DIVERSITY IN REGULARTITY

ROTATEABLE CORE MULTICOMFORT BUILDING

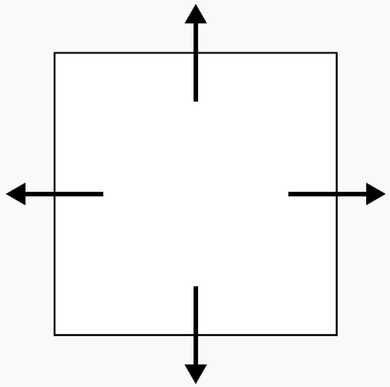
Lifestyles are diverse in Milan

But there are some regularities that combines them

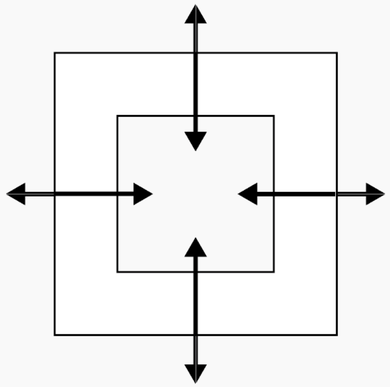
Which SHAPE can fully represent the diversity?

Hexagon
Has a lot of potential to maintain regularity in diversity

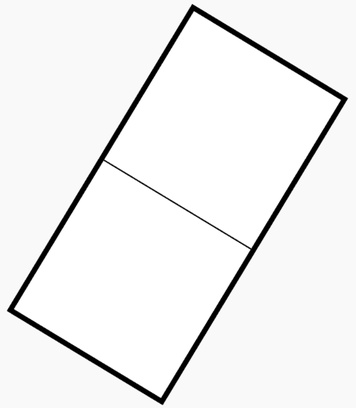
As a grid It could include triangle, rectangle, hexagon and more..



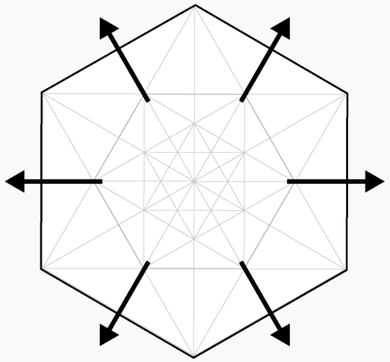
DIRECTIONAL

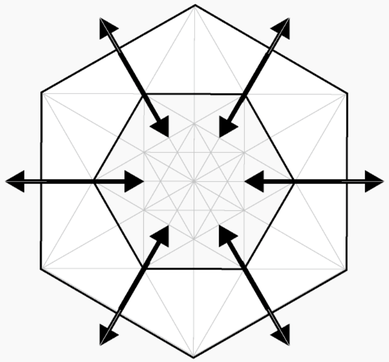


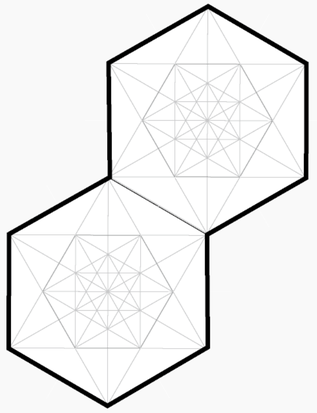
LIGHT ABSORPTION



SURFACE (OPEN) AREA

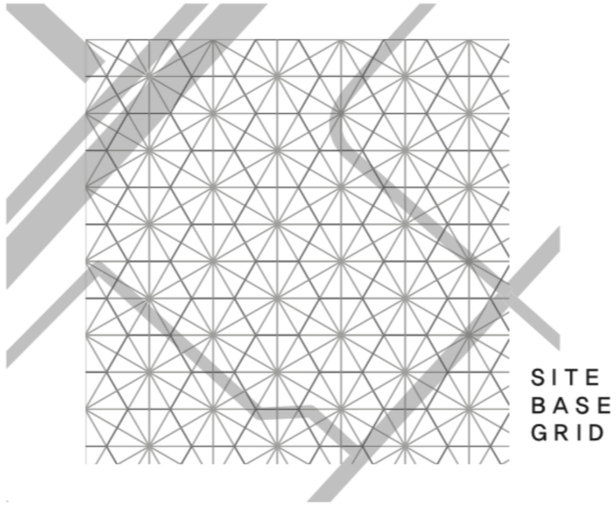


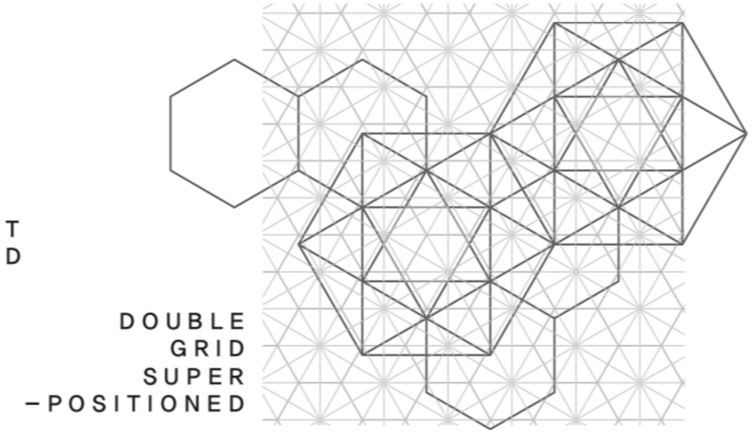




We started to make a big and flexable grid in the site,
So the smaller unit grid could fit in and make a formation.

SMALL UNITS CLUSTERING TO MAKE THE BIGGER MASS



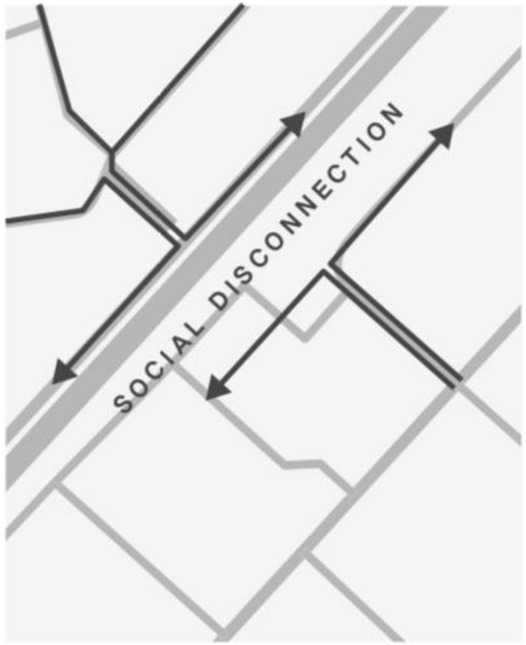


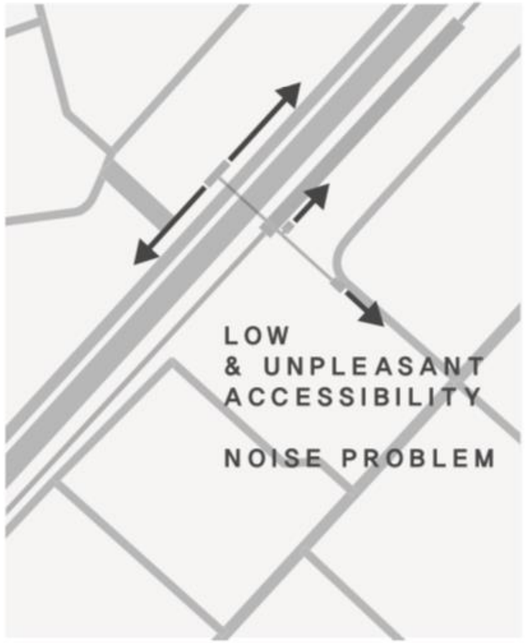
DOUBLE GRID SYSTEM

SITE BASE GRID – UNIT GRID

ISSUES OF THE SITE

OUTSKIRT OF MILAN



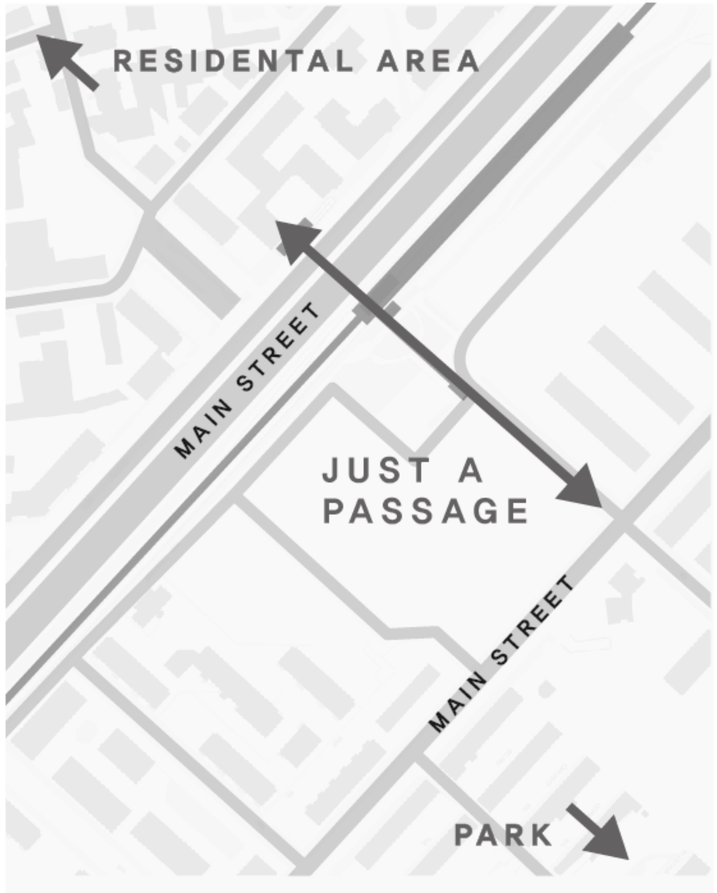


:Noise
:relative accessibility
-cant access by car; can cause physical and emotional severance, result in the division between two places.
:The level of connectivity between center of milan and the site.
(Only one sided connection- people goes out, doesn't come in)
:lack of community space bounding two places
:bedtown sustainabilty

We thought that things causing this negative issues
might even give us possitive aspects of the site by design solutions.

If we handle the noise, the transportaion accessibility is really high, so there is potential for attracting people from out side to this area.

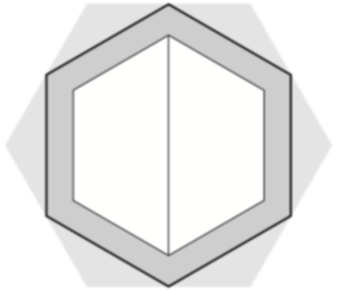
Contextual site ISSUE & need of COMMUNITY



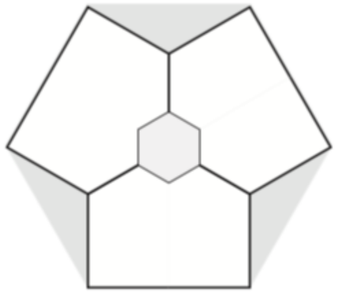
UNIT GRID EXPERIMENT

BASED ON THE NUMBER OF CELLS INSIDE

2cells



3cells



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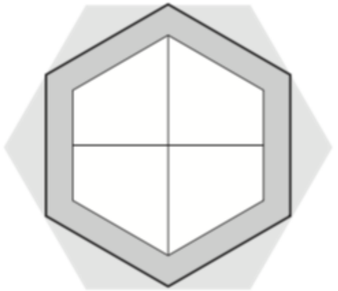
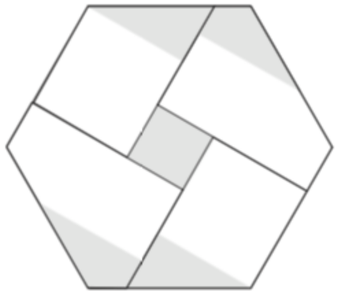
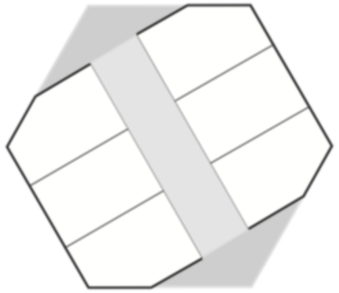
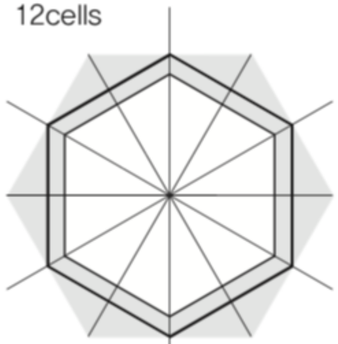
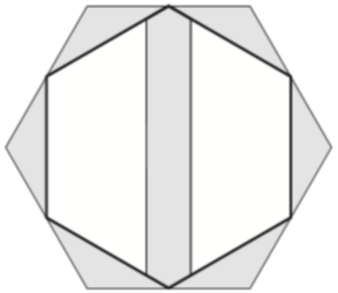


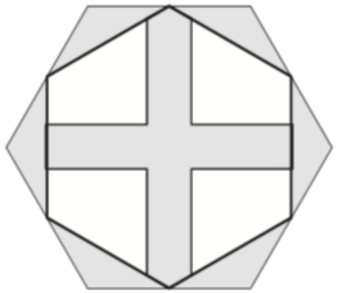




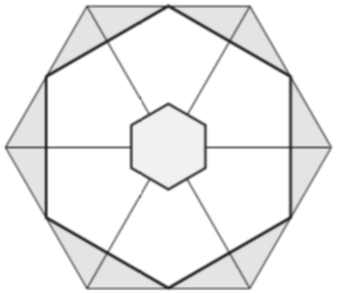
12cells

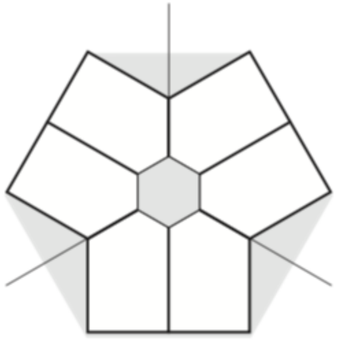


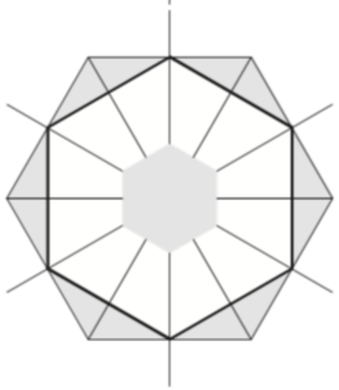




6cells







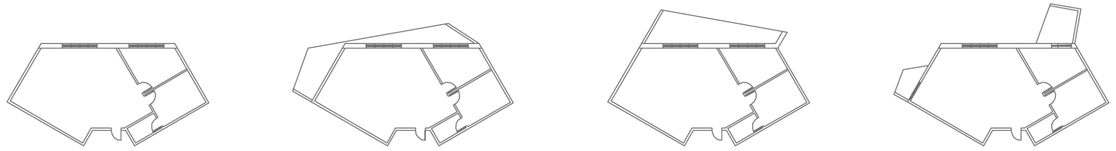
DIVERSE UNIT PLANS

UNIT TYPES 500:1

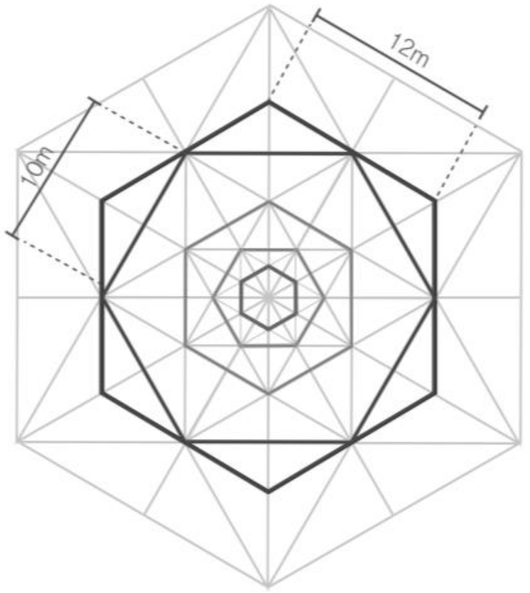
53 METER SQARE

40 METER SQARE

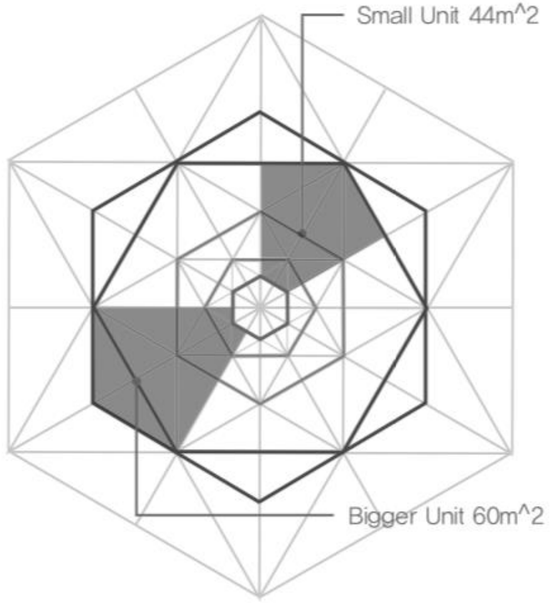
106 METER SQARE



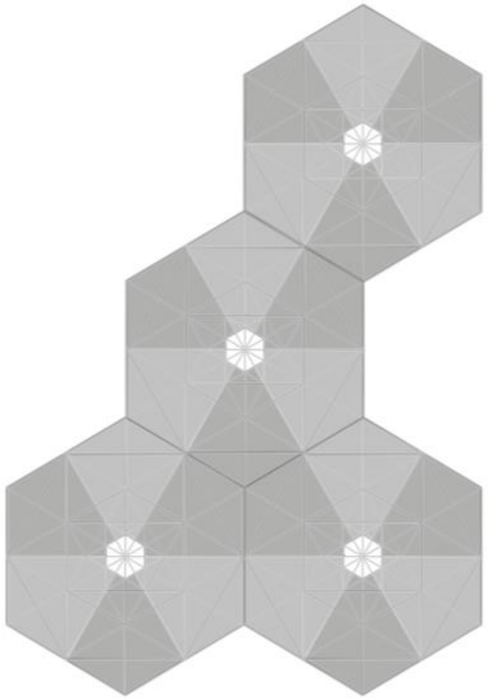
80 METER SQARE



GRID SYSTEM
BASED ON
EXPANSION OF HEXAGON



FINDING
POSSIBLE UNITS
INSIDE THE GIRD



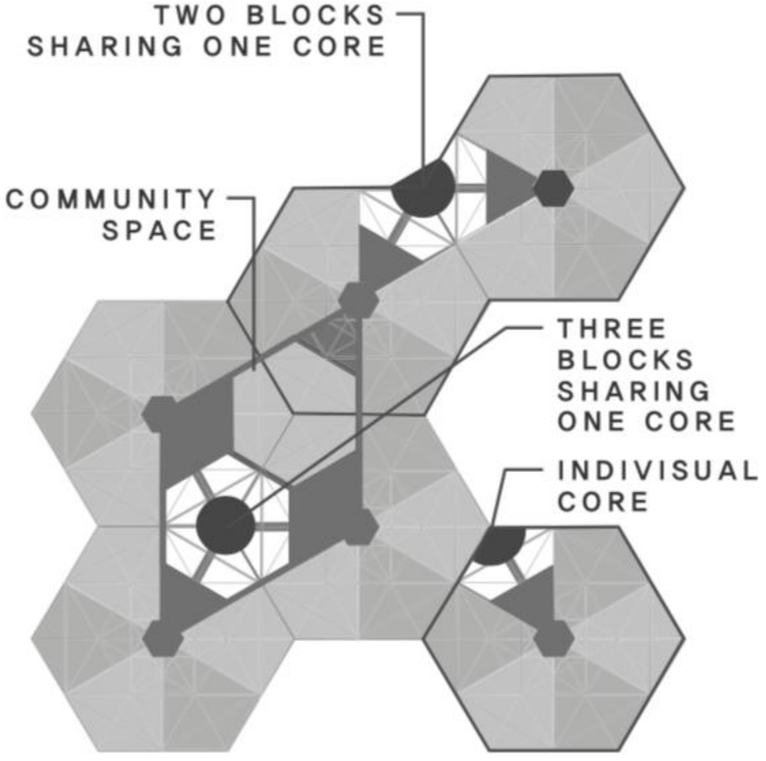
UNITS
CLUSTERING
TOGETHER

UNIT GRID DIAGRAM

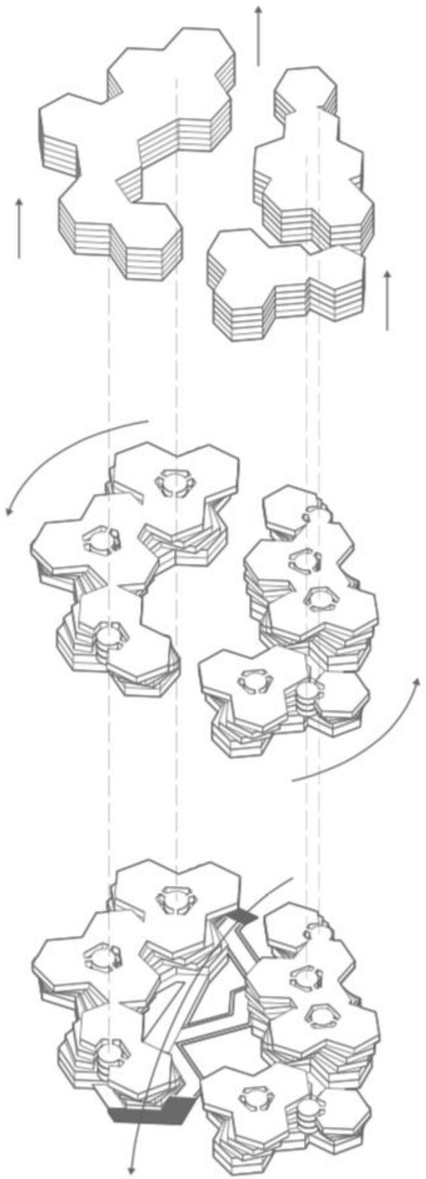
UNIT SIZE AND VOLUME ADJUSTED

UNIT GRID SYSTEM

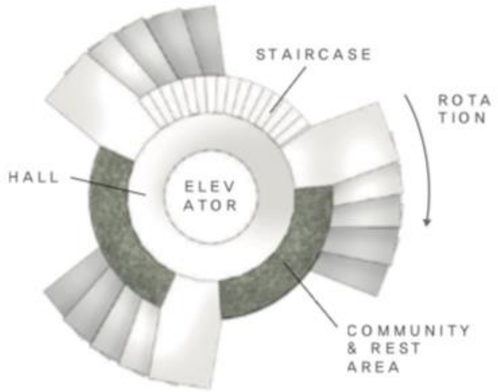
UNIT CLUSTERS CREATING HOUSING SPACE

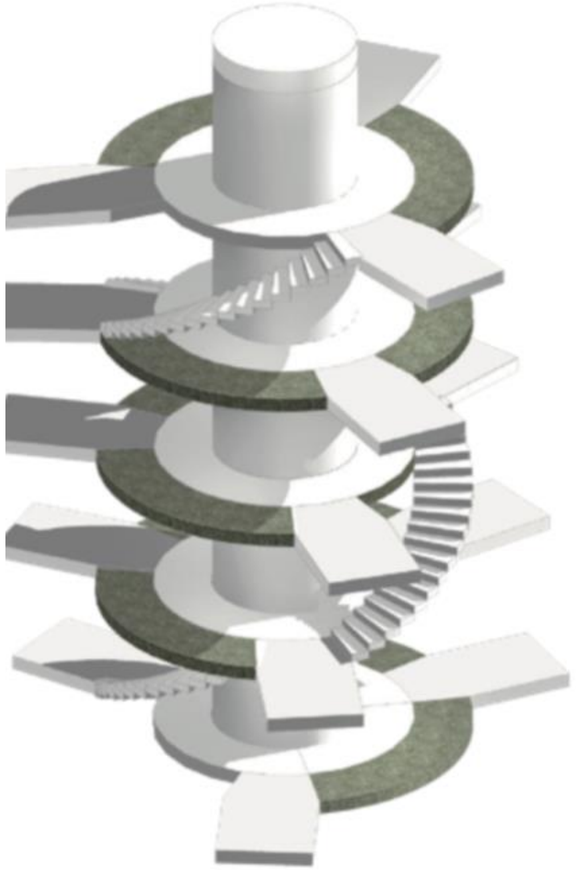


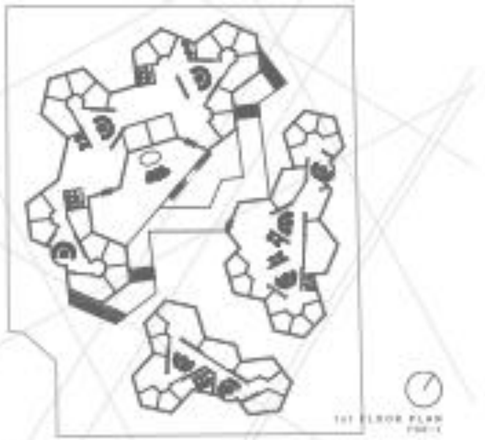
MASSING DIAGRAM



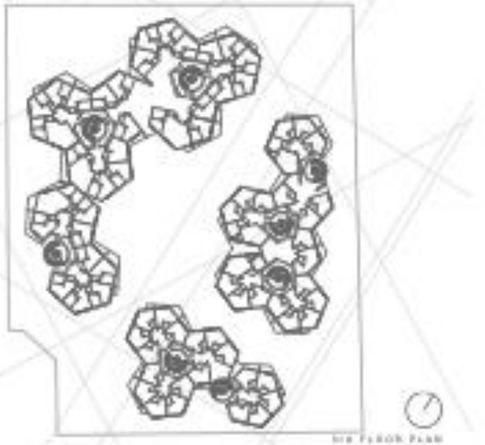
ROTATEABLE CORE DESIGN



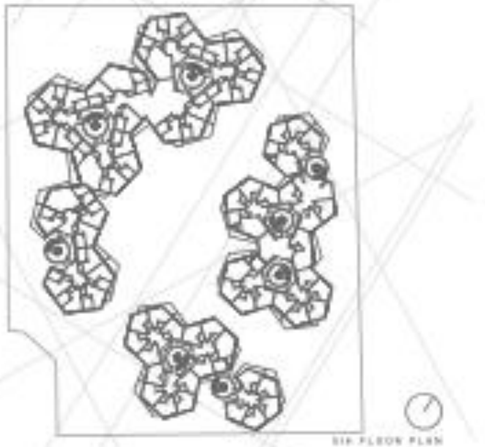




1ST FLOOR PLAN
1:200

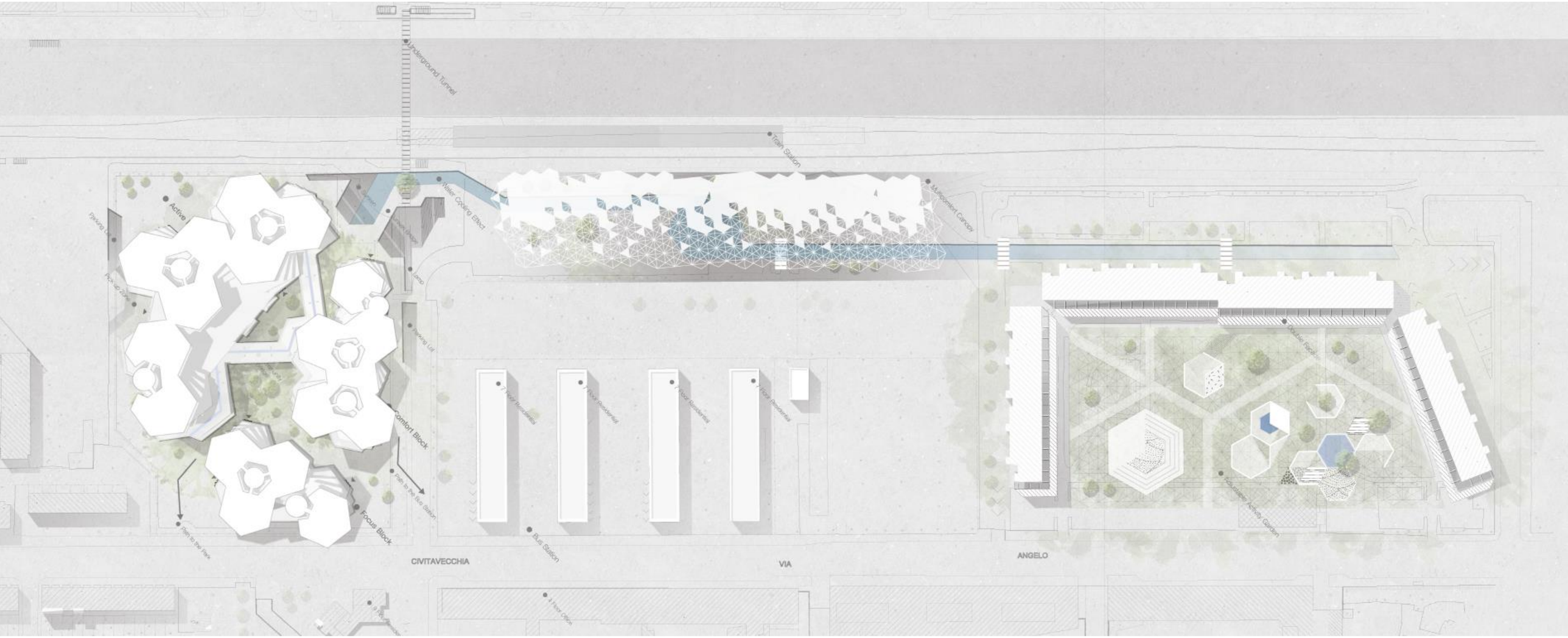


SIX FLOOR PLAN
1:200



SIX FLOOR PLAN
1:200

MASTERPLAN


Underground Tunnel
Train Station
Water Cooling Effect
Multipurpose Canopy
Active
Lamp
Parking Lot
Comfort Block
Focus Block
Path to the Park
Path to the Bus Station
Bus Station
7 Floor Residential
7 Floor Residential
7 Floor Residential
7 Floor Residential
Outdoor Facade
Adventure Activity Garden
CIVITAVECCHIA
VIA
ANGELO

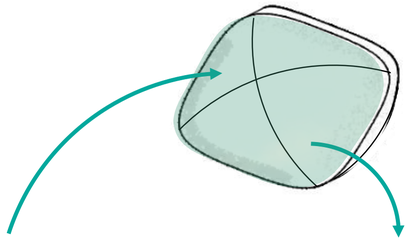
Facade System

Plot A&B

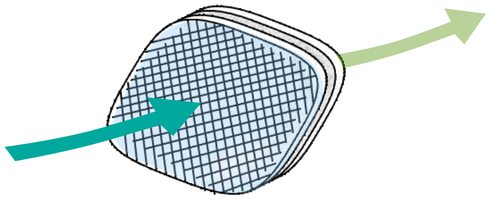
Functional Typology

Adaptable

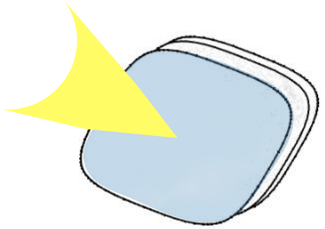
UNIT TYPOLOGY



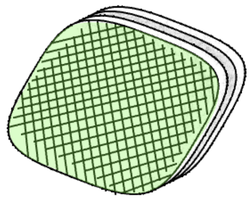
Noise Canceling



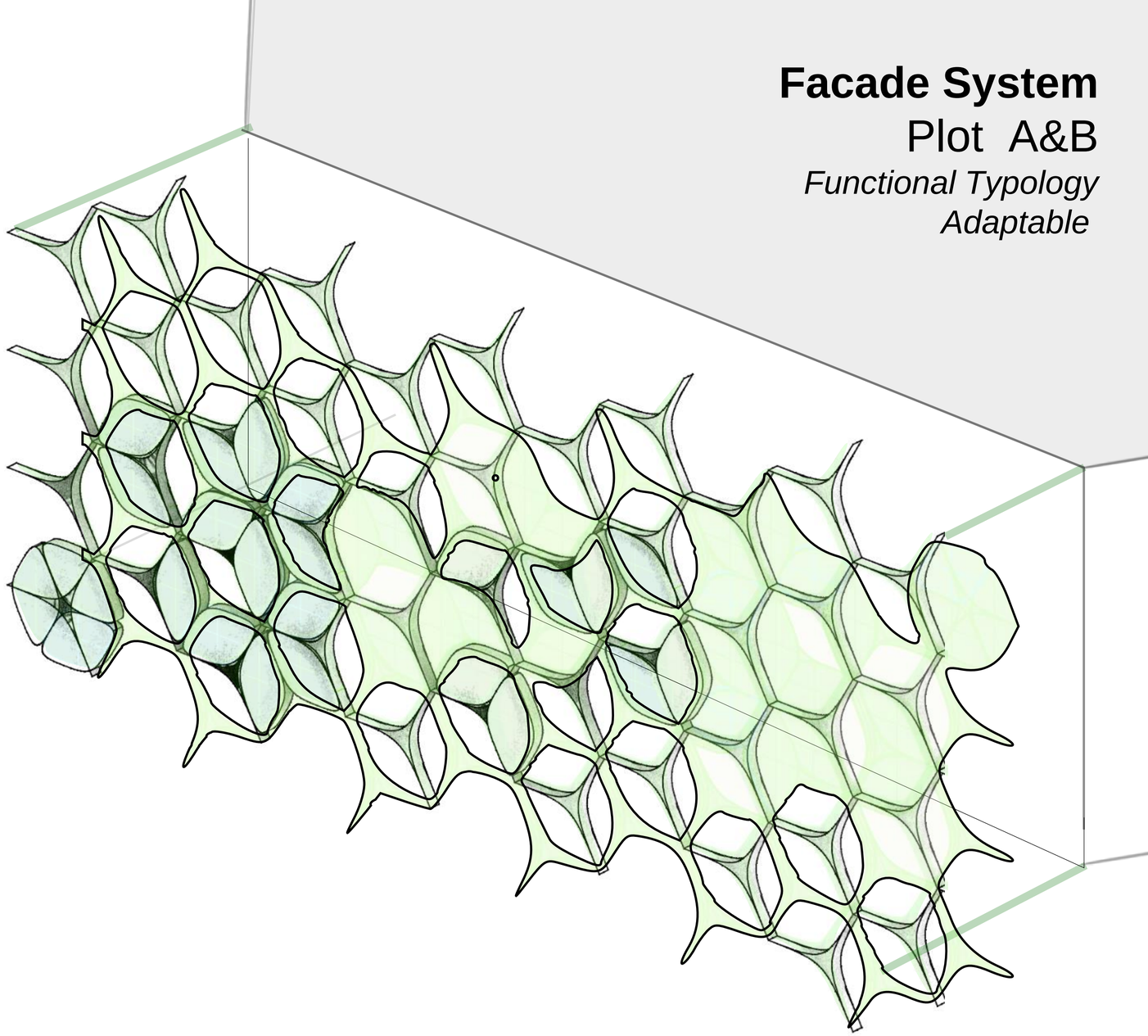
Air Filter



Solar Energy Harvesting

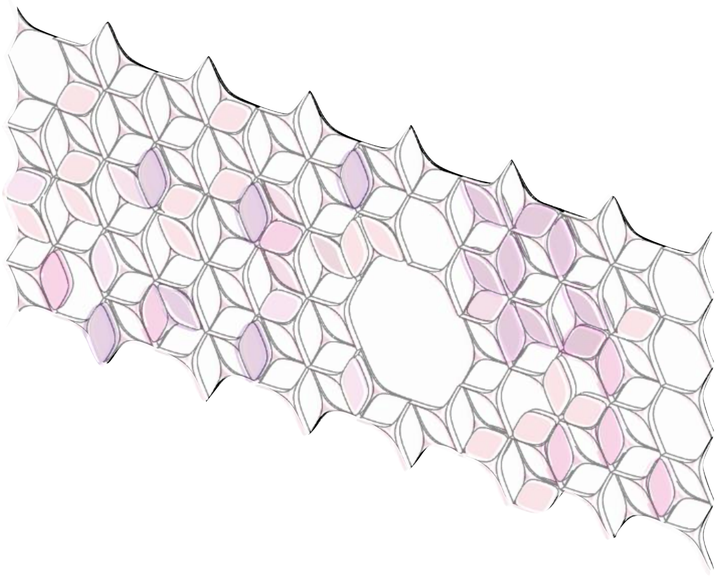


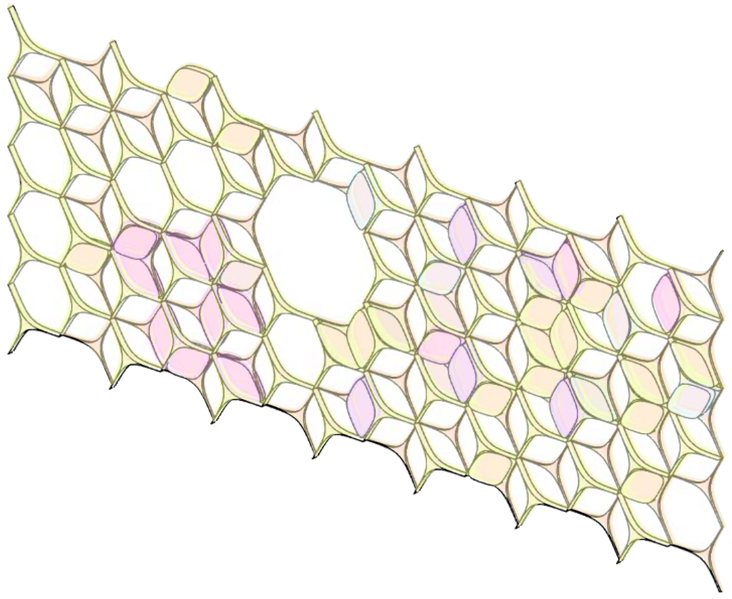
Vertical Garden

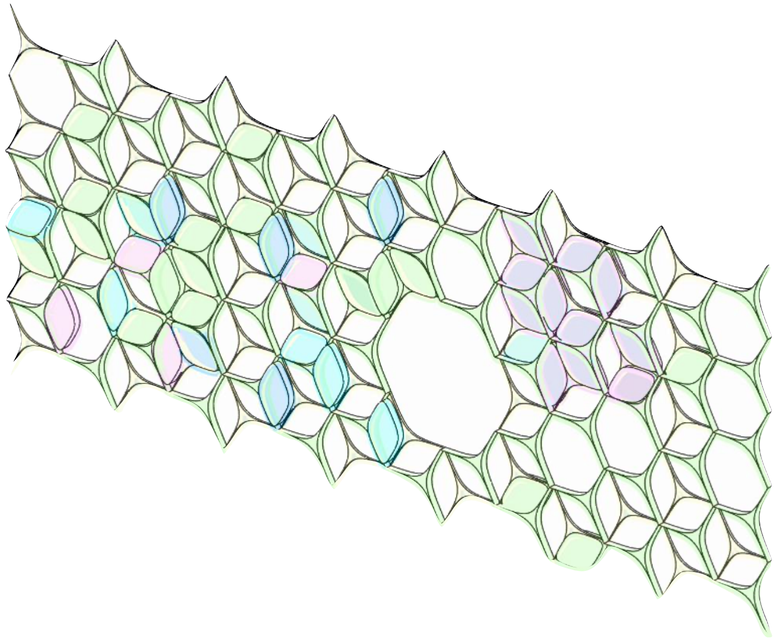


Types of Facade

Adaptable Facade Systm



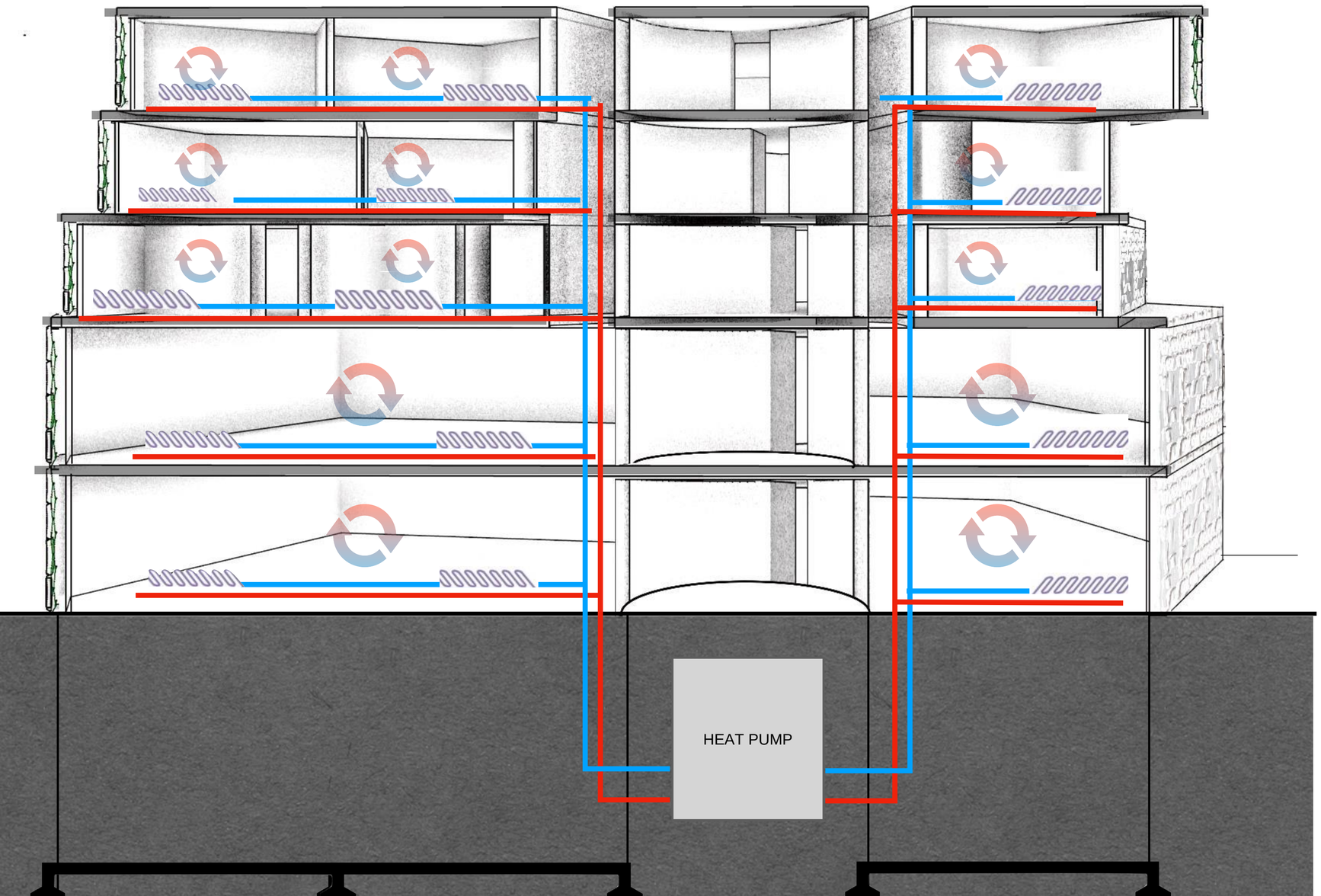


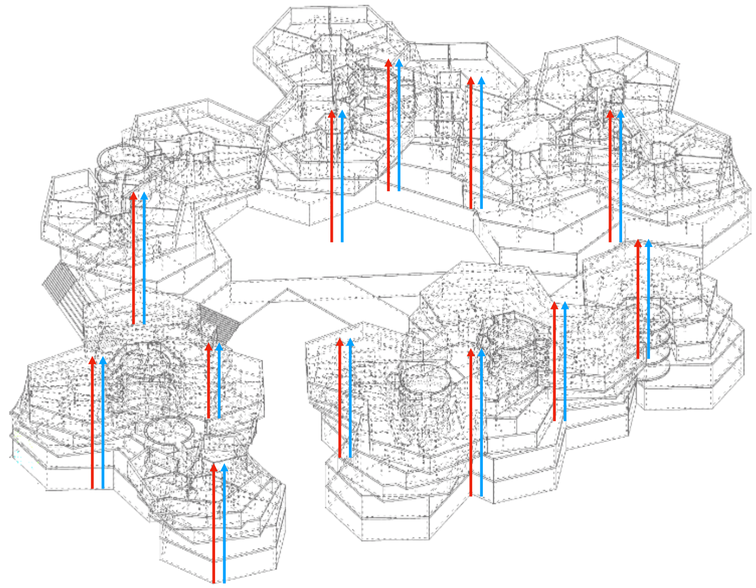


Thermal Comfort

Geothermal

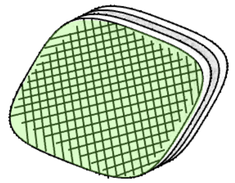
Radiant Cooling and Heating



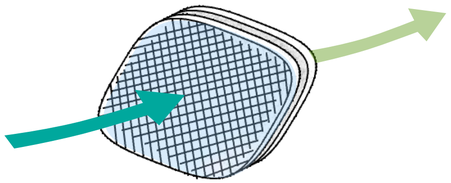


Thermal Comfort

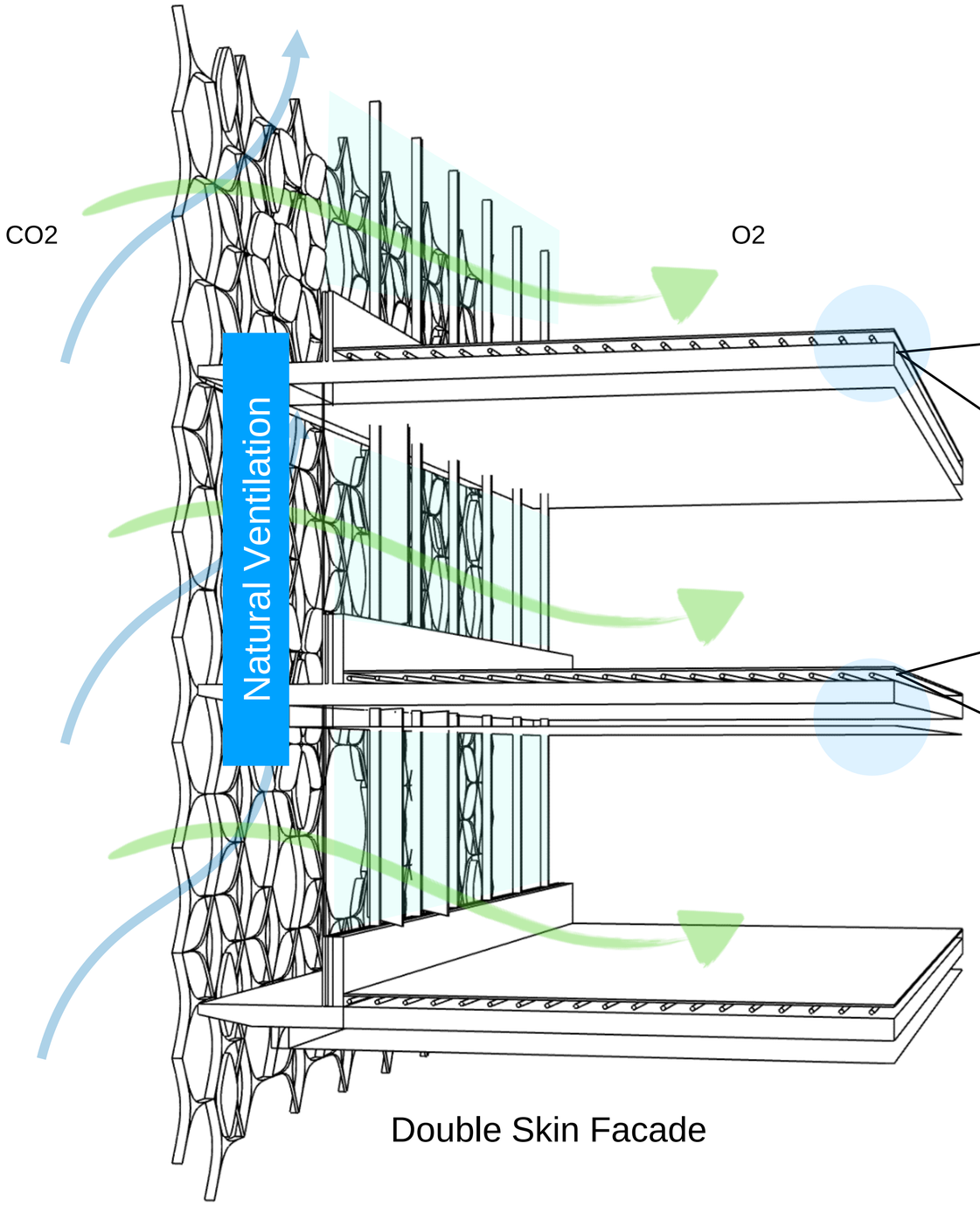
Radiant Cooling and Heating
Natural Ventilation
& Indoor Air Quality



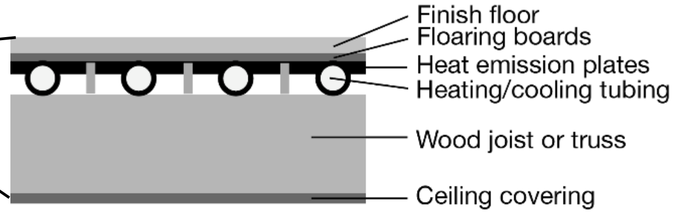
Vertical Garden

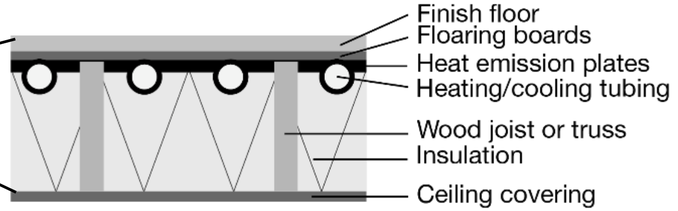


Air Filter



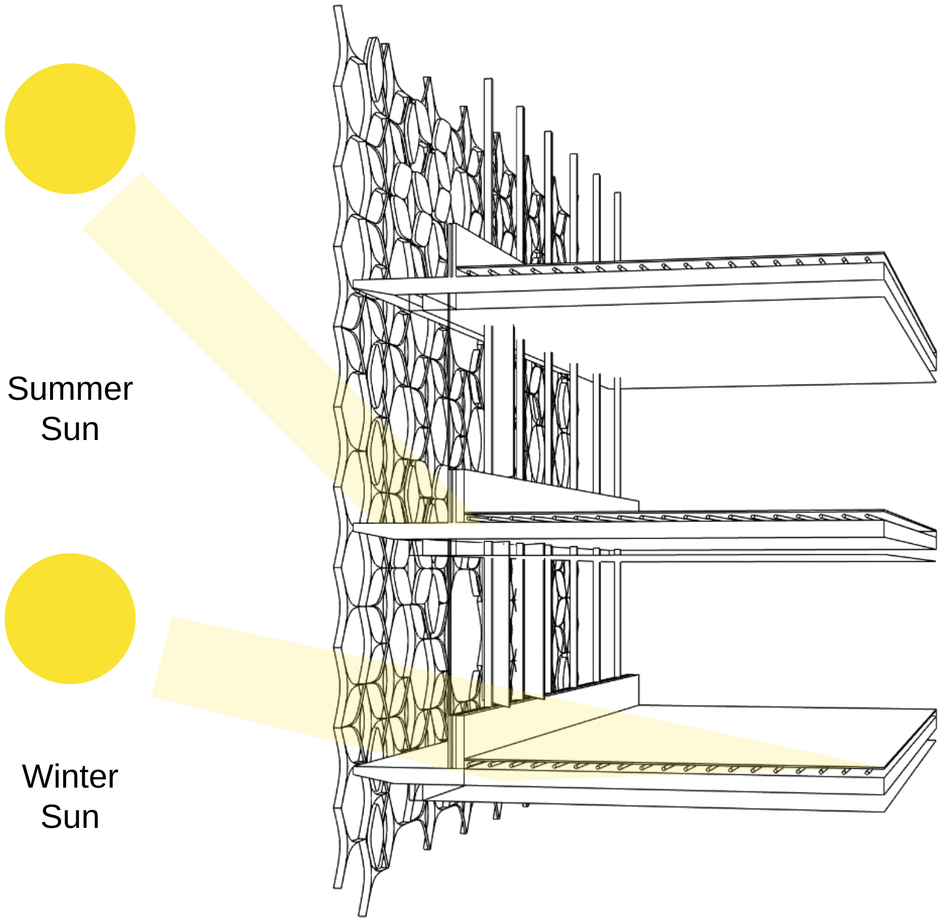
Double Skin Facade

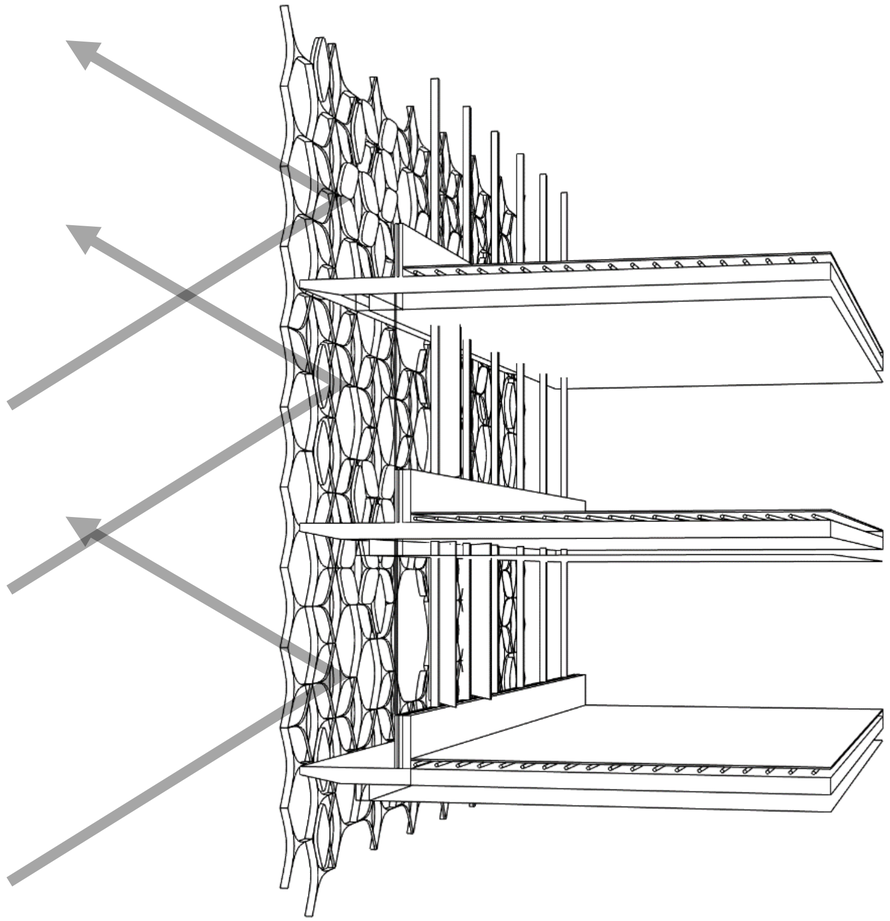




Visual & Acoustic Comfort

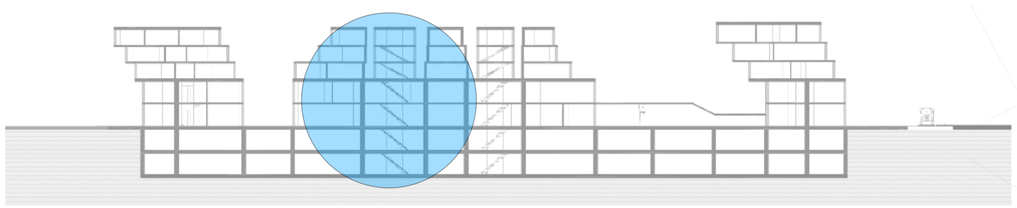
Sunlight & Noise Cancelling Facade

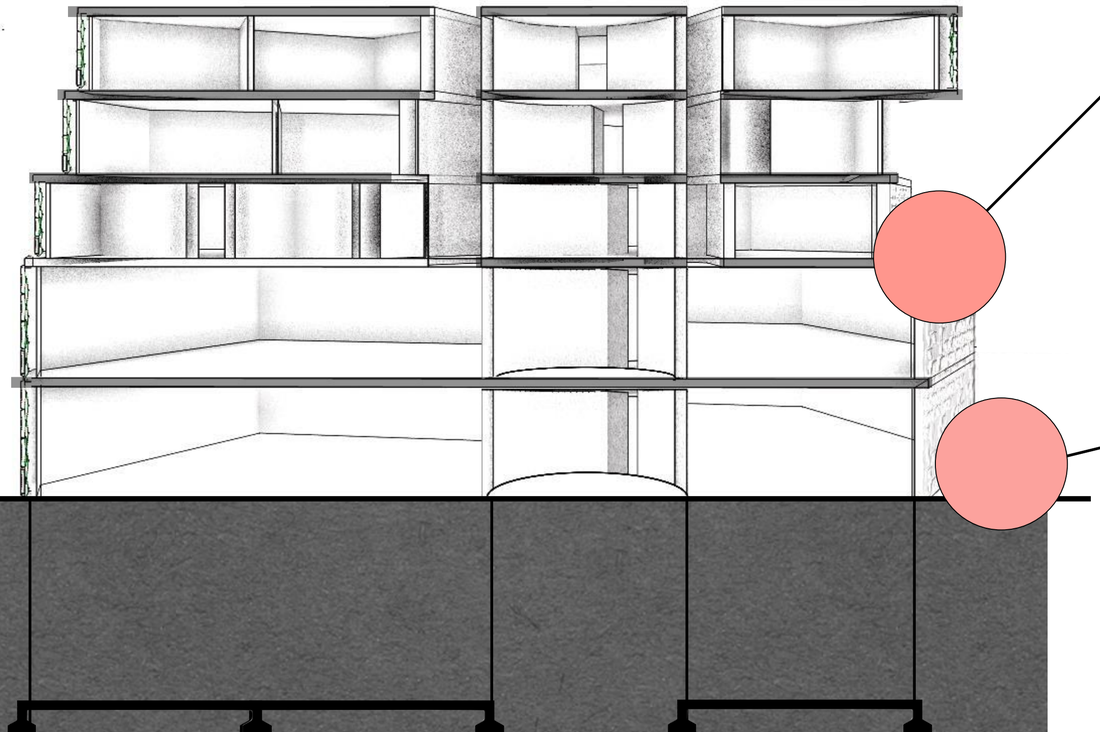




Technical Information

Details





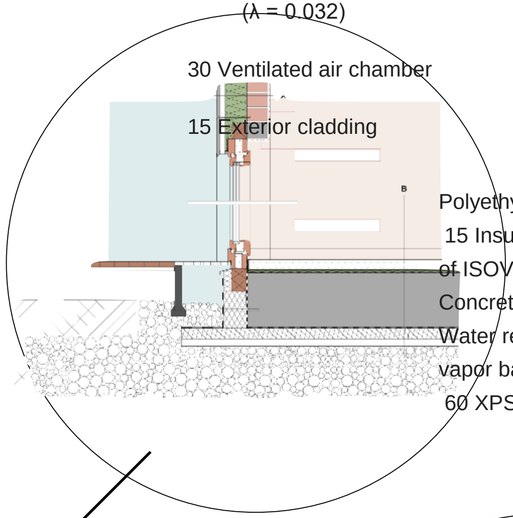
115 Perforated ceramic brick

120 Isolation ISOVER ECOVENT VN032

(λ = 0.032)

30 Ventilated air chamber

15 Exterior cladding



Polyethylene sheet

15 Insulation by ARENA PF

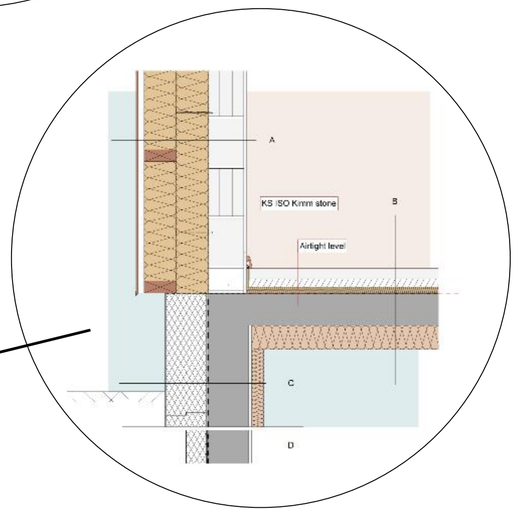
of ISOVER (λ = 0.032)

Concrete slab on ground

Water resistant insulation with

vapor barrier

60 XPS ISOVER (λ = 0.032)



Build-up A in cm

1,5	Interior plaster
17,5	Lime-sandstone KSR 6 DF (175)
16,0	ISOVER Kontur FSP 1-032 Easy Fix (wood vertical 6/16 e=60cm
16,0	ISOVER Kontur FSP 1-032 Easy Fix (wood horizontal 6/16 e=120cm)
3,0	Rear ventilation
1,0	Exterior cladding (e.g. wood, metal, plastic, stone)

Build-up B in cm

	Floor covering
5,0	Screed
	Vapour retarder and separating layer
4,0	ISOVER Exporit EPS 100/035
3,0	ISOVER Akustic EP 1
16,0	Reinforced concrete ceiling
12,0	ISOVER Topdec DP 1-032 ULTIMATE

Build-up C in cm (Plinth insulation)

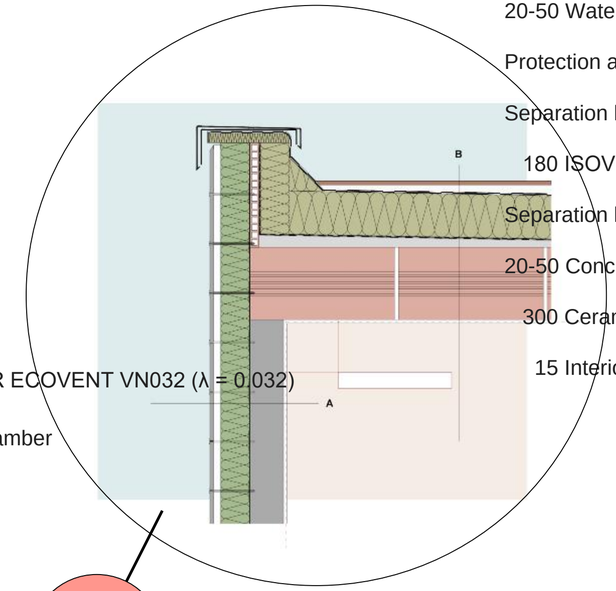
6,0	ISOVER Topdec DP 1-032 ULTIMATE
1,5	Interior plaster
20,0	Concrete wall
0,1	Bitumen preliminary coating
0,5	Sealing against moisture
20,0	ISOVER Exporit EPS PDP 1 (up to 3m installation depth) or PDP 2 (up to 6 m installation depth)
0,6	Thin plaster coat

Build-up D in cm (Perimeter insulation)

1,5	Interior plaster
20,0	Concrete wall
0,1	Bitumen preliminary coating
0,5	Feuchtigkeitsabdichtung
10,0	ISOVER Exporit EPS PDP 1 (up to 3m installation depth) or PDP 2 (up to 6 m installation depth)
	Backfill with drainage tube

Technical Information

Details



Finish

20-50 Waterproofing

Protection against water

Separation layer

180 ISOVER rock wool panel IXXO (λ = 0.039)

Separation layer

20-50 Concrete layer

300 Ceramic brick (333 Kg / m2)

15 Interior cladding

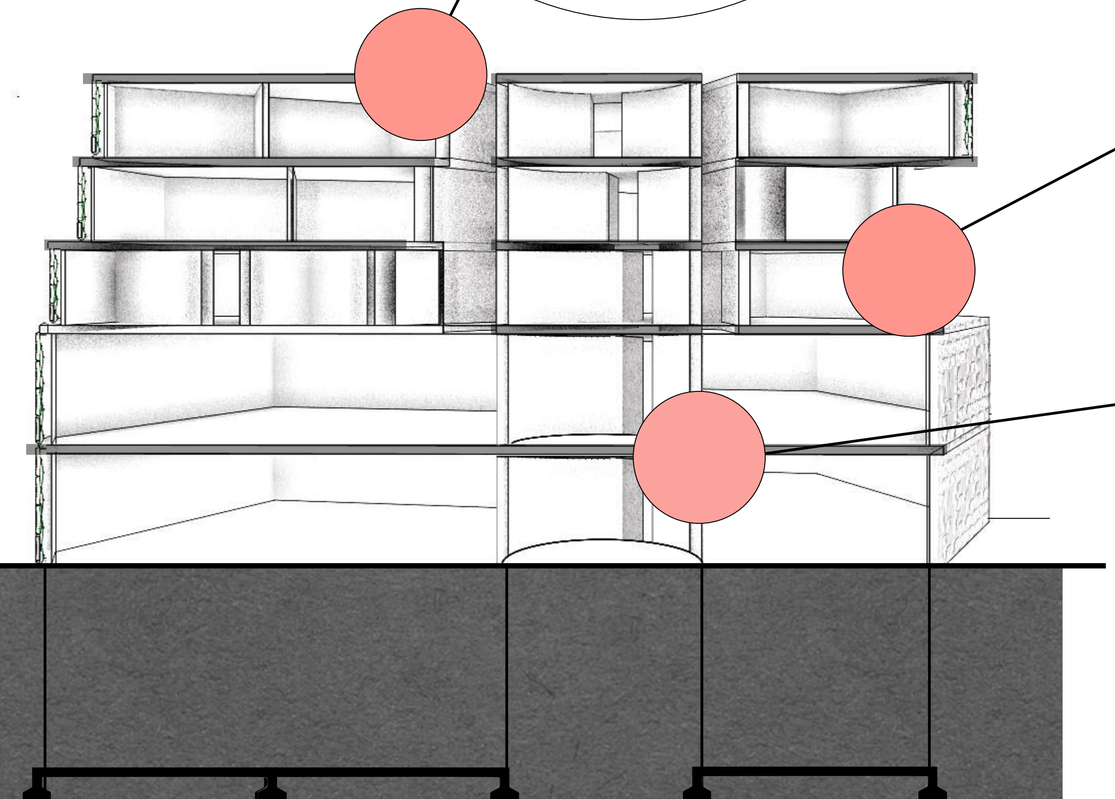
15 Interior cladding

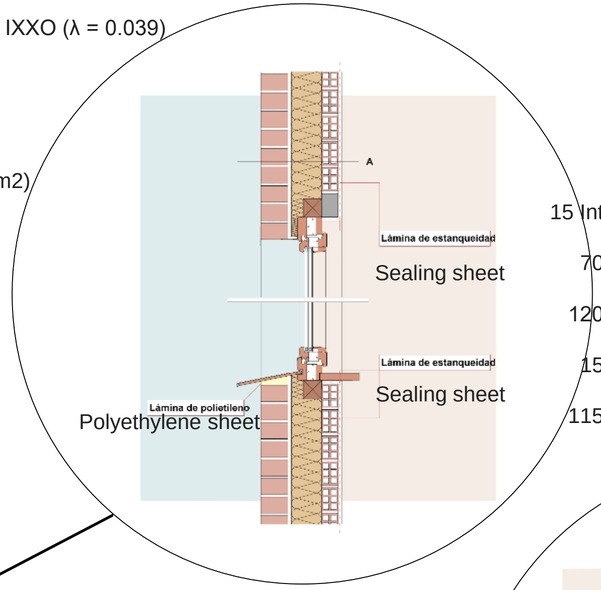
140 Concrete

120 Isolation ISOVER ECOVENT VN032 (λ = 0.032)

30 Ventilated air chamber

15 Exterior cladding





Sealing sheet

Sealing sheet

Polyethylene sheet

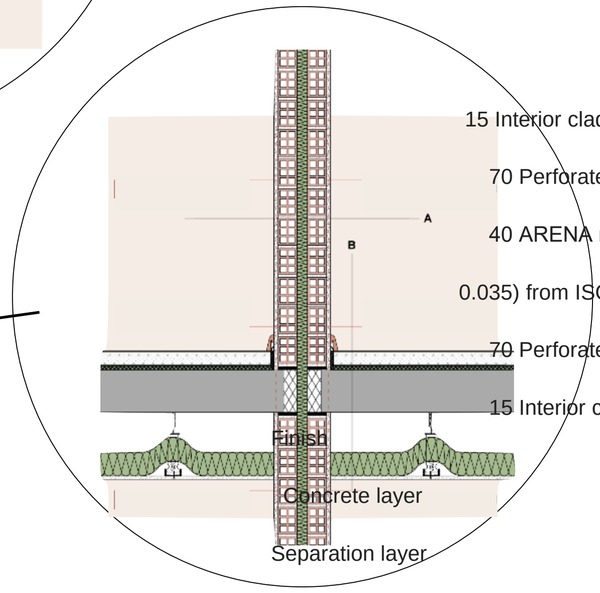
15 Interior cladding

70 Perforated ceramic brick

120 ISOVER ECO D 032 Panel (λ = 0.032)

15 Mortar

115 Perforated ceramic brick



15 Interior cladding

70 Perforated ceramic brick

40 ARENA mineral wool panel (λ = 0.035) from ISOVER

70 Perforated ceramic brick

15 Interior cladding

Finish

Concrete layer

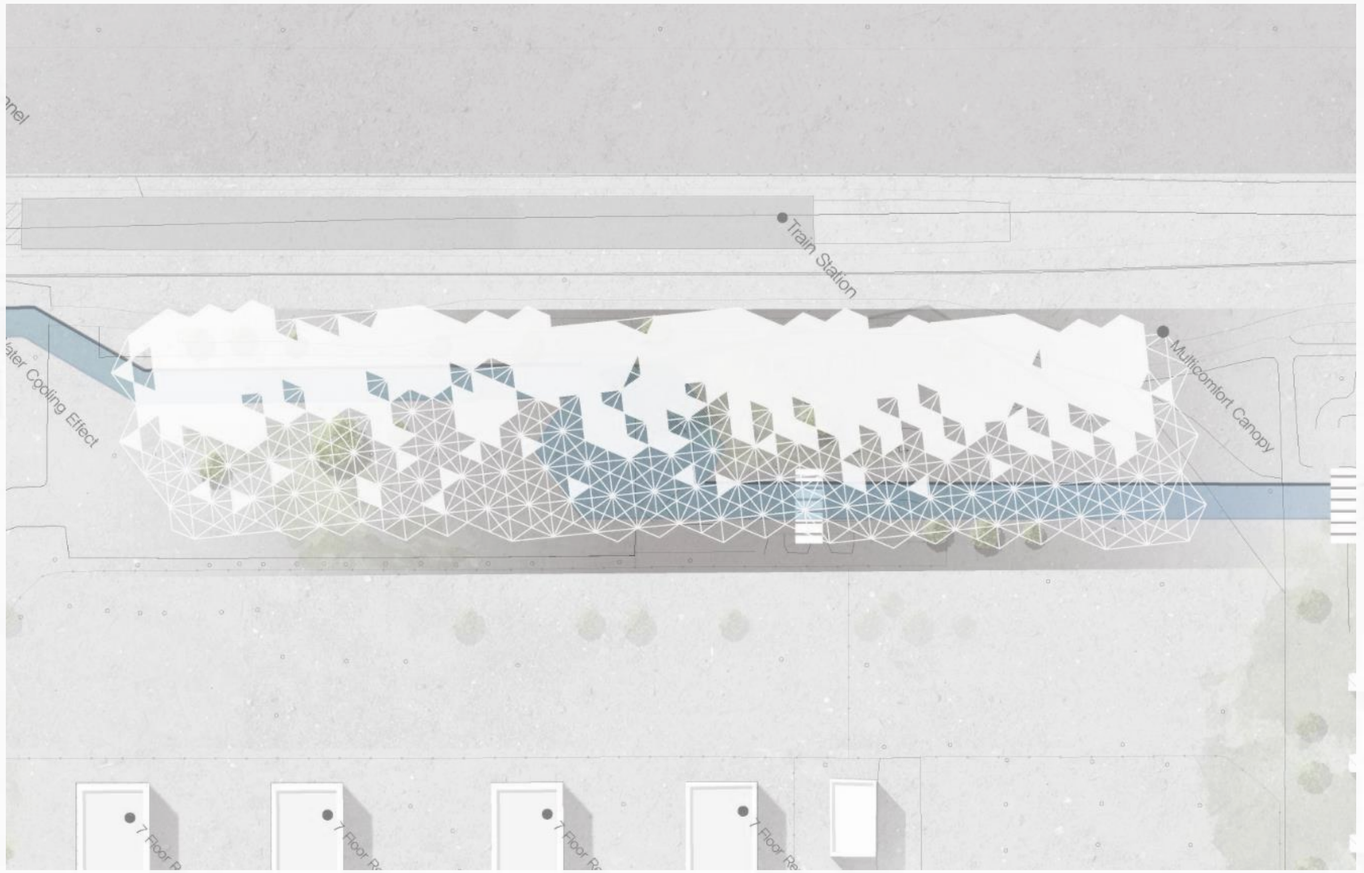
Separation layer

15 ISOVER PF Isolation (λ = 0.032)

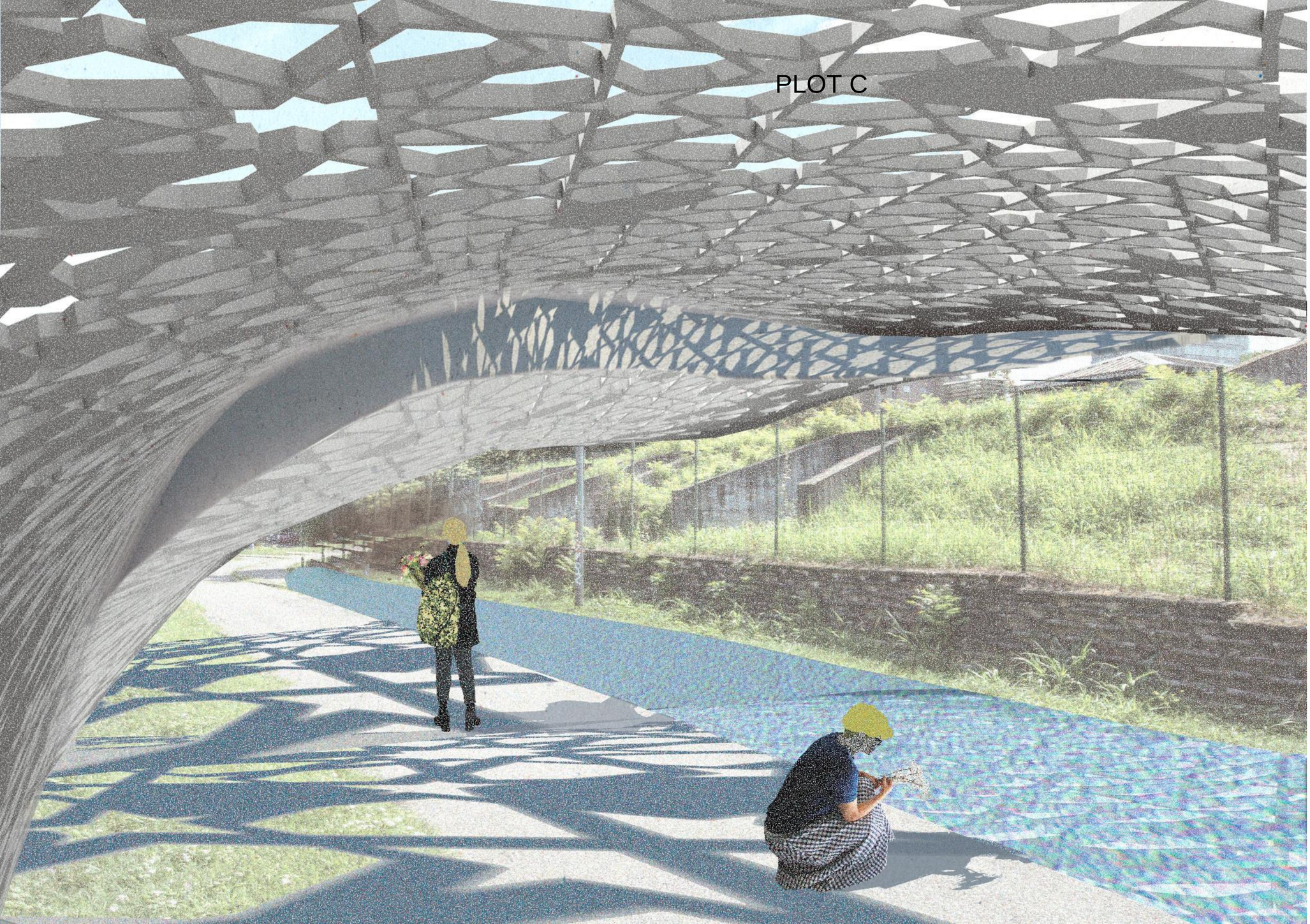
Concrete slab (333 Kg / m2)

150 Plenum

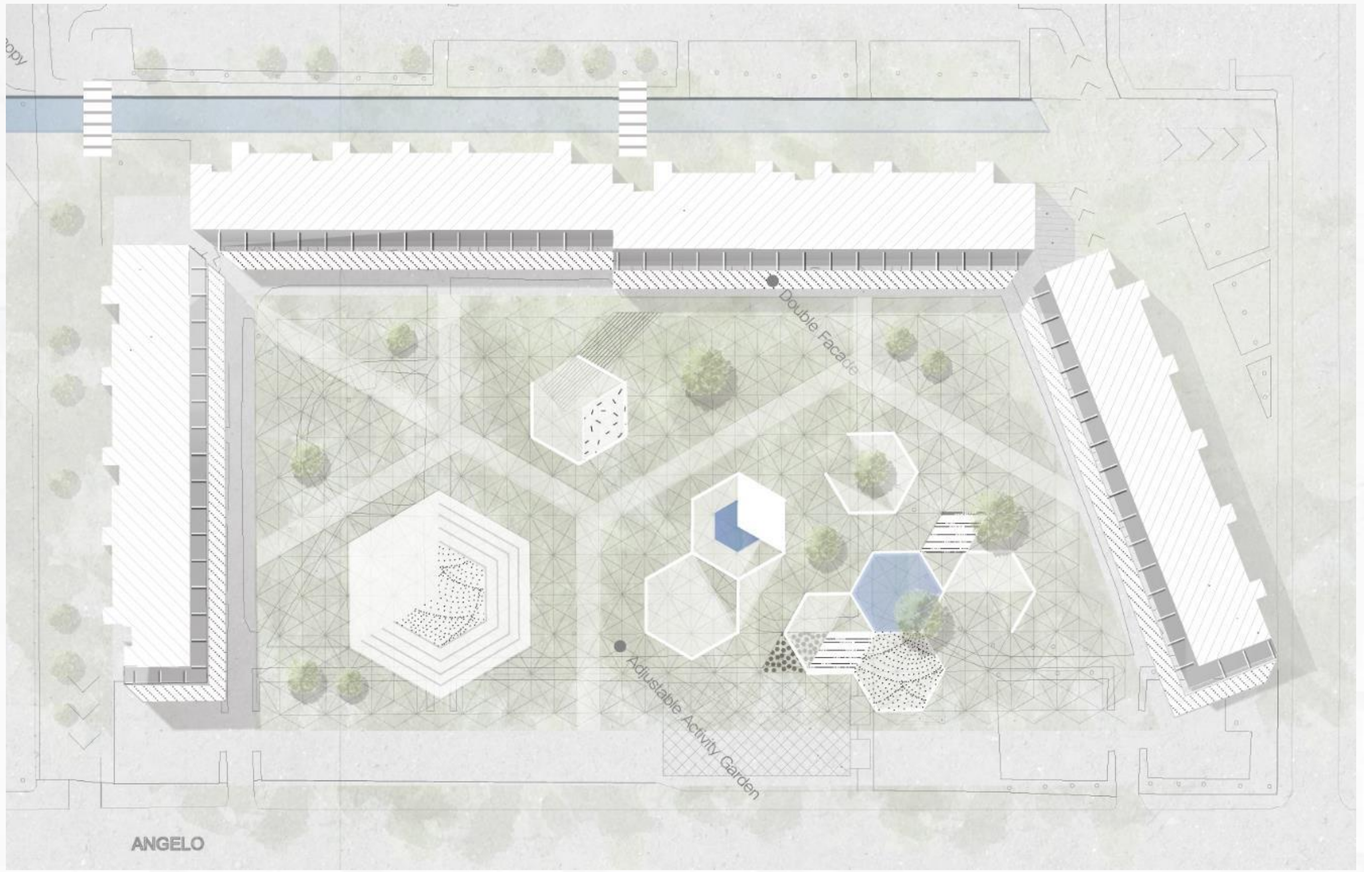
PLOT C

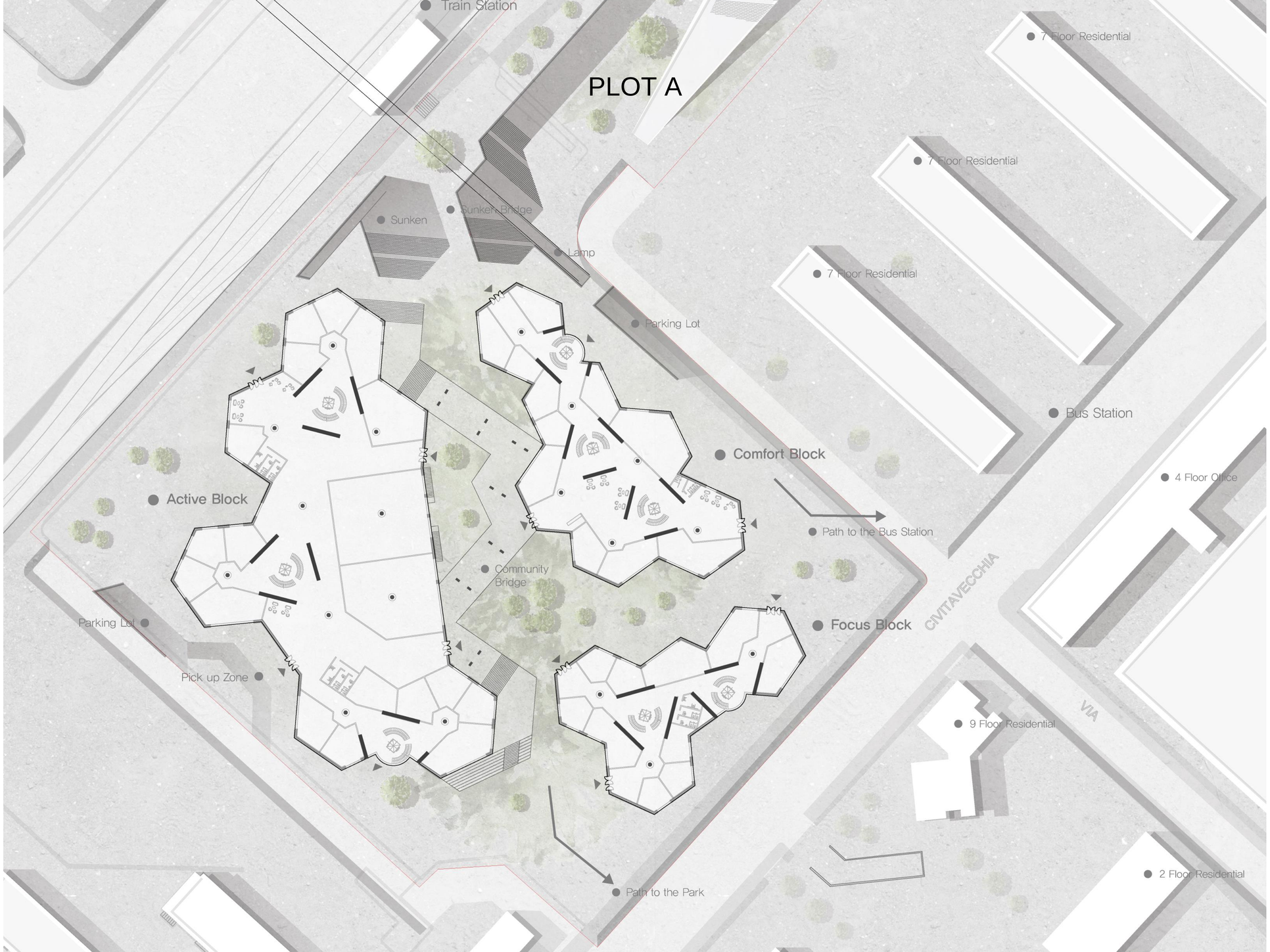


PLOT C



PLOT B




PLOT A
Train Station
7 Floor Residential
7 Floor Residential
7 Floor Residential
Sunken
Sunken Bridge
Lamp
Parking Lot
Bus Station
Comfort Block
Active Block
Path to the Bus Station
4 Floor Office
Community Bridge
Parking Lot
Pick up Zone
Focus Block
CIVITAVECCHIA
VIA
9 Floor Residential
2 Floor Residential
Path to the Park

Total Heated Space Area

Heated Space Area:	21150.00	m2

Total Heated Space Volume

Heated Space Volume:	317250.00	m3

Average U-Values

Pitched roof/mono pitched:	---- W/(m2K)
Roof flat:	0.12 W/(m2K)
Wall against air:	0.19 W/(m2K)
Wall against ground:	---- W/(m2K)
Wall against neighbour:	---- W/(m2K)
Wall against unheated cellar:	---- W/(m2K)
Slab against ground:	0.10 W/(m2K)
Slab against unheated cellar:	---- W/(m2K)

Average U-Values

Windows:	0.70 W/(m2K)
Doors:	1.20 W/(m2K)

Wall against air

ID:	EW04	
Length:	60.00	m
Height:	17.00	m
Area:	7644.00	m2
U-Value:	0.19	W/(m2K)

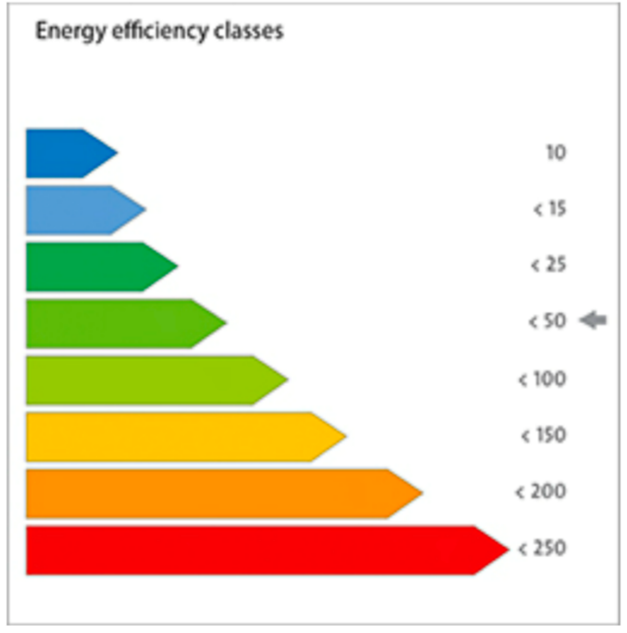
Wall against air

ID:	EW03	
Length:	60.00	m
Height:	17.00	m
Area:	7650.00	m2
U-Value:	0.19	W/(m2K)

CALCULATIONS

Specific Heat Demand

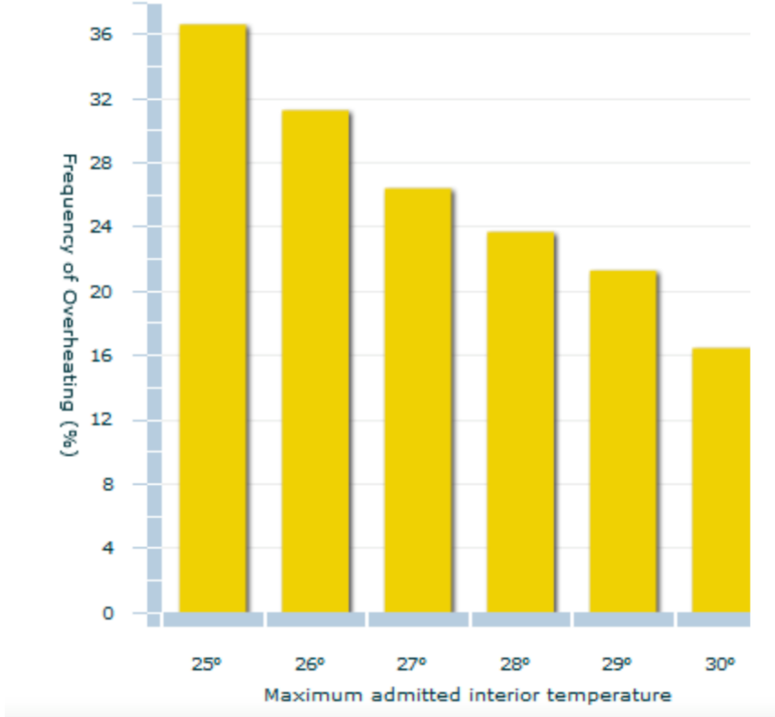
Transmission Heat Losses:	1993259.51	kWh/a
Ventilation Heat Losses:	911871.67	kWh/a
Total Heat Losses:	2905131.19	kWh/a
Internal Heat Gains:	362426.40	kWh/a
Solar Heat Gains:	1778089.28	kWh/a
Total Heat Gains:	1994876.23	kWh/a
Annual Heat Demand:	910254.96	kWh/a
Specific Heat Demand:	43.04	kWh/(m2a)



CALCULATIONS

Overheating

Exterior Thermal Transmittance:	29800.50	W/K
Ground Thermal Transmittance:	211.35	W/K
Ventilation Transmittion Ambient:	34897.50	W/K
Ventilation Transmission Ground:	0.00	W/K
Solar Aperture:	10236.48	m2
Frequency of Overheating:	36.62	%



DIVERSITY IN REGULARTITY

ROTATEABLE CORE MULTICOMFORT BUILDING