ARCHITECTURE STUDENT CONTEST

20th INTERNATIONAL EDITION, NORD ISÈRE 2025

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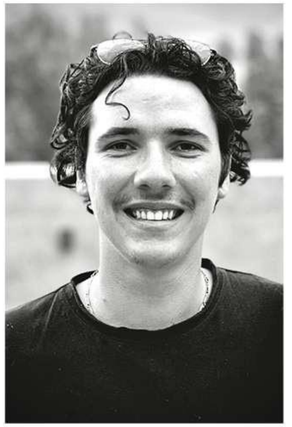

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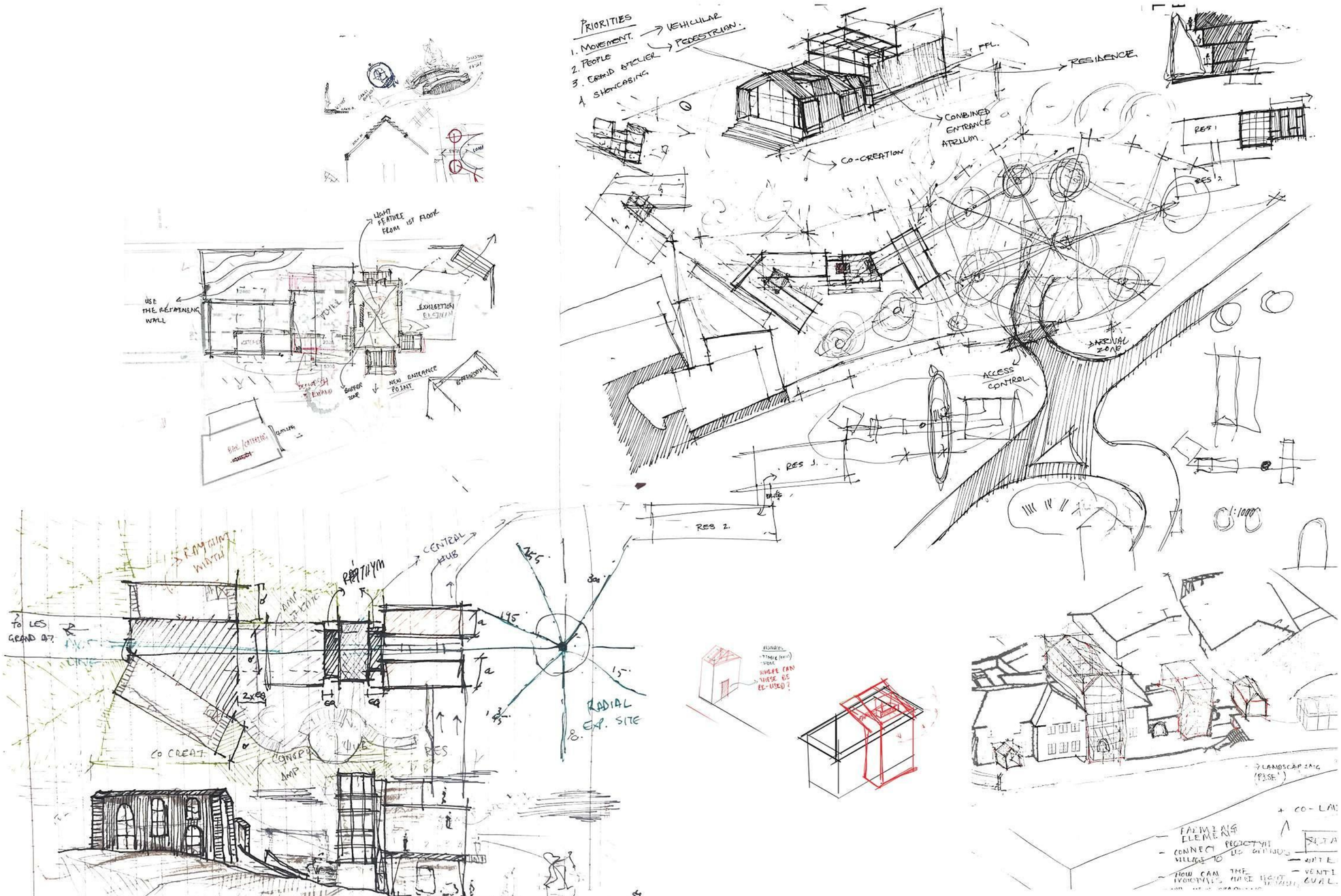
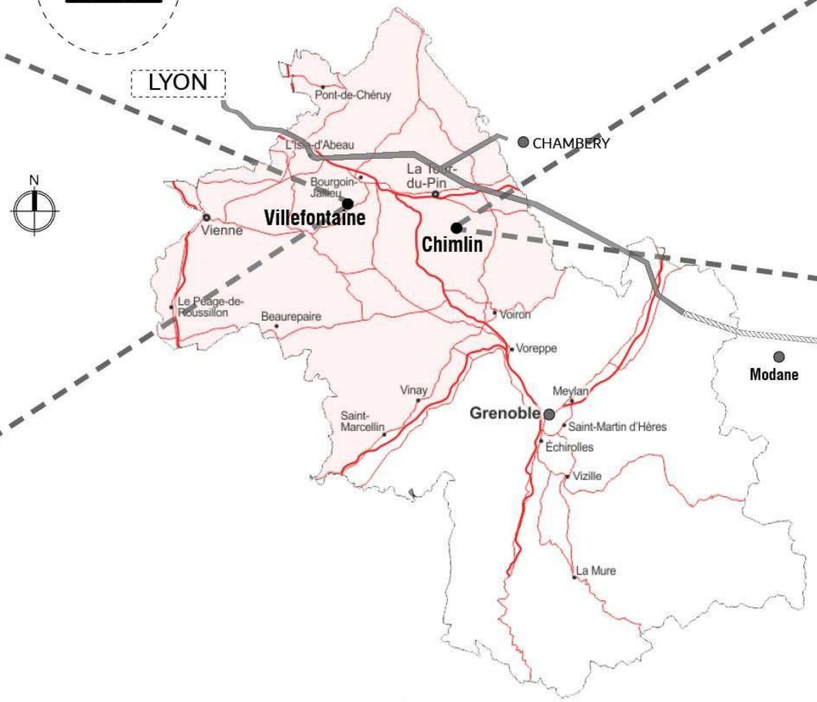


Re: Light_

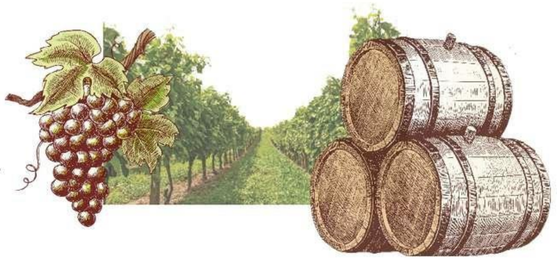
Re:Light draws from the Nord-Isère region's cultural and agricultural roots, weaving light, timber, and tradition into a vibrant community hub. The project reinterprets sustainable materials and open forms with rural heritage, inviting interaction through a luminous festival space and layered public program. It's a living expression of innovation through history.

Nord-Isère, France

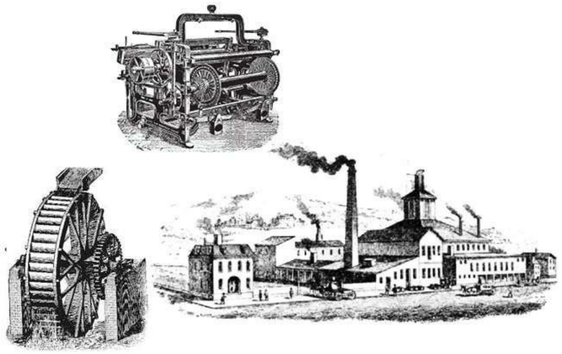
North Isère is an area located in the northern part of the Isère department in southeastern France. The area has experienced a dynamic evolution influenced by industrialisation, economic opportunities and ever-changing demographics .



-In context to Zone A, the surrounding context of the village still maintains a strong essence of medieval French architecture. This is seen in the various forms of arched windows and dramatic pointed roofs and clock towers often found in churches.



a common thread between the 2 was the value of cultural heritage and a rich history in the agricultural industry.



Significant industrialization occurred in the 19th century, especially in the fields of hydroelectric power and textiles. This change in the economy had an impact on the architecture of the area, bringing in both traditional and industrial buildings.

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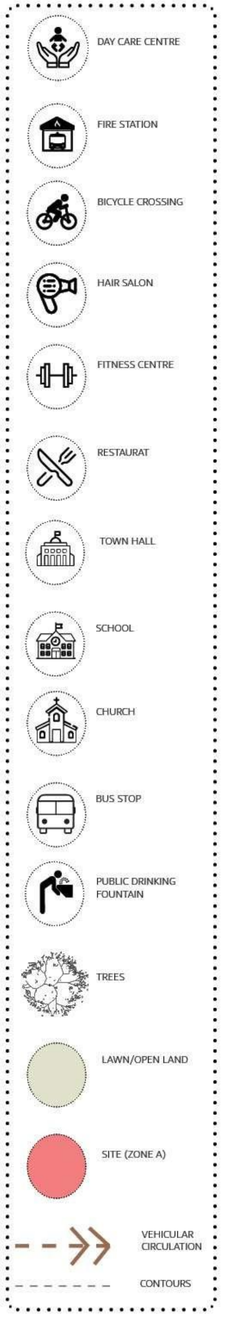
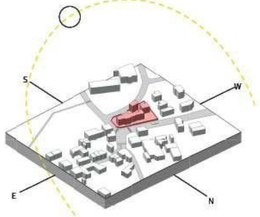
ZONE A: ANALYSIS

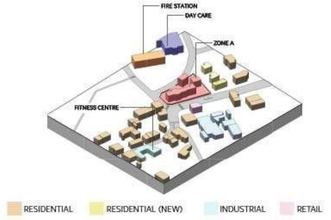


Orientation



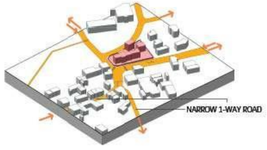
The site is orientated to the South-facing sun of the Northern Hemisphere, suggesting the need for common/ living spaces to also be oriented South in order to retain as much natural light as possible.

Building Types



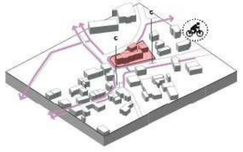
The surrounding area consists predominantly of residential buildings with the addition on retail, industrial and community infustructure.

Vehicle Circulation



Many of the roads are quite narrow and only allow for one-way access of vehicles...making the area more ideal for public transport

Pedestrian + Bicycle Circulation



The area is not quite as pedestrian friednly as one would hope due to the very small/limited sidewalk's

Vegetation

The surrounding area is partially populated with trees and bushes. Many residents opt to have outdoor gardens in their yards and balconies.

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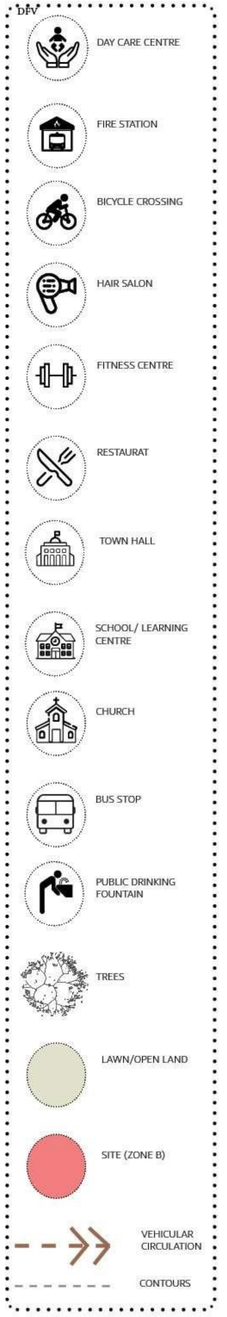
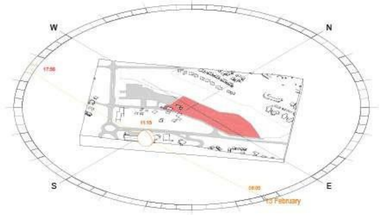
ZONE B: ANALYSIS

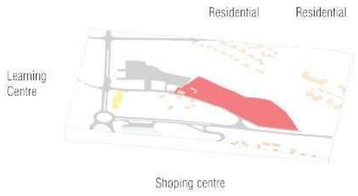


Orientation



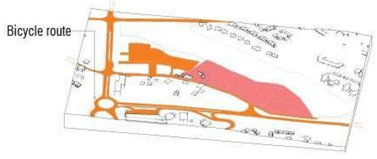
The site is orientated to the East-facing sun of the Northern Hemisphere, suggesting the need for common/living spaces to also be oriented South in order to retain as much natural light as possible.

Building Types



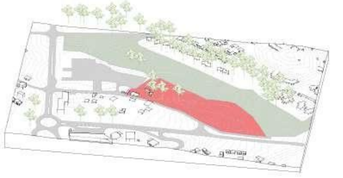
The surrounding area consists residential buildings, Shopping centre and leaning centres with the addition on retail, industrial and community infustructure.

Vehicle Circulation



Many of the roads are wide, allowing for two-way access of vehicles. Making the area more ideal for public transport and bicycle transport

Vegetation



The area is surrounded by a narural forest to the north and vegetation in the surrounding area.

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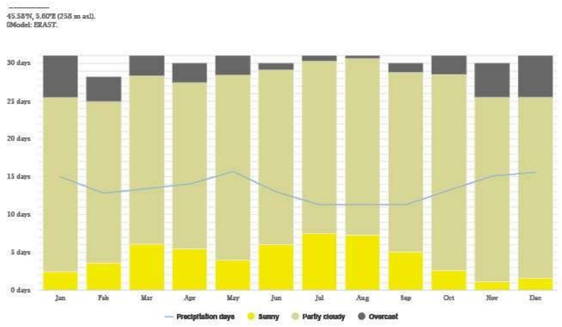
Climate Analysis

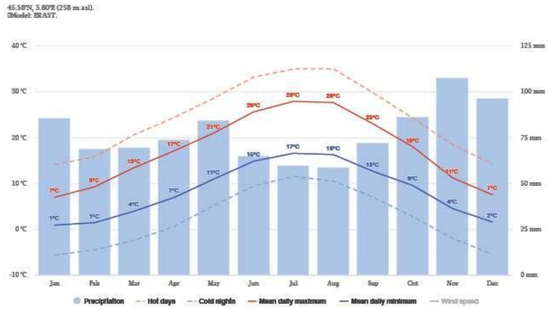
ZONE A:

Cloudy, Sunny, And Precipitation Days



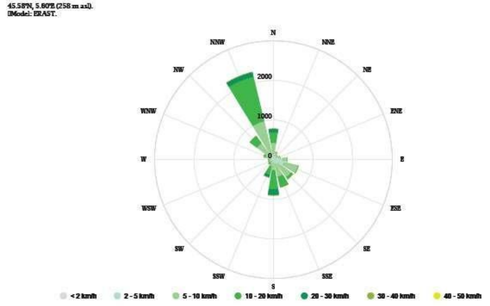
The graph shows the monthly number of sunny, partly cloudy, overcast and precipitation days. Days with less than 20% cloud cover are considered as sunny, with 20-80% cloud cover as partly cloudy and with more than 80% as overcast.

Average Temperatures And Precipitation



The "mean daily maximum" (solid red line) shows the maximum temperature of an average day for every month for Chimilin. Likewise, "mean daily minimum" (solid blue line) shows the average minimum temperature. Hot days and cold nights (dashed red and blue lines) show the average of the hottest day and coldest night of each month of the last 30 years.

WIND ROSE



The wind rose for Chimilin shows how many hours per year the wind blows from the indicated direction. Example SW: Wind is blowing from South-West (SW) to North-East (NE).

-Oceanic climate with continental influences.

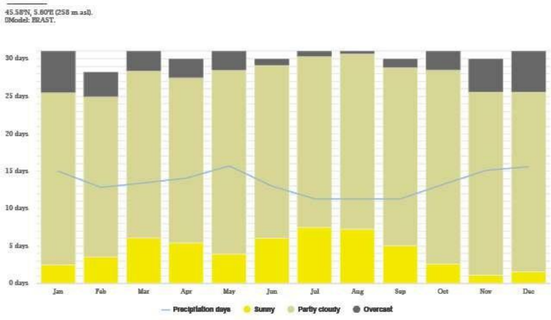
-Summers are generally warm and sometimes humid, with average temperatures between 20°C and 28°C.

-Winters are cold, often dropping below freezing, with occasional snowfall.

-Rainfall is moderate and fairly evenly distributed throughout the year, but there can be more precipitation in autumn and spring.

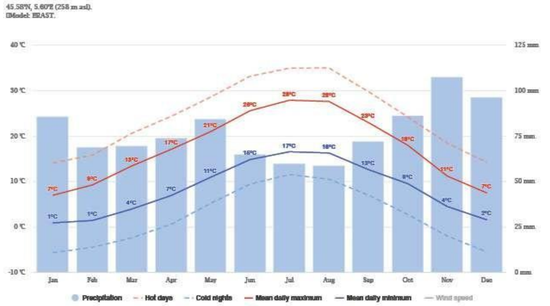
ZONE B:

Cloudy, Sunny, And Precipitation Days



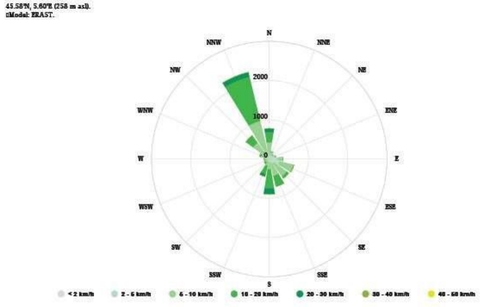
The graph shows the monthly number of sunny, partly cloudy, overcast and precipitation days. Days with less than 20% cloud cover are considered as sunny, with 20-80% cloud cover as partly cloudy and with more than 80% as overcast.

Average Temperatures And Precipitation



The "mean daily maximum" (solid red line) shows the maximum temperature of an average day for every month for Villefontaine. Likewise, "mean daily minimum" (solid blue line) shows the average minimum temperature. Hot days and cold nights (dashed red and blue lines) show the average of the hottest day and coldest night of each month of the last 30 years.

WIND ROSE



The wind rose for Villefontaine shows how many hours per year the wind blows from the indicated direction. Example SW: Wind is blowing from South-West (SW) to North-East (NE).

-Temperate oceanic climate, similar to Chimilin but slightly more influenced by the urban environment of nearby cities.

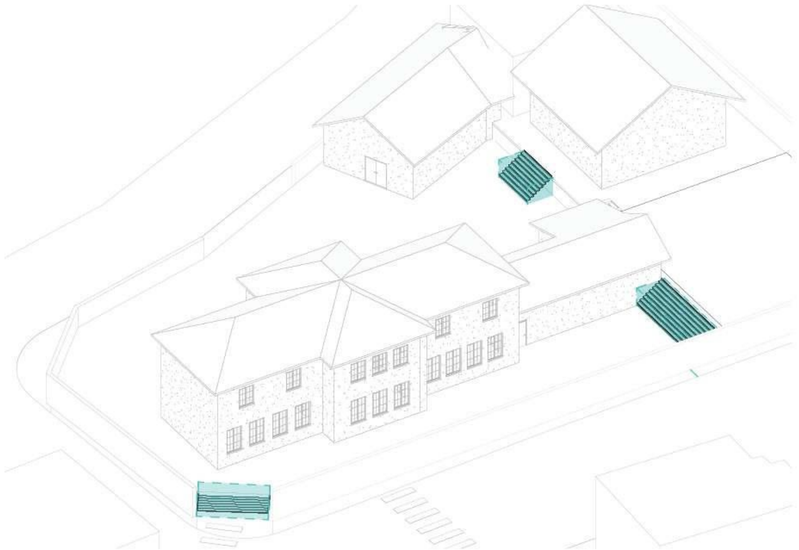
-Summers are warm, with temperatures usually between 22°C and 30°C.

-Winters are cool to cold, with temperatures often between 0°C and 5°C, and occasional light snow.

-Rainfall is moderate, with no true dry season, but thunderstorms can occur in late spring and summer.

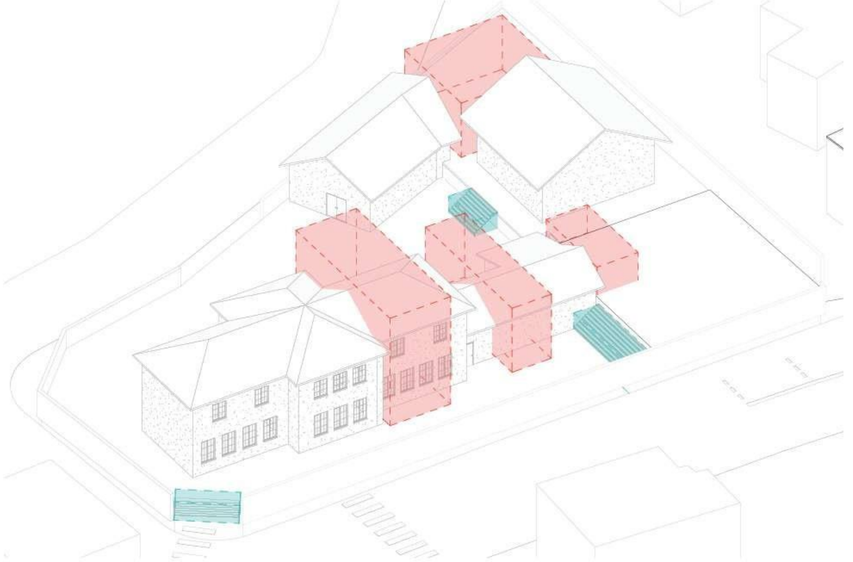
Site A: Concept Development

Acccess



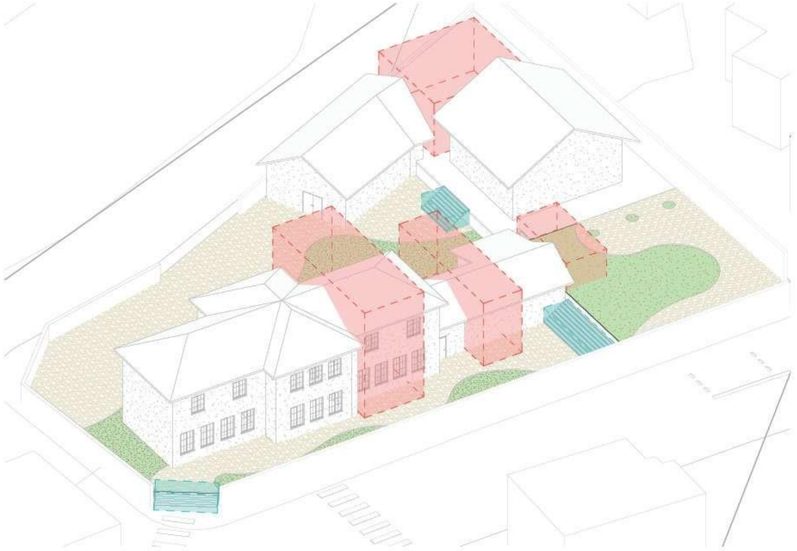
The addition of new staircases both within and on the edege of the site, allow for more public access and circulation

Volumetric Additions



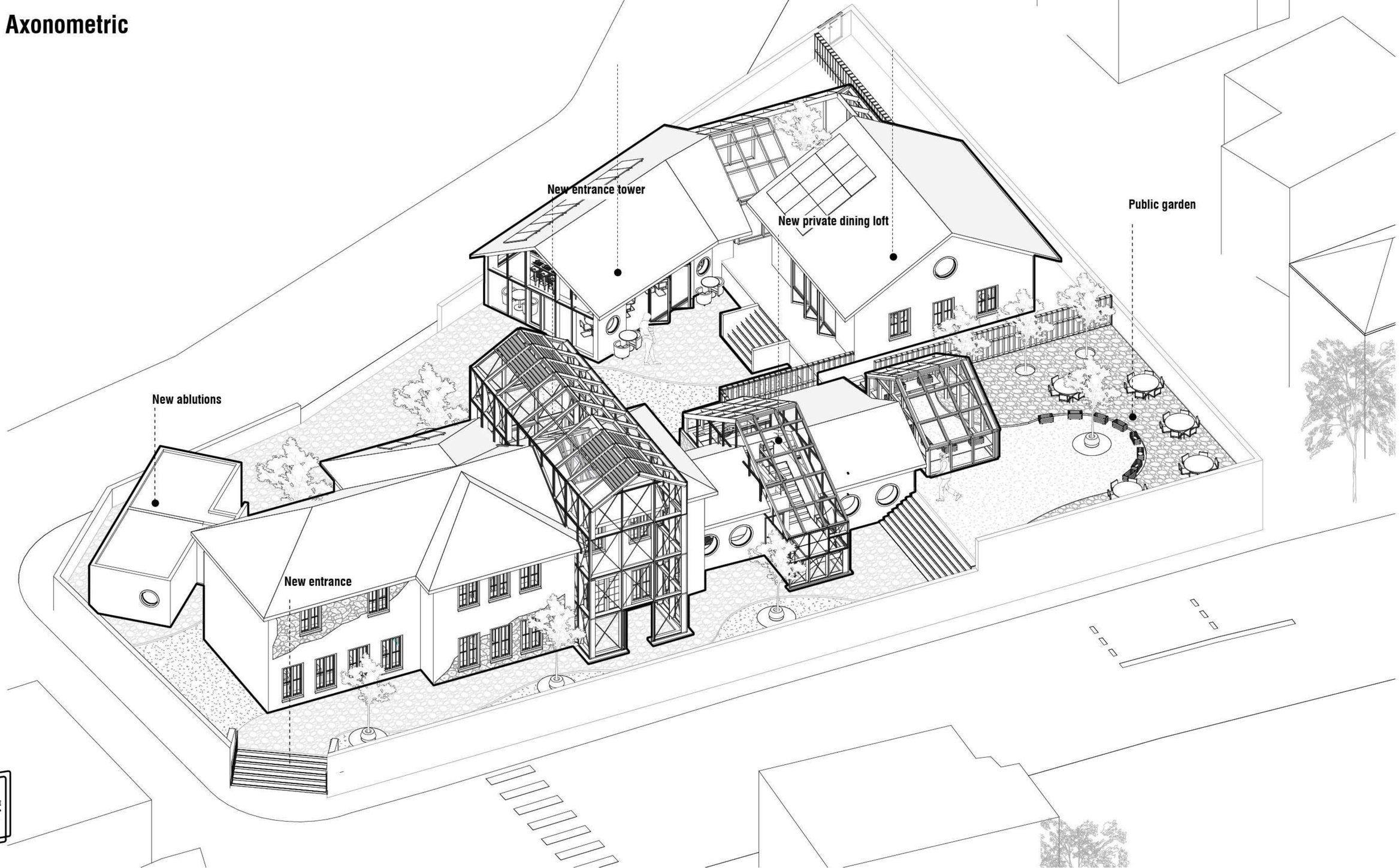
New volumetric additions allows building to act as a beacon for students, locals and tourists

Landscaping



The addition of landscaping and plantlife contributes to aesthetic and social benefits whilst also improving the air quality of the site.

Site A: Axonometric



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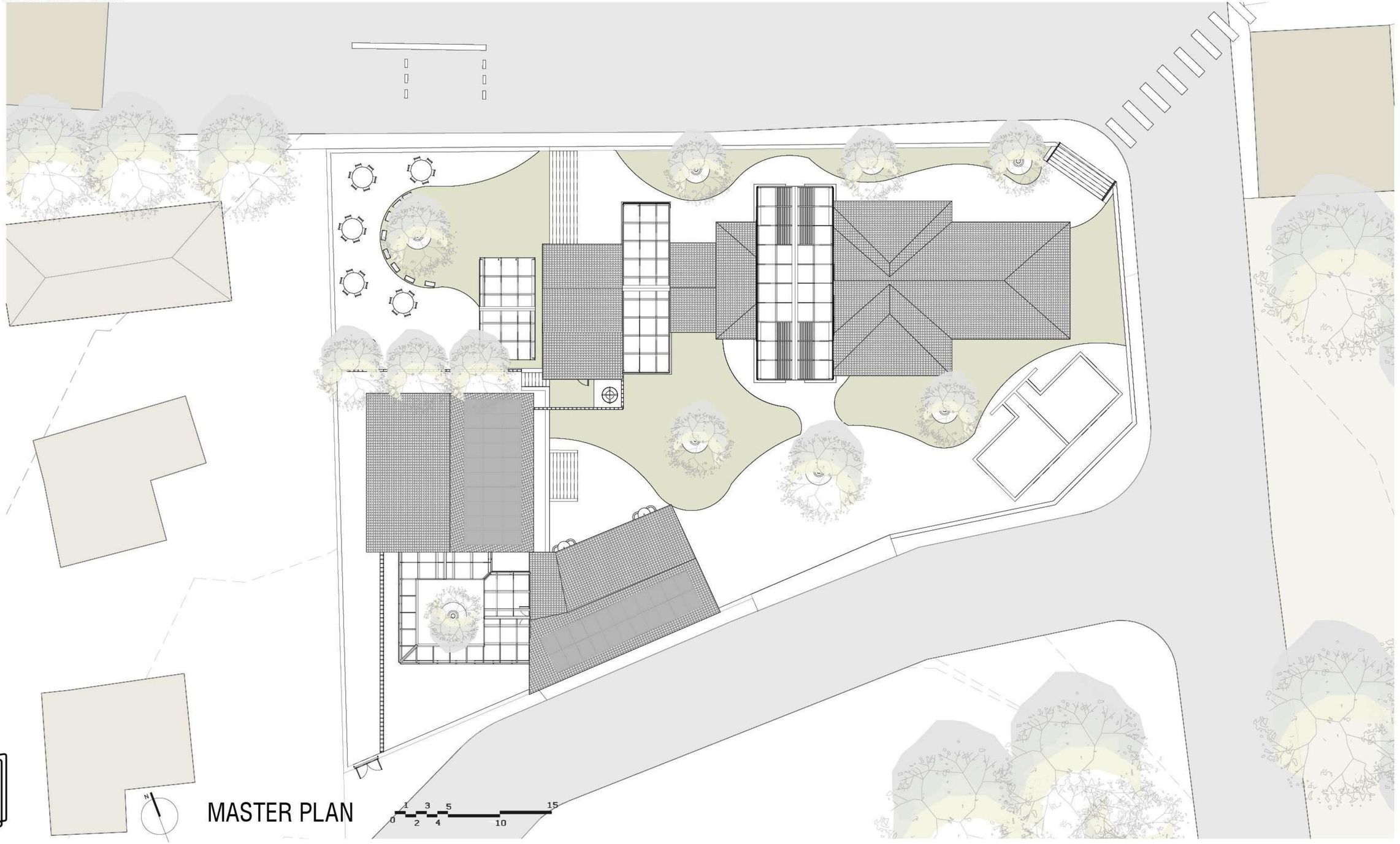
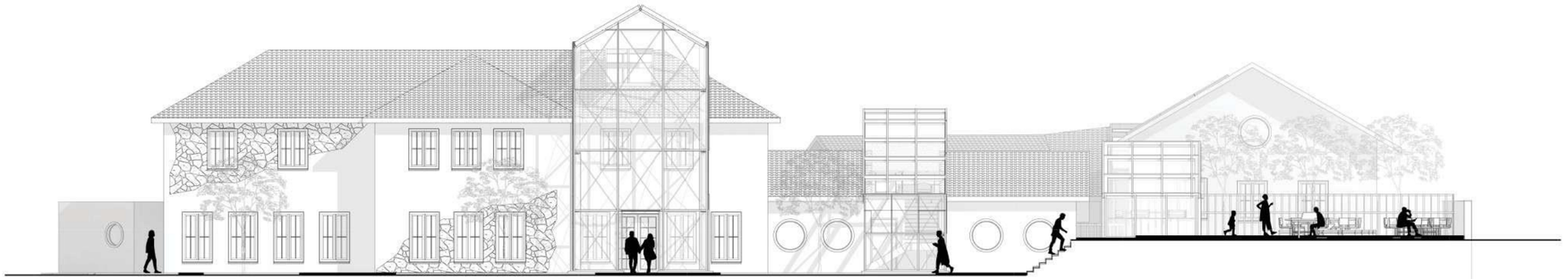
Site A: Master Plan



MASTER PLAN

ARCHITECTURE STUDENT CONTEST

Site A: Elevations and Section



NORTH ELEVATION

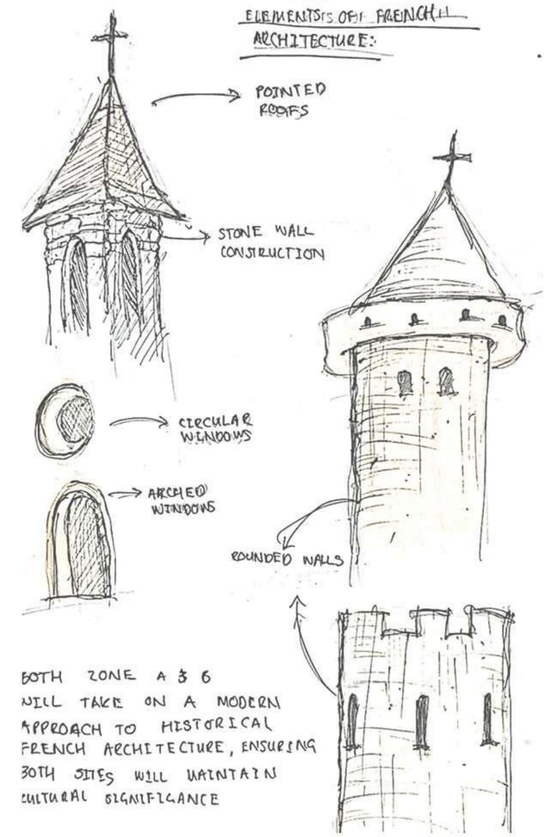
SOUTH ELEVATION

NEW SKYLIGHT AND ATRIUM

A portion of the existing floor and atti has been removed to allow for an atrium space creates a warm reception due to natural lighting from the new skylight.

PUBLIC GARDEN

Design inspiration



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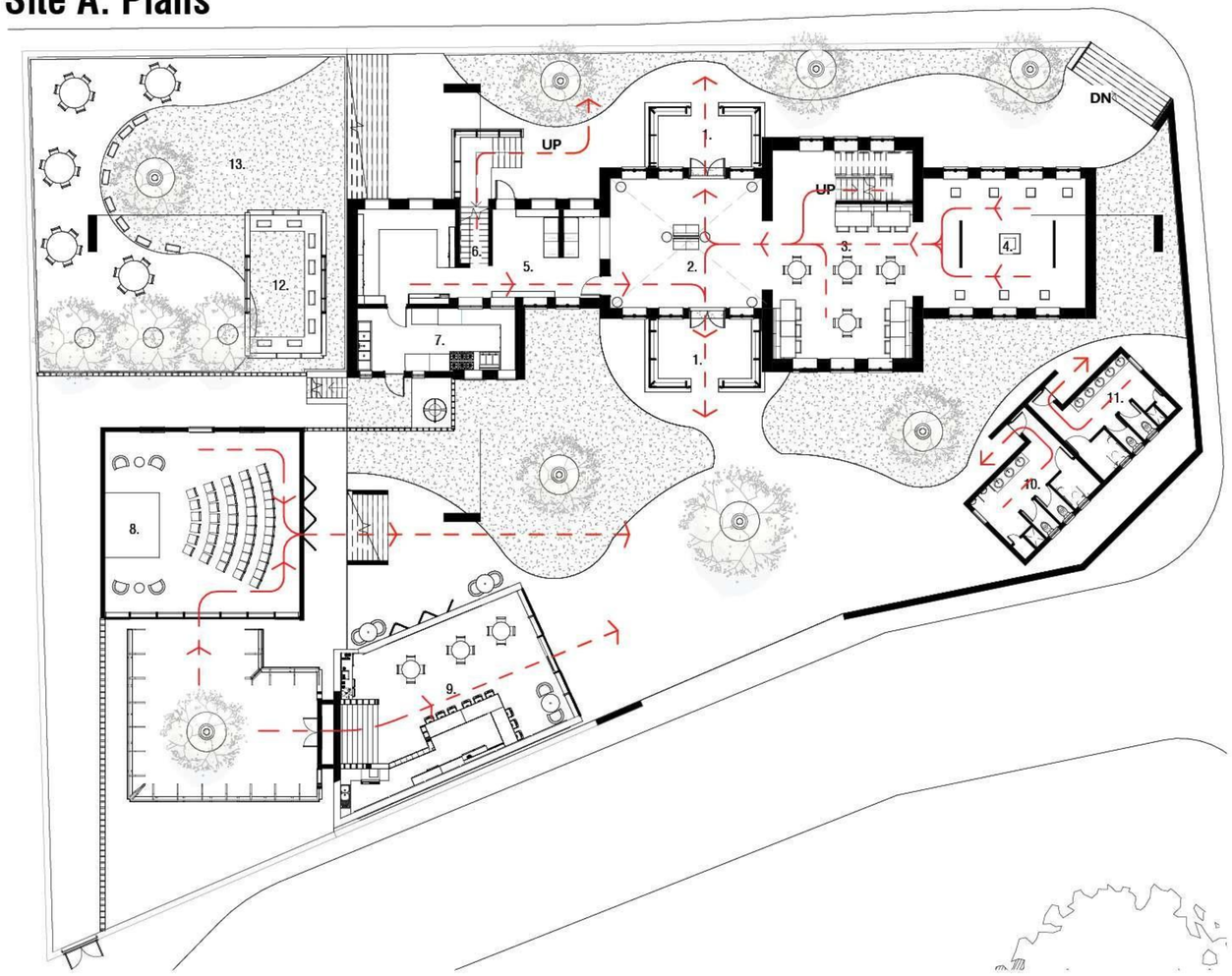
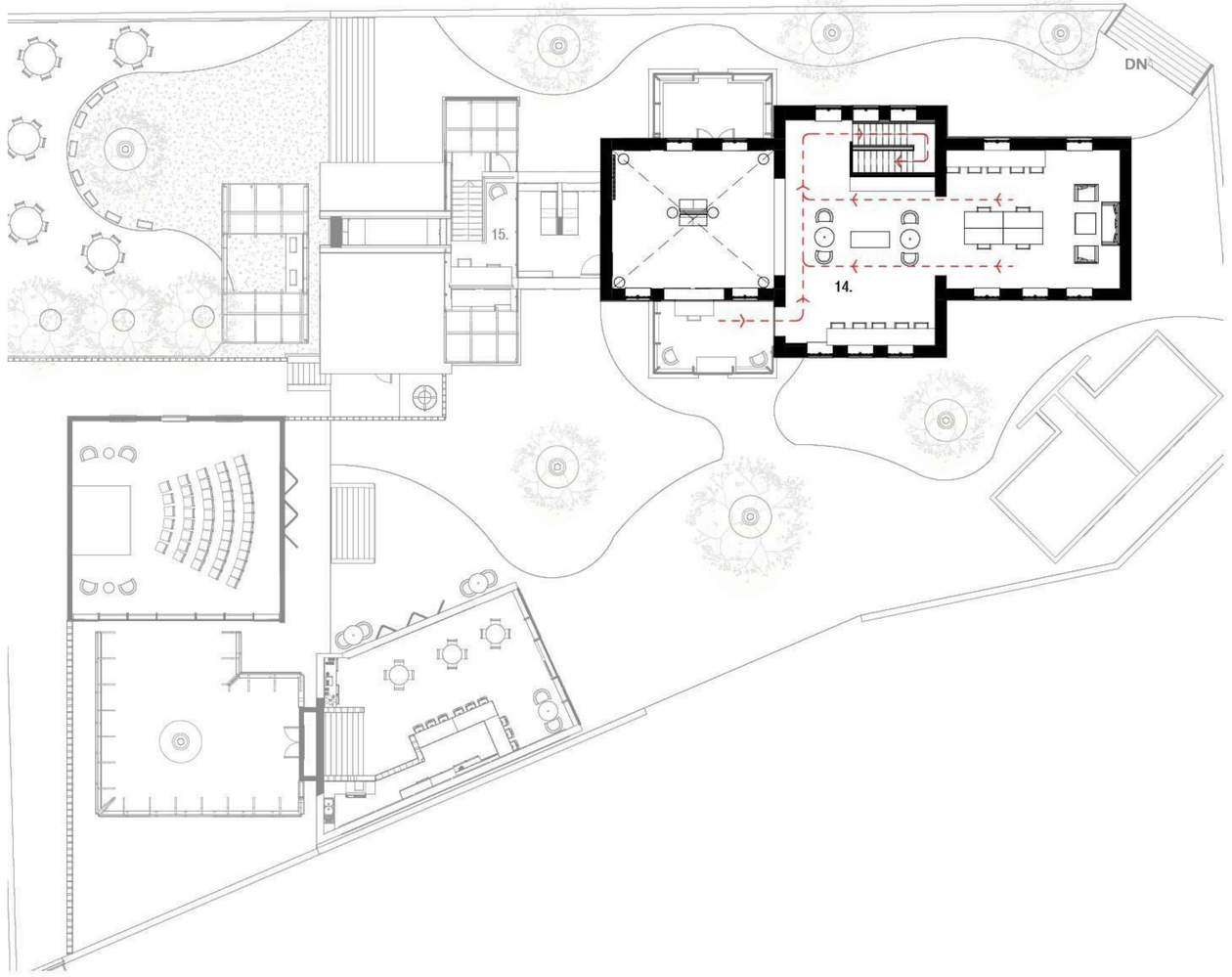
Site A: Plans



GROUND FLOOR

0 1 2 3 4 5 10 15



FIRST FLOOR

0 1 2 3 4 5 10 15

1.new entrance 2.foyer 3.cafe 4.exhibition area 5.bakery 6. pantry 7.kitchen 8.event area 9.bar

10.new ablutions (M) 11.new ablutions (F) 12.greenhouse 13. public garden 14.internet cafe 15. loft

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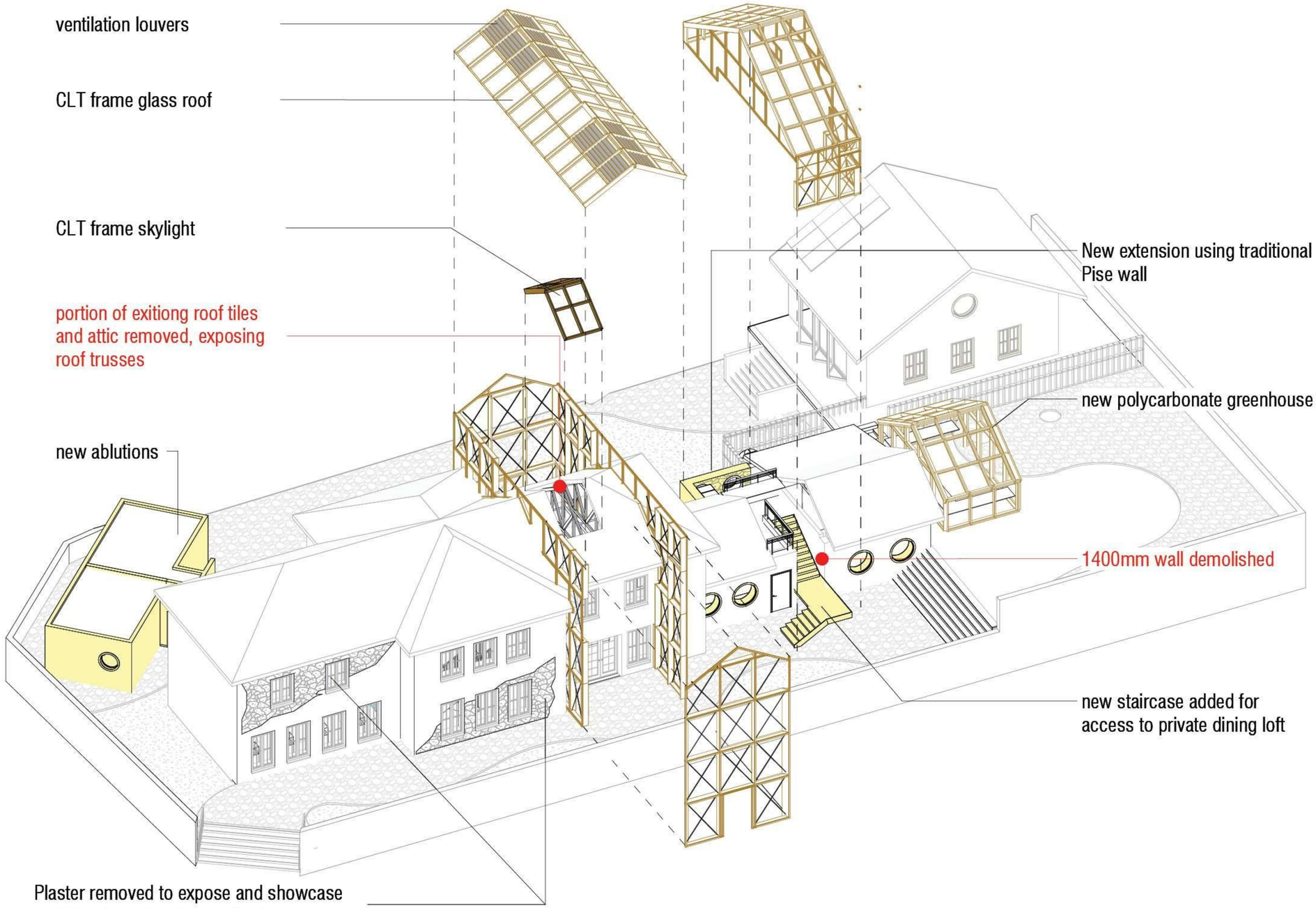
Site A: Exploded Axonometric



Site A: Sustainability_Loft Section

SAINT-GOBAIN GLASS

PLANITHERM® XN (II) glass panels

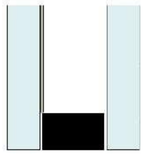
-Light transmittance (TL): 82%

-Solar factor (g): 65%

-External reflection (RLe): 11%

-Internal reflection (RLe): 12%

-Insulation (Ug): 1.1 W/mK



NORTH

SOUTH

Winter

IMPROVED THERMAL COMFORT

Low-E Coating reflects heat back into the space and prevents heat from escaping through your windows in winter

LOWER HEATING COSTS:

By minimizing heat loss, Low-E glass reduces the need for heating systems, leading to lower energy bills.

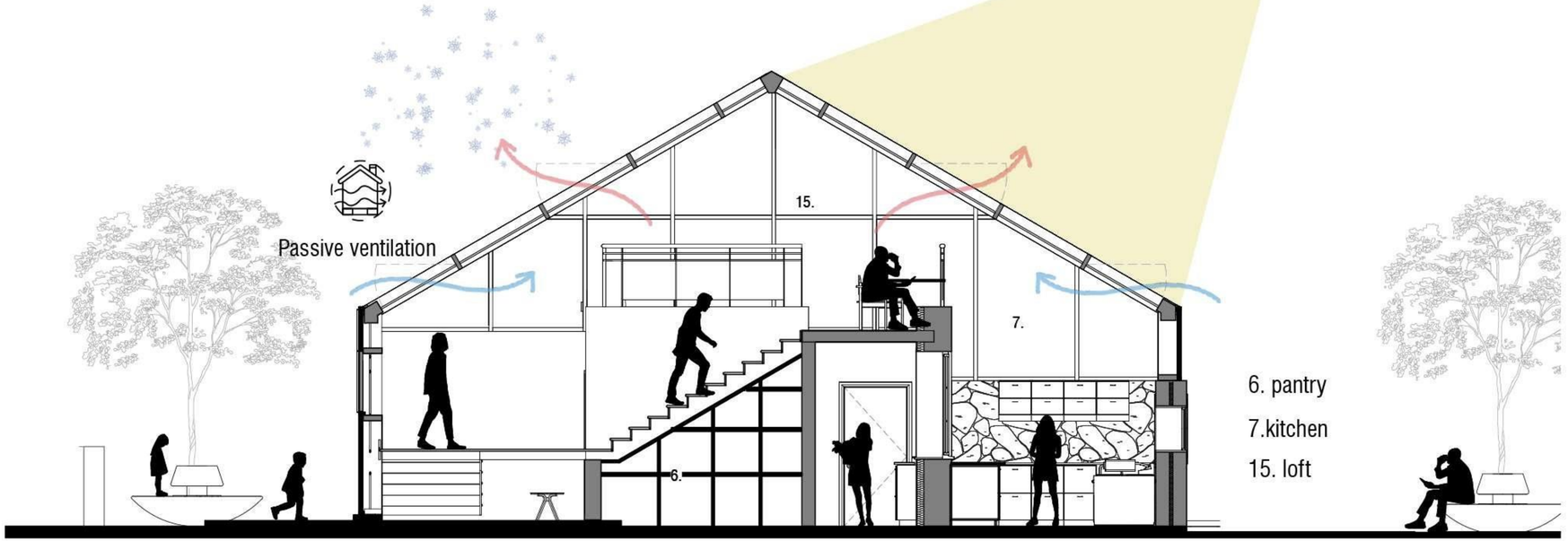
Summer

NATURAL LIGHT + VISUAL COMFORT

Panels provide a high level of natural light transmission, allowing ample natural light into the building, enhancing **visual comfort**

REDUCES HEAT GAIN

Low-E glass's coating reflects solar radiation, preventing it from entering the home and keeping it cooler.



6. pantry

7.kitchen

15. loft

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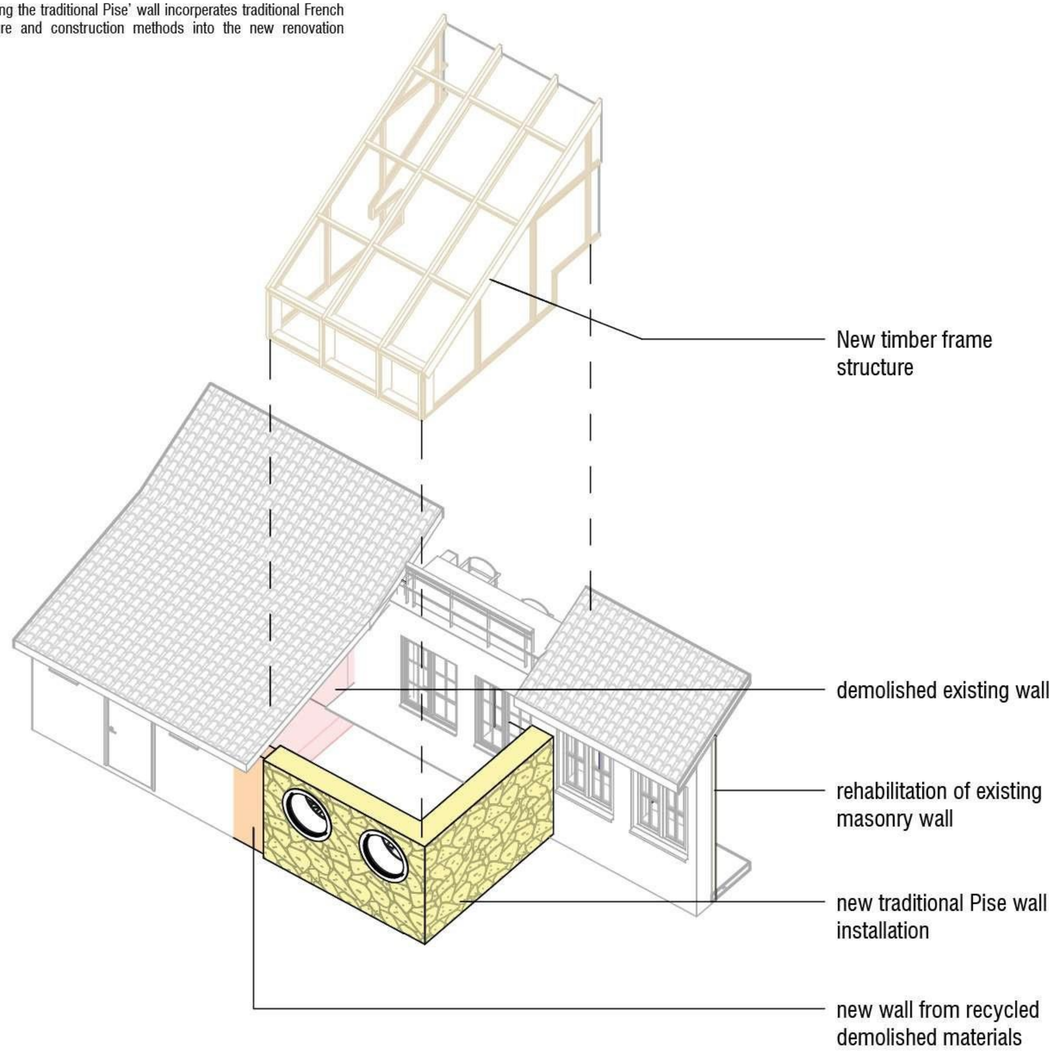
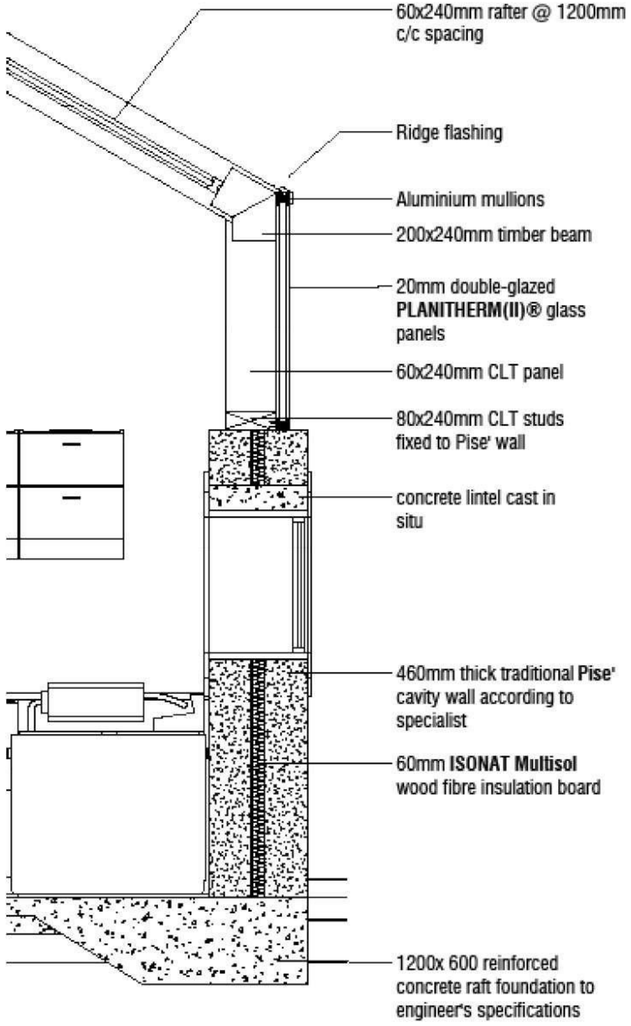
Site A: Pise Construction

Adding the traditional Pise' wall incorperates traditional French culture and construction methods into the new renovation





Thermal Conductivity: W/m.K

0,5 to 1,1

Water vapour diffusion resistance coefficient:

5 to 11

Thermal phase shift (h):

10 to 12 hours for a 50 cm wall

Fire resistance (class in accordance with NF EN 13501-1):

A2 (non-combustible)

Batiserf
Ingénierie structure tous matériaux

isover SAINT-GOBAIN

SAINT-GOBAIN GLASS

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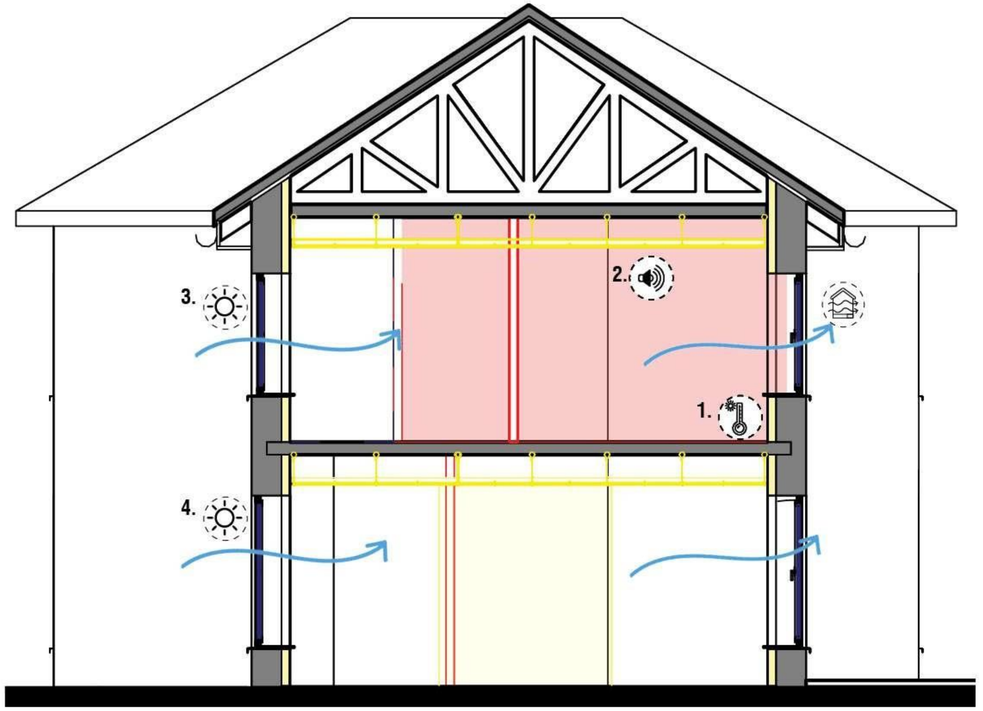
Site A: Sustainable interventions

demolished

new installation



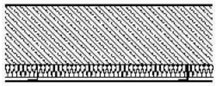
1. Treatment of existing walls: **"OPTIMA MURS"** SYSTEM WITH **GR30 GLASS WOOL INSULATION**

-High-performance thermal and acoustic insulation

-Complete, dry and clean system

-Acoustic performance: gain of 12 to 26 dB

-Thermal conductivity 0.03 W/mK



2. New suspended ceilings: **"TONGA THERM A 80"**

-Thermo-acoustic solution

-Thermal resistance: 2.20 m². K/W

-100% flat regardless of the humidity level

-IAQ: Class A+ (aw = 1 : class A / NRC = 1)

-Compatible with French thermal building regulations (RT 2012)

-Fire performance: A1

3. New glass panels **PLANITHERM® XN (II)**

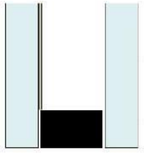
-Light transmittance (TL): 82%

-Solar factor (g): 65%

-External reflection (RLe): 11%

-Internal reflection (RLe): 12%

-Insulation (Ug): 1.1 W/mK

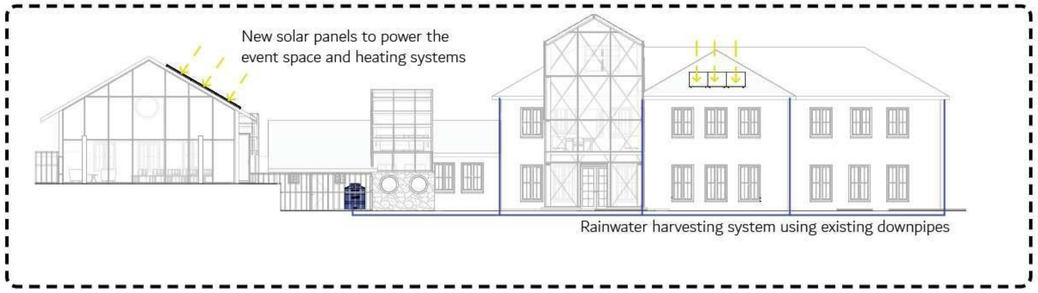


4. Treatment of existing glass panels: SOLARGUARD **Ecolux™ low-emissivity thermal insulation film**

-Improved U-factor. Effective instantly and improves the insulation of your windows by up to 41%.

-Rejects 99% of UV radiation to reduce the risk of cancer and limit the fading of furniture and floors.

RAINWATER HARVESTING AND SOLAR ENERGY



SOLAR PANEL ANNUAL OUTPUT CALULATIONS

Total System Capacity

- **Number of panels:** 54
- **Panel capacity:** 450 W

54 x450
=24 300 W
=24 300 / 1000
=24.3 kW

Daily Energy Output = System Capacity × Peak Sun Hours

Daily Energy Output = 24.3 kW × 4 hours = **97.2 kWh/day**

Annual Energy Output = Daily Energy Output × 365 days

Annual Energy Output = 97.2 kWh/day × 365 = **35 478 kWh/year**

Converting kilowatt-hours to megawatt-hours: Annual Energy Output

= 35 478 kWh/year ÷ 1,000
= **35.478 MWh/year**

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ZONE B_Villefontaine

Products Cross-Laminated timber
GLULAM timber

Area 2435 m^2

Cubic meter of Timber 235 m^3

Carbon 235 CO_2e Captured

Site B: Master Plan

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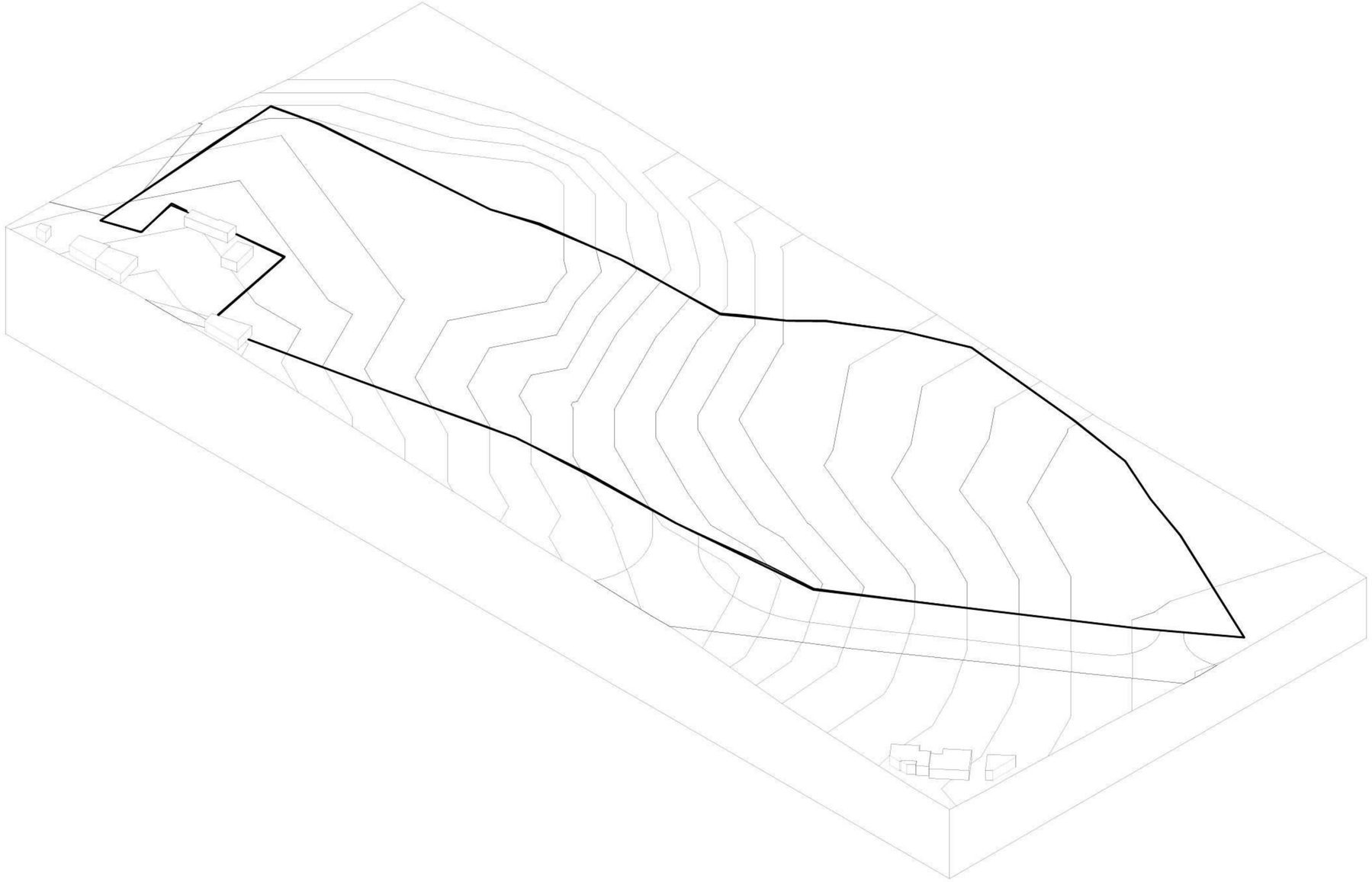
N

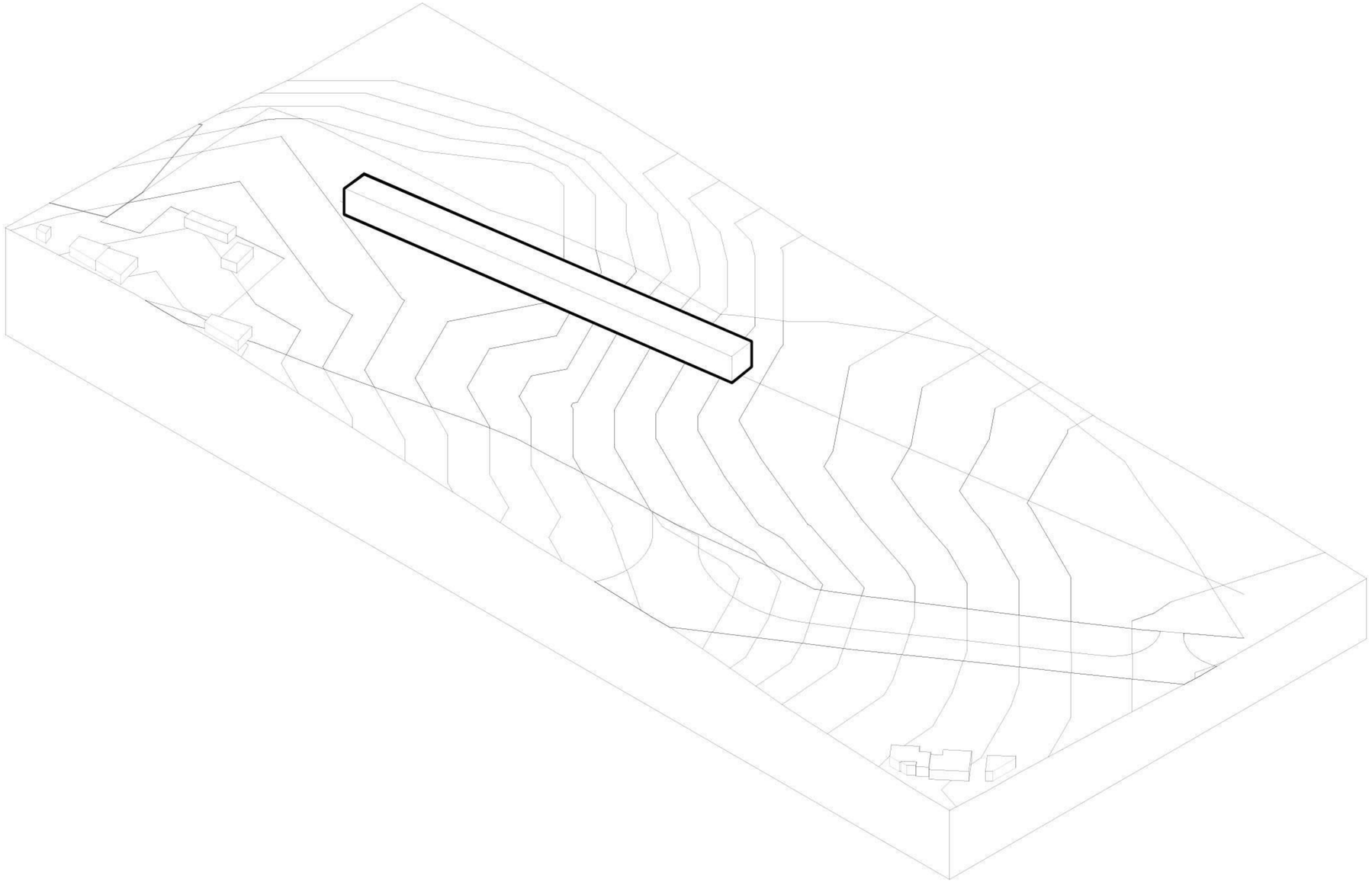
Master plan

Green wall | Entrance | Bus stop | Loading bay | Seating areas | Solar panels | Pedestrian walkways

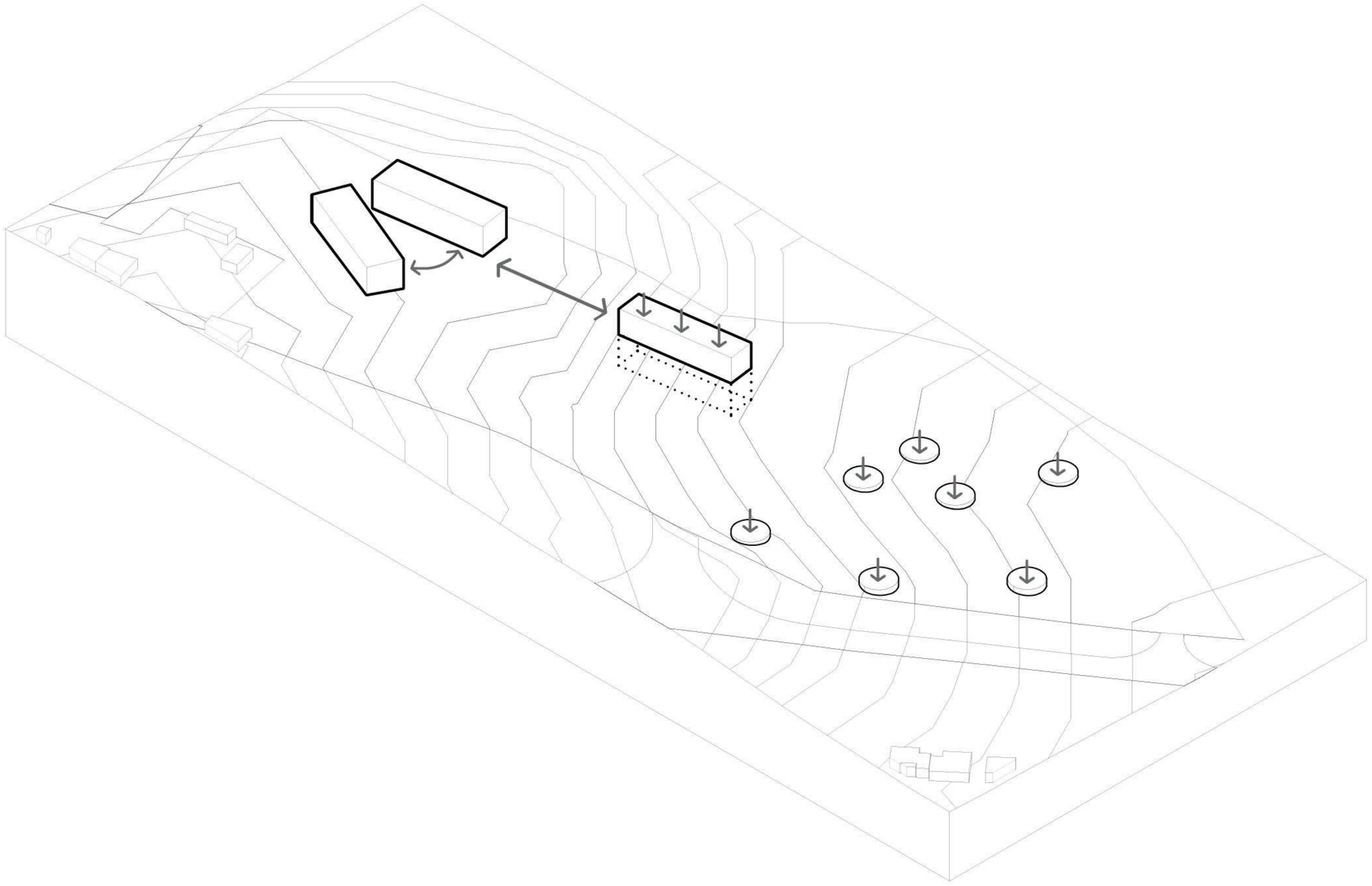
Site B: Concept Development_Site



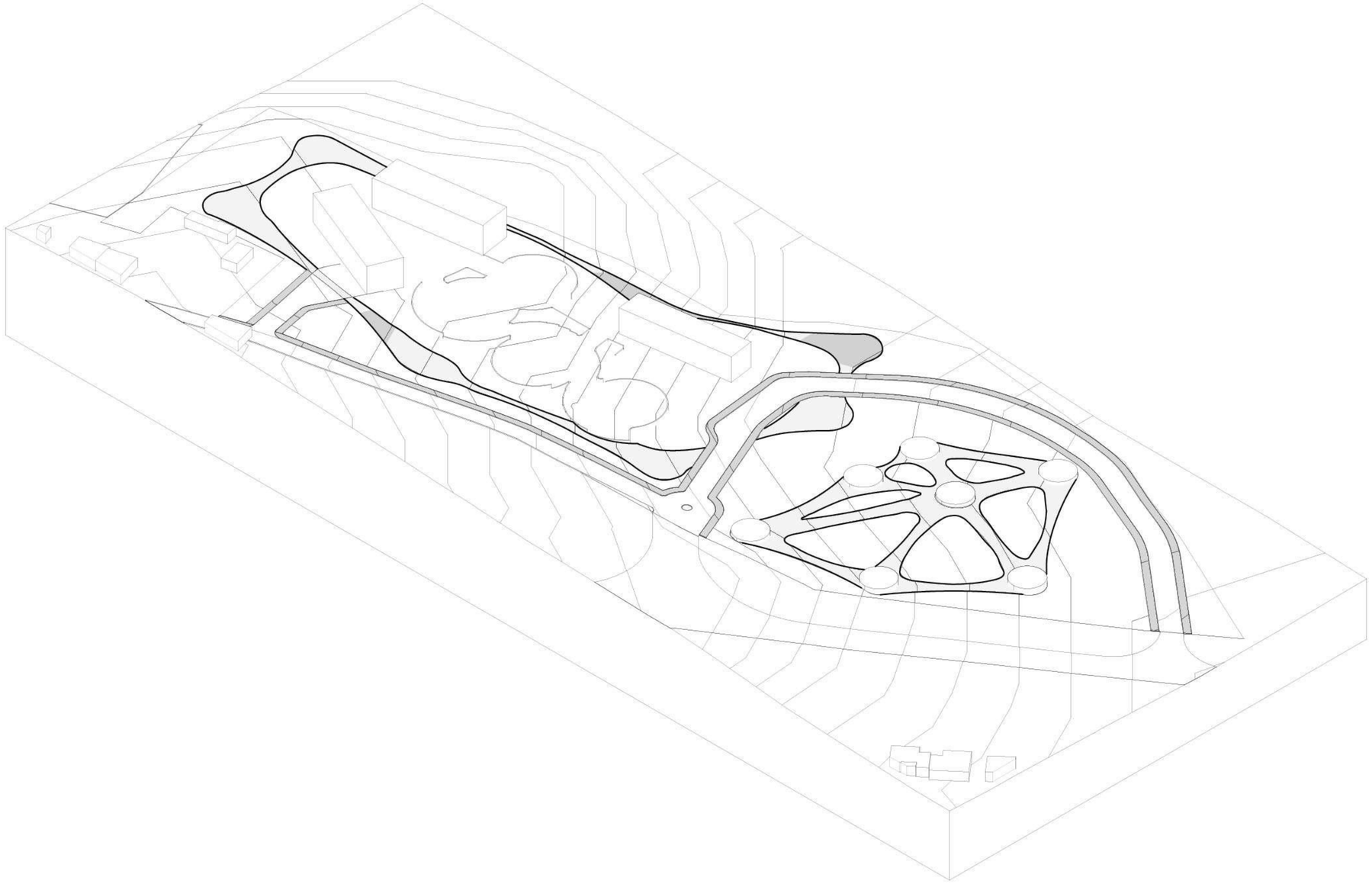
Site B: Concept Development_Axis



Site B: Concept Development_Mass



Site B: Concept Development_Movement



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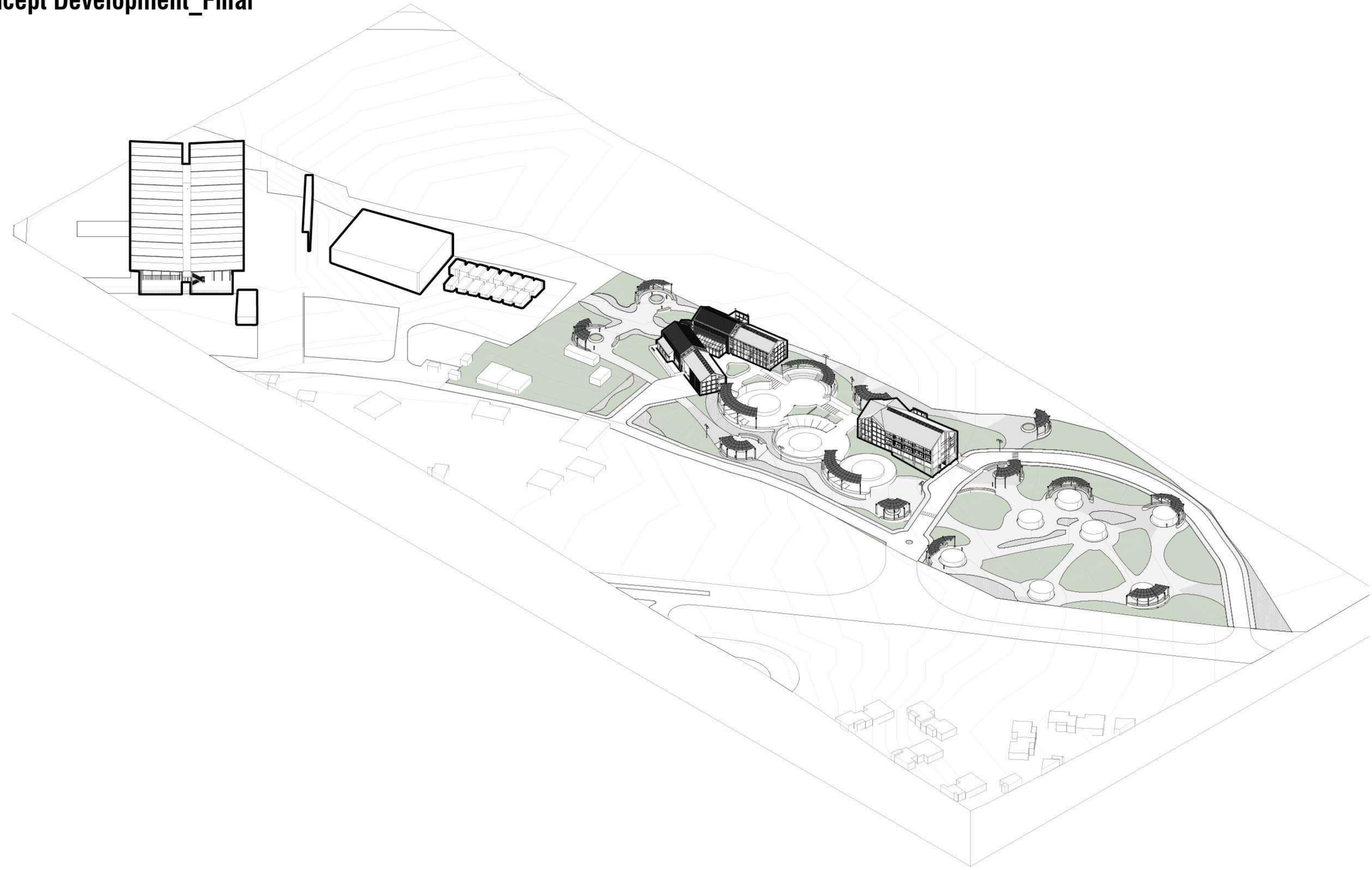
Site B: Concept Development_Final



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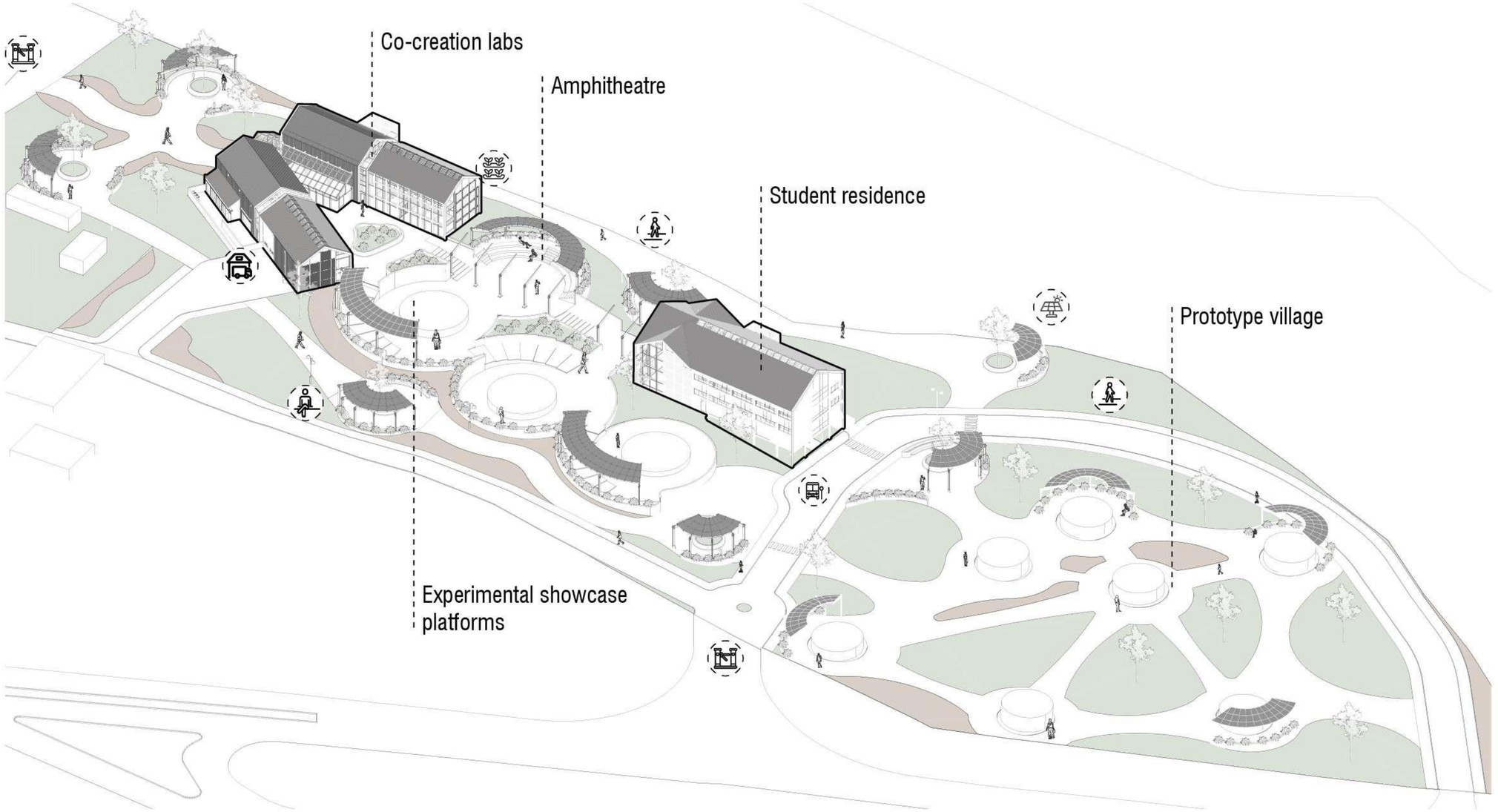
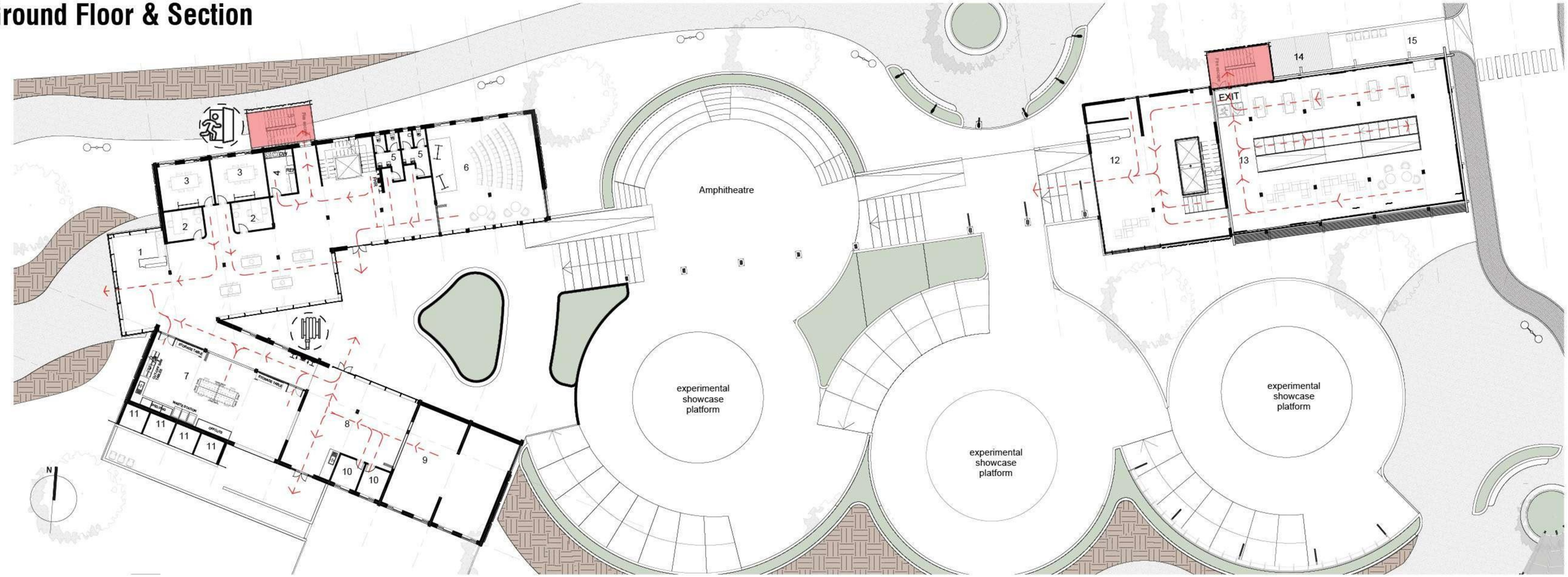
Site B: Masterplan Axonometric



Master Plan Axonometric view

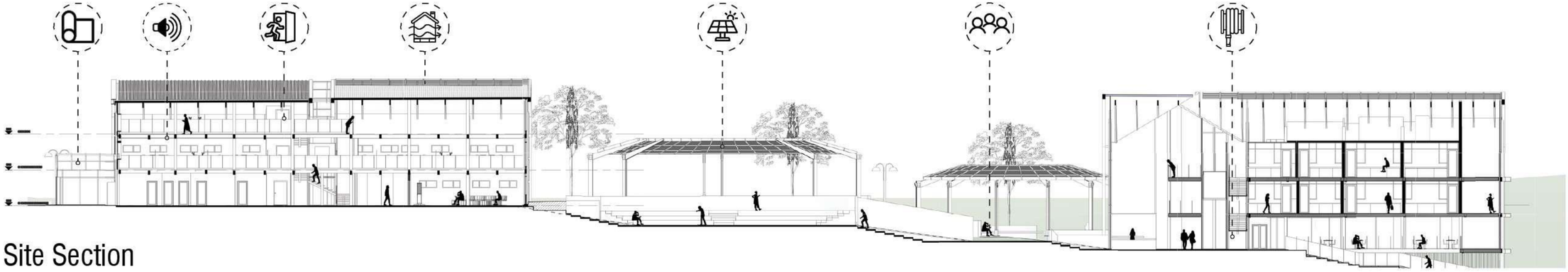
Green wall | Entrance | Bus stop | Loading bay | Seating areas | Solar panels | Pedestrian walkways

Site B: Ground Floor & Section



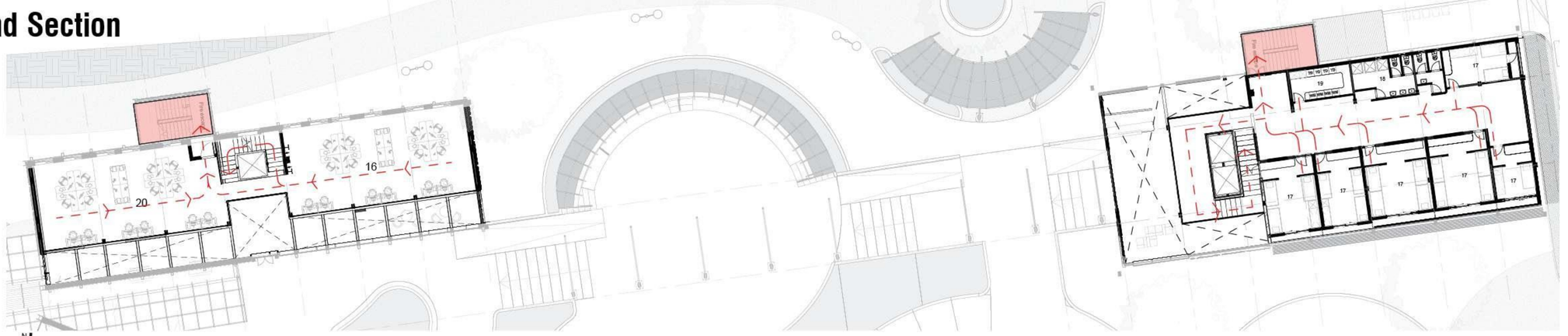
Ground floor plan

1.reception 2.small meeting rooms 3.large meeting rooms 4.kitchen 5.ablutions 6.multipurpose room
7.laboratory 8.prototype area 9.boiler room 10.cloakroom 11.machine rooms
12.reception 13.gathering space 14.boiler room 15.refuse area



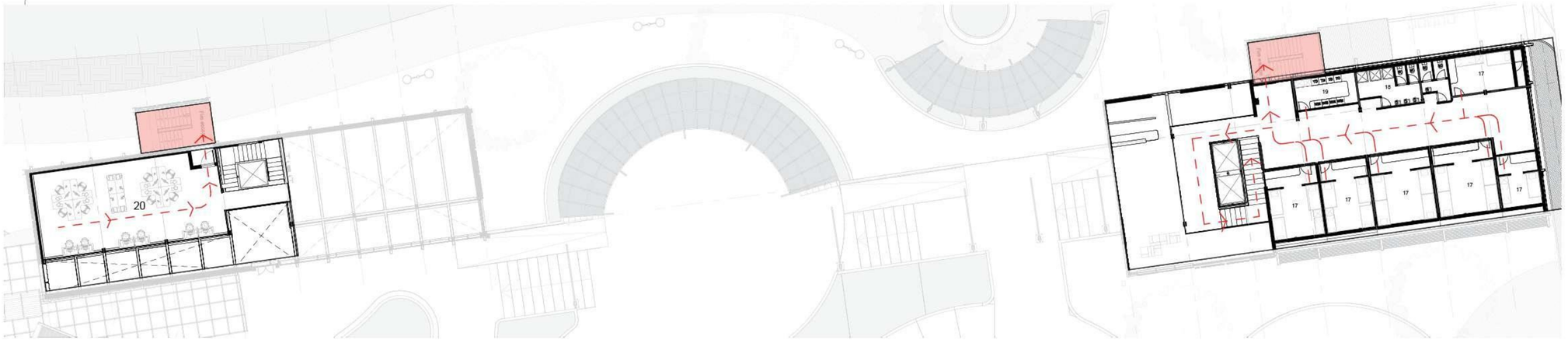
Site Section

Site B: Plans and Section

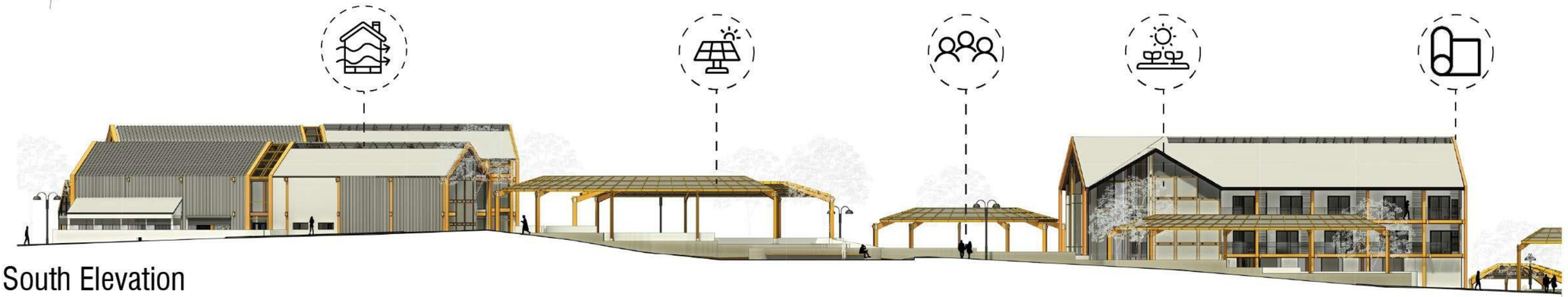


First floor plan

16.office 17. dormitories 18.ablutions 19.laundry 20.office

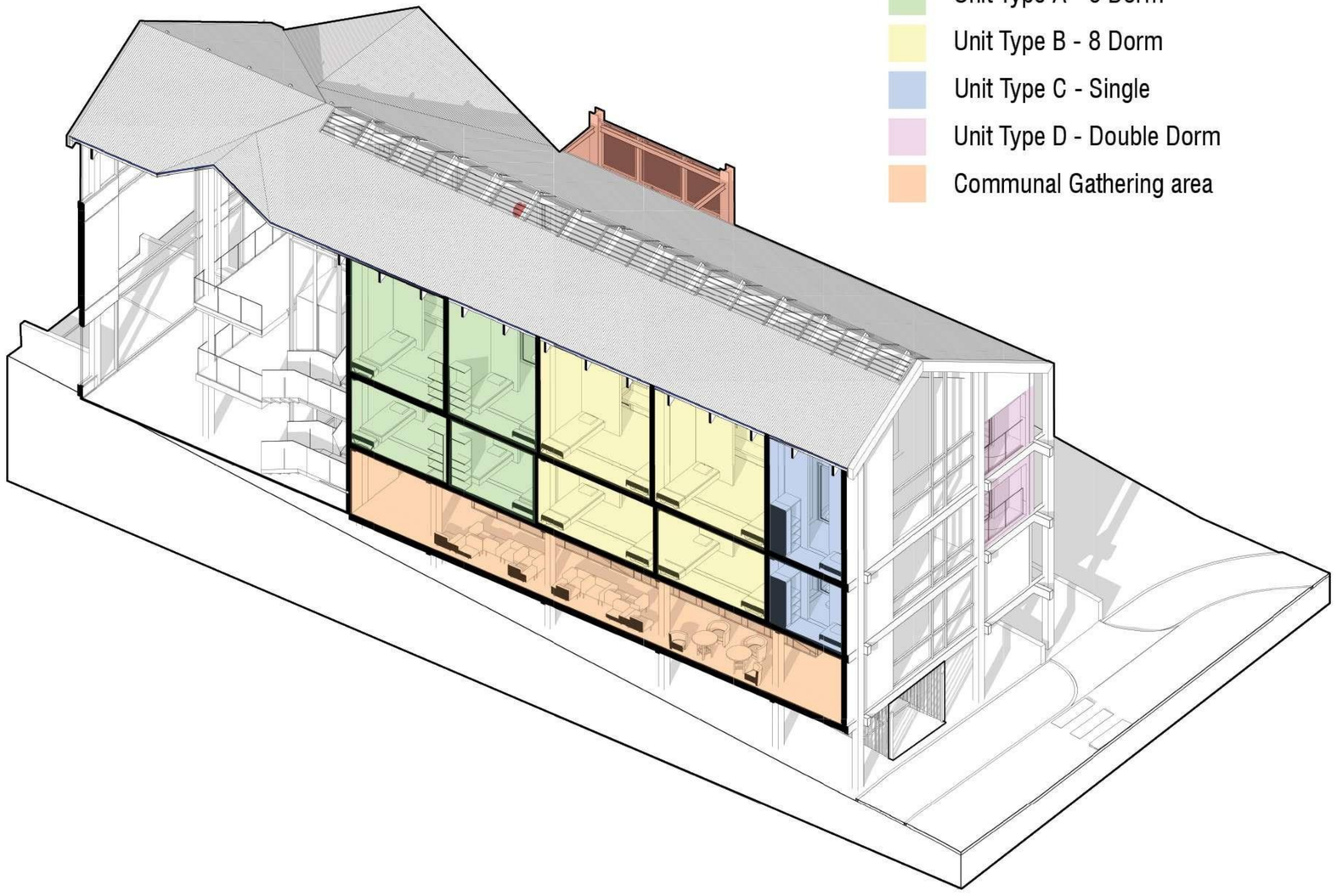


Second floor plan



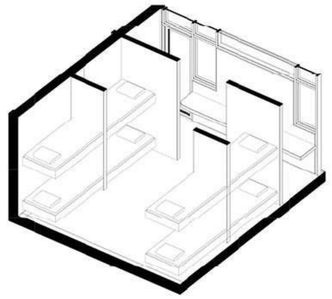
South Elevation

Site B: Residential Axonometric and Unit Types

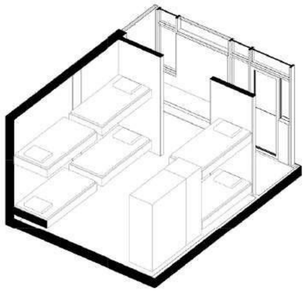


- Fire-Escape
- Unit Type A - 6 Dorm
- Unit Type B - 8 Dorm
- Unit Type C - Single
- Unit Type D - Double Dorm
- Communal Gathering area

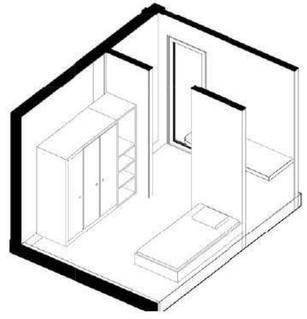
Unit Type B - 8 Dorm



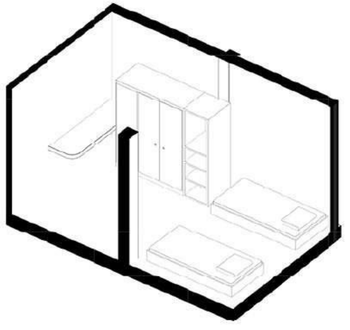
Unit Type A - 6 Dorm



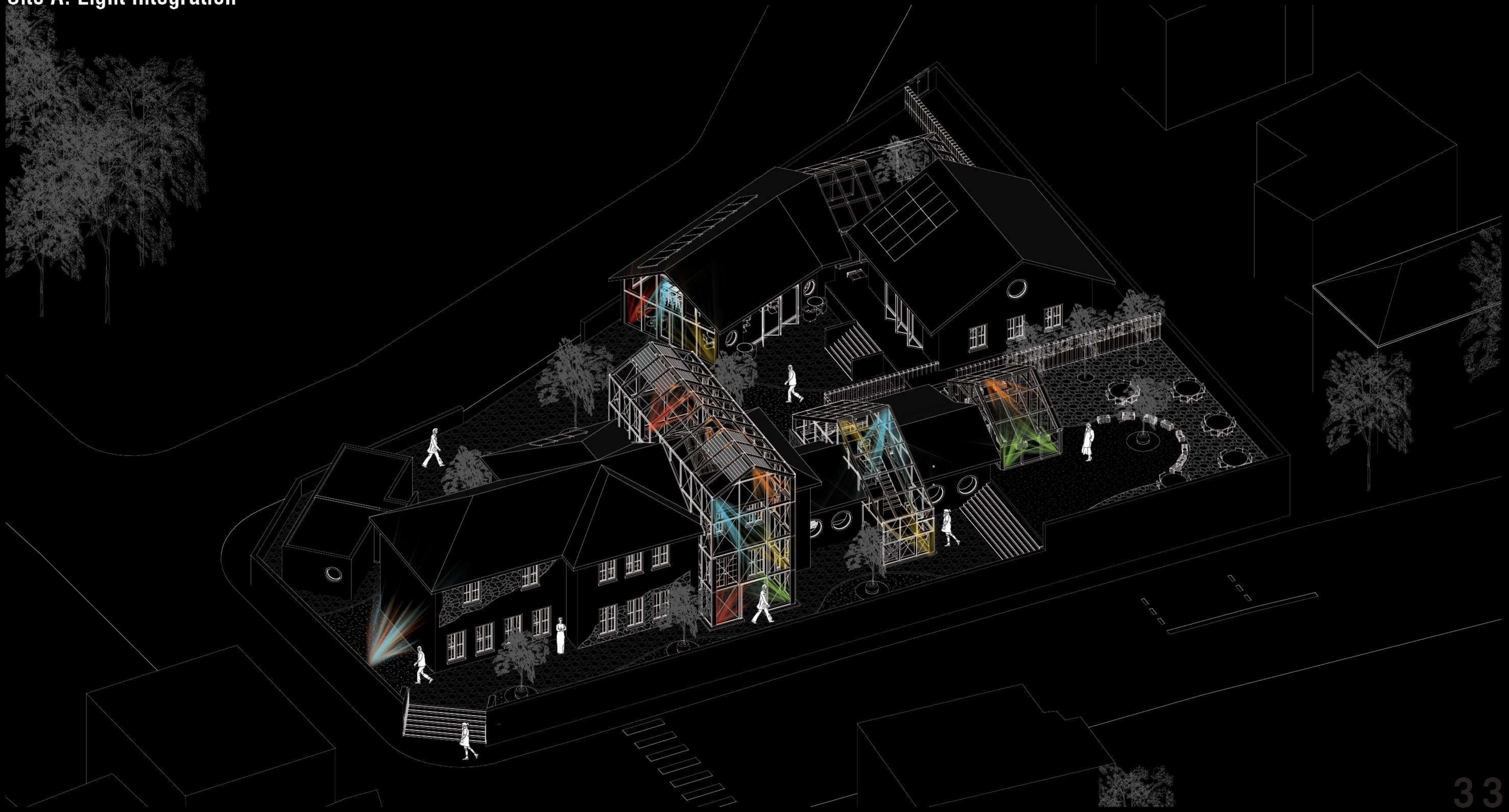
Unit Type D - Double Dorm



Unit Type C - Single



Site A: Light Integration

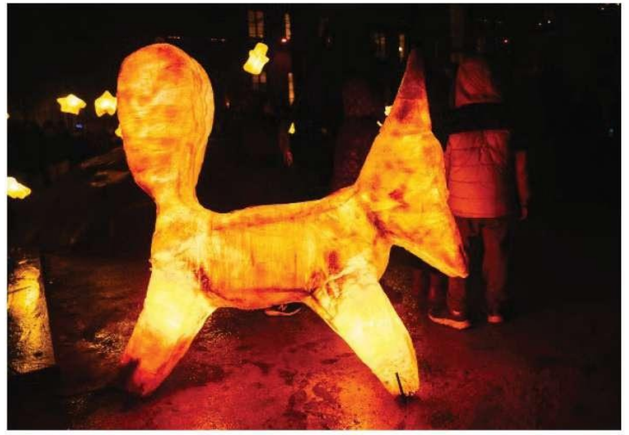


Lyon Festival of Lights

Fête des Lumières (The Lyon Festival of Lights)

he Lyon Festival of Lights (Fête des Lumières) is an annual festival held in Lyon, France that celebrates the city's patron saint, the Virgin Mary. The festival takes place every year on December 8th, which is the Feast of the Immaculate Conception. The tradition of the festival dates back to 1852

Lyon Festival of Light and Les Grands Artiliers

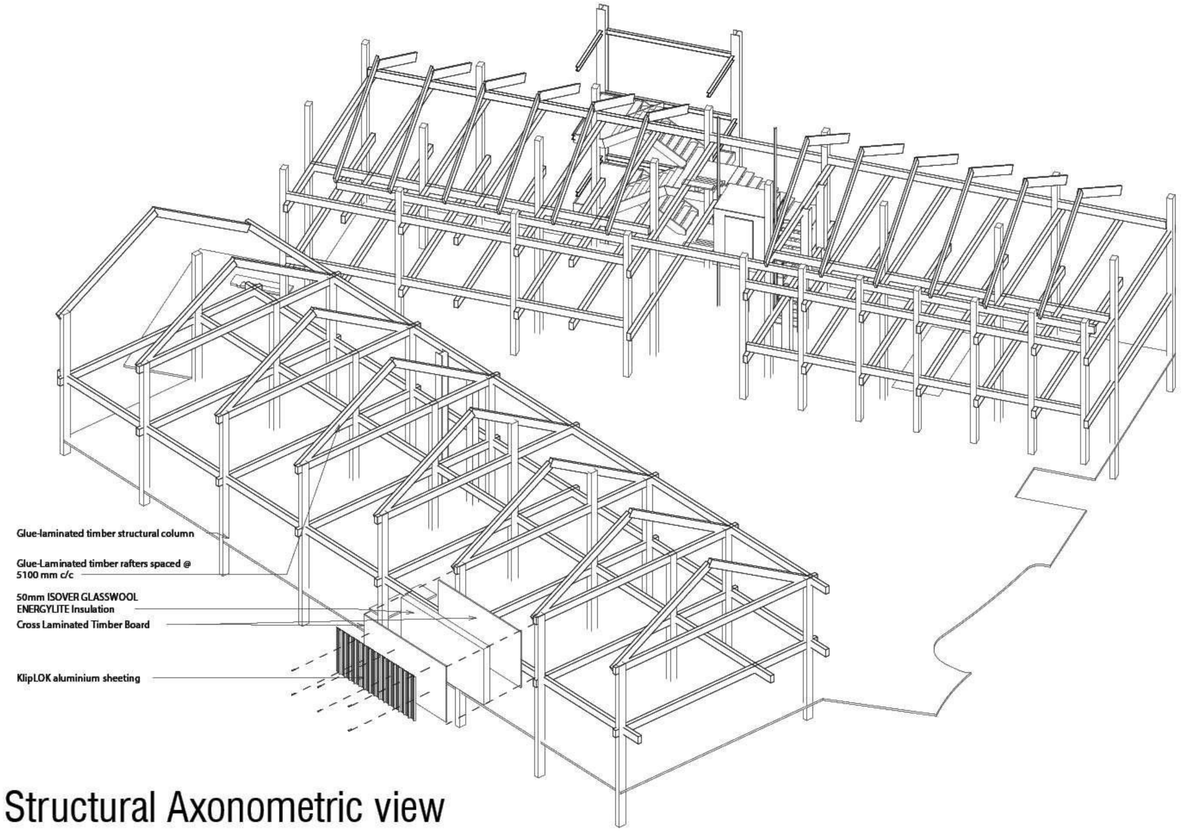


The Lyon Festival of Lights and Les Grands Ateliers are closely connected. Les Grands Ateliers, located in Villefontaine near Lyon, plays an important role in the festival. They launch an annual call for projects from French and European art, architecture and design schools to participate in the Festival of Lights. 13 This allows students and young artists to showcase their light-based creations and experiments as part of the festival.

The city of Lyon works closely with Les Grands Ateliers to develop the light art strategy and programming for the Festival of Lights.

Details and Sustainability

Timber Structure and Details



Structural Axonometric view

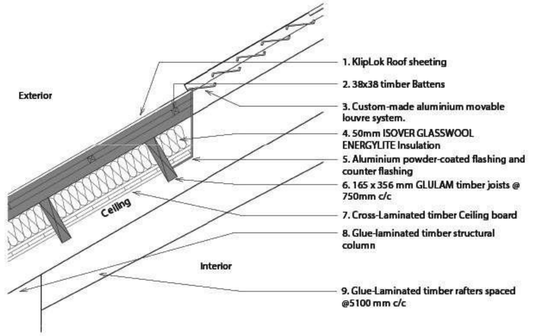
Volume = width(mm) x depth(mm) x length(mm) x Quantity

GLULAM Columns = $\frac{235 \times 337 \times 9000 \times 74}{1\,000\,000\,000} = \frac{52\,228\,410\,000}{1\,000\,000\,000} = 52.23$ m3

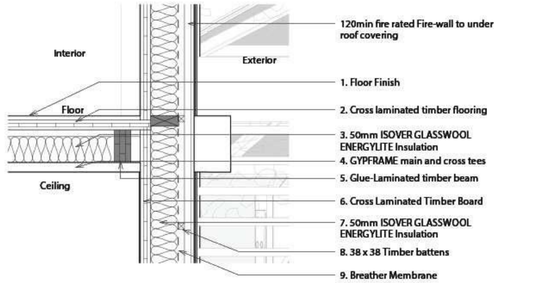
GLULAM BEAMS = $\frac{175 \times 345 \times 6000 \times 107}{1\,000\,000\,000} = \frac{38\,808\,750\,000}{1\,000\,000\,000} = 38.8$ m3

CLT Panels = $\frac{65 \times 3060 \times 5100 \times 102}{1\,000\,000\,000} = \frac{114\,081\,600\,000}{1\,000\,000\,000} = 114$ m3

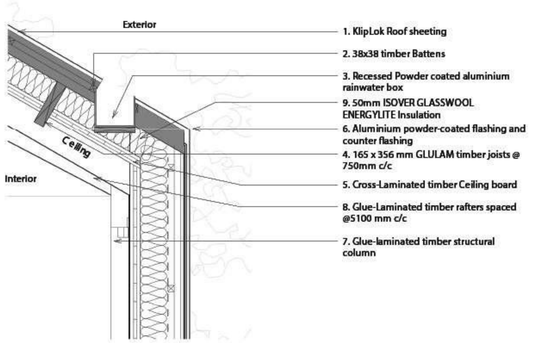
Total : 235.03 m3 of Timber Used = 235.03t CO2e Captured



01_Louvre Detail
1 : 15



02_Floor Connection detail
1 : 15



03_Roof Gutter detail
1 : 15

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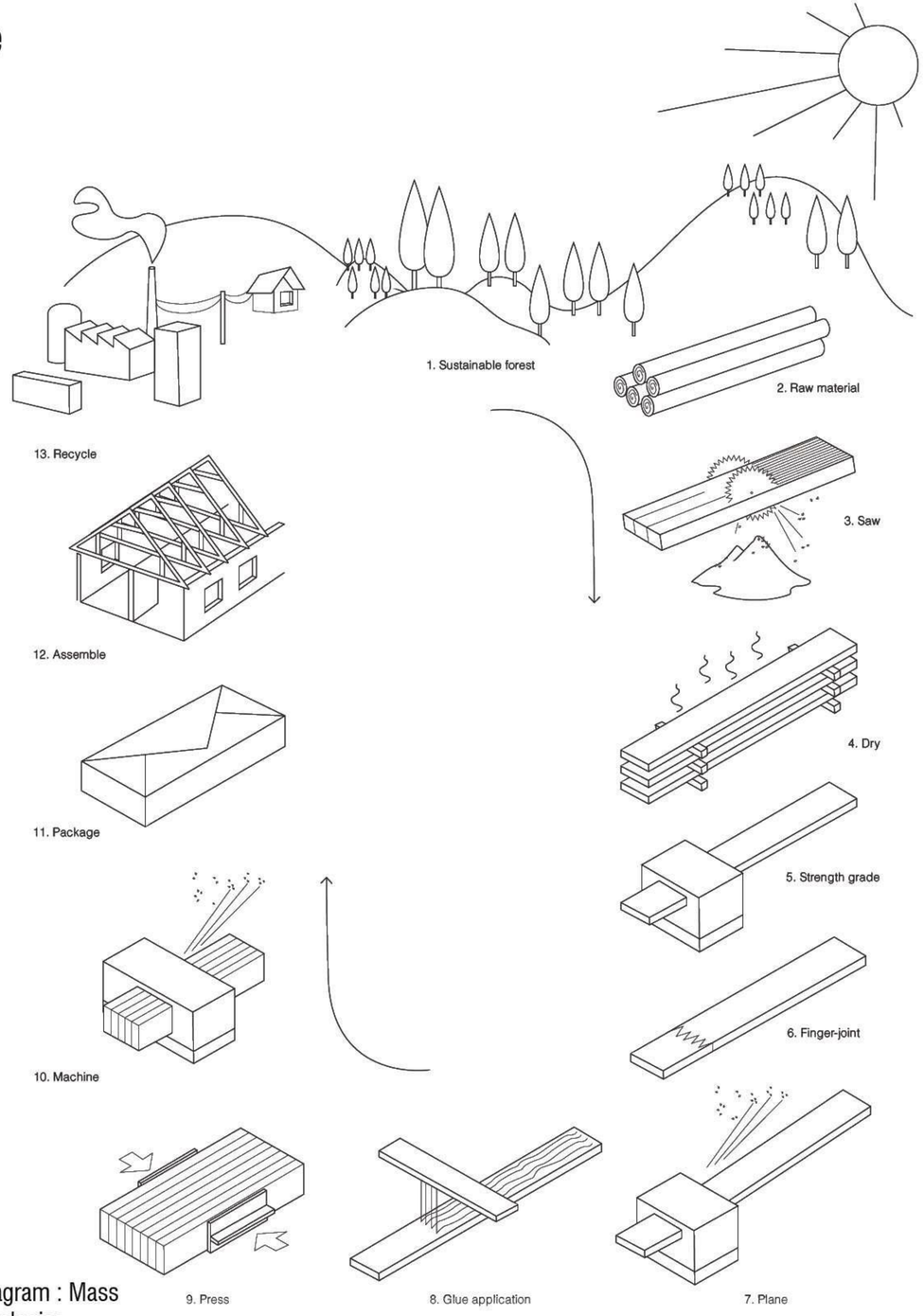
Timber Structure



Life-Cycle Diagram : Mass Timber Technologies

Timber Benefits

Design for Disassembly

The use of mechanical connections allows for disassembly, re-use or reconfiguration of the structure components.

CO2 Absorbtion

Atmospheric CO2 Emissions are trappped and held within the timber elements for the duration of its lifespan.

Biophillic Design

The natural origins of the timber makes it an ideal connection to a natural environment through biophillic space making.

Rapid Prefabrication

Automated off-site production benefits the time constraints due to low weather delays, waste and inaccuraccies in a controlled environment.

Phsycologically Beneficial

Studies show that the use of Timber can relieve stress and have an increased productivity rating of its occupants.

Fast On-Site Assembly

Due to the prefabrication, a mass timber building can get put together in a span of weeks instead of months or even years.

Site B: Sustainability Strategies

Shading

Thick curtain wall mullions act as horizontal shading louvers to keep out harsh sunlight.

Passive heating

Well-insulated building envelope minimizes energy requirements for heating.

Acoustic comfort

Roof, walls and ceiling are insulated with ENERGY LITE, which has exceptional thermal and acoustic qualities.

Water Collection

Rainwater is collected, stored and re-used for irrigattion and grey water.

Passive Ventilation

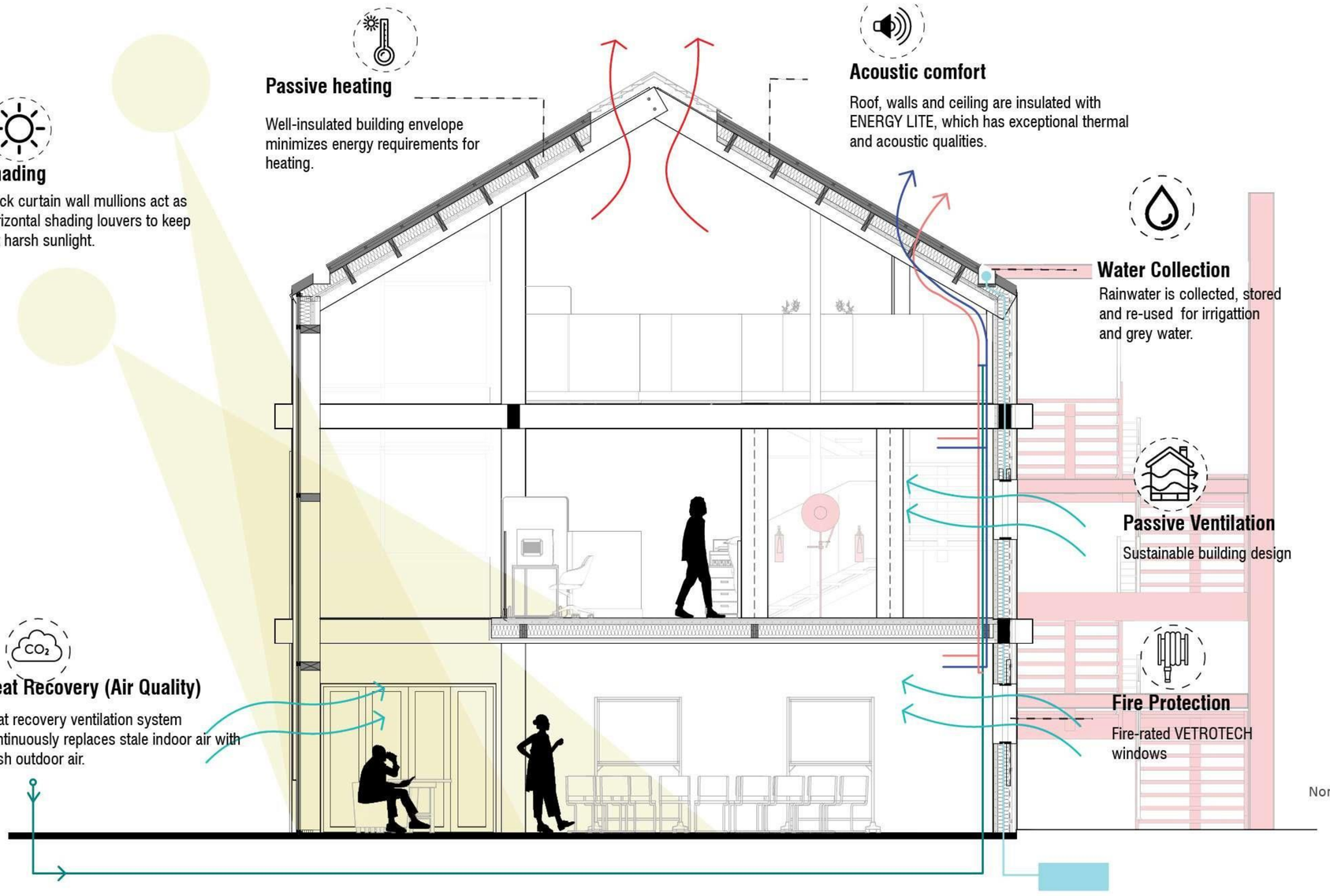
Sustainable building design

Fire Protection

Fire-rated VETROTECH windows

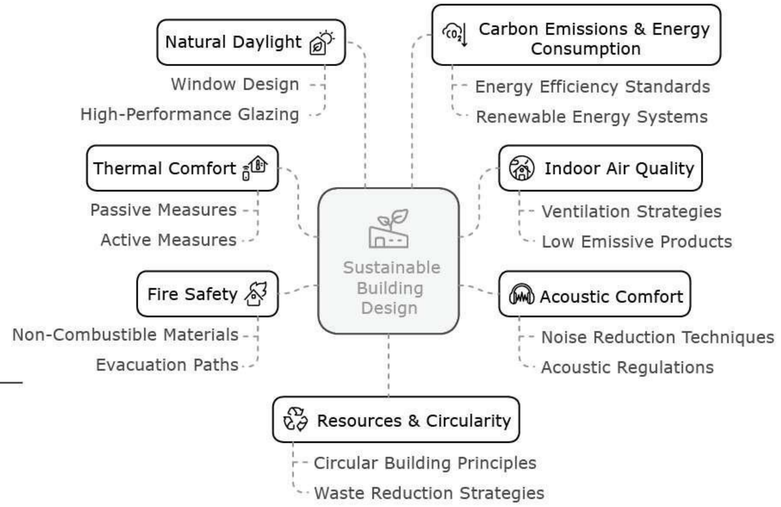
Heat Recovery (Air Quality)

Heat recovery ventilation system continuously replaces stale indoor air with fresh outdoor air.



Saint Gobain products used

gyproc SAINT-GOBAIN
isover SAINT-GOBAIN
ecophon SAINT-GOBAIN
SAINT-GOBAIN GLASS
vetrotech SAINT-GOBAIN
PAM SAINT-GOBAIN



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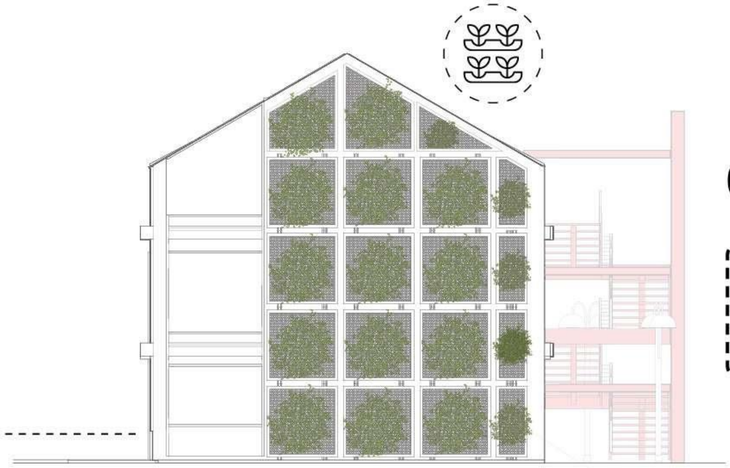
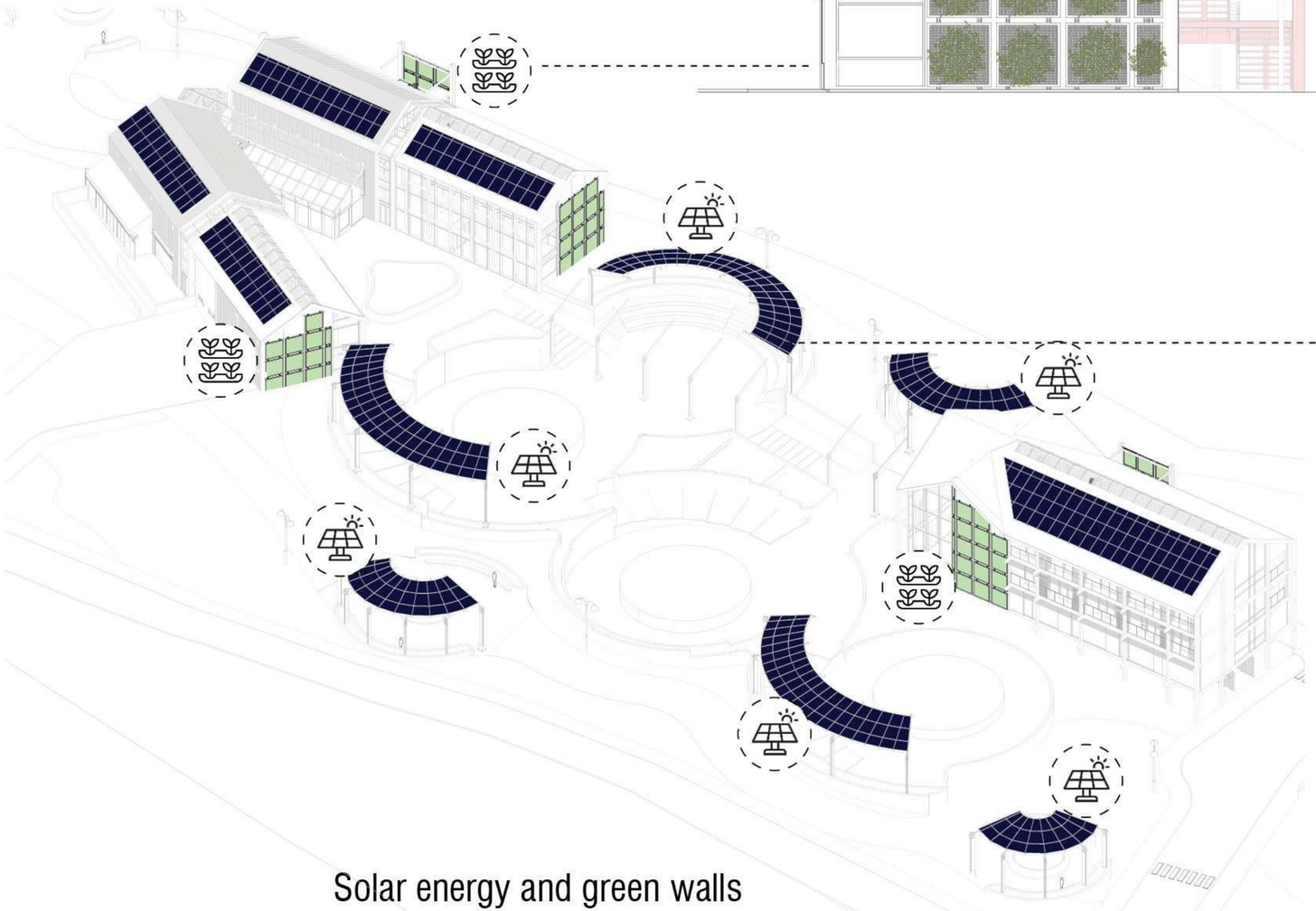
Site B: Sustainability Strategies

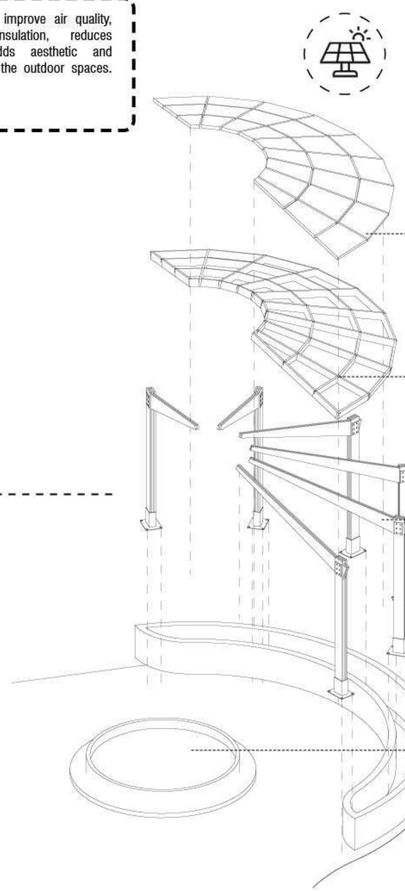


Green wall

A green wall systems improve air quality, enhance building insulation, reduces urban heat, and adds aesthetic and environmental value to the outdoor spaces.



Solar energy and green walls



Solar panels

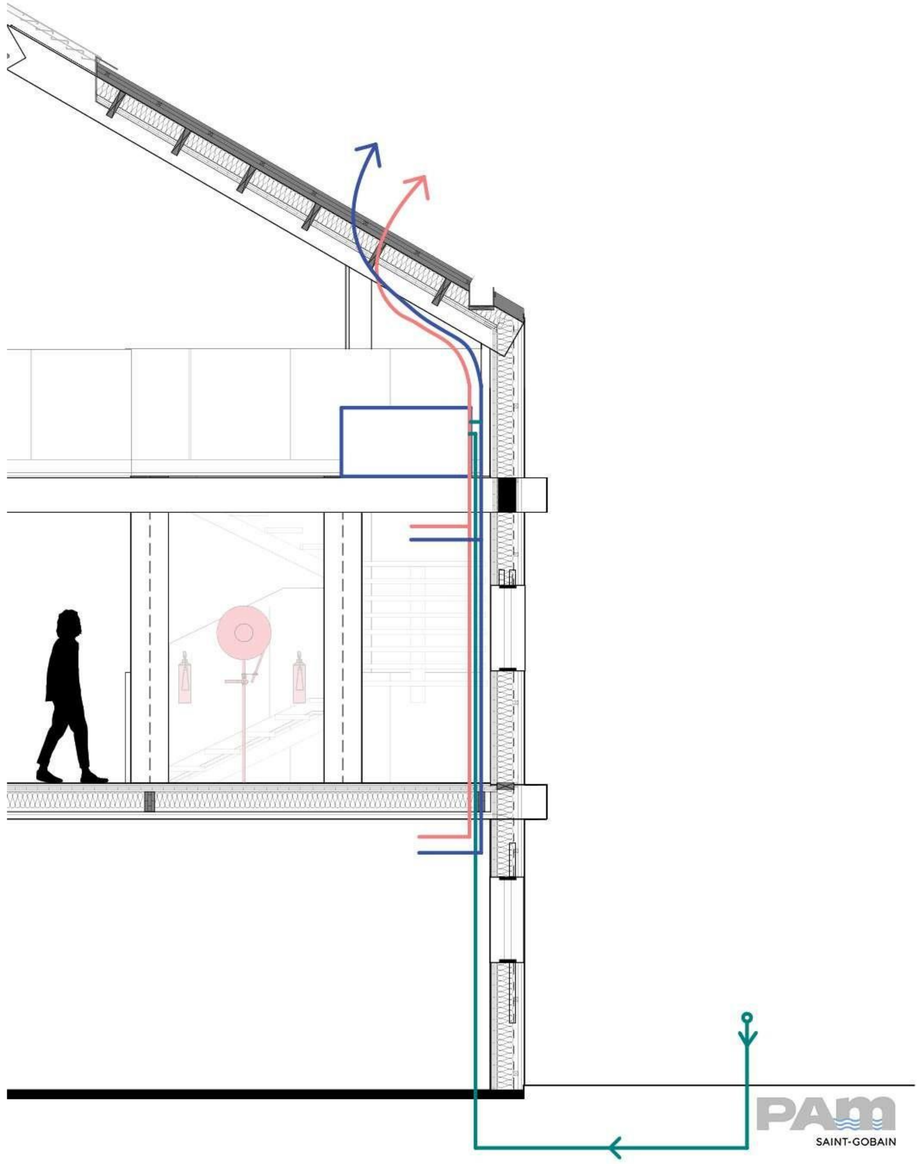
Photovoltaic Panels placed as a roof covering, producing power for the site. Any excess unused power generated is given back to the grid power to help the surrounding community

Lightweight timber roof structure

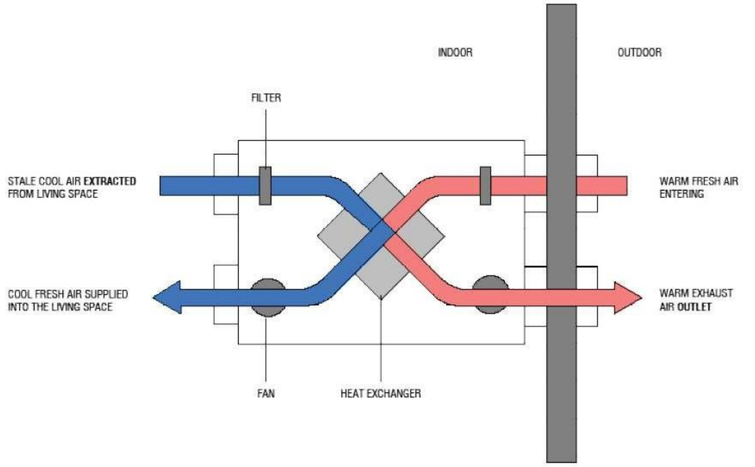
Cross-Laminated Timber support structure chemically bolted to the floor slab beneath.

Not only is this a design to produce power, but to enhance the **social sustainability** by having gathering spaces placed strategically around the site.

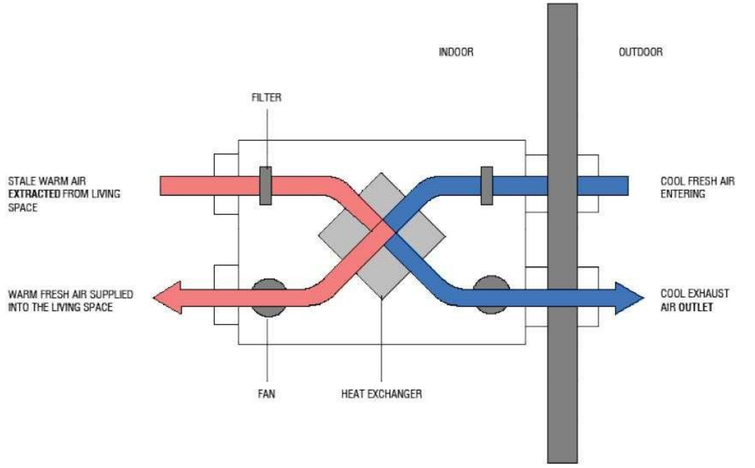
Site B: Indoor Air Quality + Thermal Comfort : Heat recovery



SUMMER



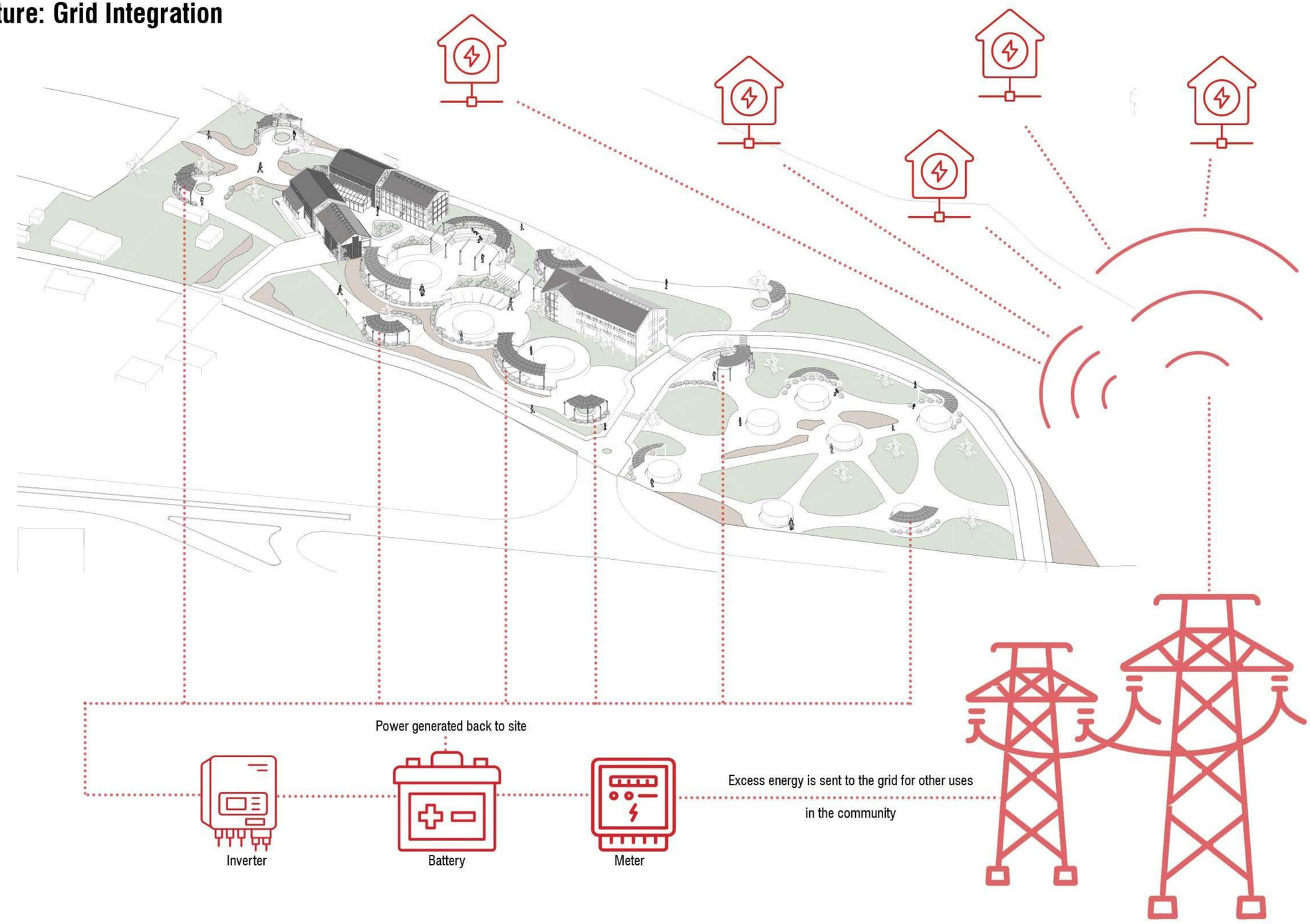
WINTER



RE-USE

Heat recovery ventilation system continuously replaces stale indoor air with fresh outdoor air. This process reduces energy consumption for heating and cooling, improving indoor air quality and thermal comfort, and potentially reducing energy bills.

Vision for the future: Grid Integration



Site A: Energy Calculations

Edge 2015–2025 A Decade of Impact

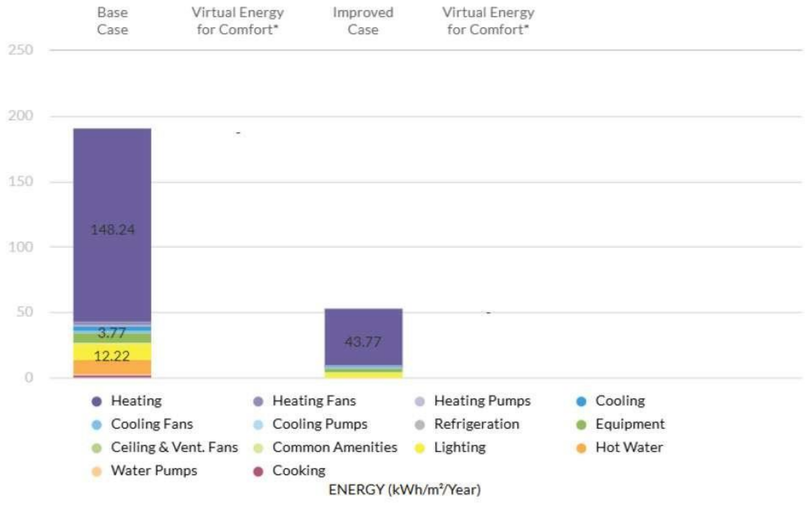
IFC International Finance Corporation WORLD BANK GROUP

Heating Demands: 53.97 kWh/m²/year

Cooling Demands: 4.6 kWh/m²/year

Results

Final Energy Use (kWh/Month) **2,925**	Embodied Carbon Savings (tCO2e) **182.23**
Final Water Use (m3/month) **81**	District Heating Demand (kWh/Month) **22.10**
Final Utility Cost (EUR/Month) **420**	Utility Cost Savings in USD (USD/Year) **11,717.82**
Subproject Floor Area (m²) **650**	Base Case EPI (kWh/m²/year) **192.0**
Energy Savings (MWh/Year) **92.74**	Improved Case EPI (kWh/m²/year) **54.0**
Water Savings (m³/Year) **630**	Operational CO2 Savings (tCO2/Year) **19.1**



Water Efficiency Measures 39.32%

Meets EDGE Energy Standard

Energy Efficiency Measures 71.84%

Meets EDGE Energy Standard

Energy Efficiency Measures 71.84%

✓ EEM15 Fresh Air Pre-conditioning System: Efficiency 95%
Base Case: No Fresh Air Pre-conditioning
Select System: Sensible Heat Recovery Wheel
Efficiency (%) : 95

✓ EEM16 Space Heating System Efficiency: Efficiency (%) 95
Base Case Heating System: District Heating
Base Case Efficiency: 80.5%
Select System: Default Base Case System With Improved Efficiency
Efficiency (%): 95

✓ EEM17 Room Heating Controls with Thermostatic Valves
Base Case: No Thermostatic valve control

✓ EEM18 Domestic Hot Water (DHW) System : Solar 100%, Heat Pump 0%, Boiler 0%
Base Case Solar HW Usage : 0%
Base Case Hot Water Heater Usage: 0%
Base Case Hot Water Heater Efficiency: 100%

	Default Hot Water Usage (%)	User Entry Hot Water Usage (%)	Default	User Entry
Solar	50%	100		
Heat Pump	50%	0	3.00	COP
Boiler	0%	0	100%	% Efficiency

EEM19 Domestic Hot Water Preheating System

✓ EEM20 Economizers
Air Economizers: Yes
Water Economizers: Yes

EEM21 Demand Control Ventilation Using CO_2 Sensors

✓ EEM22 Efficient Lighting for Internal Areas
Base Case Value: 65 LPW
Efficiency Type: Luminous Efficacy

✓ EEM23 Efficient Lighting for External Areas
Base Case Value: 65 LPW
Efficiency Type: Luminous Efficacy

✓ EEM24 Lighting Controls
Type of Lighting Control: Timer Control with Continuous Dimming

✓ EEM25 Skylights

	Default	User Entry
Skylit Floor Area (m²)	32.10	52
VT (Factor)	0.64	
U-Value (W/m²·K)	3.56	
Solar Heat Gain Coefficient (SHGC)	0.50	
Orientation	Horizontal	Horizontal
Slope	0	0
Type Of Daylight Control	Auto On/Off	Auto On/Off

EEM26 Demand Control Ventilation for Parking Using CO Sensors

EEM30 Submeters for Heating and/or Cooling Systems

✓ EEM31 Smart Meters for Energy

EEM32 Power Factor Corrections

✓ EEM33 Onsite Renewable Energy: 60% of Annual Energy Use
Base Case: No Onsite Renewable Energy

Renewable Energy System Type	Default Annual Energy Use (%)	User Entry Annual Electricity Use (%)	Annual Energy Use (kWh/Year)
Solar Photovoltaic	25%	60	52,627
Wind Turbine	0%	0	-
Biomass	0%	0	-
Other	0%	0	-

✓ EEM34 Other Energy Saving Measures
Energy Savings (%):

EEM35 Offsite Renewable Energy Procurement: 100% of Annual Operational CO_2

EEM36 Carbon Offsets: 100% Annual Operational CO_2

ARCHITECTURE STUDENT CONTEST

Site B: Energy Calculations

Edge 2015–2025 A Decade of Impact

IFC International Finance Corporation WORLD BANK GROUP

Heating Demands: 55.67 kWh/m²/year

Cooling Demands: 3.78 kWh/m²/year

Results

Final Energy Use (kWh/Month)
11,337

Final Water Use (m3/month)
75

Final Utility Cost (EUR/Month)
1,090

Subproject Floor Area (m²)
2,431

Energy Savings (MWh/Year)
270.30

Water Savings (m³/Year)
746.40

Operational CO2 Savings (tCO2/Year)
19.1

Embodied Carbon Savings (tCO2e)
950.70

Total Building Construction Cost (Million EUR)
5.8

Incremental Cost (Million EUR)
1.33

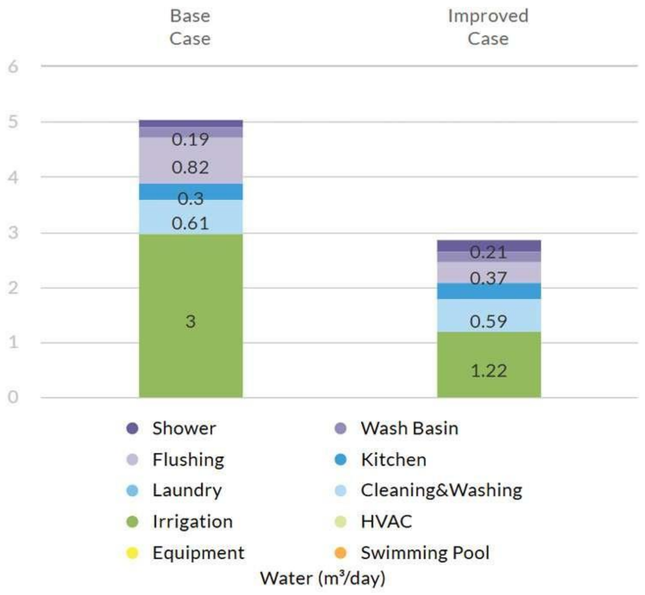
% Increase in cost
23.03%

District Heating Demand (kWh/Month)
21,210.77

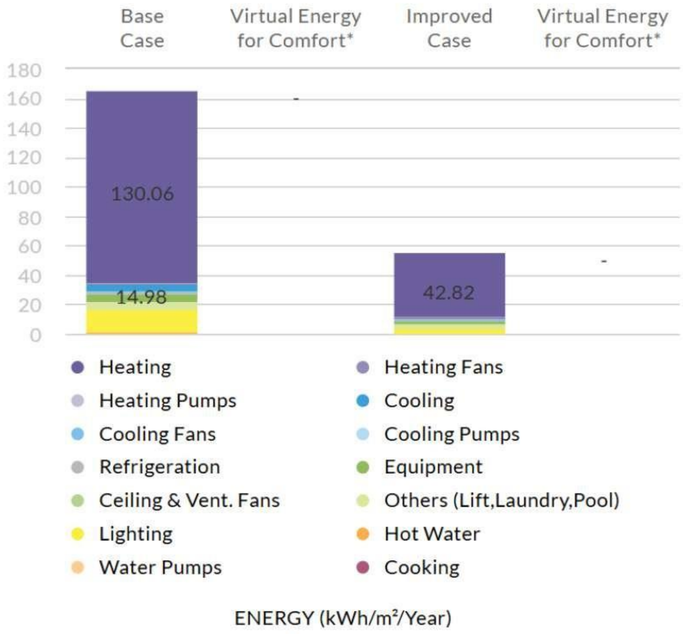
Utility Cost Savings in Local Currency (EUR/Year)
18,606.8

Base Case EPI (kWh/m²/year)
166.0

Improved Case EPI (kWh/m²/year)
55.7



Water Efficiency Measures: 43.18%
(Meets EDGE Water Standard)



Energy Efficiency Measures: 66.46%
(Meets EDGE Energy Standard)

Energy Efficiency Measures: 66.46%

✓ EEM01* Window-to-Wall Ratio: 26.57%
Base Case Value: 22%
WWR (%): 26.57

EEM02 Reflective Roof: Solar Reflectance Index 85

EEM03 Reflective Exterior Walls: Solar Reflectance Index 85

✓ EEM04 External Shading Devices: Annual Average Shading Factor (AASF) 0.11
Base Case Value: No Shading
AASF: 0.11

✓ EEM05* Insulation of Roof: U-value 1.05 W/m²·K
Base Case Value: 0.86 W/m²·K
U-Value (W/m²·K): 1.05

✓ EEM06* Insulation of Ground/Raised Floor Slab: U-Value 0.8 W/m²·K
Base Case Value: 0.35 W/m²·K
U-Value (W/m²·K): 0.8
Edge Insulation Type: None

EEM07 Green Roof

✓ EEM08* Insulation of Exterior Walls: U-Value 1 W/m²·K
Base Case Value: 0.72 W/m²·K
U-Value (W/m²·K): 1

EEM15 Fresh Air Pre-conditioning System: Efficiency 65%

✓ EEM16* Space Heating System Efficiency: COP (W/W) 2,Efficiency (%) NA,EER (Btu/hW) NA
Base Case Heating System: District Heating
Base Case : 80.5%
Select System: Air Cooled, DX Unitary Heat Pump

✓ EEM17 Room Heating Controls with Thermostatic Valves
Base Case: No Thermostatic valve control

✓ EEM18 Domestic Hot Water (DHW) System : Solar 50%, Heat Pump 45%, Boiler 5%, Instantaneous Water Heater 0%, District Hot Water System 0%
Base Case Solar HW Usage : 0%
Base Case Hot Water Heater Usage: 100%
Base Case Hot Water Heater Efficiency: 80%

	Default Hot Water Usage (%)	*User Entry Hot Water Usage (%)*	*Default*	*User Entry*
Solar	50%	50		
Heat Pump	50%	45	3.00	*COP*
Boiler	0%	5	100%	*% Efficiency*

EEM19 Domestic Hot Water Preheating System

✓ EEM20 Economizers
Air Economizers: Yes
Water Economizers: Yes

✓ EEM21 Demand Control Ventilation Using CO_2 Sensors

✓ EEM22 Efficient Lighting for Internal Areas
Base Case Value: 65 L/W
Efficiency Type: Luminous Efficacy

✓ EEM23 Efficient Lighting for External Areas
Base Case Value: 65 L/W
Efficiency Type: Luminous Efficacy

EEM24 Lighting Controls

EEM09* Efficiency of Glass: U-Value 1.95 W/m²·K, SHGC 0.6 and VT 0.45

EEM10 Air Infiltration of Envelope: 50% Reduction

✓ EEM11 Natural Ventilation
Base Case Facade Opening: 0%

EEM12 Ceiling Fans

✓ EEM13* Cooling System Efficiency: 3.3 COP (W/W)
Base Case System: Air Cooled DX Split System
Base Case COP: 2.84
Select System: Default Base Case System With Improved Efficiency

EEM14 Variable Speed Drives

✓ EEM25 Skylights

	Default	*User Entry*
Skylit Floor Area (m²)	28.85	350
VT (Factor)	0.64	
U-Value (W/m²·K)	3.56	
Solar Heat Gain Coefficient (SHGC)	0.50	
Orientation	Horizontal	Horizontal
Slope	0	0
Type Of Daylight Control	Auto On/Off	Auto On/Off

EEM26 Demand Control Ventilation for Parking Using CO Sensors

✓ EEM30 Submeters for Heating and/or Cooling Systems
Base Case: No Submeters
Usage Type: Both Cooling and Heating

✓ EEM31 Smart Meters for Energy

✓ EEM32 Power Factor Corrections

✓ EEM33 Onsite Renewable Energy: 50% of Annual Energy Use
Base Case: No Onsite Renewable Energy

Renewable Energy System Type	Default Annual Energy Use (%)	User Entry Annual Electricity Use (%)	Annual Energy Use (kWh/Year)
Solar Photovoltaic	25%	50	135,357
Wind Turbine	0%	0	-
Biomass	0%	0	-
Other	0%	0	-

✓ EEM34 Other Energy Saving Measures
Energy Savings (%):

✓ EEM35 Offsite Renewable Energy Procurement: 100% of Annual Operational CO_2
kWh/Year: 67,679

EEM36 Carbon Offsets: 100% Annual Operational CO_2

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Site B: Life Cycle Analysis

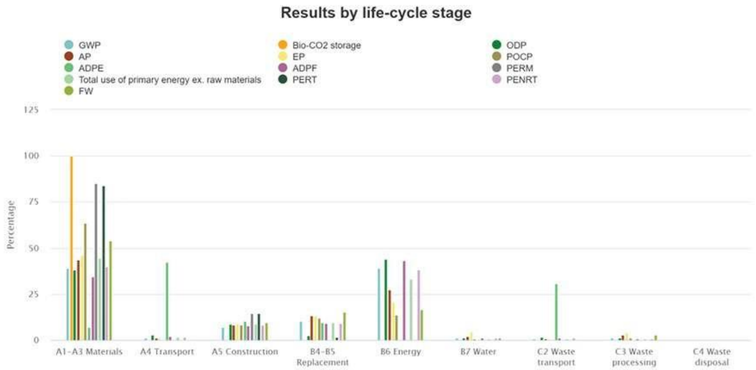
1 093 Tonnes CO_2e

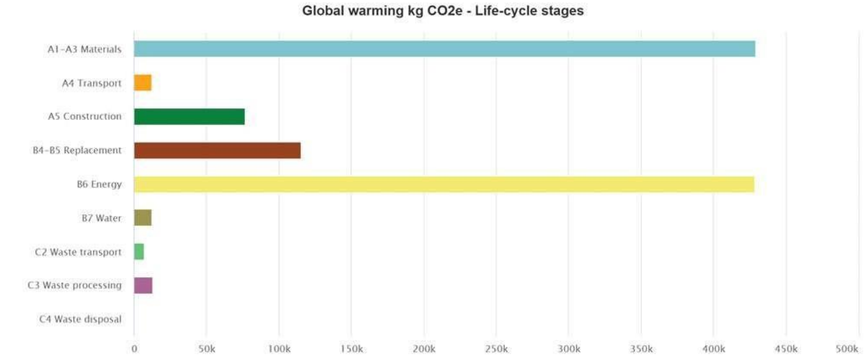
9 kg CO_2e / m^2 / year

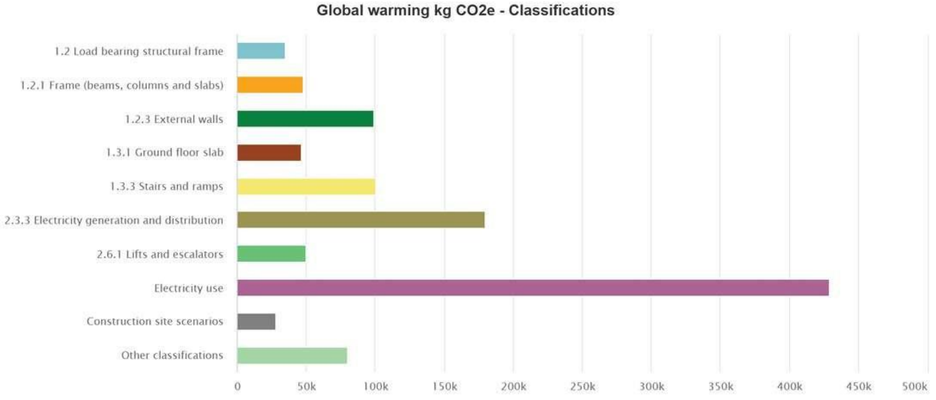
54 673 € Social cost of carbon

Cradle to grave (A1-A4, B4-B5, C1-C4)	kg CO_2e/m^2
(< 350) A (350-530) B (530-710) C (710-890) D (890-1070) E (1070-1250) F (> 1250) G	262

One Click LCA

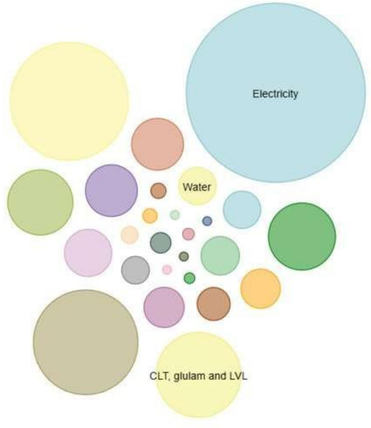




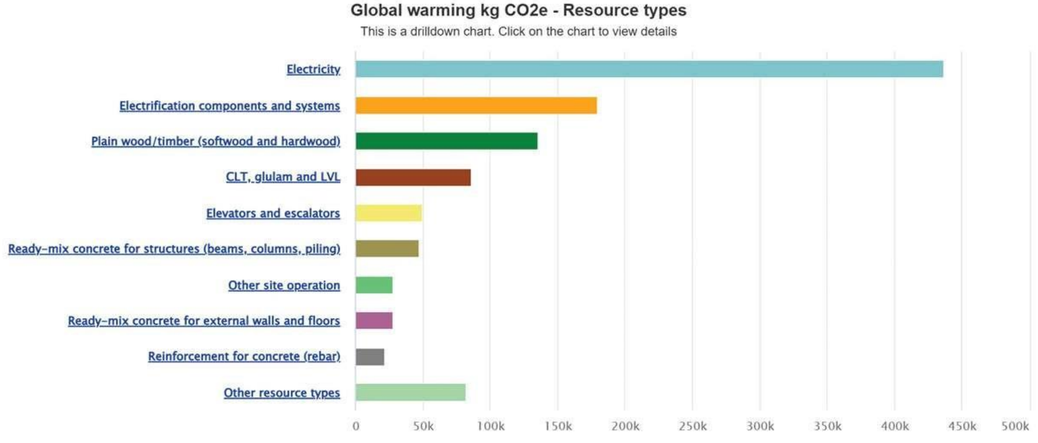


Bubble chart, total life-cycle impact by resource type and subtype, Global warming

Hover your mouse over legends or the chart to highlight impacts. Bubble minimum and maximum sizes constrained for readability



- Glass wool insulation
- Elevators and escalators
- CLT, glulam and LVL
- Internal wall systems, permanent
- Aluminium-framed glass doors
- Plastic membranes
- Ready-mix concrete for structures (beams, columns, piling)
- Sand, soil and gravel
- Infrastructure constructions
- Ready-mix concrete for external walls and floors
- Other site operation
- Organic waste and paper
- Waste water treatment
- Glass facades and glazing
- Other steel/iron
- Plain wood/timber (softwood and hardwood)
- Aluminium frame windows
- External wall constructions
- Reinforcement for concrete (rebar)
- Foundation constructions
- Floor slab constructions
- Aluminium
- Electrification components and systems
- Electricity
- Mineral waste
- Water



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Merci (Thank You).