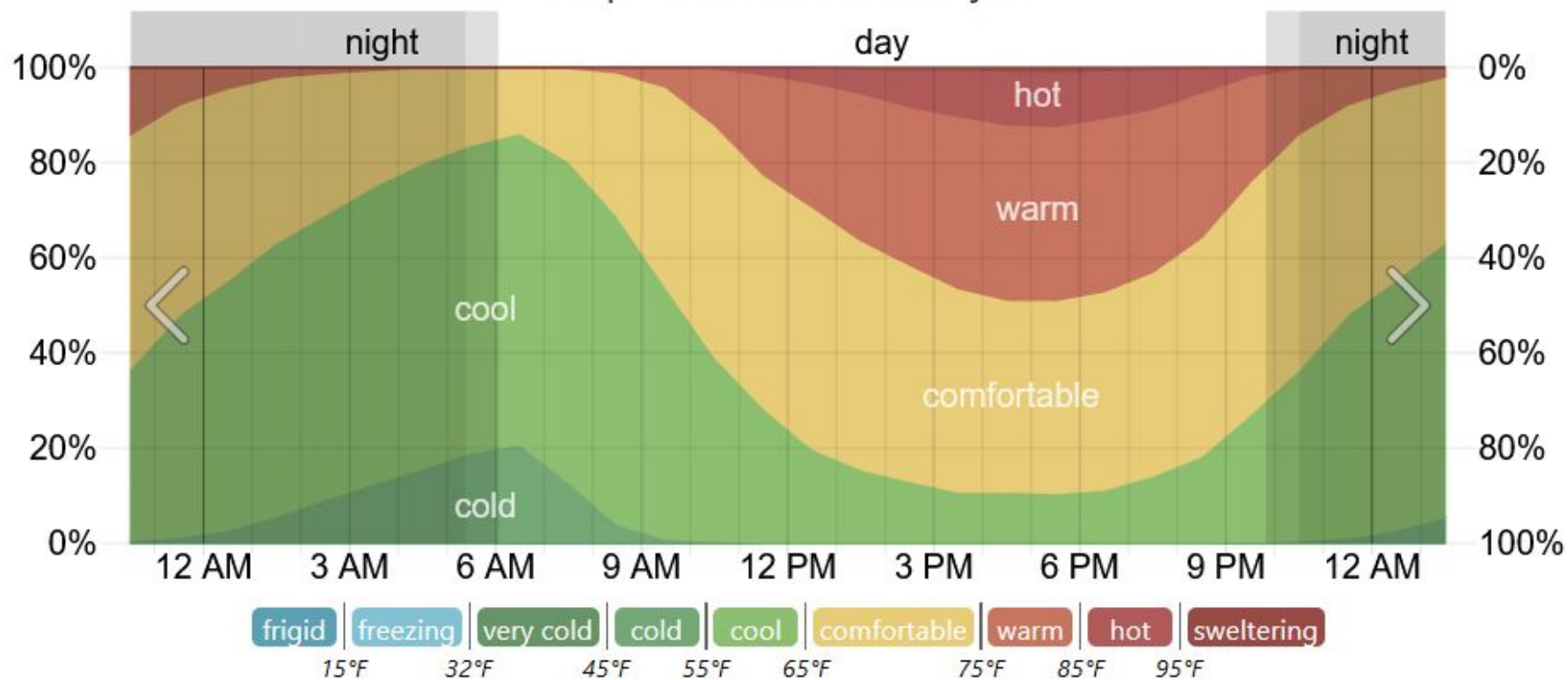


Average rainfall days in July Paris, France



Average rainfall days in July: **14.8 days**

Temperature Bands on July 15

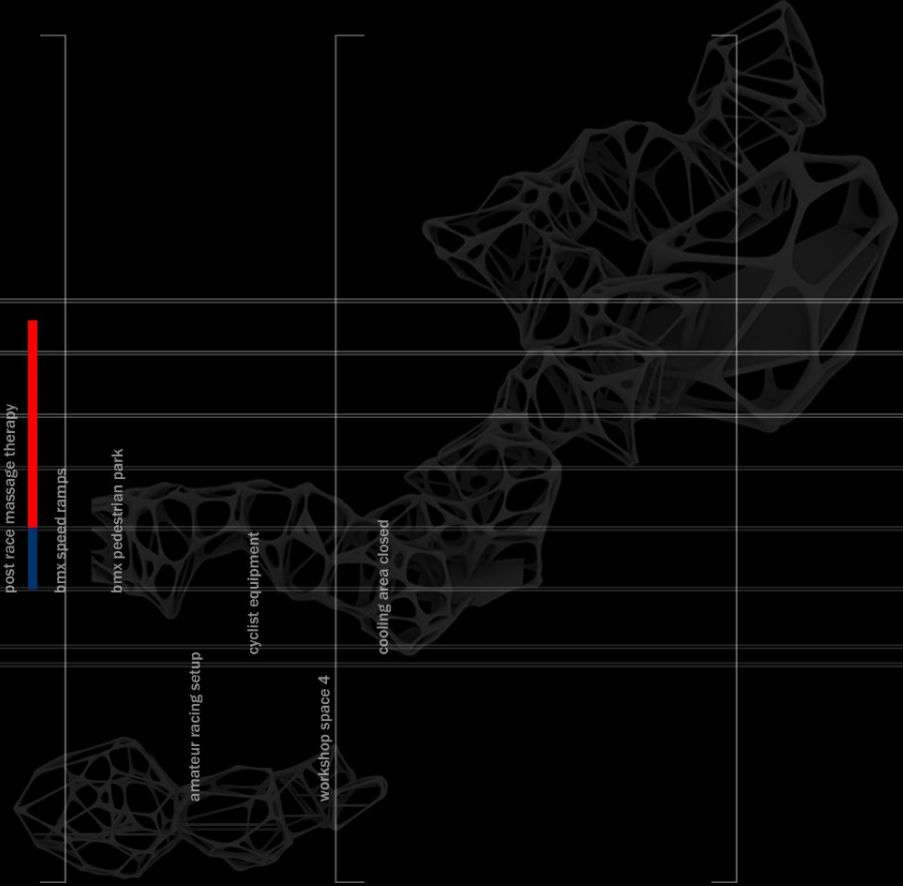
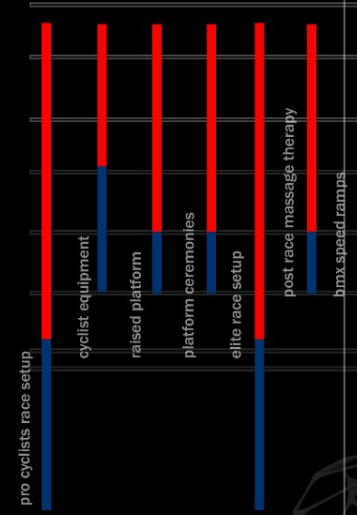


The percentage of time spent in various temperature bands. Civil twilight and night are indicated by shaded overlays.

PROGRAM CONFIGURATION

TEMPERATURE

39
36
33
30
27
24
21
18
15



bmx pedestrian park

amateur racing setup

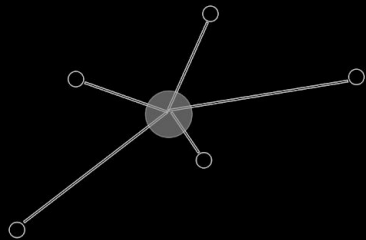
cyclist equipment

workshop space 4

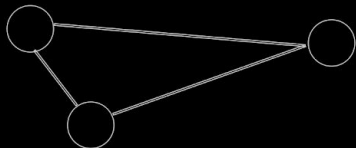
cooling area closed

CIRCULATION

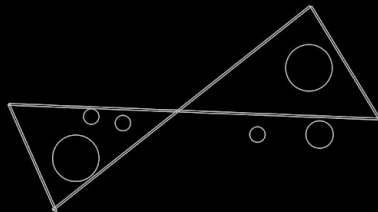
hierarchy path
hybrid path



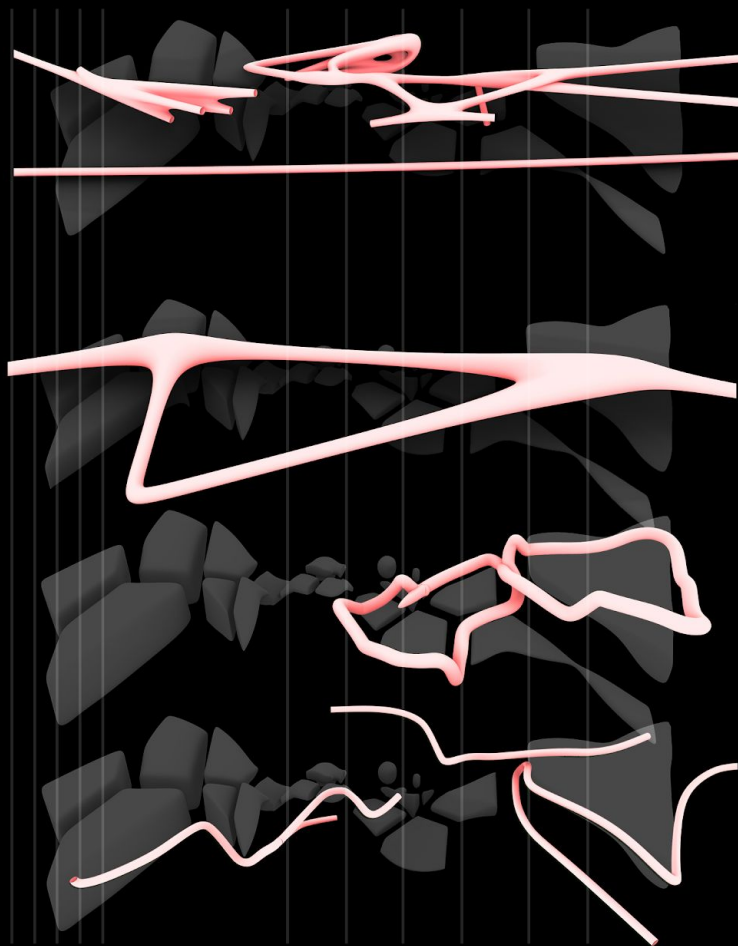
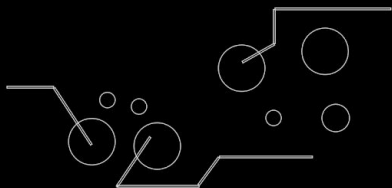
cycling highway

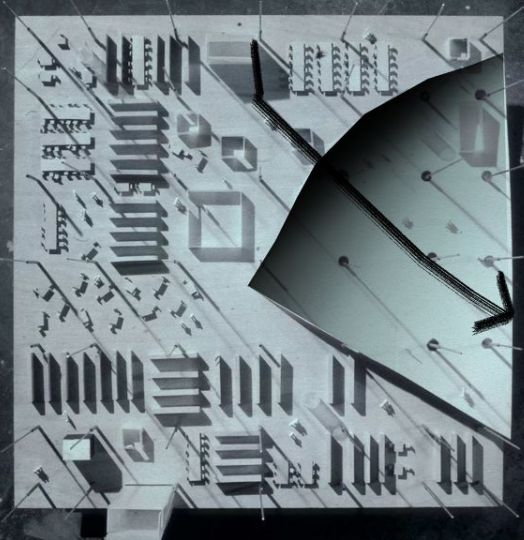
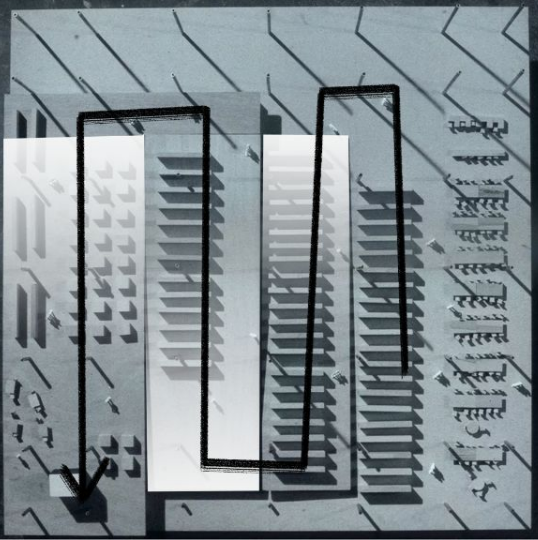


looping track



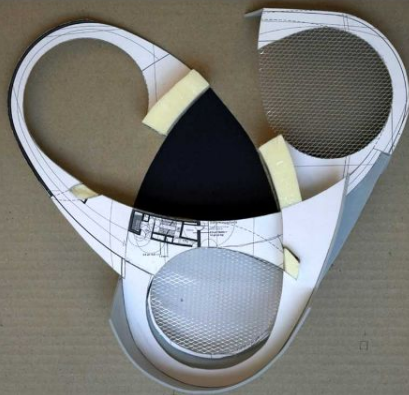
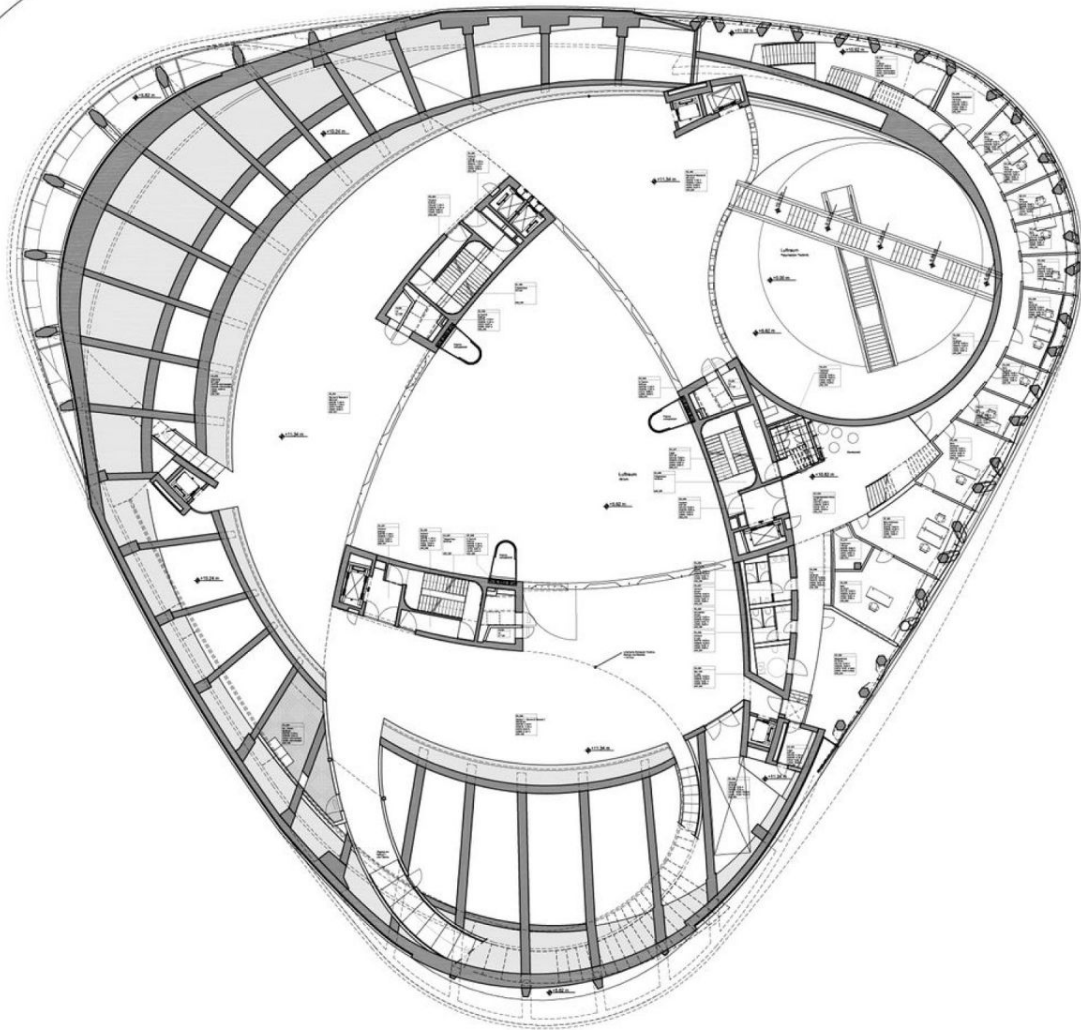
back to water
back to earth
urban weaving path







Mercedes Museum, UN Studio



SITE VIEW

type of connections

pedestrians, cyclists

total surface

visual porosity

city proximity spots

street level

function activity

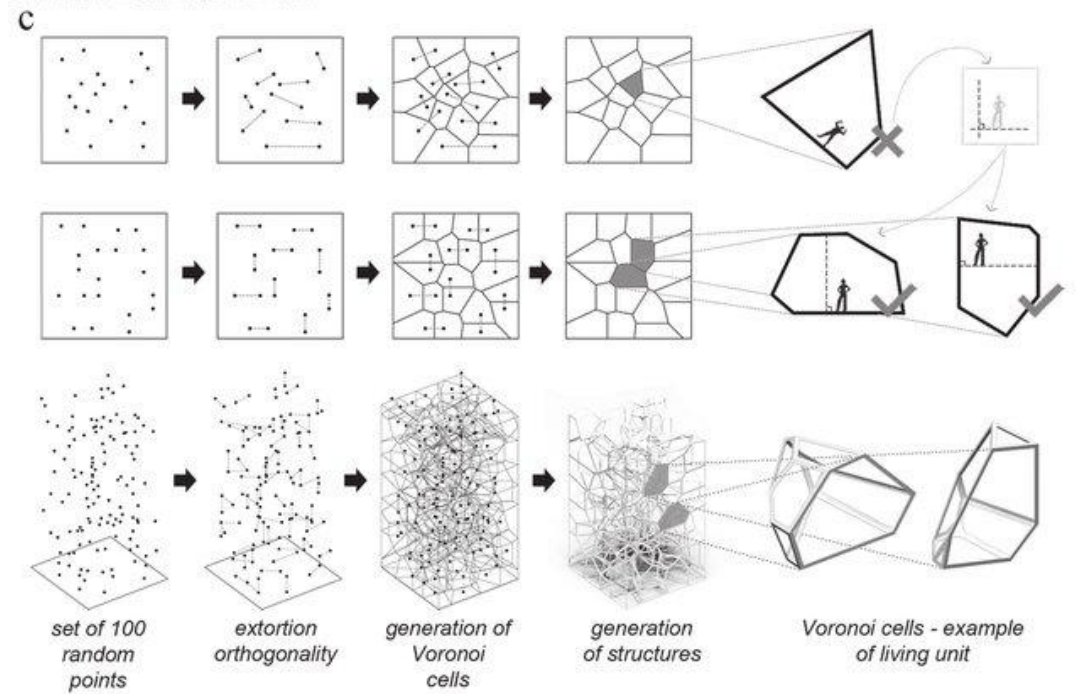
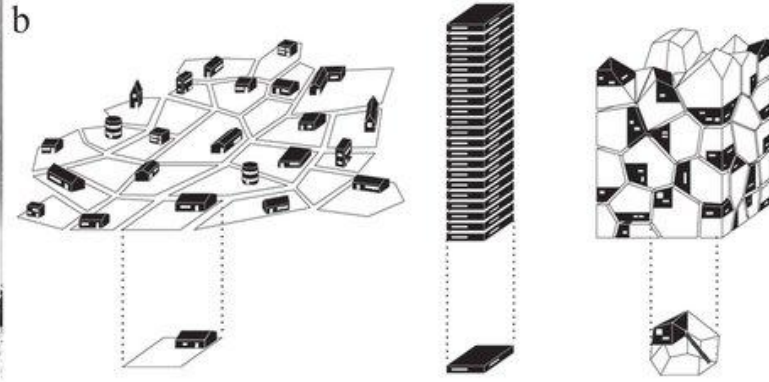
height of function



Waterfront
Waterfront
de Solferino
de Solferino

trovati-re-00
trovati-re-00
trovati-re-00
trovati-re-00

2.25



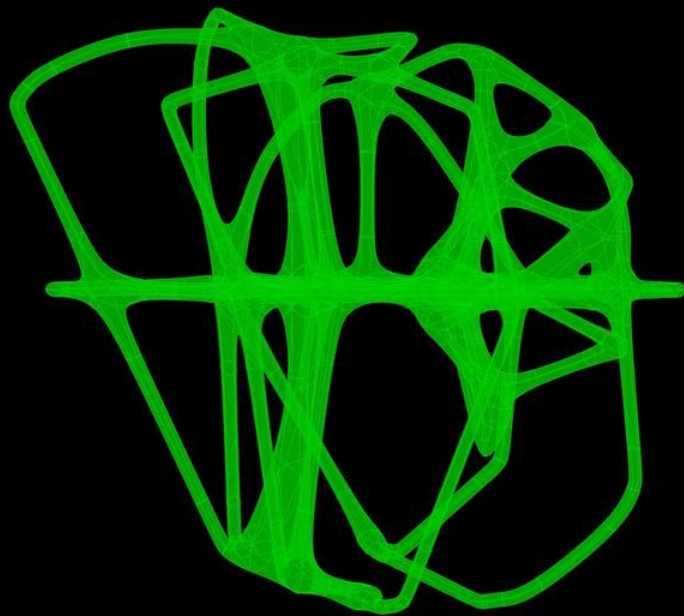
set of 100
random
points

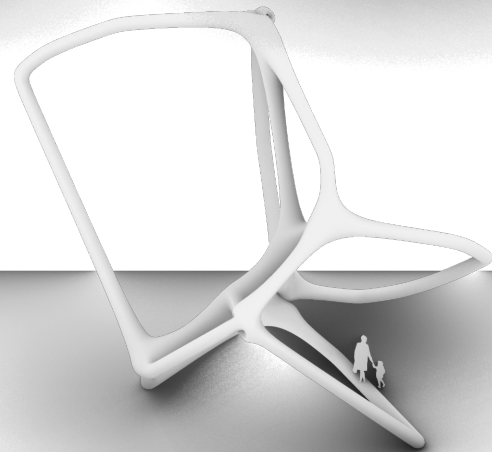
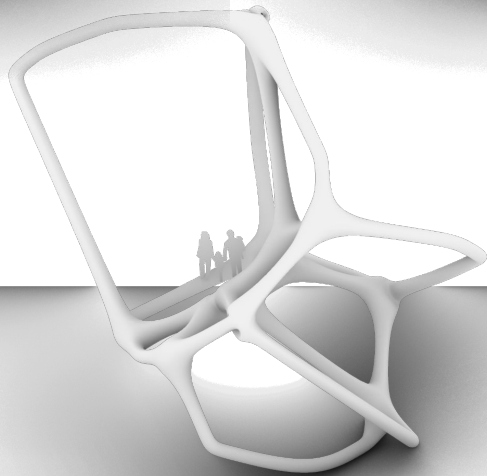
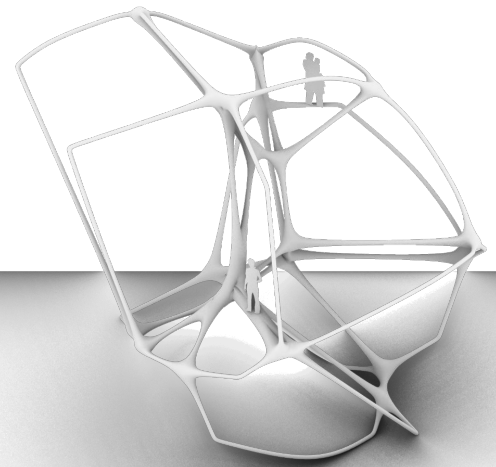
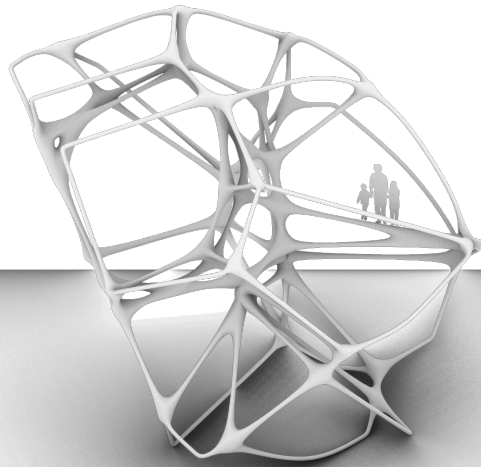
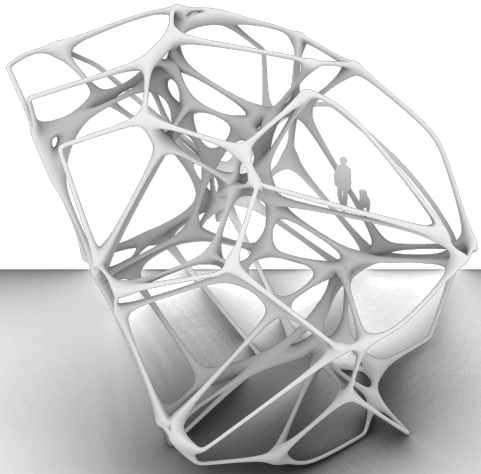
extortion
orthogonality

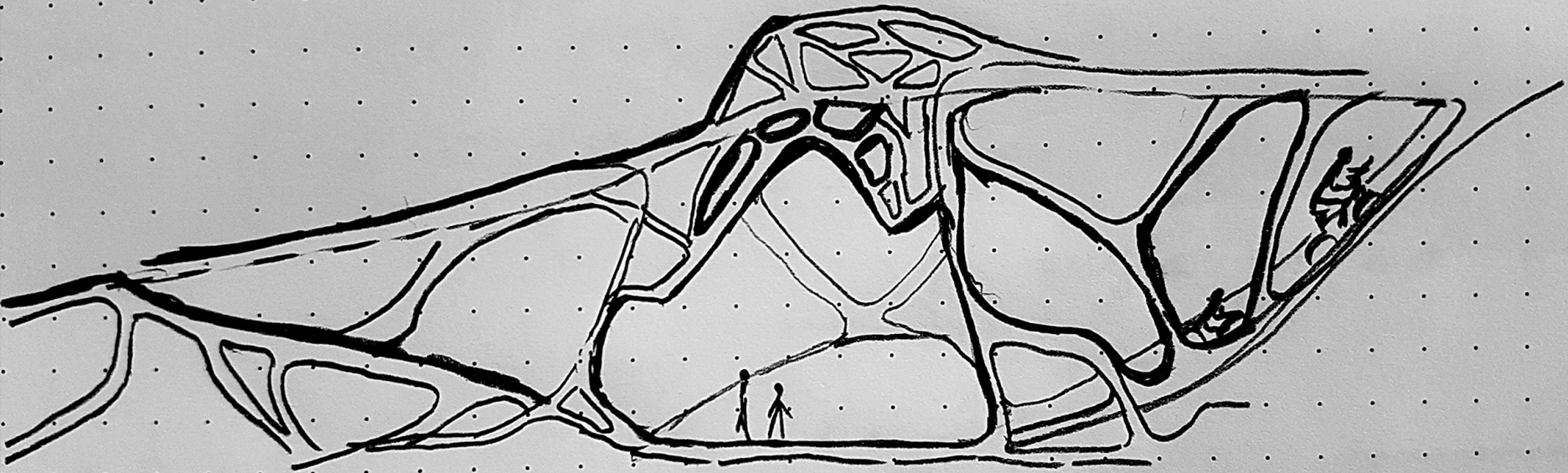
generation of
Voronoi
cells

generation
of structures

Voronoi cells - example
of living unit







TIME 8 10 12 14 16 18 20 22 24

SURFACE AREA IN m2

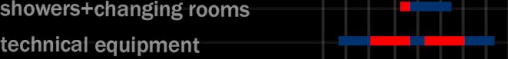
I.ROAD RACING



II.BMX CYCLING



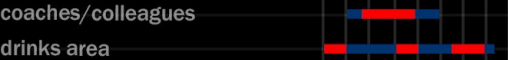
III.technical spaces



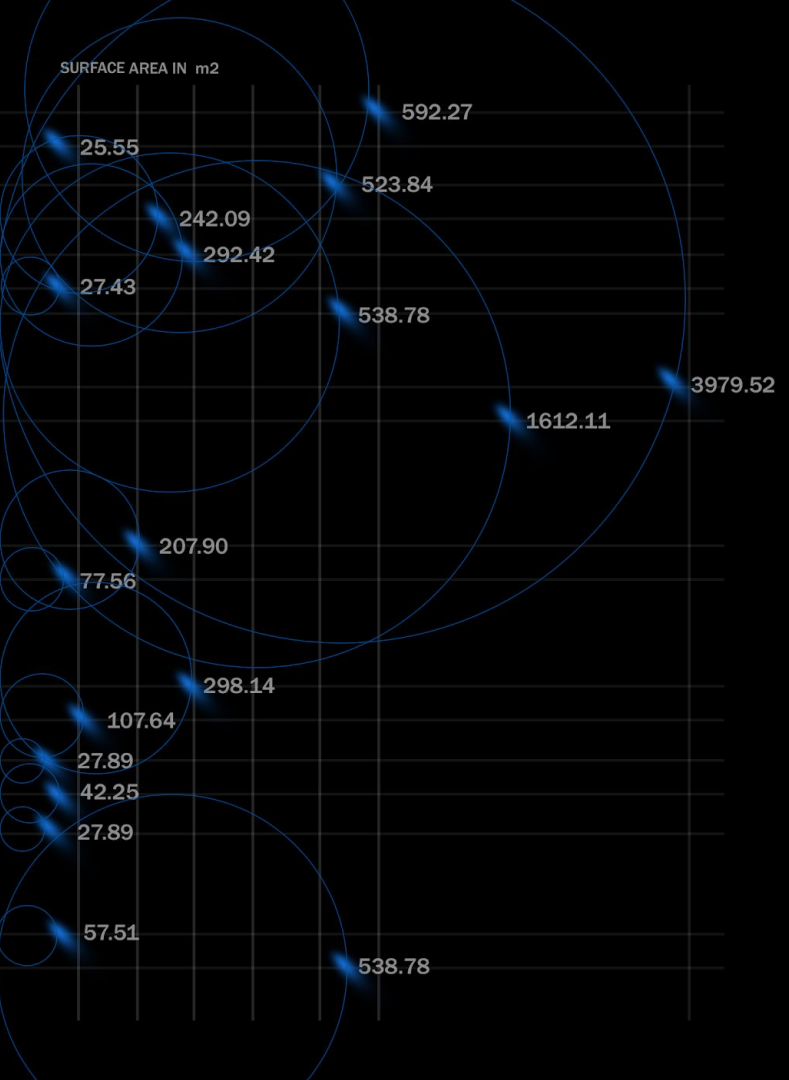
IV.amateur cyclists



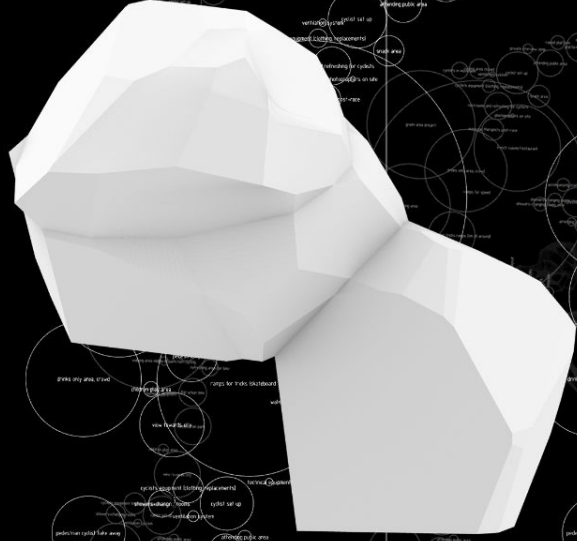
V.PUBLIC



min max



MATERIALIZATION



Base Volume



Compression Regions

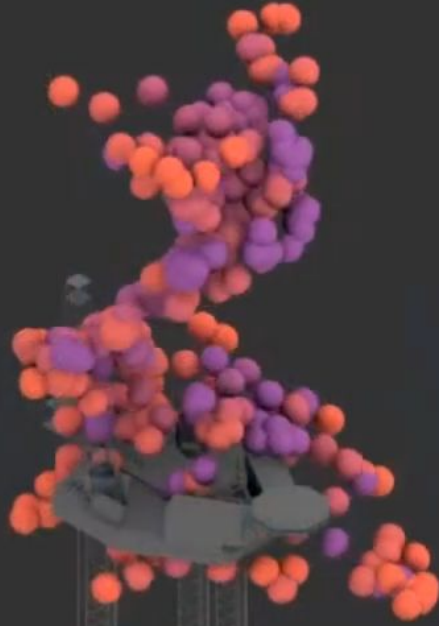


Materialization

agent based modeling
BB C
ABM 4
var 4

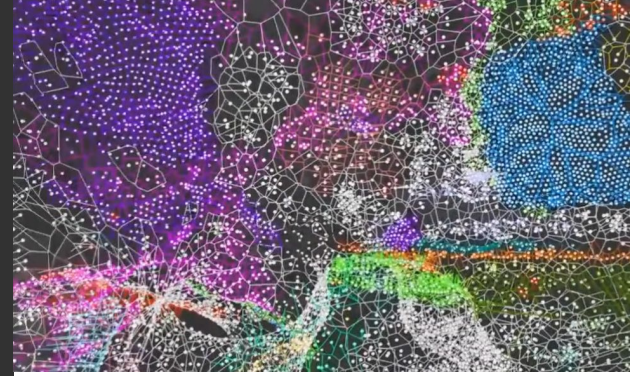
functions

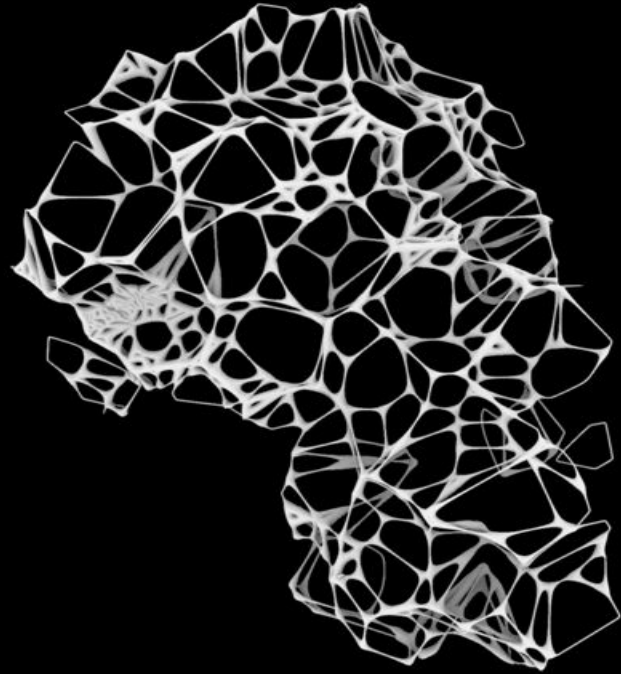
- living
- work
- leisure
- nature
- food
- energy



agent based modeling
volume swarm

10^6





TIME

8 10 12 14 16 18 20 22 24

SURFACE AREA IN m2

FRAGMENT PANELIZATION

surface per user

coaches/colleagues	2
cooling area closed	0.5
triathlon	1
ultra-cycling	3.5
networking local teams	1
team/racing strategies	1

analysis slope gradient

200

15

structural analysis

15

105

7

30

voronoi support structure

13%

25%

25%

65%

100%

80%

city proximity spots

Not relevant
Waterfront
Waterfront
Rue de Solferino
Rue de Solferino

stress level

function activity

coaches/colleagues
cooling area closed
triathlon
ultra-cycling
networking local teams
team/racing strategies

height of function

1.17

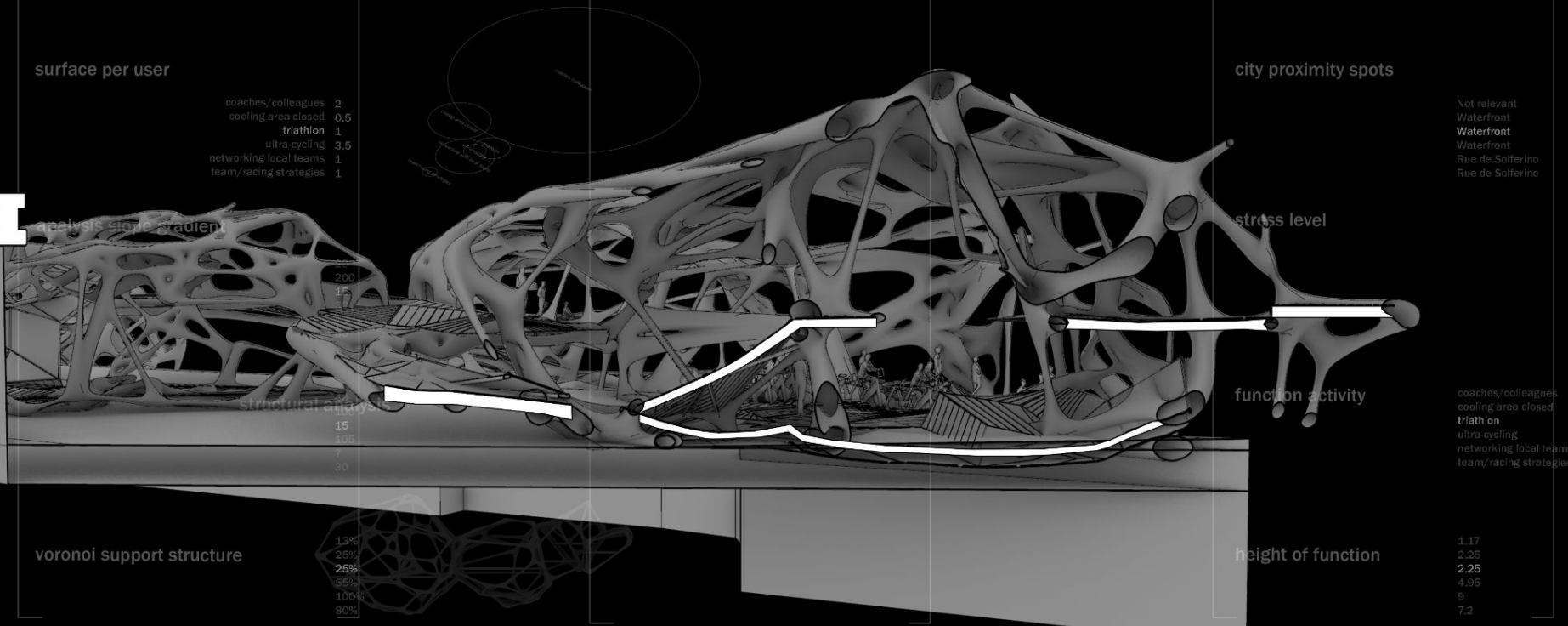
2.25

2.25

4.95

9

7.2



TIME

8 10 12 14 16 18 20 22 24

SURFACE AREA IN m2

FRAGMENT PANELIZATION

surface per user

analysis
gradient
0.0

analysis along gradient

structure

voronoi support structure

25%
65%
100%
80%

city proximity spots

not relevant
Waterfront
Waterfront
ruelles Solferino
rue de Solferino

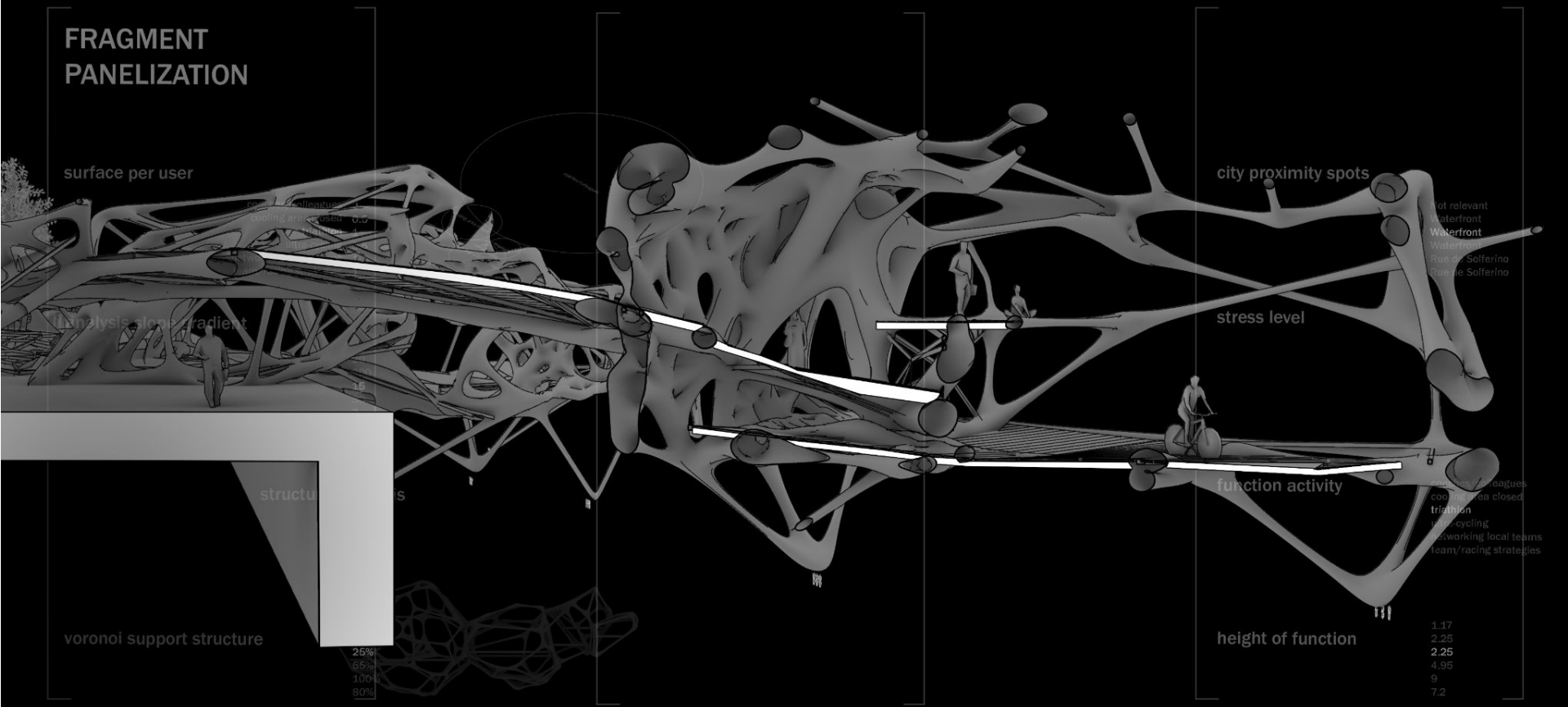
stress level

function activity

leagues
cooling area closed
transition
recycling
networking local teams
team/racing strategies

height of function

1.17
2.25
2.25
4.95
9
7.2



TIME

8 10 12 14 16 18 20 22 24

SURFACE AREA IN m²

FRAGMENT PAVIMENTATION

coaches/colleagues
cooling area closed
triathlon
ultra cycling
working local
team/racing street

fragment

city proximity spots

Not relevant
Waterfront
Waterfront
Rue de Solferino
Rue de Solferino

function activity

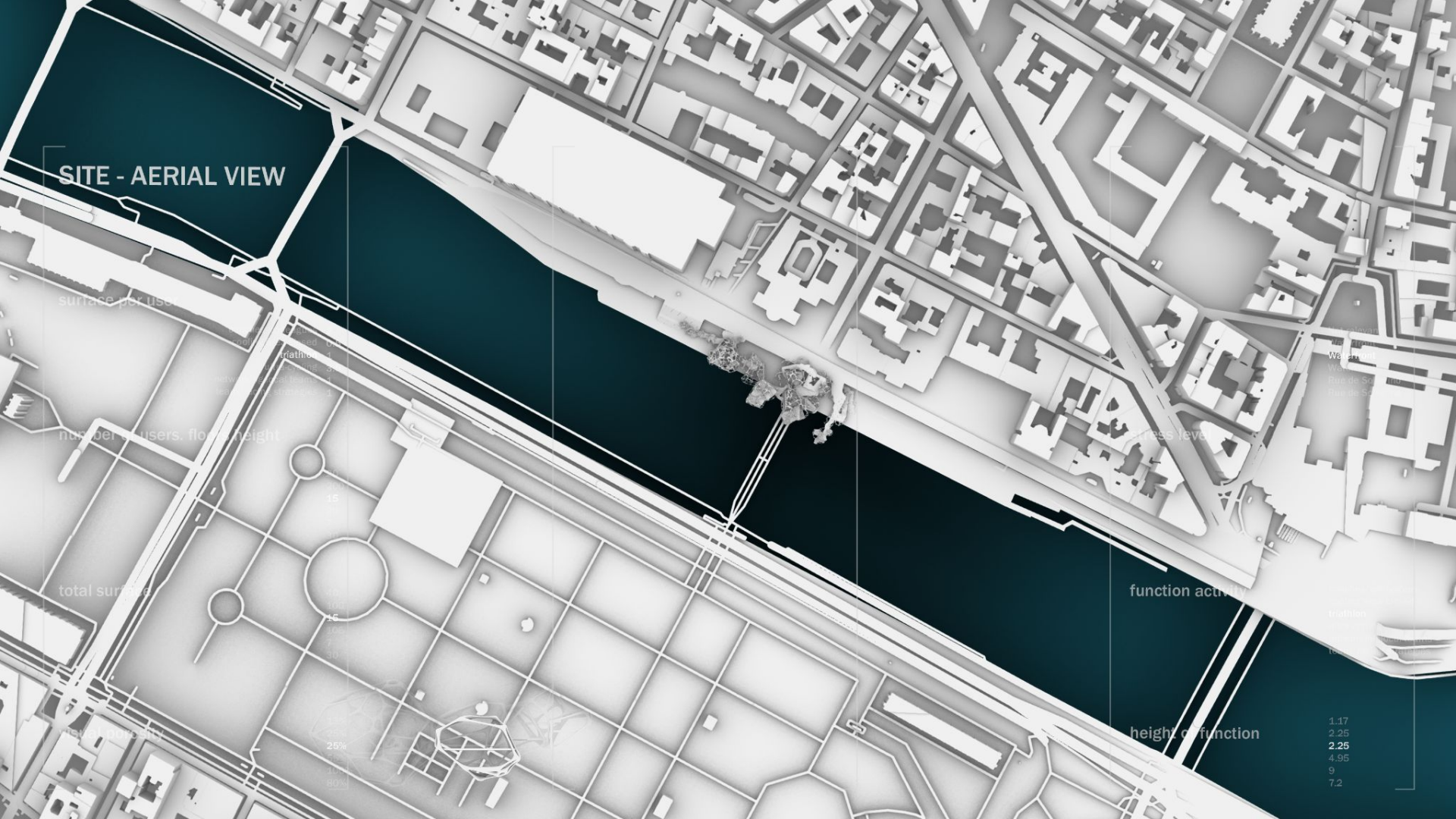
voronoi support structure

12%
25%
35%
100%
80%

height of function



SITE - AERIAL VIEW



surface per user

number users, floor height

total surface

net floor area

radius

15

10

15

20

25

30

35

40

45

50

55

60

25%

50%

75%

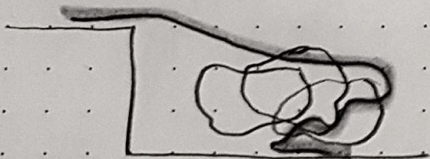
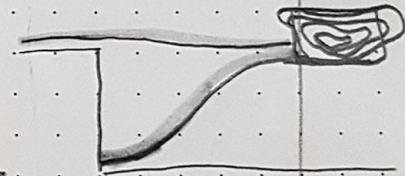
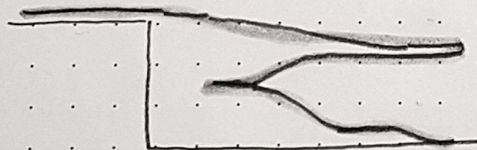
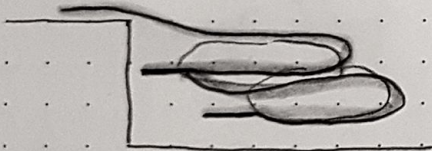
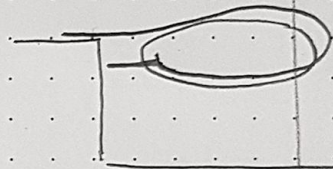
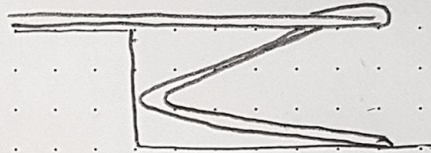
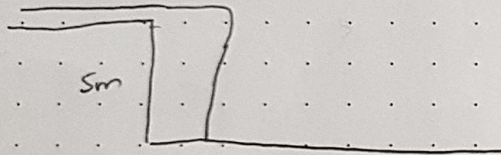
100%

pressure level

function activity

height of function

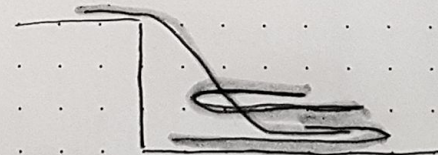
- 1.17
- 2.25
- 2.25**
- 4.95
- 9
- 7.2



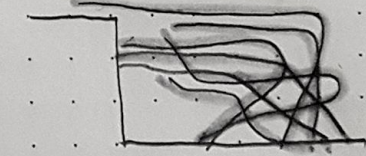
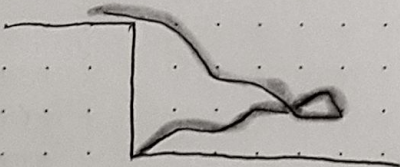
ramp along architecture



ramp on top of archit.



maxxi



surface per user

coaches/colleagues	2
cooling area closed	0.5
triathlon	1
ultra-cycling	3.5
networking local teams	1
team/racing strategies	1

number of users. floors height

20
200
15
30
7
30

total surface

40
100
15
105
7
30

visual porosity

SITE - AERIAL VIEW

13%
25%
25%
55%
100%
80%



stress level

location activity

height of function

Waterfront
Waterfront
Rue de S
Rue de S

Waterfront
Waterfront
Waterfront
Waterfront
Waterfront

2.25
4.95
9
7.2

SITE - ELEVATION

surface per user

2
0.5
triathlon
1
3.5
1
1

number of users, floors height

15
15

total surface

30
100
15
105
30

visual porosity

13%
25%
26%
59%
10%

Not relevant
Waterfront
Waterfront
Waterfront
Rue de Solferino
Rue de Solferino

coaches/colleagues
cooling area closed
triathlon
ultra-cycling
networking local teams
team/racing strategies

1.17
2.25
2.25
4.95
9
7.2

SITE - ELEVATION

surface per user

2
0.5
1
3.5
1
1

number of users, floors height

20
15
10
7
5

total surface

46
15
105
7
30

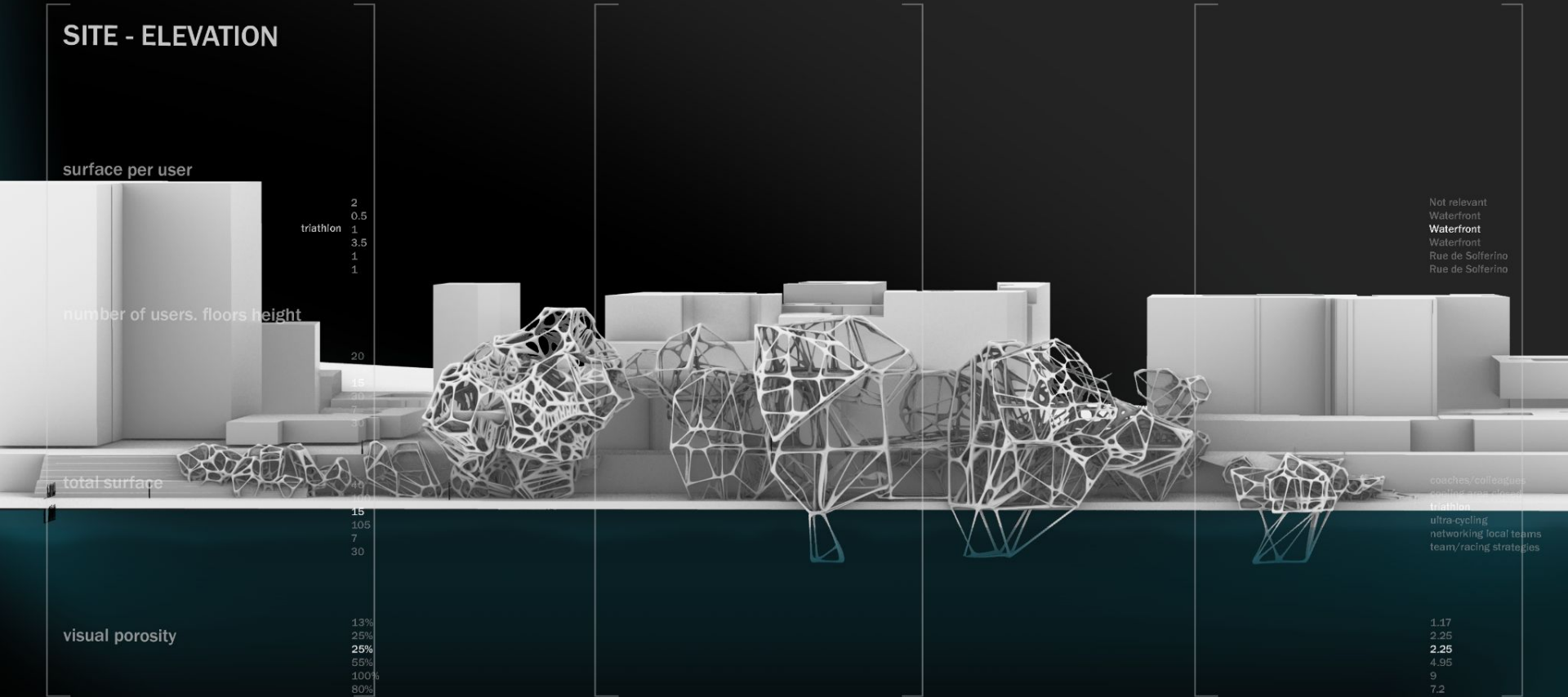
visual porosity

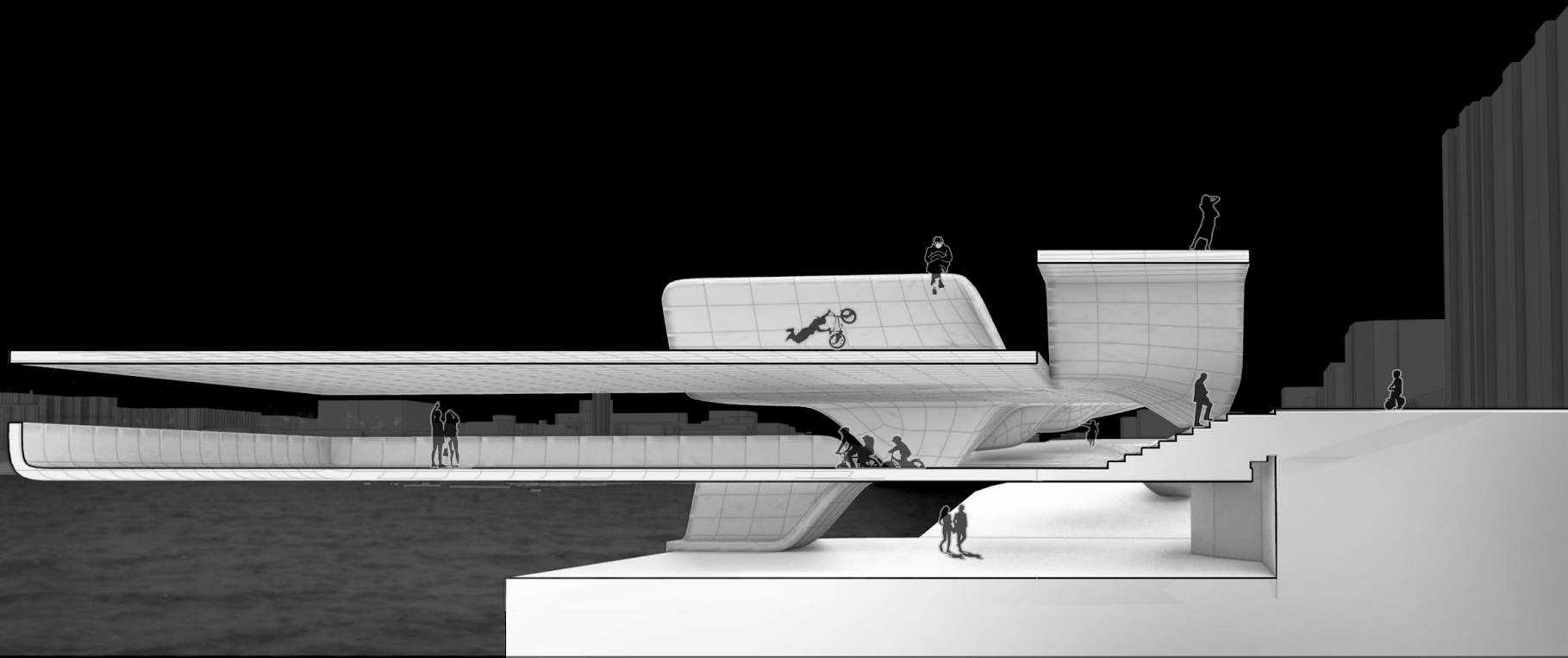
13%
25%
25%
55%
100%
80%

Not relevant
Waterfront
Waterfront
Waterfront
Rue de Solferino
Rue de Solferino

couches/collectives
couches/collectives
triathlon
ultra-cycling
networking local teams
team/racing strategies

1.17
2.25
2.25
4.95
9
7.2





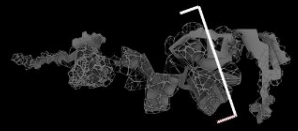
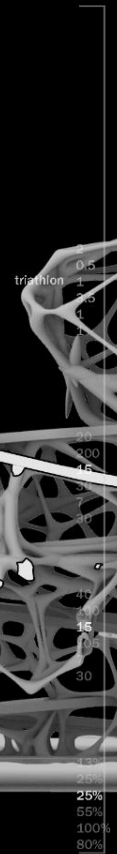
SITE - SECTION A

type of connections

pedestrians. cyclists

total surface

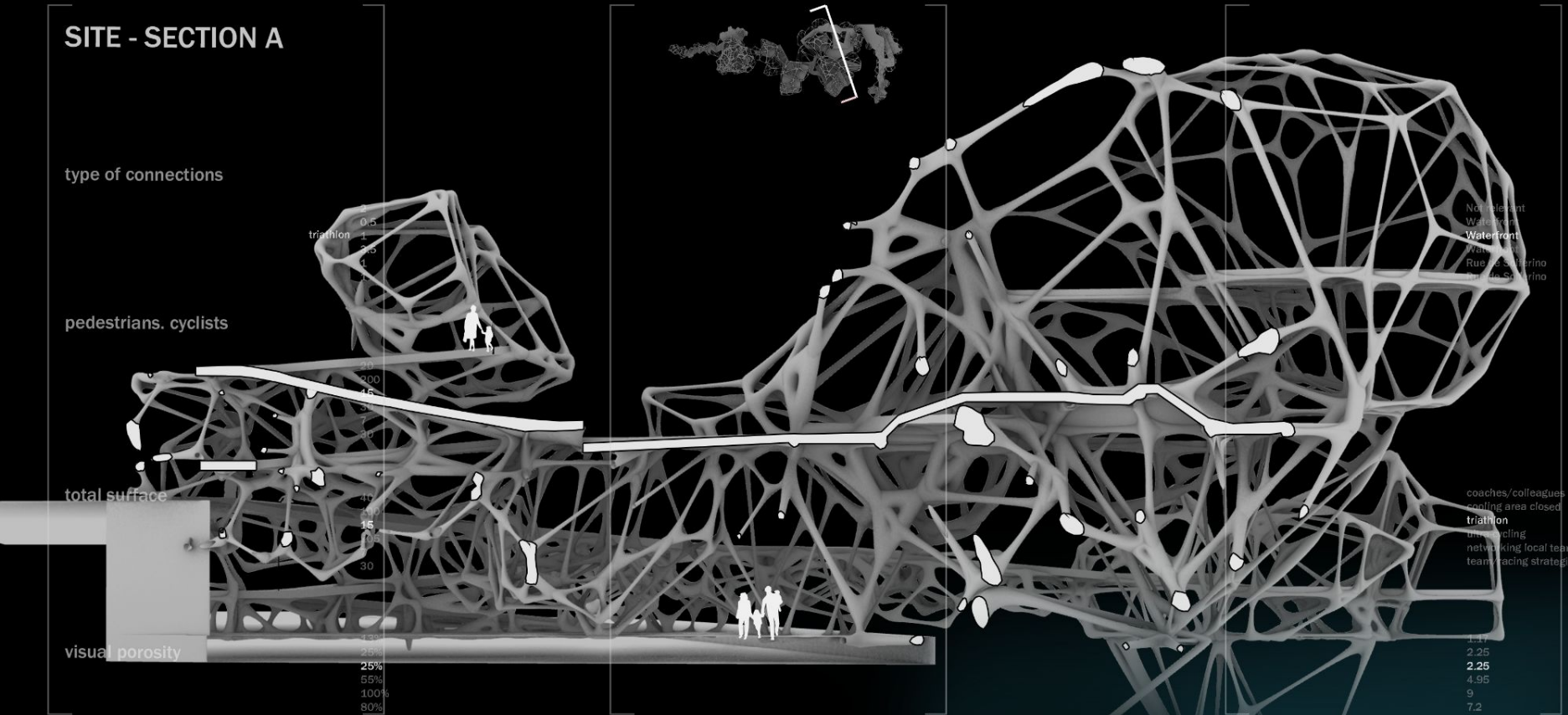
visual porosity



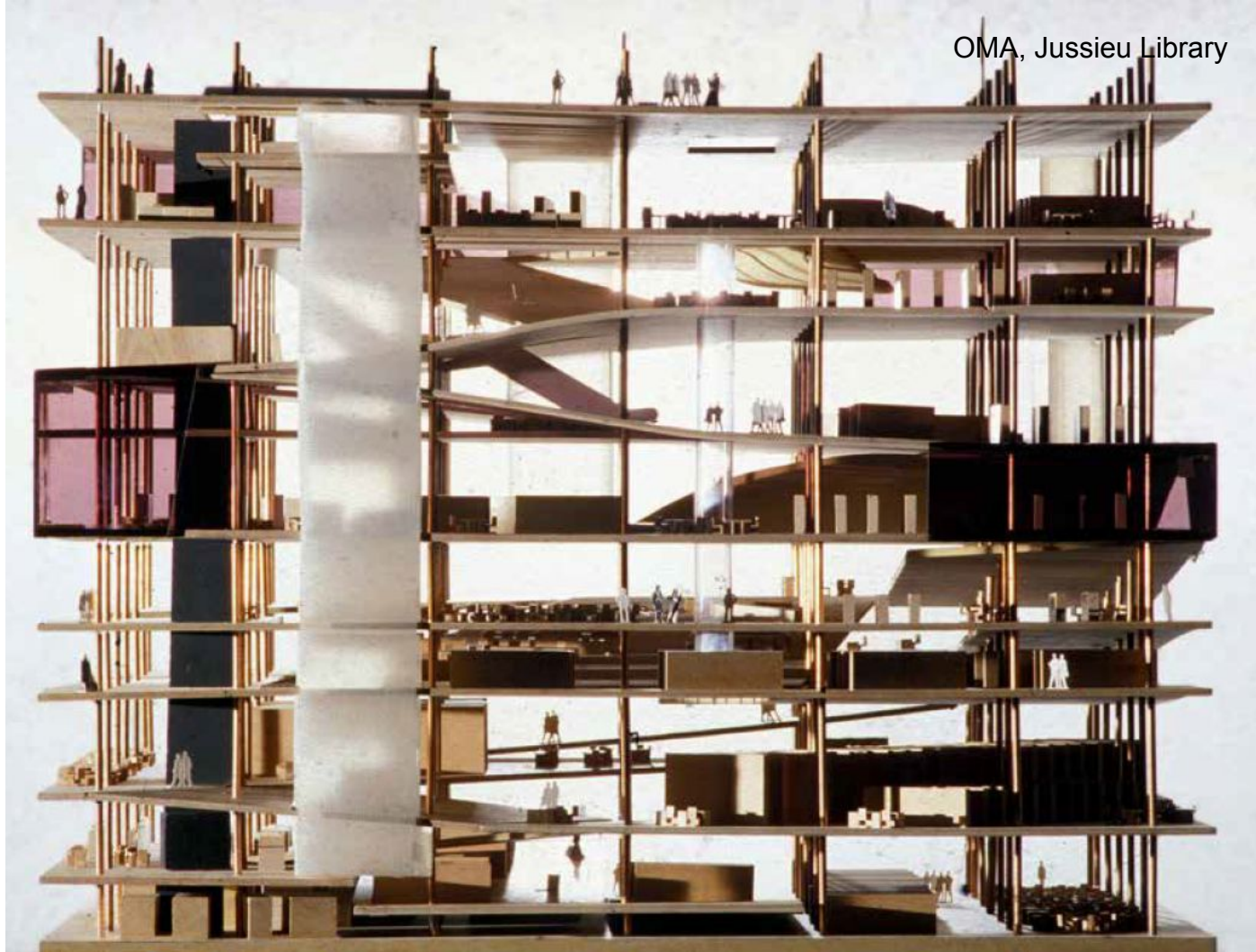
Not relevant
Waterfront
Waterfront
Waterfront
Rue de S. Martin
Rue de S. Martin

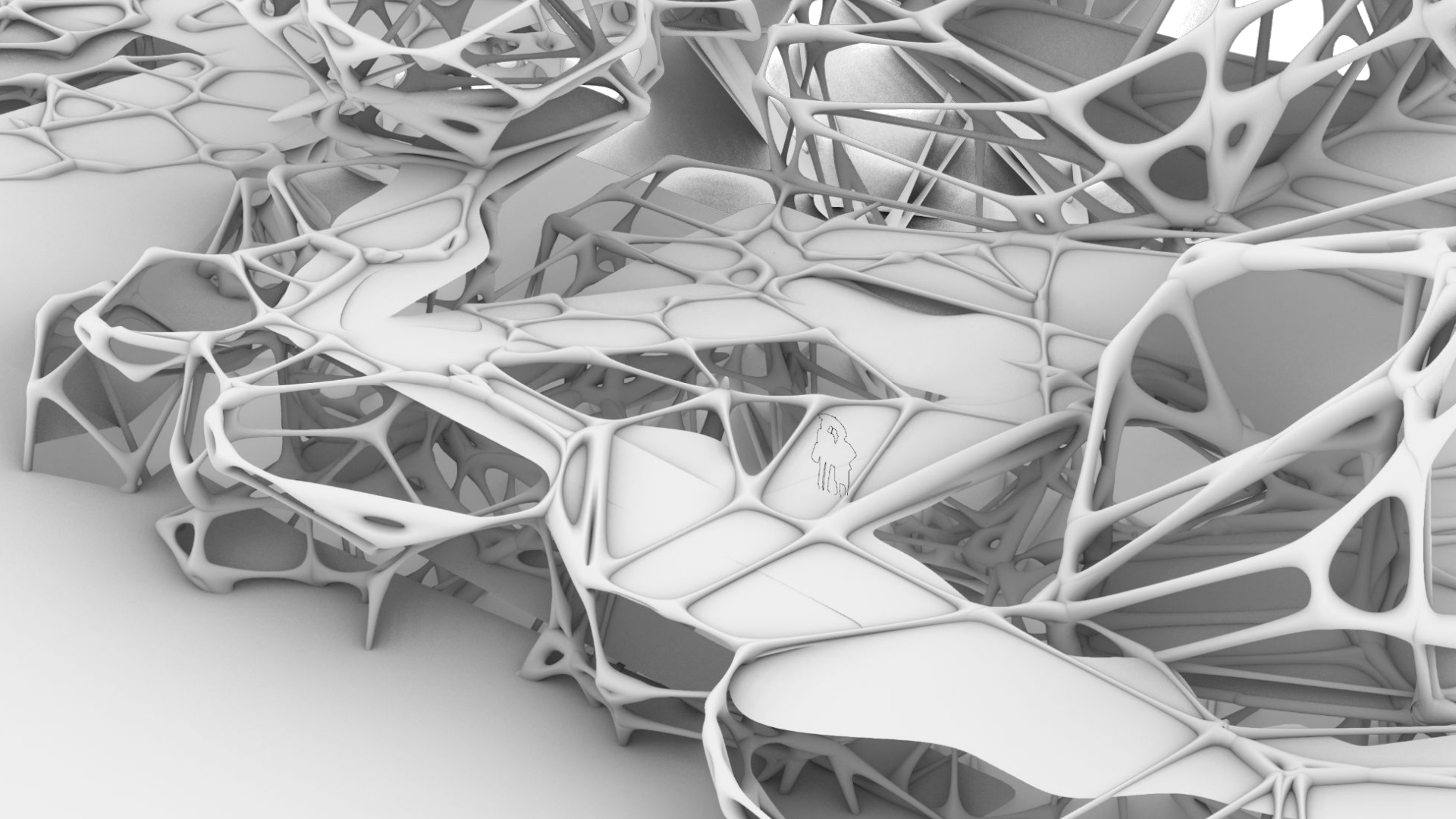
coaches/colleagues
cooling area closed
triatlon
triatlon
networking local teams
team racing strategies

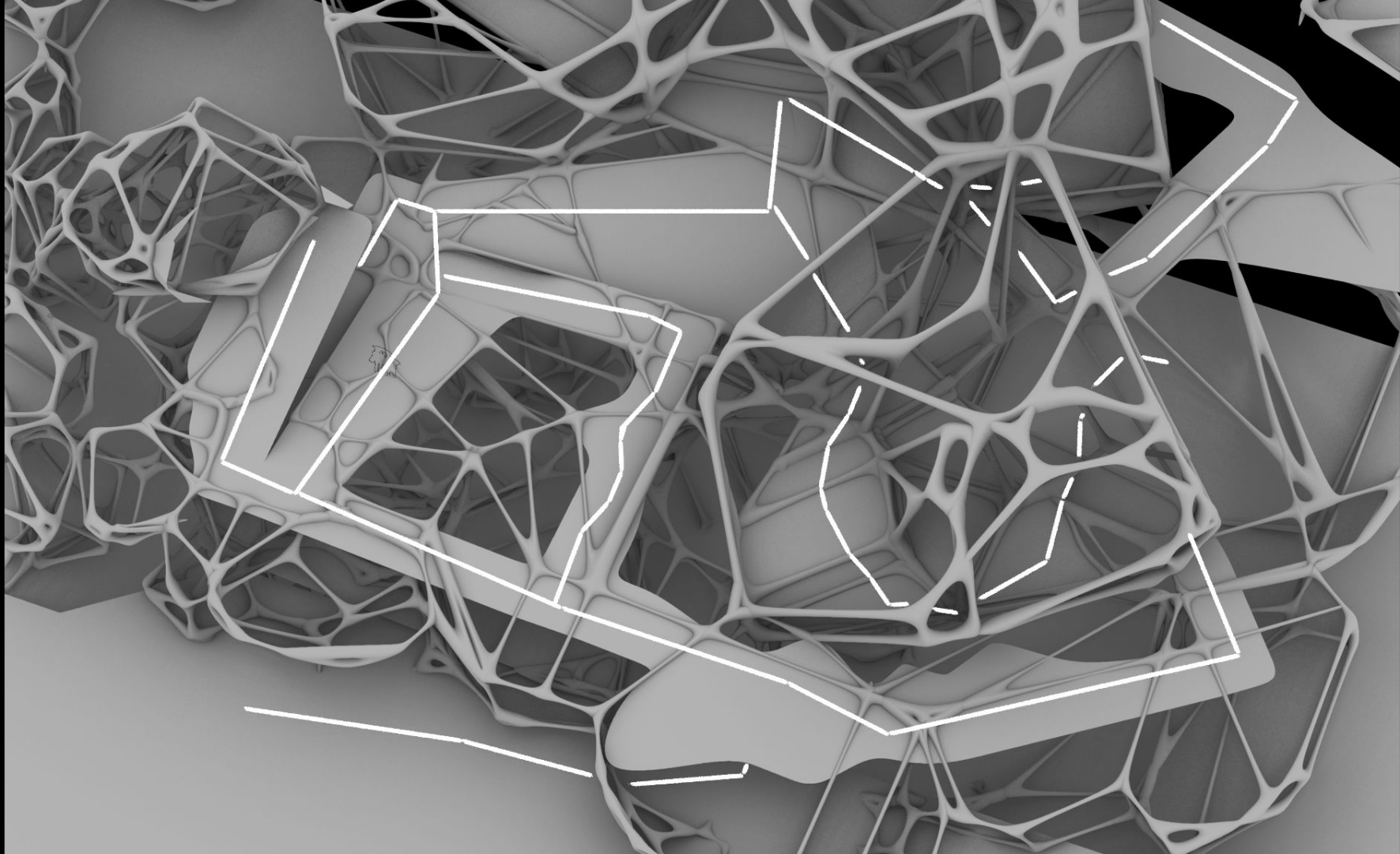
1.4
2.25
2.25
4.95
9
9
7.2



OMA, Jussieu Library







SITE - SECTION B

type of connections

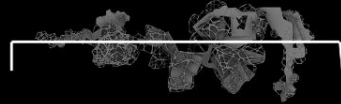
2
0.5
1
3.5
1
1

pedestrians. cyclists

20
15
40
100
15
105
7
30

visual porosity

13%
25%
25%
55%
100%
80%



Not relevant
Waterfront
Waterfront
Waterfront
Rue de Solferino
Rue de Solferino

triathlon
ultra-cycling
networking local teams
team/racing strategies

1.17
2.25
2.25
4.95
9
7.2

SITE VIEW

type of connections

2
0.5
1
3.5
1
1

triathlon

pedestrians. cyclists

20
200
15
30
7
30

total surface

40
100

city proximity spots

Not relevant
Waterfront
Waterfront
Waterfront
Rue de Solferino
Rue de Solferino

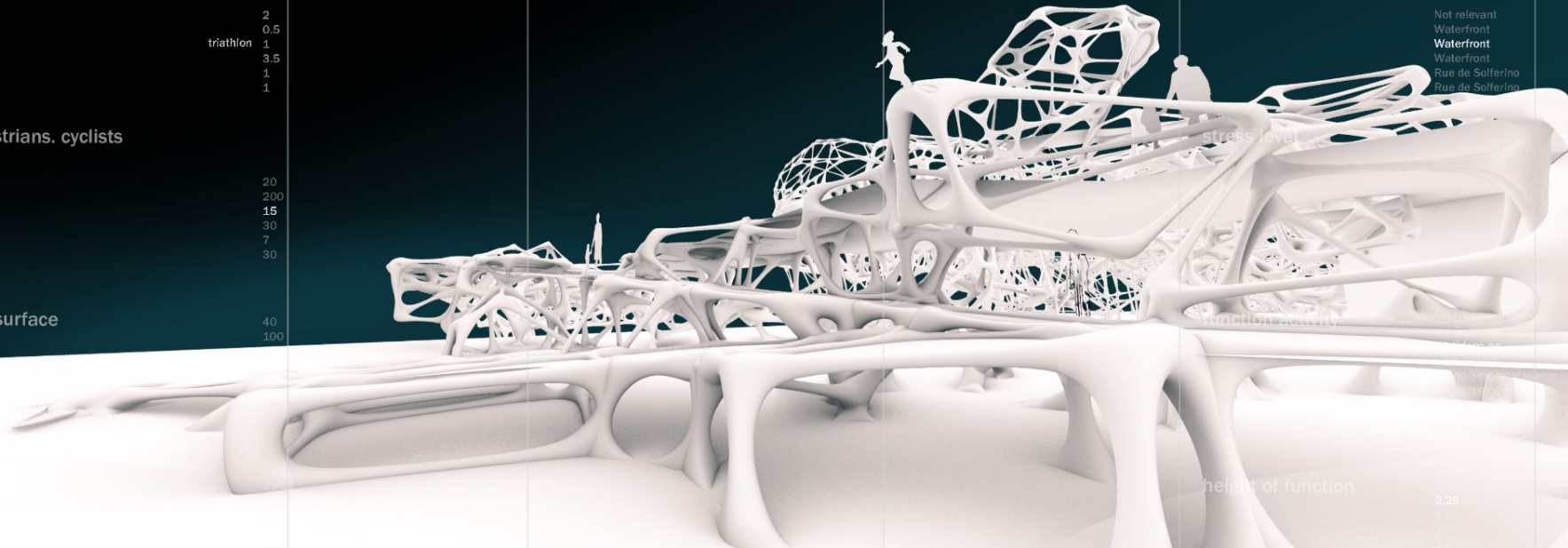
stress level

function activity

height of function

0.5
1
1.5
2
2.5
3
3.5

1.25
2.25
3.25
4.25



type of connections

2
0.5
1
3.5
1
1

triathlon

pedestrians. cyclists

20
200
15
30
7
30

total surface

40
100
15
105
7
30

visual porosity

13%
25%
25%
55%
100%
80%

SITE - PLAN h:3m

triathlon
ultra-cycling
networking local teams
team/racing strategies

1.17
2.25
2.25
4.95
9
7.2

type of connections

2
0.5
1
3.5
1
1

pedestrians. cyclists

20
200
15
30
7
30

total surface

40
100
15
105
7
30

visual porosity

13%
25%
25%
55%
100%
80%

SITE - PLAN h:7m

triathlon
ultra-cycling
networking local teams
team/racing strategies

1.17
2.25
2.25
4.95
9
7.2

type of connections

triathlon
1
3.5
1
1

pedestrians. cyclists

20
200
15
30
7
30

total surface

40
100
15
105
7
30

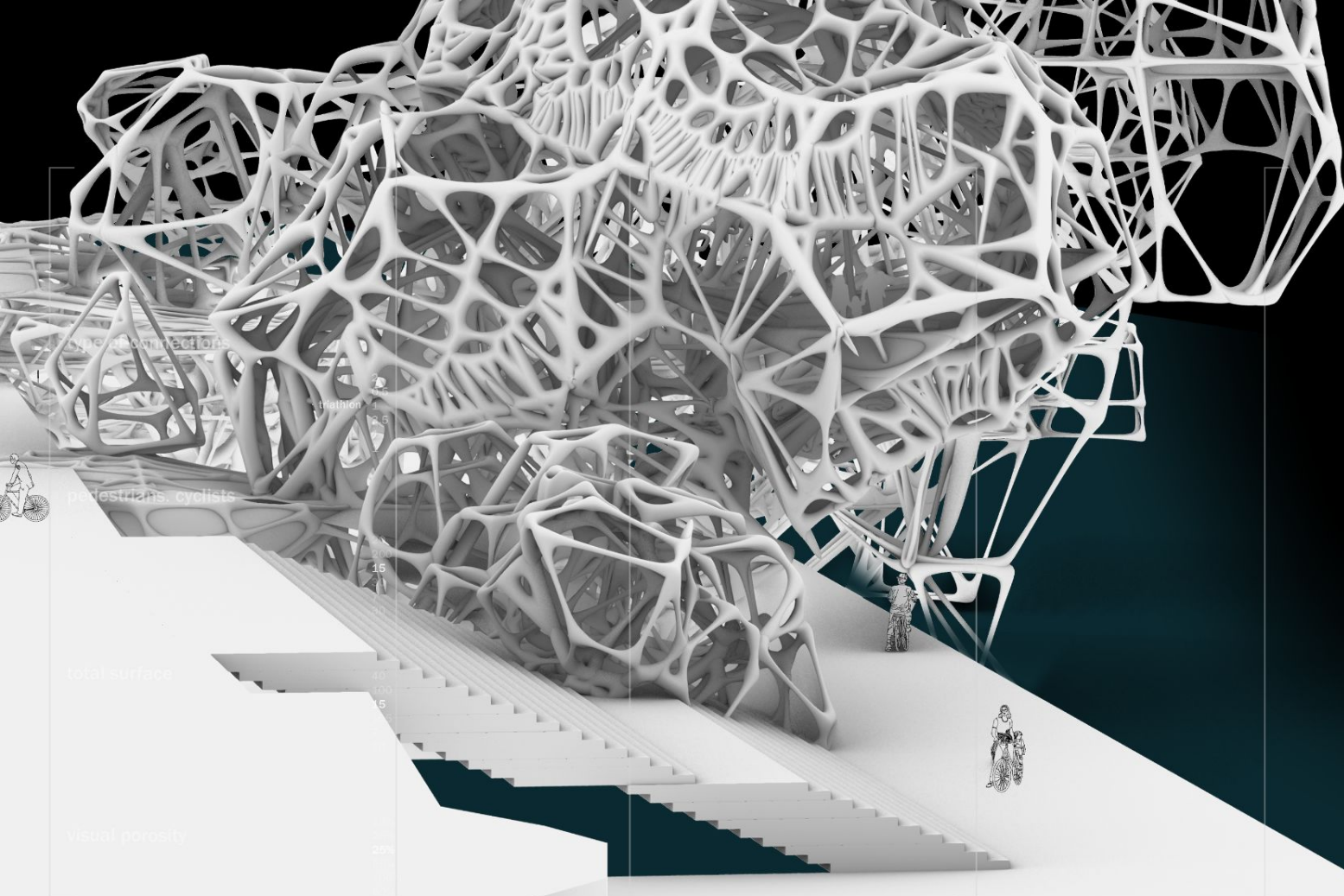
visual porosity

13%
25%
25%
55%
100%
80%

SITE - PLAN h:11m

triathlon
ultra-cycling
networking local teams
team/racing strategies

1.17
2.25
2.25
4.95
9
7.2



pedestrians, cyclists

triathlon

pedestrians, cyclists

total surface

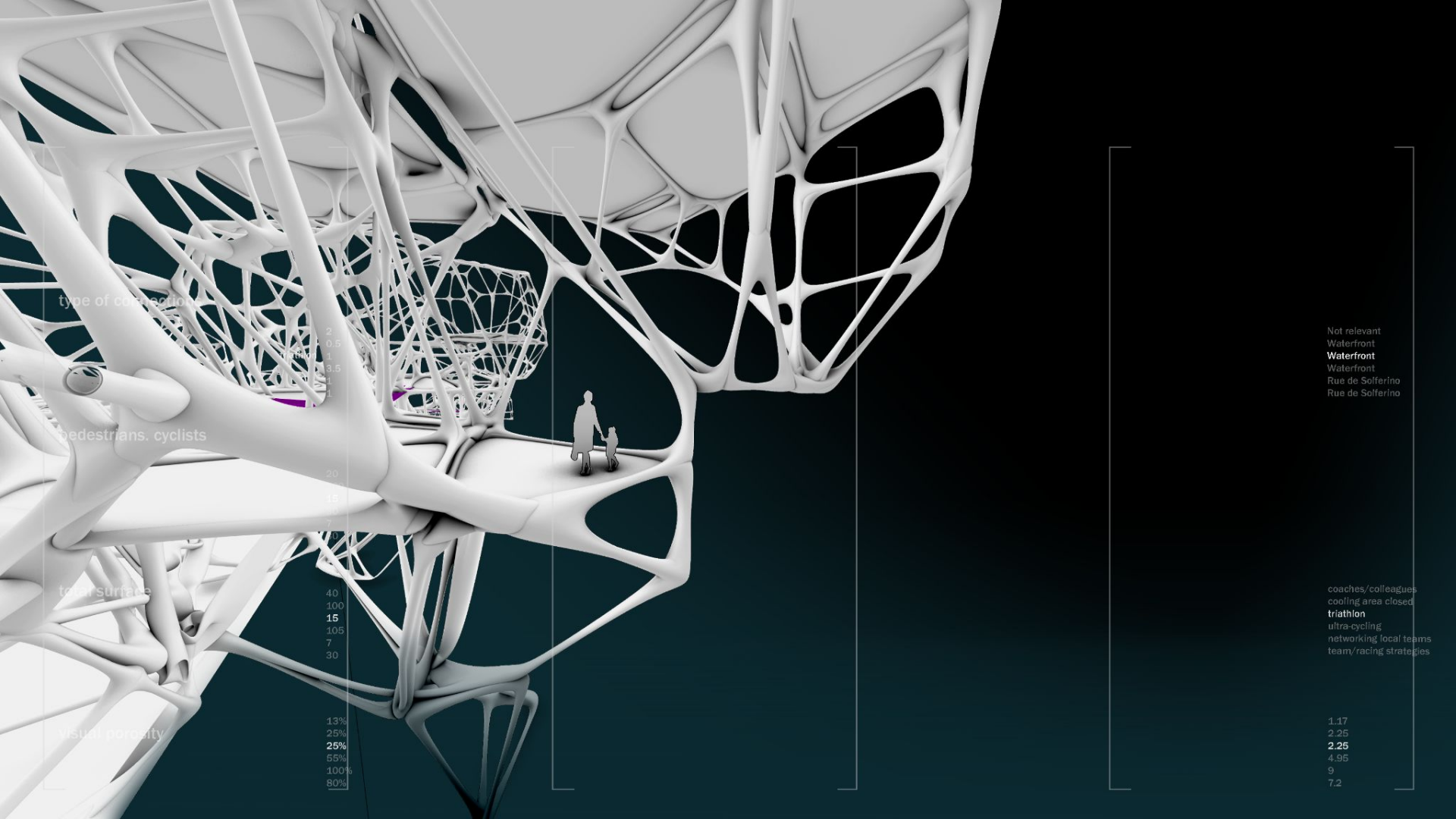
visual porosity



Not relevant
Waterfront
Waterfront
Waterfront
Rue de Solferino
Rue de Solferino

coaches/colleagues
cooling area closed
triathlon
ultra-cycling
networking local teams
team/racing strategies

1.17
2.25
2.25
4.95
9
7.2



type of connection

2
0.5
1
3.5
1
1

pedestrians, cyclists

20
15
10
5

total surface

40
100
15
105
7
30

visual porosity

13%
25%
25%
55%
100%
80%

Not relevant
Waterfront
Waterfront
Waterfront
Rue de Solferino
Rue de Solferino

coaches/colleagues
cooling area closed
triathlon
ultra-cycling
networking local teams
team/racing strategies

1.17
2.25
2.25
4.95
9
7.2

I. CONTEXT

II. ANALYSIS AND URBAN STRATEGY

III. POSITION - ARCHITECTURAL STRATEGY

IV. MATERIALIZATION

V. STRUCTURAL STABILITY

VI. REFLECTION



Stacked wood prepared for milling



Robotic Arm

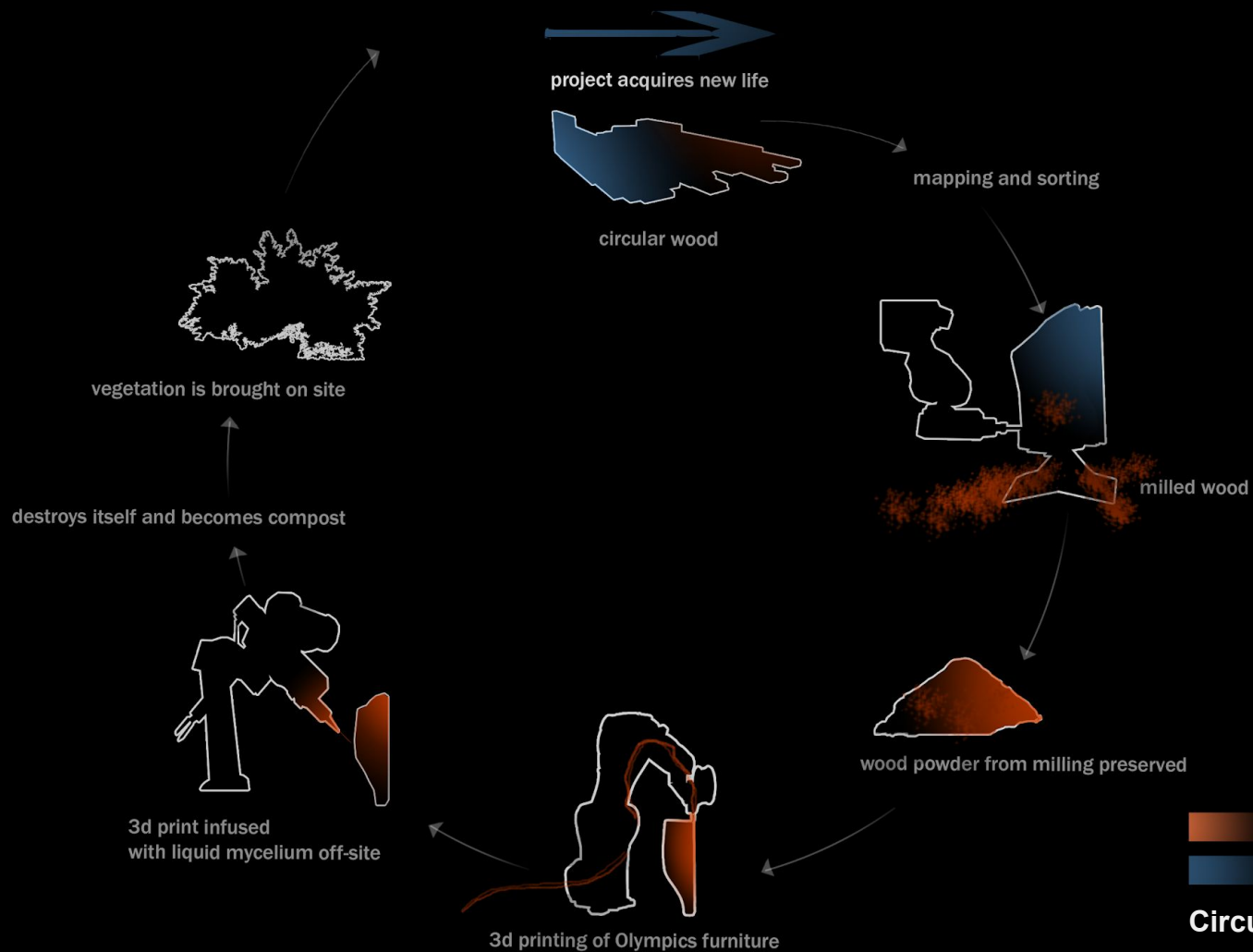


Milled wood

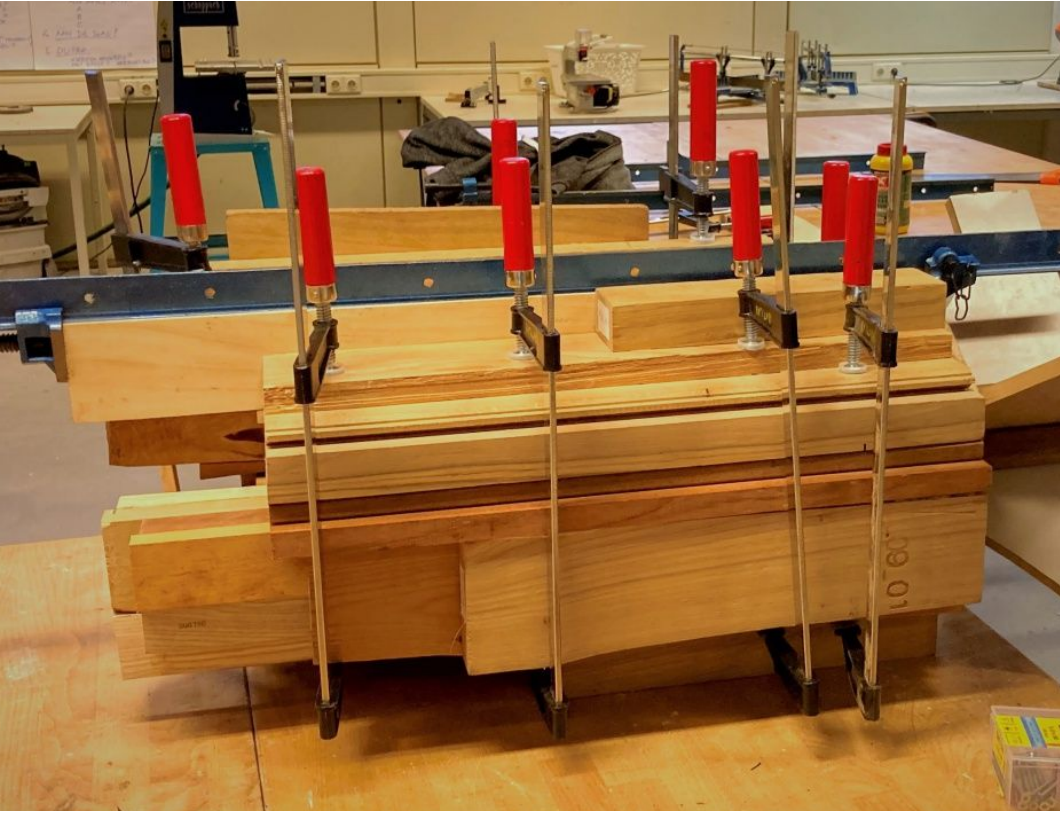


Wood powder

The Material components of Circular Milling



Circularity scheme





Stacked wood prepared for milling



Robotic Arm



Milled wood



Wood powder

The Material components of Circular Milling





SITE VIEW

type of connections

2
0.5
1
3.5
1

visual distance

total surface

visual distance

city proximity spots

- Not relevant
- Waterfront
- Waterfront
- Rue de Solférino
- Rue de Solférino

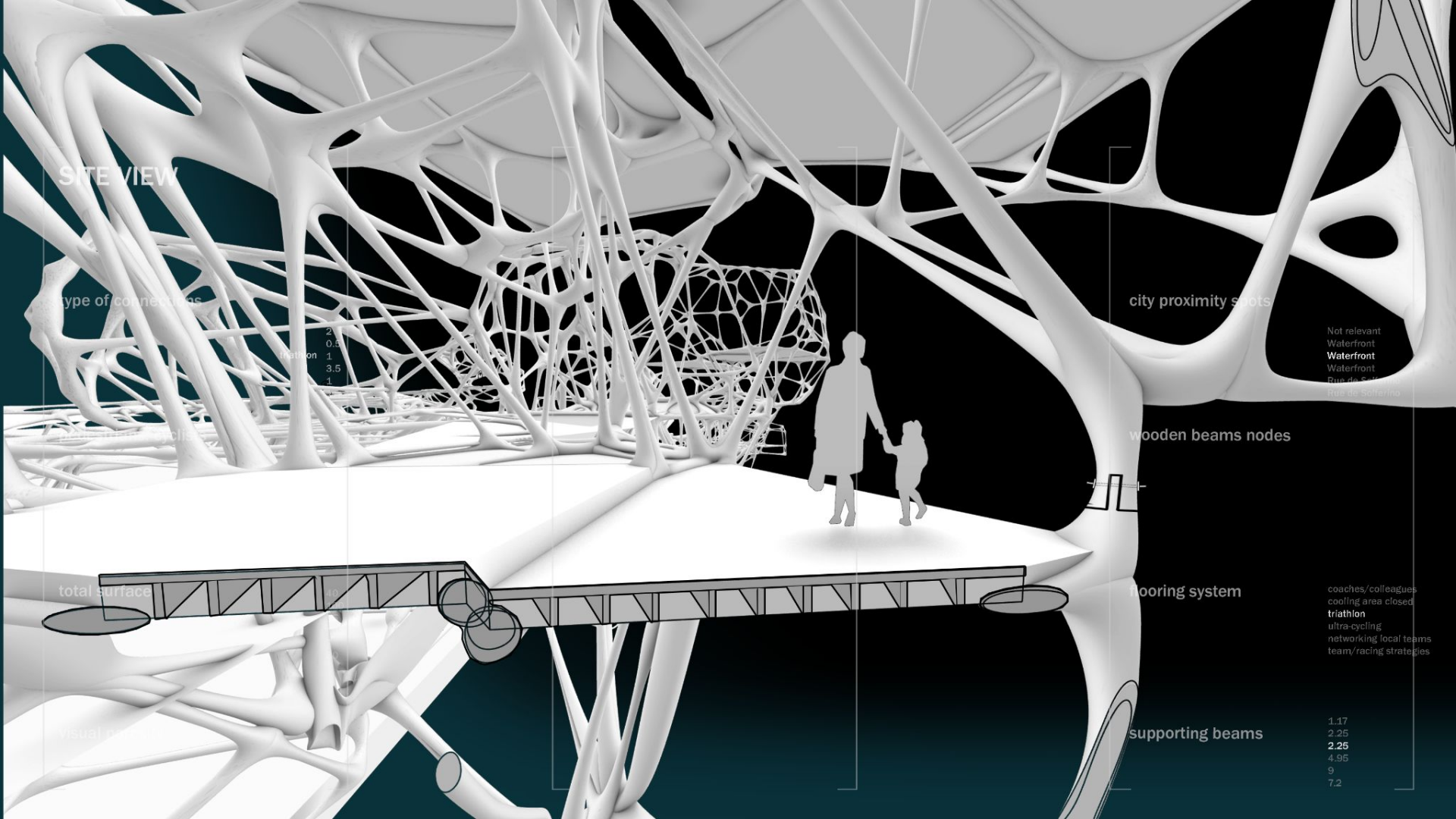
wooden beams nodes

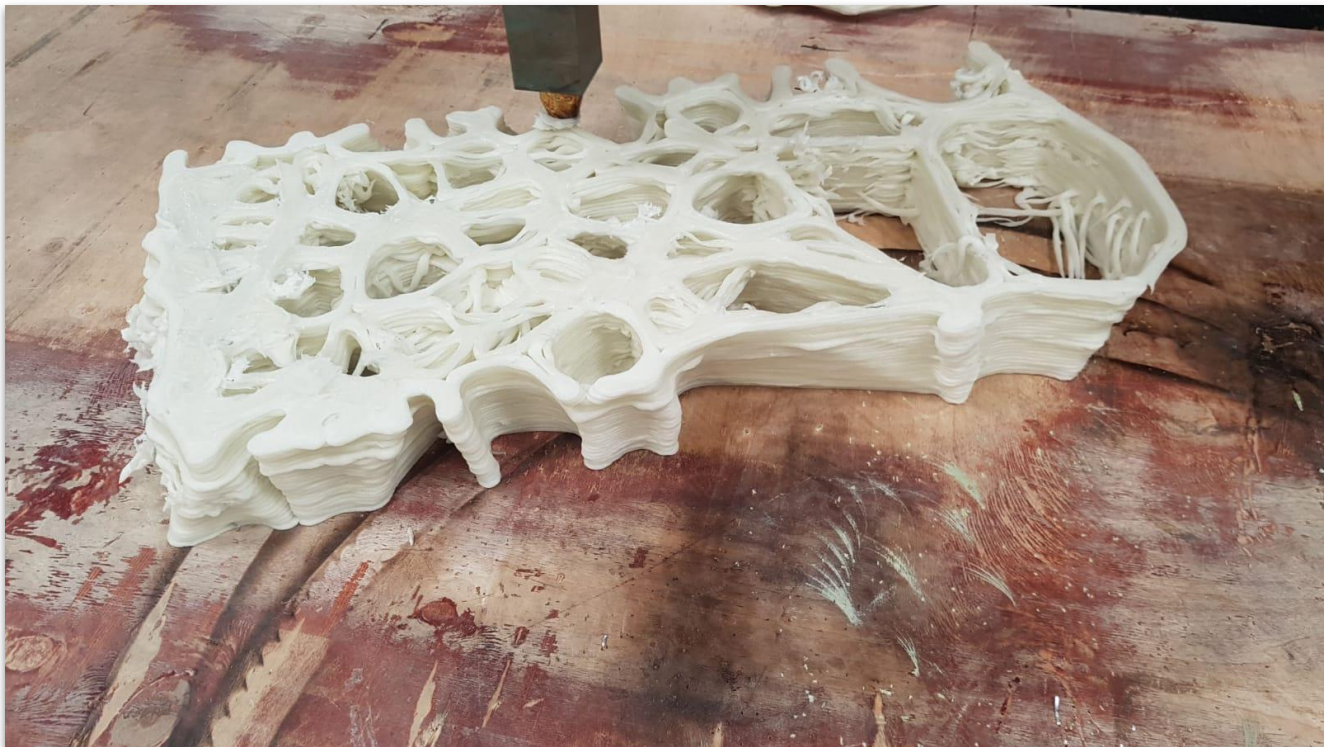
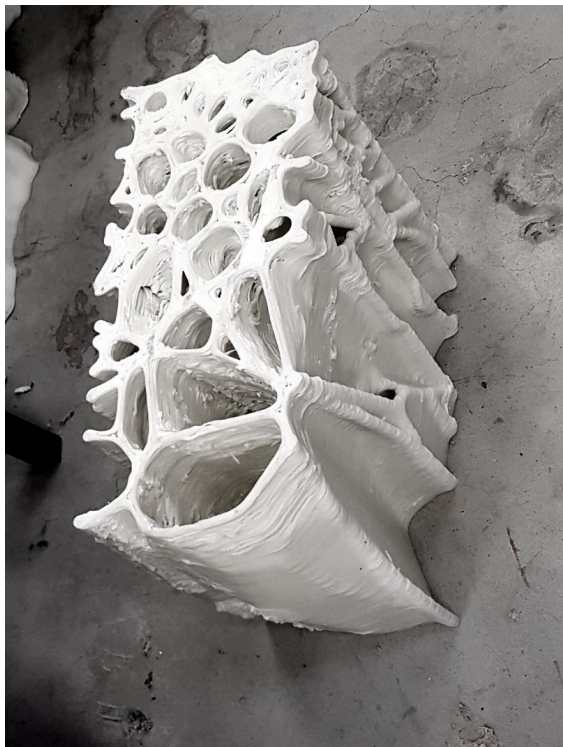
flooring system

supporting beams

- coaches/colleagues
- cooling area closed
- triathlon
- ultra-cycling
- networking local teams
- team/racing strategies

- 1.17
- 2.25
- 2.25**
- 4.95
- 9
- 7.2

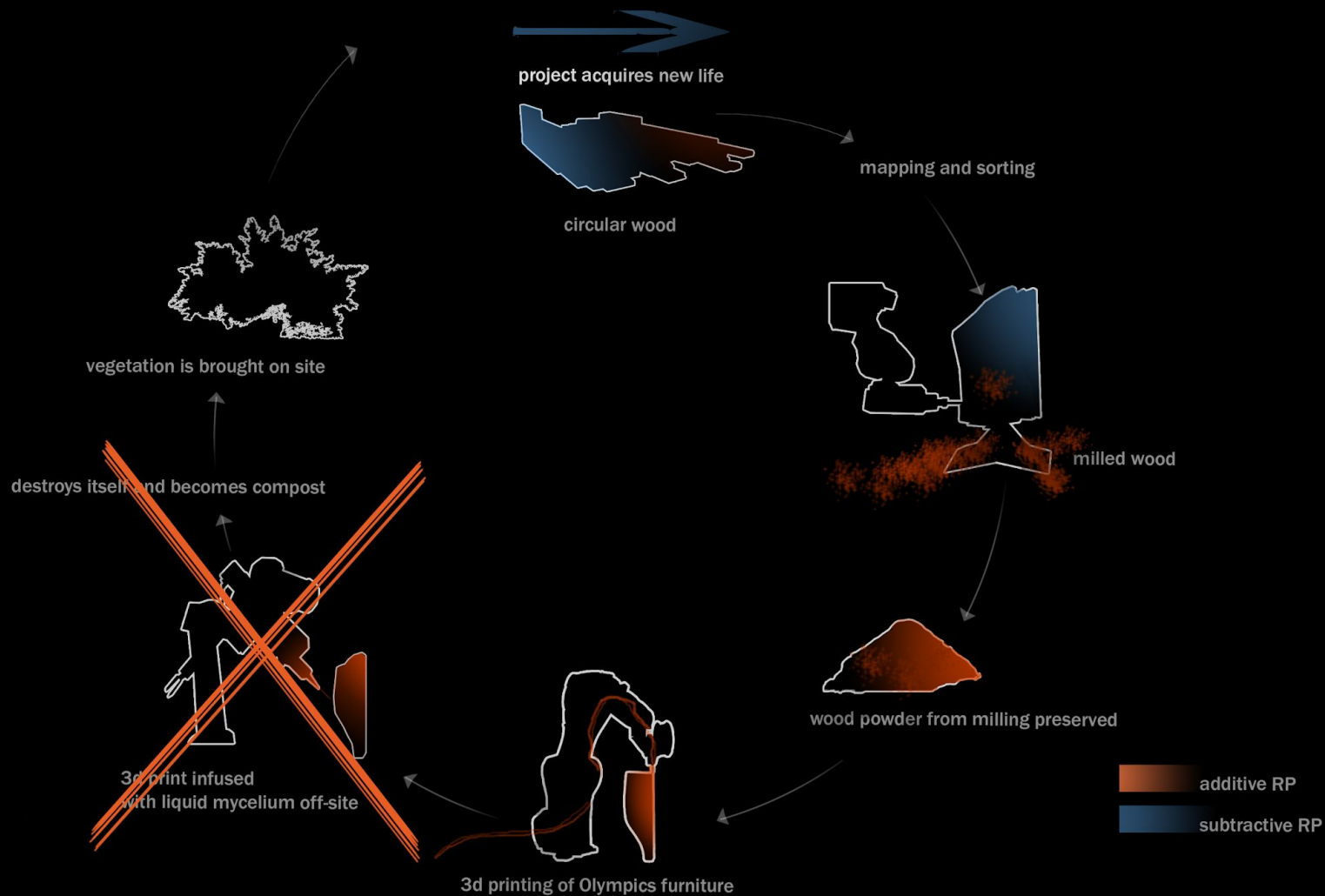


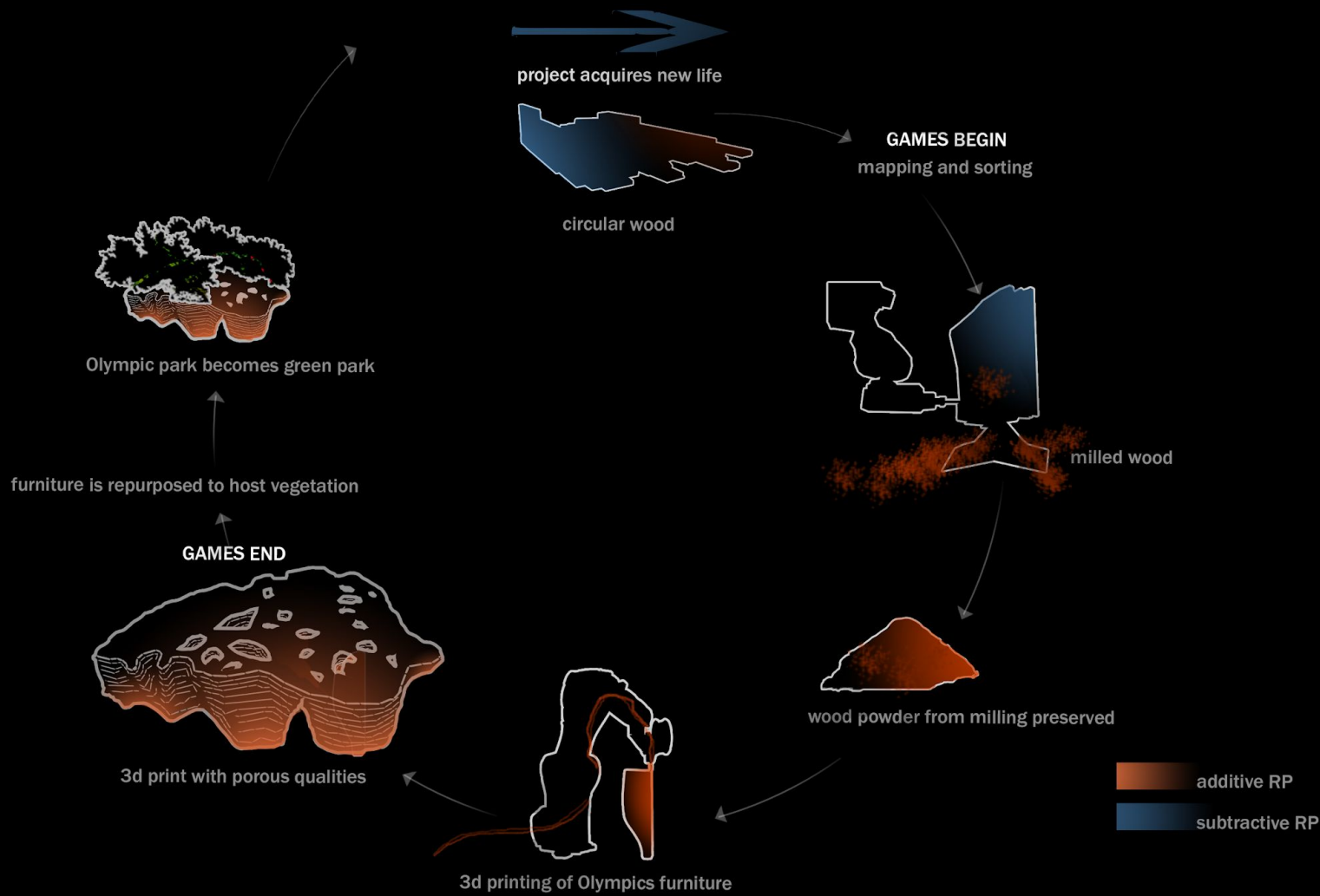




Heterogeneous structure 3d printed with the wood filament





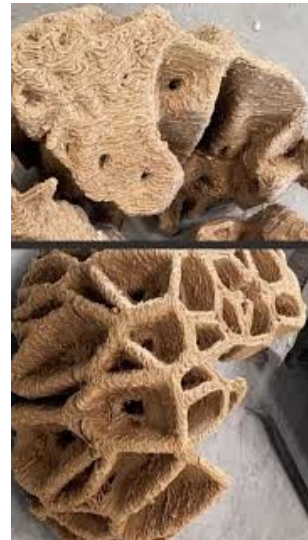
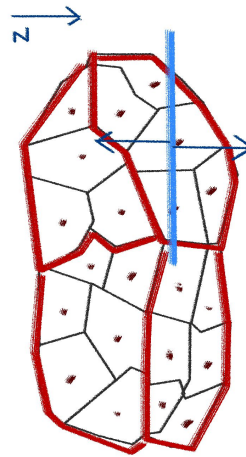
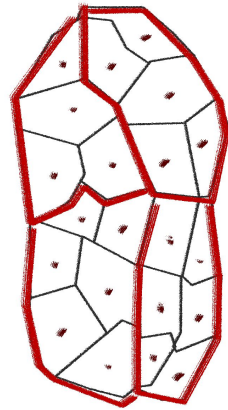
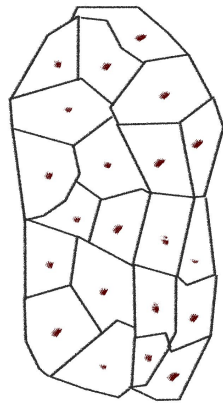
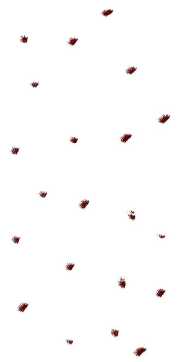


scalable porosity



MORE VIDEOS

Bio-Cyber-Physical Planetoid, Robotic Building Lab, TU Delft



I. CONTEXT

II. ANALYSIS AND URBAN STRATEGY

III. POSITION - ARCHITECTURAL STRATEGY

IV. MATERIALIZATION

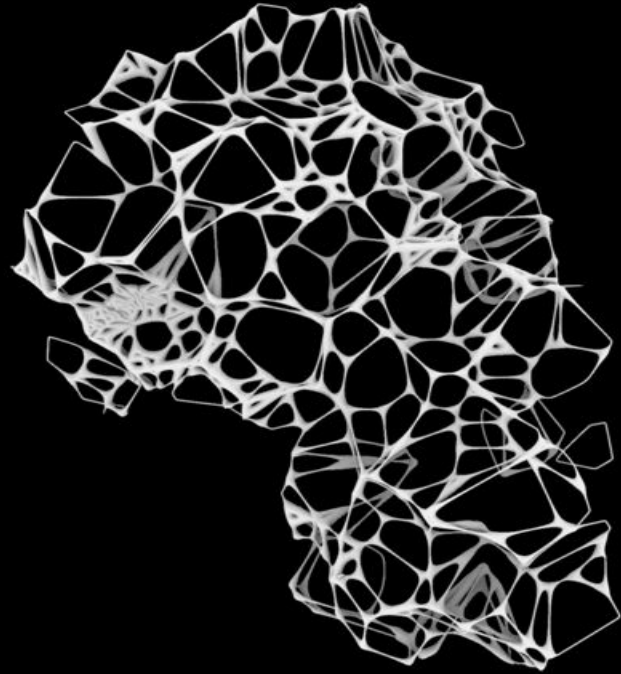
V. STRUCTURAL STABILITY

VI. REFLECTION

‘Without gravity a dome would be flat.

Where would be the excitement in designing a flat structure?

No gravity, no fun!’



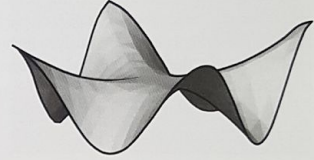
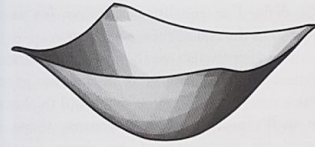
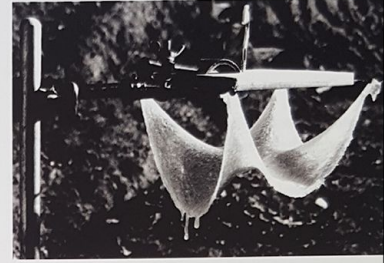
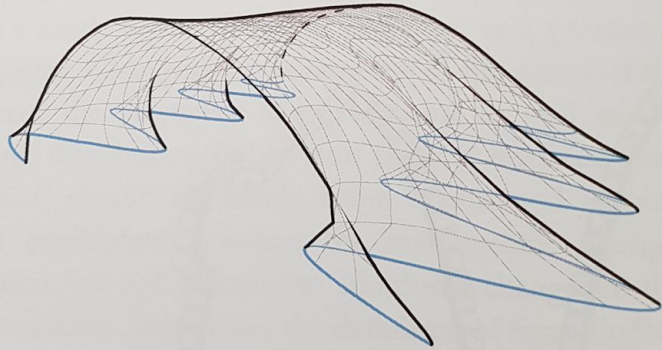
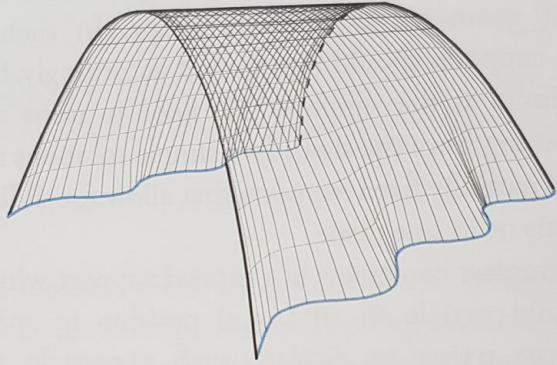
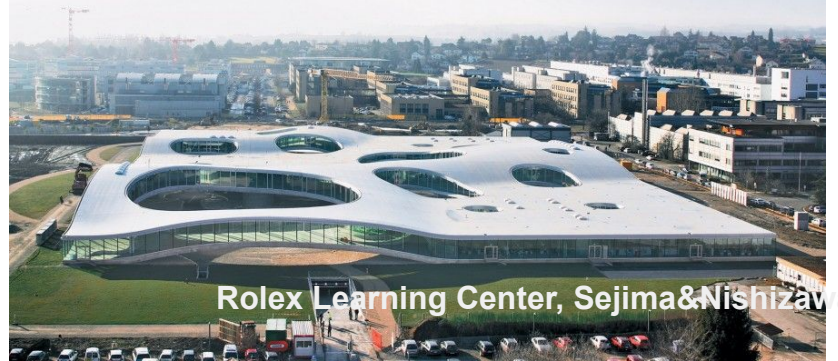


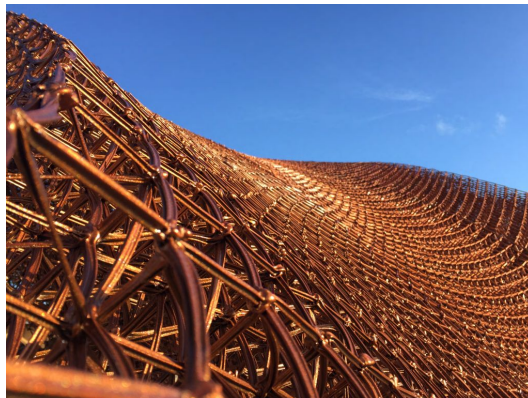
Figure 11.4 Undulating support edge of the mesh



Teshima, Art Museum



Rolex Learning Center, Sejima&Nishizawa



Flotsam&Jetsam, 255 sm, SHoP Architects
Printed in 10 weeks, assembled in 4 days

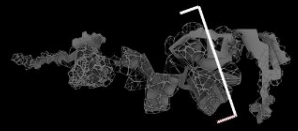
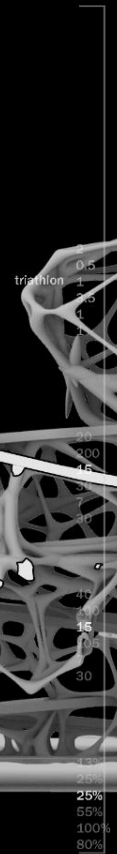
SITE - SECTION A

type of connections

pedestrians. cyclists

total surface

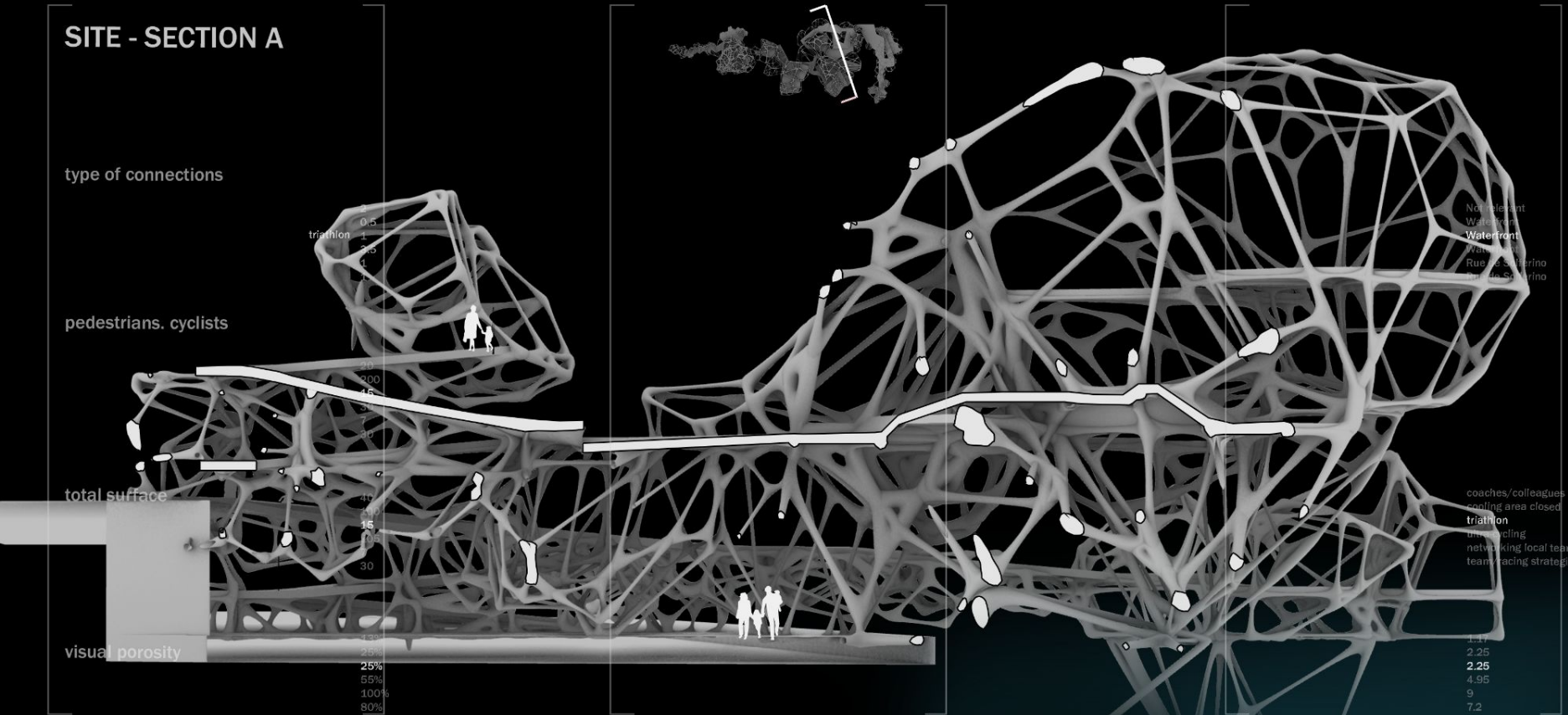
visual porosity



Not relevant
Waterfront
Waterfront
Waterfront
Rue de S. Martin
Rue de S. Martin

coaches/colleagues
cooling area closed
triatlon
triatlon
networking local teams
team racing strategies

1.4
2.25
2.25
4.95
9
9
7.2



SITE VIEW

type of connections

2
0.5
1
3.5
1

visual distance

total surface

visual distance

city proximity spots

- Not relevant
- Waterfront
- Waterfront
- Rue de Solférino
- Rue de Solférino

wooden beams nodes

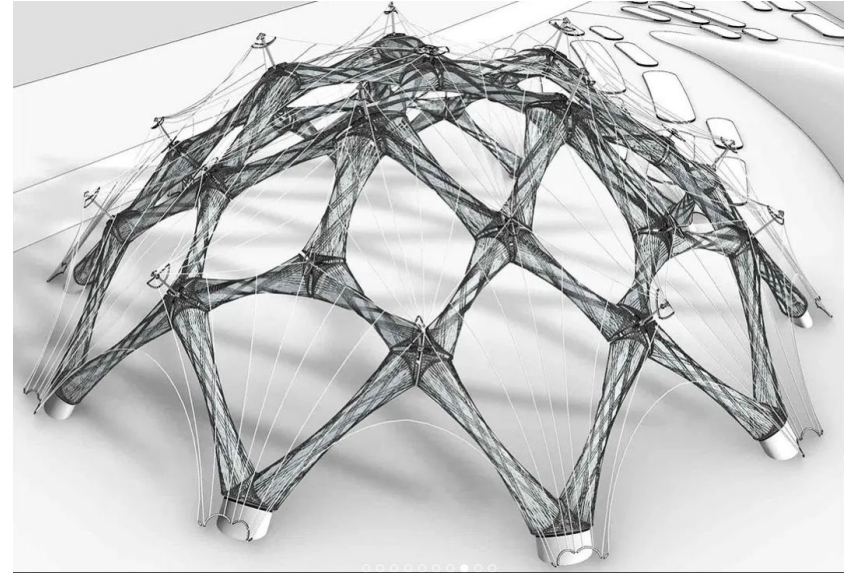
flooring system

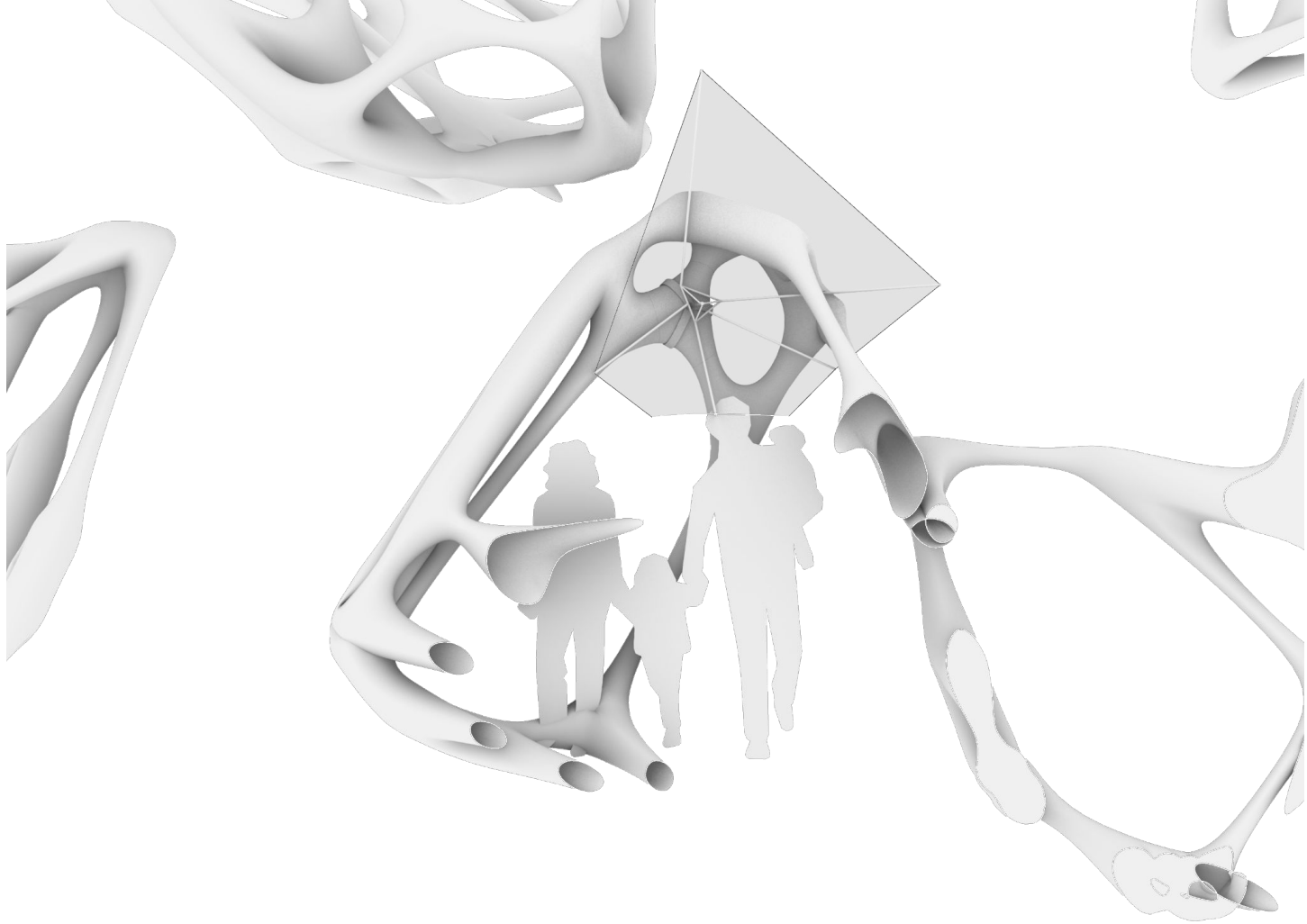
supporting beams

- coaches/colleagues
- cooling area closed
- triathlon
- ultra-cycling
- networking local teams
- team/racing strategies

- 1.17
- 2.25
- 2.25**
- 4.95
- 9
- 7.2







I. CONTEXT

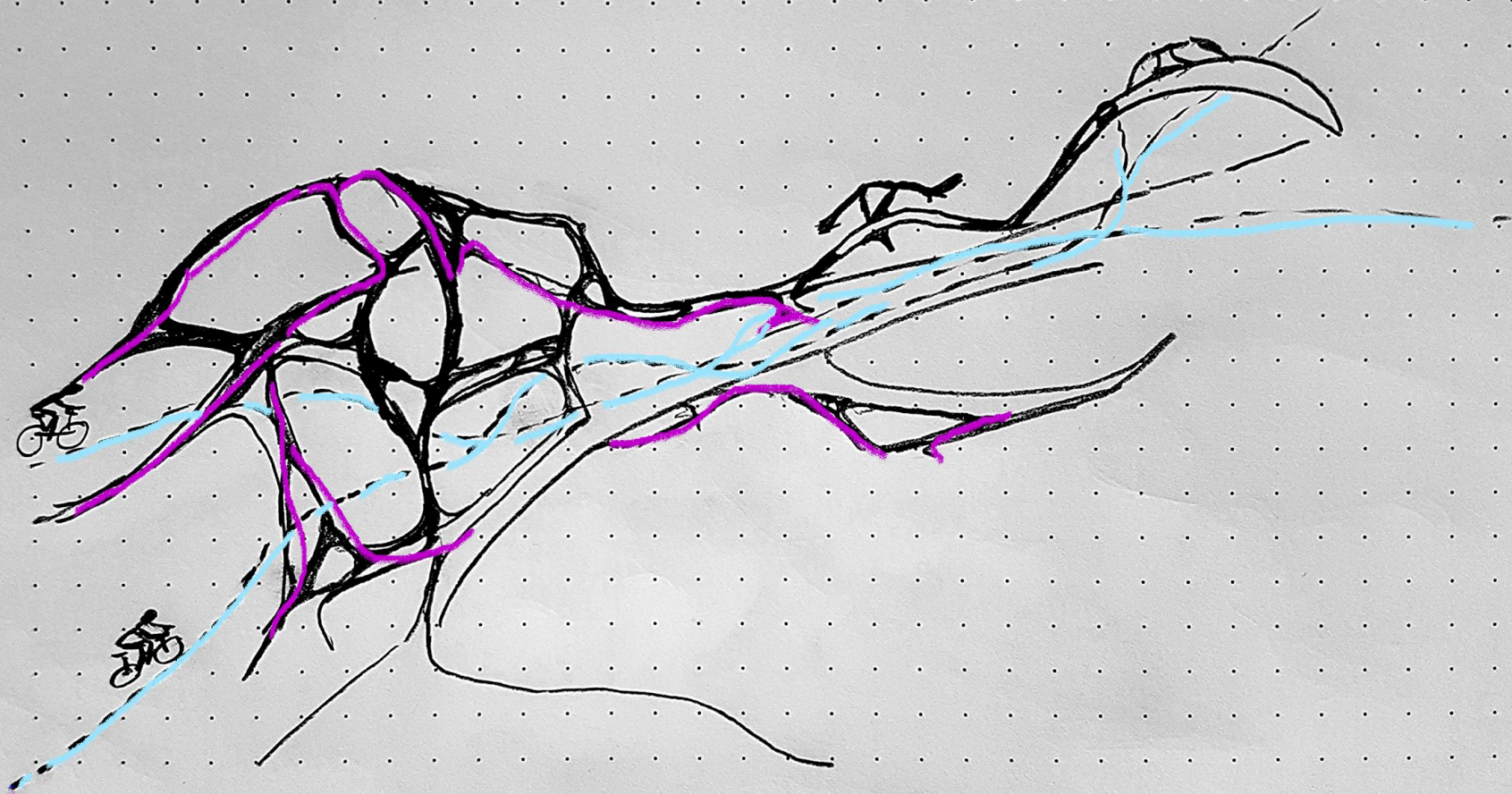
II. ANALYSIS AND URBAN STRATEGY

III. POSITION - ARCHITECTURAL STRATEGY

IV. MATERIALIZATION

V. STRUCTURAL STABILITY

VI. REFLECTION



DESIGN DEVELOPMENT

number of users: 2
floors height: 1
cooling area closed: 1
coaches/colleagues: 1
ultra-cycling: 1
networking local teams: 1
team/racing strategy: 1

number of users, floors height

total surface

visual porosity

13%
25%
55%
100%
80%

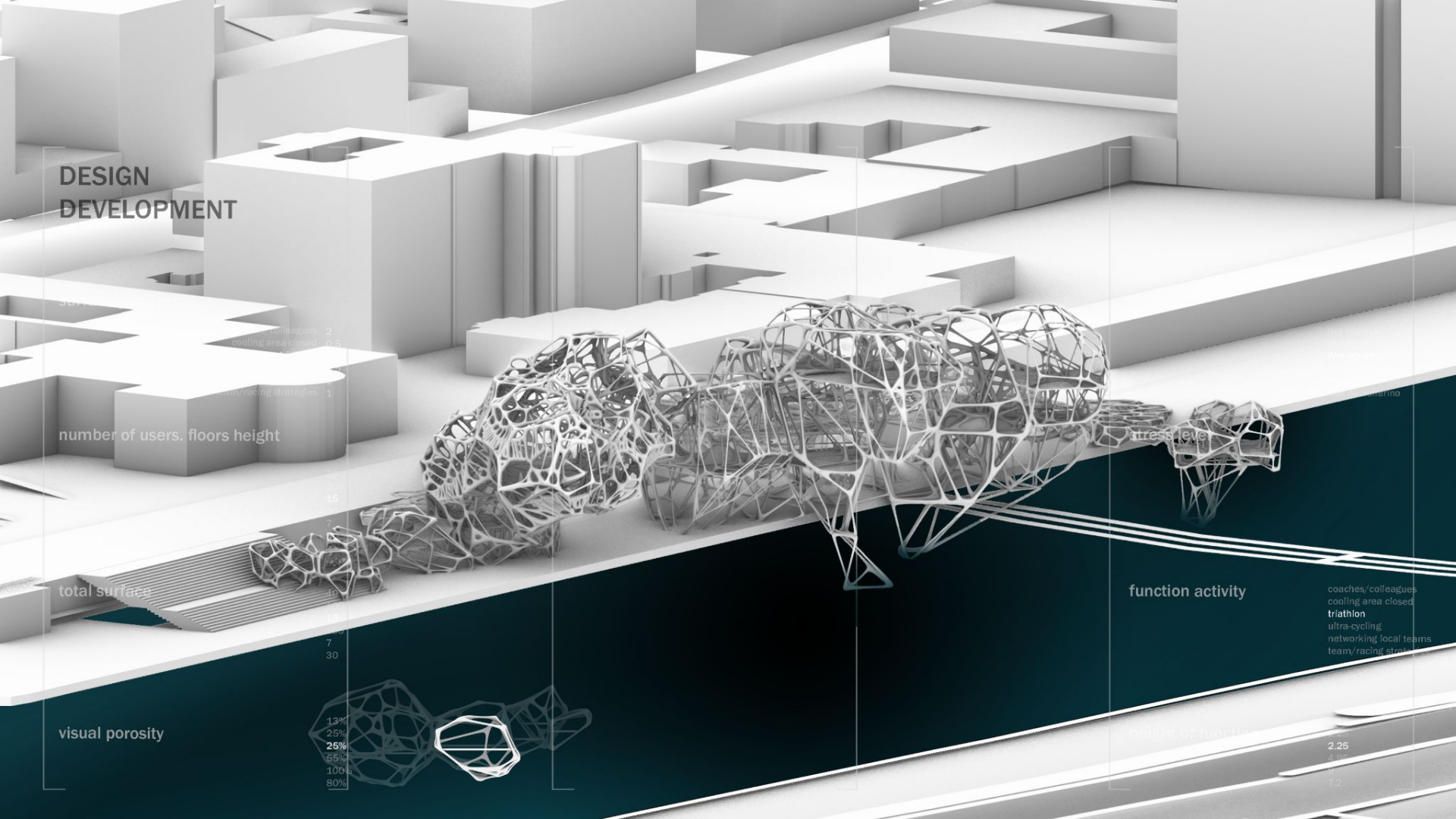


function activity

coaches/colleagues
cooling area closed
triathlon
ultra-cycling
networking local teams
team/racing strategy

height of function

2.25
1.15
2.72







Bike is ready for the Olympics!

Thank you!