MONT VERTE

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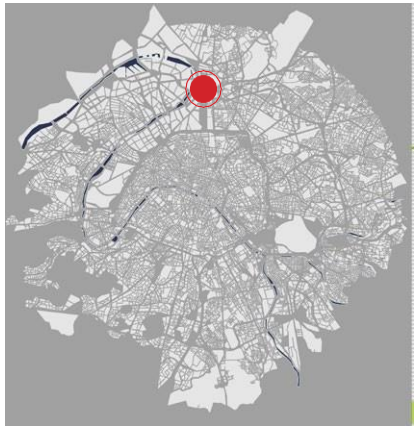
University of Cape Town

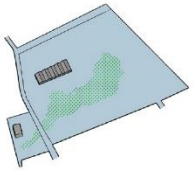
Saint-Gobain Multicomfort Student Competition 2020

Location

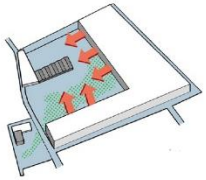


Concept

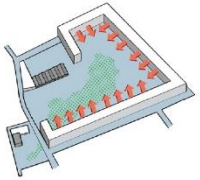
- Revitalization through water and wetland park
- Introduction of biodiverse plants, birds and animals
- Promoting a healthy relationship between urban lifestyle and nature
- Safety, beauty and opportunity for the community
- Interaction between this scheme and the greater urban context



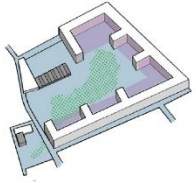
1 The Wetland



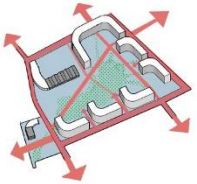
2 Views of the wetland



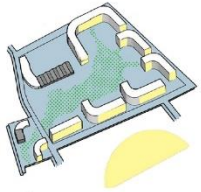
3 Hollowing out the L to get a larger surface area for views



4 Creation of courtyards for more intimate communities



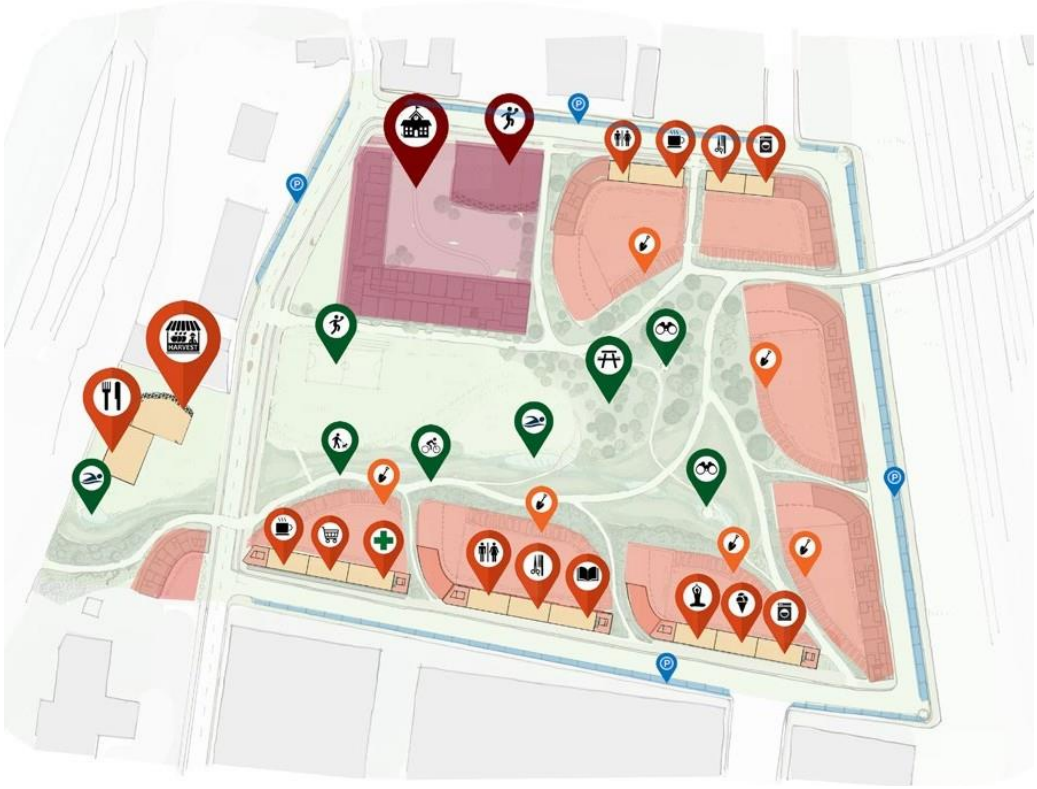
5 Separation of L's for ease of circulation



6 Every unit gets south light and views

Masterplan

Masterplan: Outdoor Safety, Social Comfort and Privacy

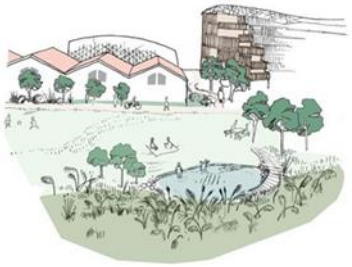


Institutional

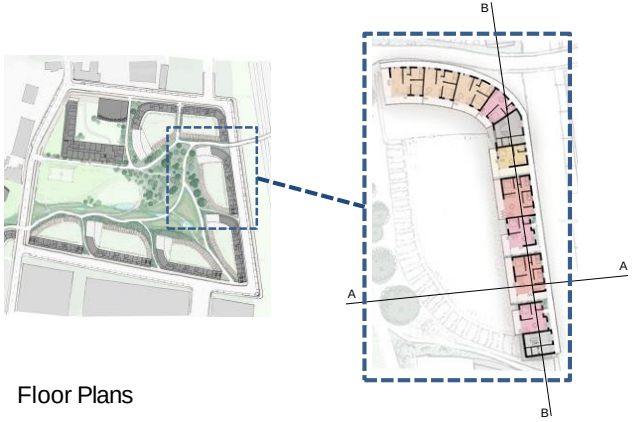
Commercial

Private

Public

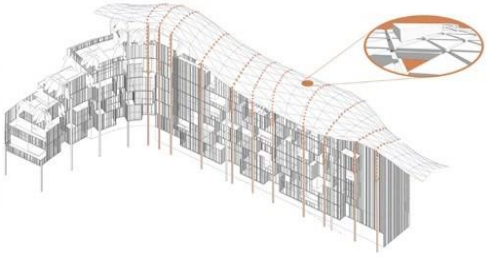


A typical residential building



Floor Plans

Section A



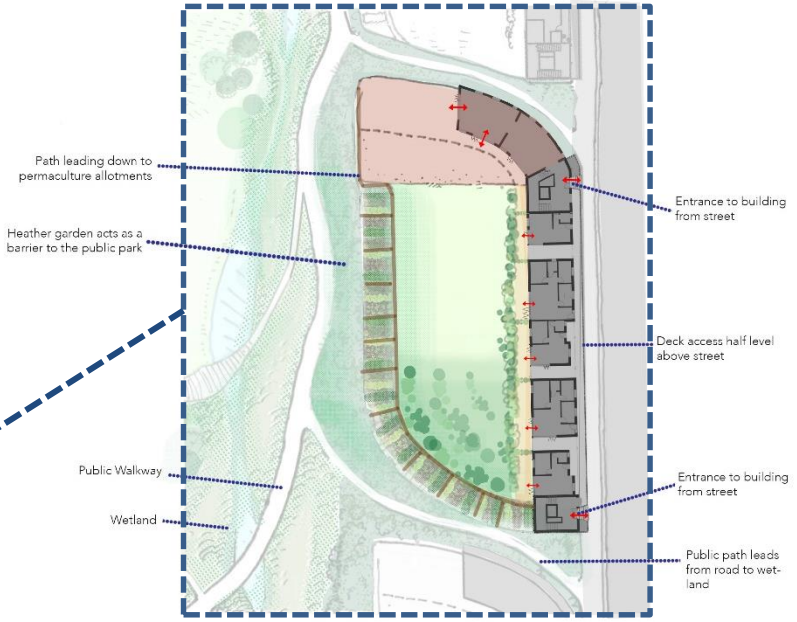
Structural Diagram

Section B

Residential building: Courtyard Programming

Each living unit has access to:

- Views of the park providing safety for the park and visual comfort for the units
- Private terrace or balcony.
- A semi-private communal courtyard
- Communal permaculture urban farming



Courtyard Program of Residential building

- Communal outdoor braai/ gathering space
- Indoor communal area
- Private outdoor space for each living unit bordered by a hedge
- Communal lawn
- Quiet zone with garden, marsh and benches
- Permaculture allotments

Residential building: Typical Floor Plan

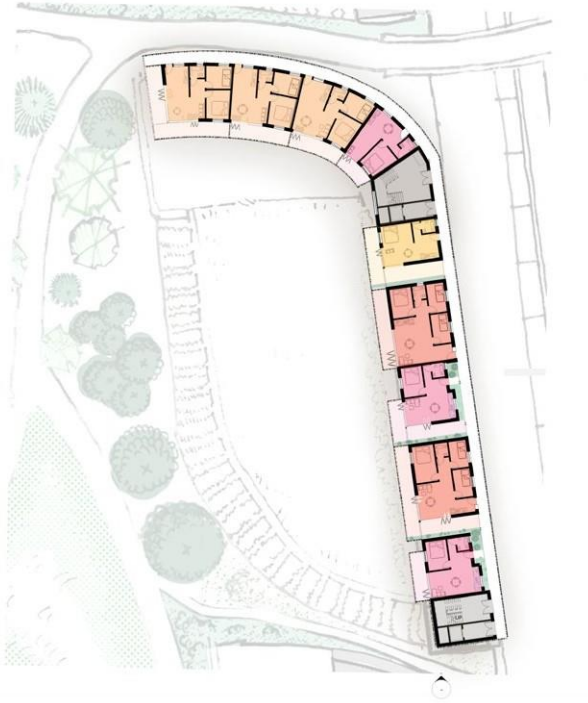
Mixed tenure apartments for a variety of different dwellers such as young families, retired people, students and workers.

Studio apartment

2 bedroom apartment

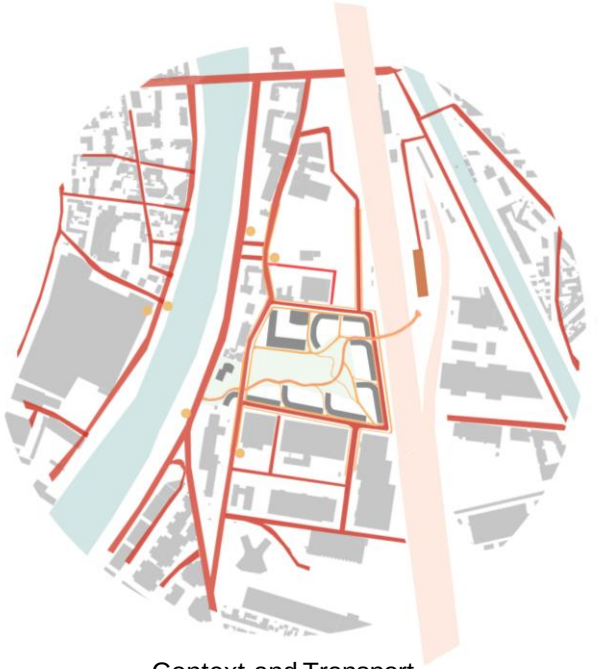
1 bedroom apartment

3 bedroom apartment



Typical floor plan: 3rd floor

Urban Strategy: Context and Connections



Context and Transport

- Railway Line
- Bus stops
- Train station
- Motorway
- Bike lanes and sidewalks
- Local road

Connection

- west-east connection
- north-south connection
- train station

Circulation

- routes for bicycles and people
- major pedestrian route
- private circulation

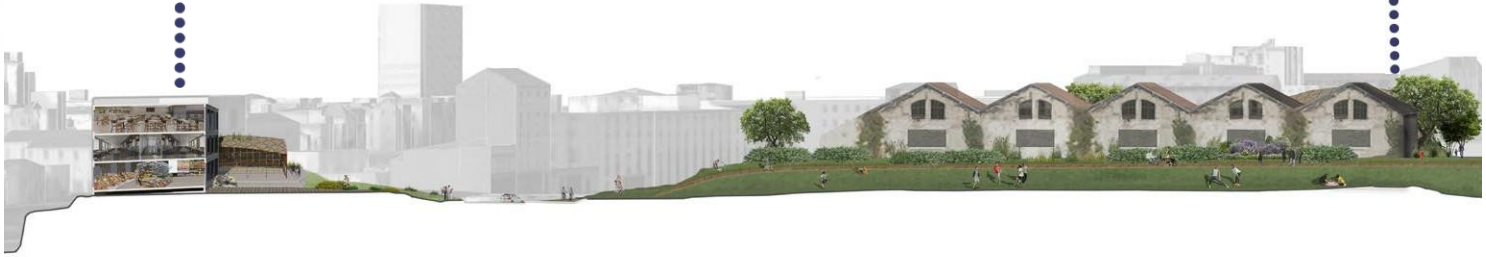
Strategy: Biodiversity and Local Value Creation

Biomes and Zones

- Wetland
- Heather Garden
- Permaculture Lots
- Courtyards
- Lawn
- Food forest

Heritage Buildings

The Maison Coignet becomes a restaurant and fresh produce market, and the warehouses become part of the school.



The School

Ground Floor Plan

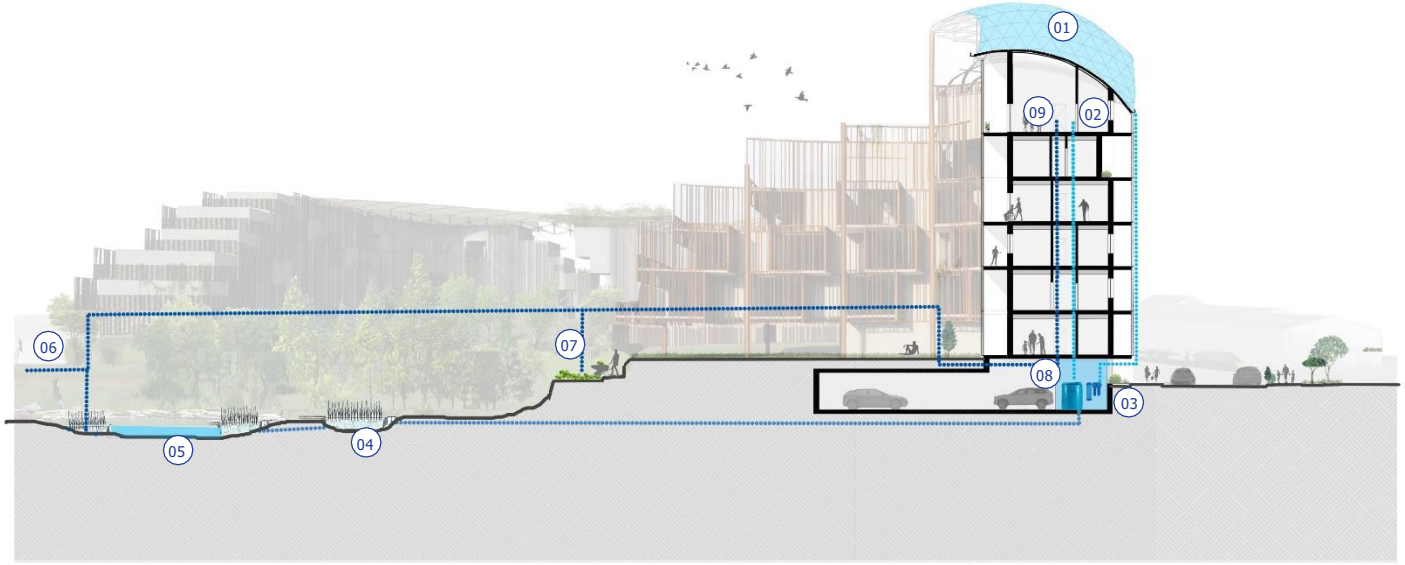
First Floor Plan

Second Floor Plan

The school is mainly situated in the renovated warehouses, with an additional wing housing the majority of the kindergarten functions. The leisure centre is placed on the boundary and activates the street.

Sustainable Strategy: Water

01 Rainwater catchment on roof
02 Greywater collection
03 Charcoal filtration and UV filtration
04 Reed bed filtration + sud system
05 Natural pools for swimming
06 Excess recycled water goes to the Seine
07 Recycled water irrigates permaculture
08 Recycled water pumped through plant room
09 Recycled water used for irrigation and toilet flushing



Sustainable Strategy: Energy Supply

Custom solar geyser tubes mounted on roof

Custom solar panels mounted on roof

Hot water radiant floor system

Geothermal well connects to boilers in the plant room

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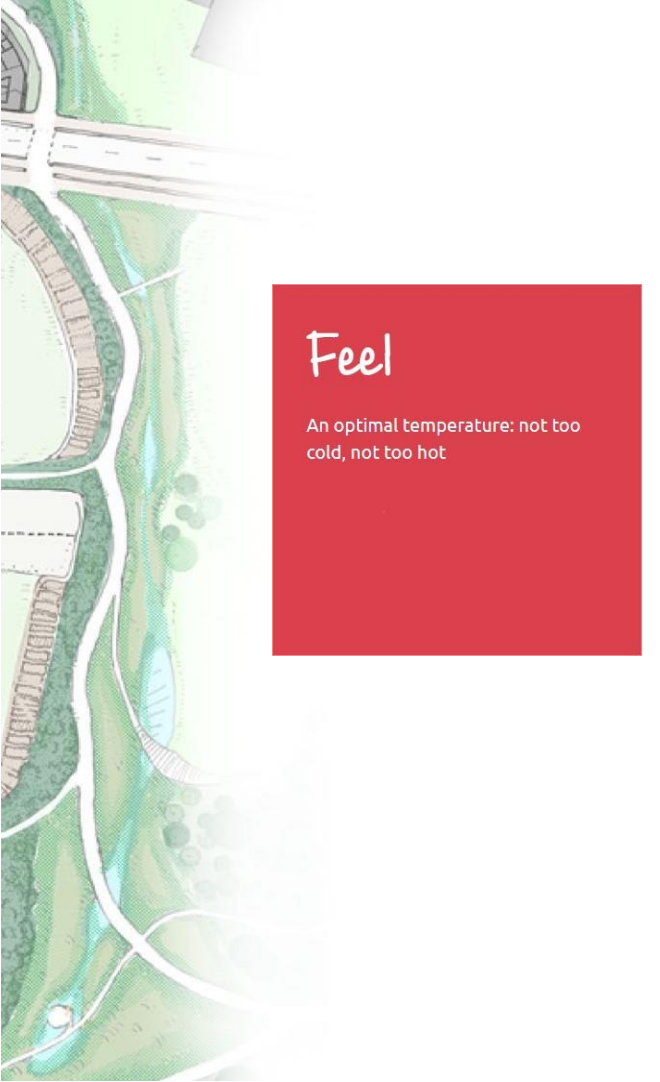

Feel

An optimal temperature: not too cold, not too hot

See

Maximising daylight to aid productivity and alertness

Hear

Active acoustic protection for well-balanced sound

Breathe

Indoor air is always kept fresh and clean

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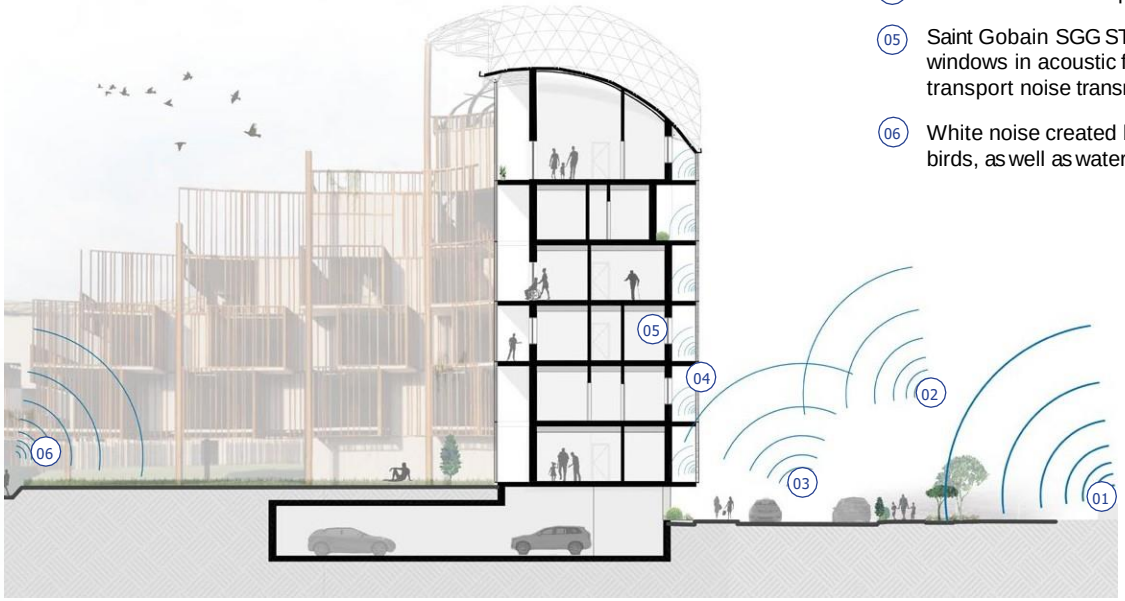
Acoustic Comfort



01 Noise from railway can reach high levels due to thousands of trains passing every day.

02 Planted barriers act as first level of noise diffusion.

03 Noise of cars on residential road.

04 Timber screens dampen sound.

05 Saint Gobain SGG STADIP SILENCE® double glazing windows in acoustic facade as per engineer's spec to reduce transport noise transmission.

06 White noise created by biodiversity in park such as frogs and birds, as well as water noises, combats industrial noise.

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Thermal Comfort

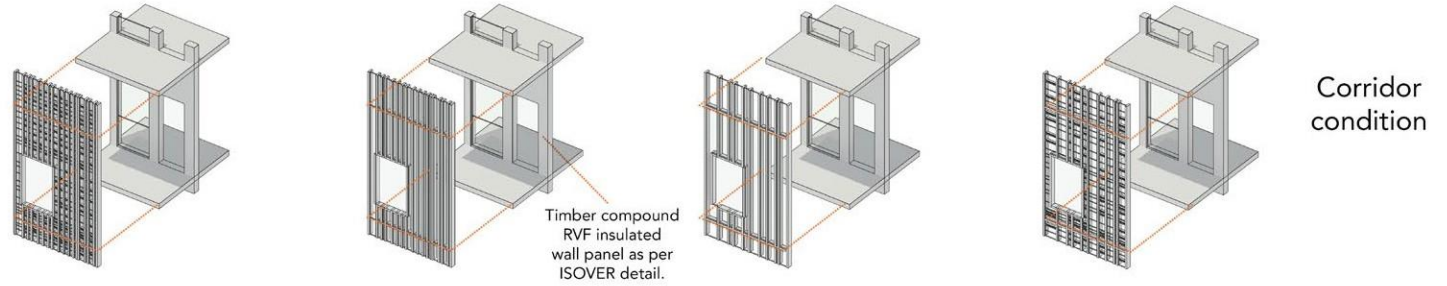
Comfort ventilation used for cooling during summer.

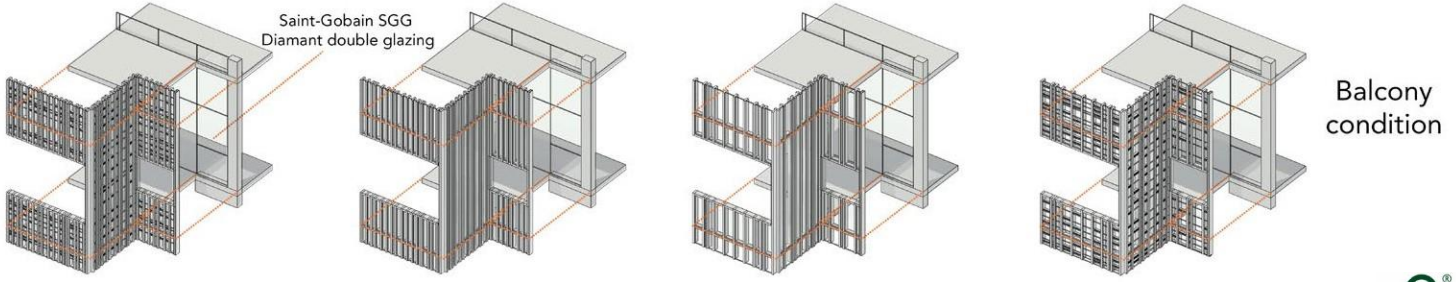
Geothermal well supplies heat to hot water radiant floor used to heat in winter.

Balconies and communal walkways provide shading to the flats, allowing winter sun in but preventing summer sun from entering.

The timber screens are custom designed for the required shading on each facade.

Thermal Comfort





South Façade
Vertical and horizontal shading
for visual comfort

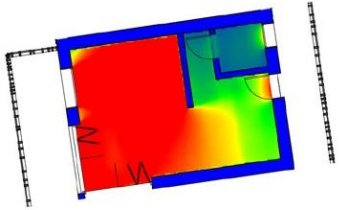
West Façade
Vertical shading
for visual comfort

North Façade
Widely spaced vertical shading
for visual comfort

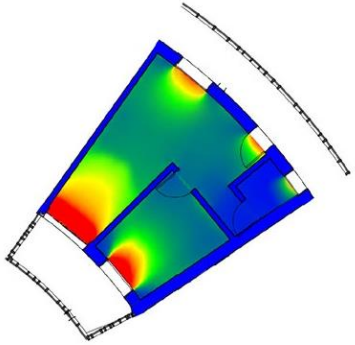
East Façade
Horizontal shading
for visual comfort

FSC

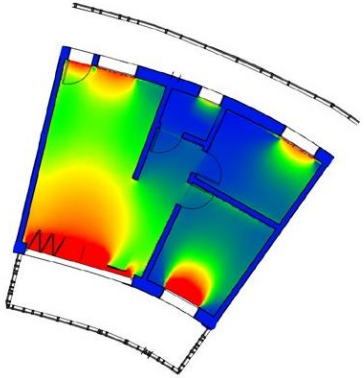
Thermal and Visual Comfort



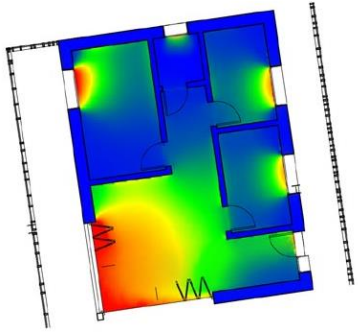
Studio



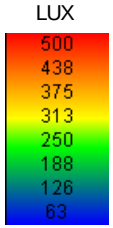
1 Bedroom



2 Bedroom



3 Bedroom



VELUX mapping of the natural light in each type of flat.

Multi Comfort BY SAINT-GOBAIN

VELUX®

Visual Comfort

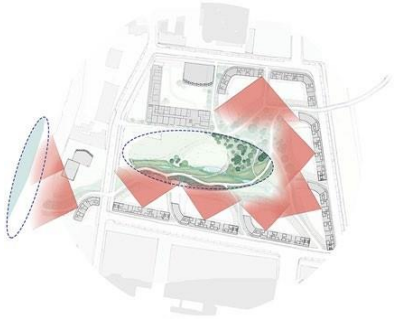
Light filtration to prevent glare:

01 Custom timber screens target the kind of shading required.

02 Planting on balconies.

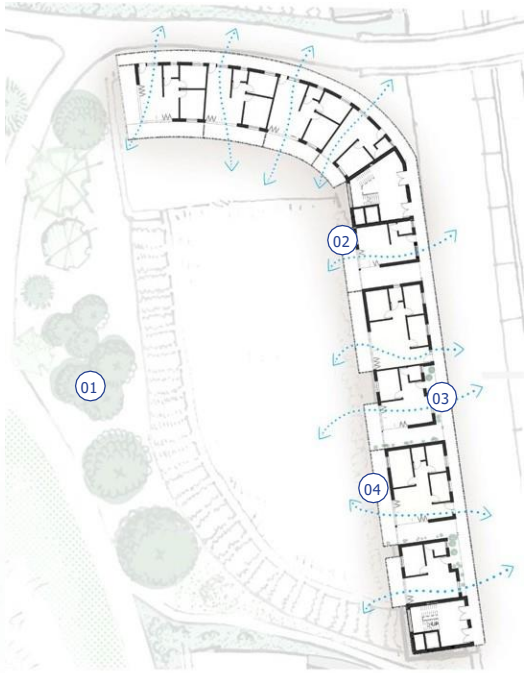
03 Soft reflective floor treatment.

04 Each flat designed to maximise natural light and views of park.



Views of Park and Seine

Air Quality

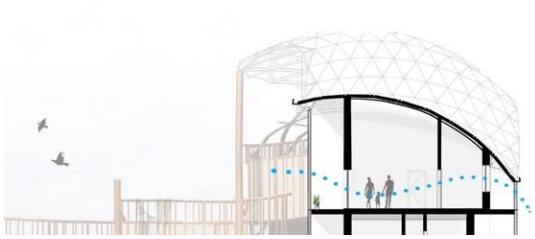


01 Fresh and naturally cleaned air from trees in park and cooled by evaporative cooling over wetlands.

02 Windows are fitted with trickle vents to allow a good quality of indoor air year round.

03 Windows on railway side are fitted with small opening sections to allow cross ventilation but reduce noise.

04 Windows on park side have larger opening sections to allow maximum ventilation.



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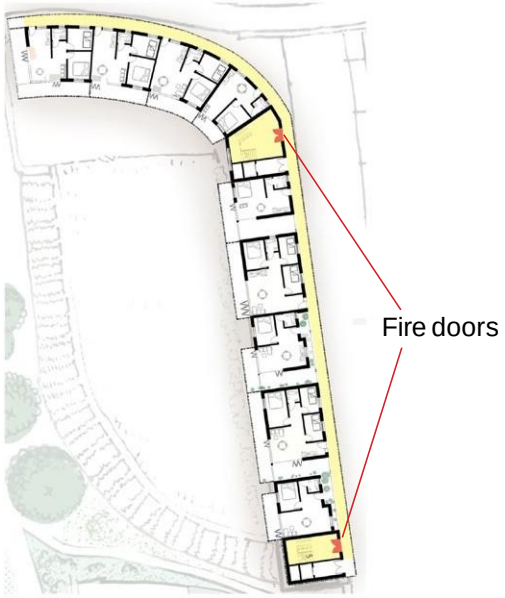
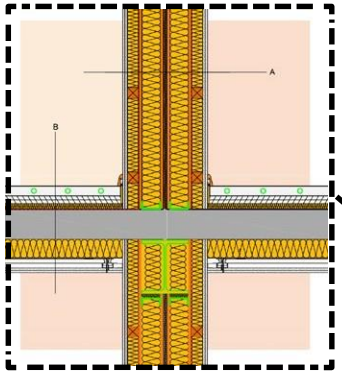
Fire Safety

Fire evacuation routes are highlighted in yellow, designed to satisfy French standards.

Facade is made from non-combustible materials, specified in the details that follow.



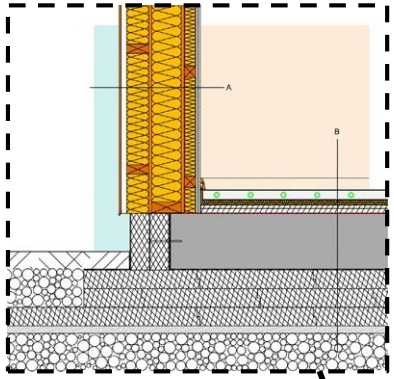
Technical details



Partition Wall Detail

Build-up A in cm

2,5	Rigips Rigidur H double layer, each layer 12.5 mm
6,0	ISOVER Integra UKF 1-032 (wood 6/6 e=40cm, 13% wp)
	ISOVER VARIO KM Duplex UV
1,5	OSB board
10,0	ISOVER Integra ZKF 1-032 (wood 6/10 e=62.5cm, 9% wp)
1,5	OSB board
2,0	ISOVER Akustik HWP2 smartpack (035)
1,5	OSB board
10,0	ISOVER Integra ZKF 1-032 (wood 6/10 e=62.5cm, 9% wp)
1,5	OSB board or chipboard
	ISOVER VARIO KM Duplex UV
6,0	ISOVER Integra UKF 1-032 (wood 6/6 e=40cm, 13% wp)
2,5	Rigips Rigidur H double layer, each layer 12.5 mm



Ground Floor Detail

Build-up B in cm

	Floor covering
5,0	Screed with embedded PEX pipes for hydronic floor
	Vapour retarder and separating layer
3,0	ISOVER Akustic EP 3 040
4,0	ISOVER Exporit EPS 100/035 as compensation for height
0,5	Sealing against moisture
30,0	Concrete foundation slab
	Separating layer
10,0	Styrodur CS
10,0	Styrodur CS
10,0	Styrodur CS
	Granular subbase

FSC

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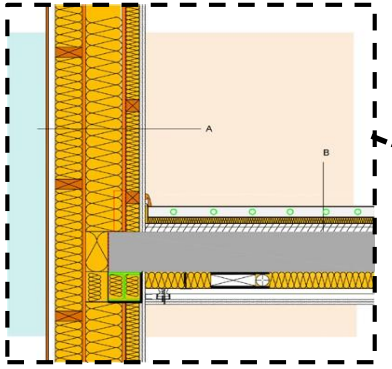
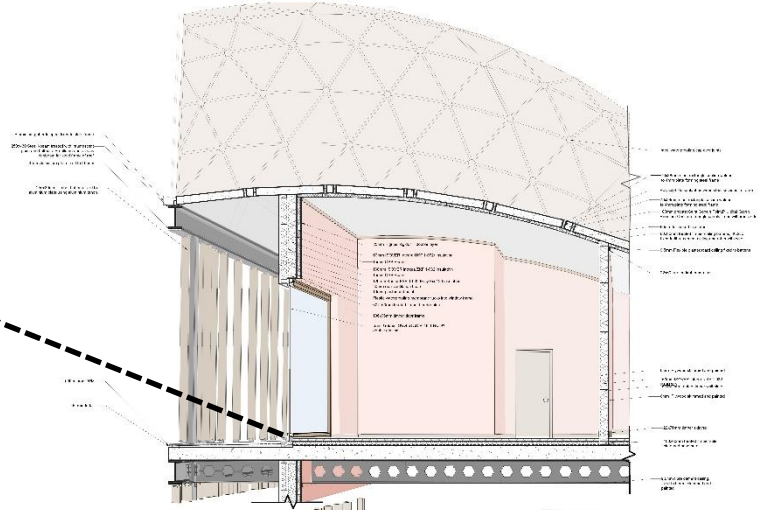
ISOVER SAINT-GOBAIN

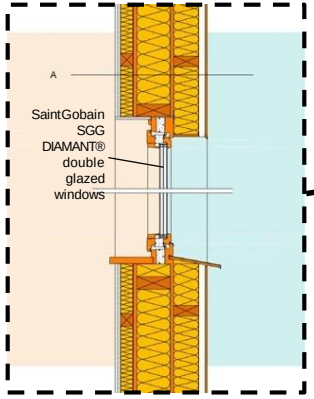


Build-up B in cm

Floor covering
5.0 Screed with embedded PEX piping for hydronic radiant floor
3.0 ISOVER Akustic EP 3 040
4.0 ISOVER Expert EPS 100/035 as compensation for height of tube
20 Reinforced concrete slab
8.0 Installation level with ISOVER Akustik TP 1 (glass wool, WLG 040)
2.7 Rigips Ceiling profile CD 60/27 as basic profile
2.7 Rigips Ceiling profile CD 60/27 as supporting profile
2.5 Rigips Rigidur H double layer, each layer 12.5 mm

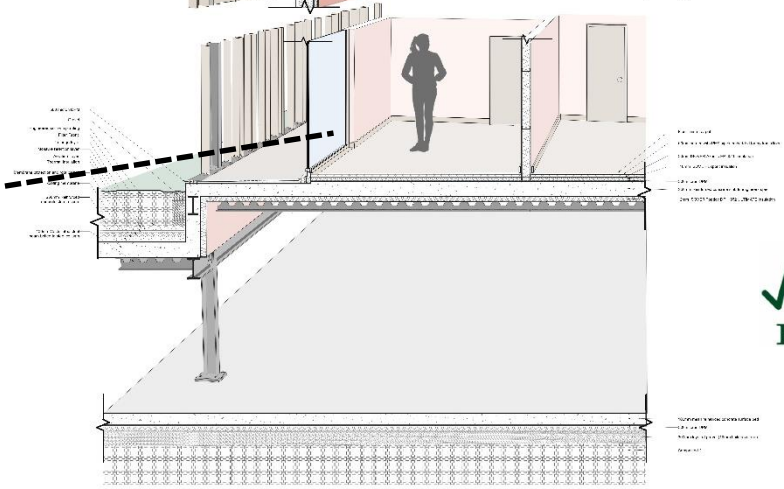
Intermediary Floor Detail





2,5 Rigips Rigidur H double layer, each layer 12.5mm
6,0 ISOVER Integra UKF 1-032 (wood 6/6 e=40cm, 13% wp)
ISOVER VARIO KM Duplex UV
1,5 OSB board
16,0 ISOVER Integra ZKF 1-032 (wood 6/16 e=62.5cm, 14%wp)
1,5 OSB board
12,0 Kontur FSP 1-032 Easy Fix 120 (wood 6/12 e=60cm, 12%wp)
3,0 Rear ventilation
1,0 Exterior Plaster

External Wall and Window Detail



FSC

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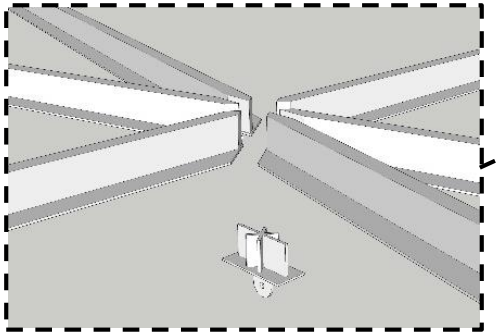
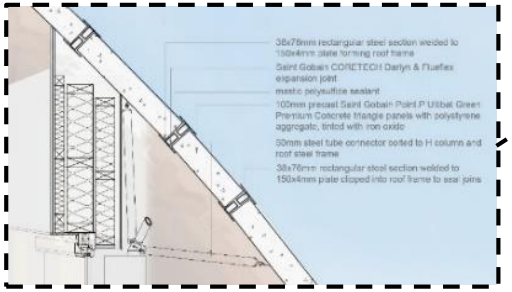
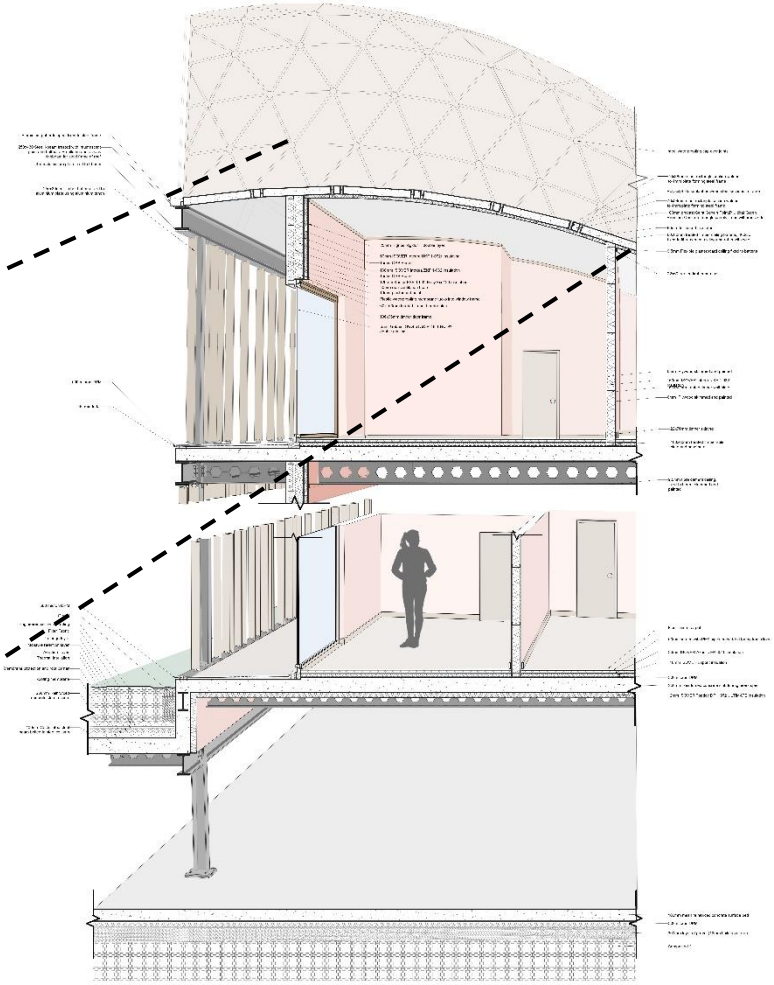






Calculations

A: Project Data	
Object	Eastern Building
Climate Zone	Paris
Construction	New building
Building Type	Residential
Usage	For living
Design Temp	20°

B: Area Input	
Sum of living area	595m²
Sum of heated space volume	1785m³
A/V ratio	0.33
Sum of thermal envelope	1689,80m²

C: Opaque Elements (mean U-values)	
Roof	n/a
Wall against air	0.11
Slab against unheated cellar	0.1

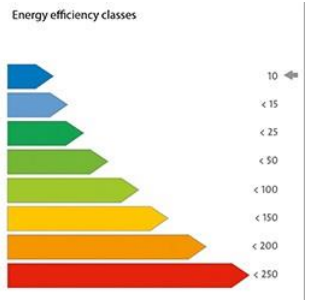
D: Windows/Doors (mean U-values)	
Windows	0.73
Doors	0,8

E: Quality	
Airtightness:	0,60
Thermal bridge free	Yes

F: Shading	
80°	0,62
195°	0,77
260°	0,49
15°	0,39
Horizontal	1,00

H: Summer ventilation strategy	
Summer air exchange area	0,20
With heat recovery system	Yes
Night ventilation	Fully open wind + (33% 2h)
Day ventilation	Fully open wind + (33% 2h)

Calculations	
Specific annual heat demand	9,64 kWh/(m²a)
Specific annual cooling demand	13,36 kWh/(m²a)
Frequency of overheating	25.48%



Multi Comfort
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“We need to rediscover how to be sustainable. To move from being apart from nature to becoming a part of nature once again.”

- Sir David Attenborough