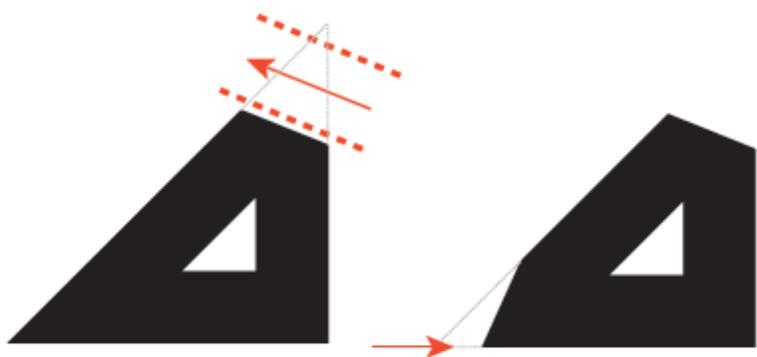


# ELBETITSA

**by Anton Dobrevski**

Student number:	4539265
Studio:	ExploreLab
Stage:	P5
Architecture tutor:	Roel van de Pas
Technology tutor:	Jan van de Voort
Research tutor:	Peter Koorstra
External examiner:	Ype Cuperus



“For a moment I forget all the maze of (architectural) problems, I erase them from my mind and busy myself with something which can best be described as abstract art. I start drawing, giving free rein to my instinct, and suddenly the basic idea is born, a starting-point...”

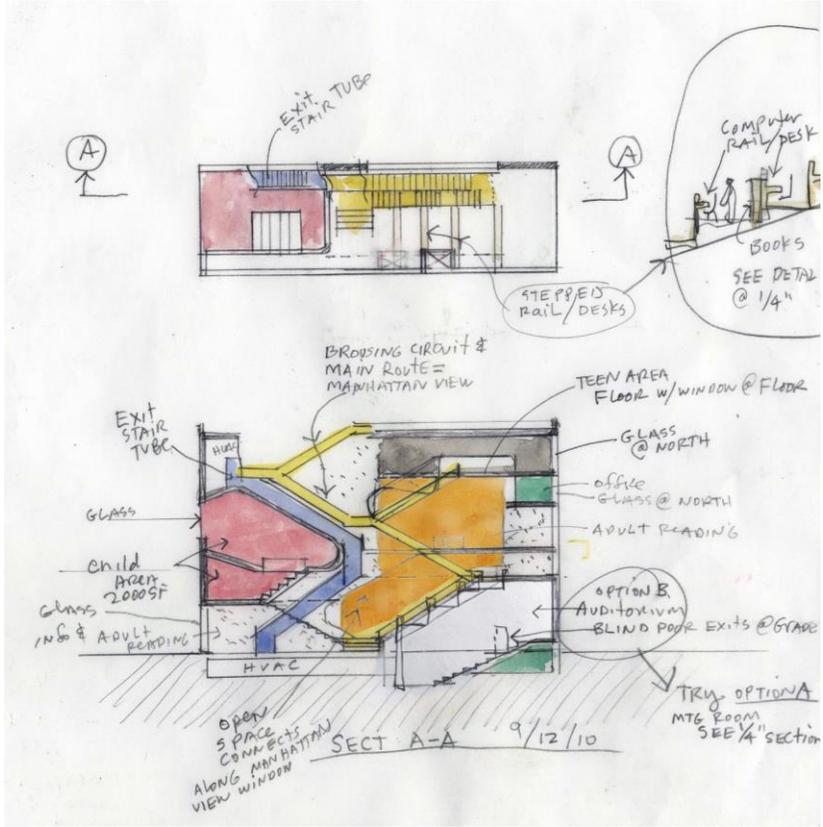
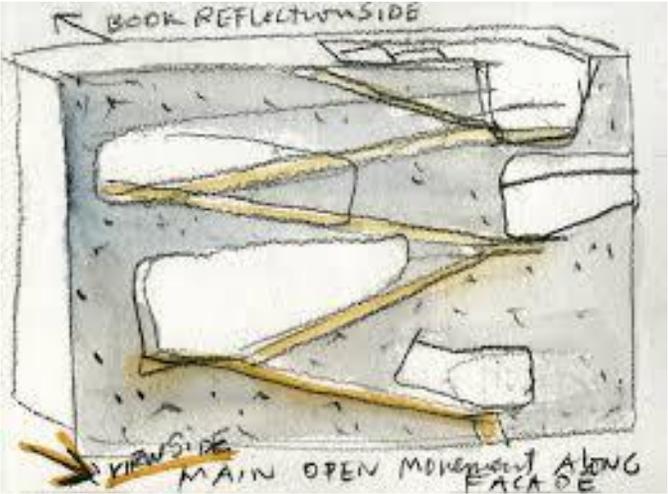
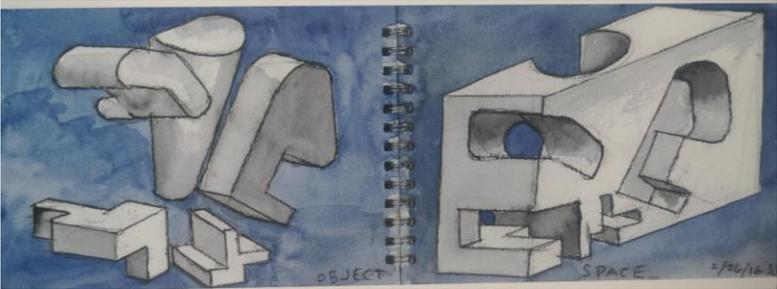
Alvar Aalto

**How can painting be used within  
the architectural design process  
and architectural development?**

# **Main outcomes**

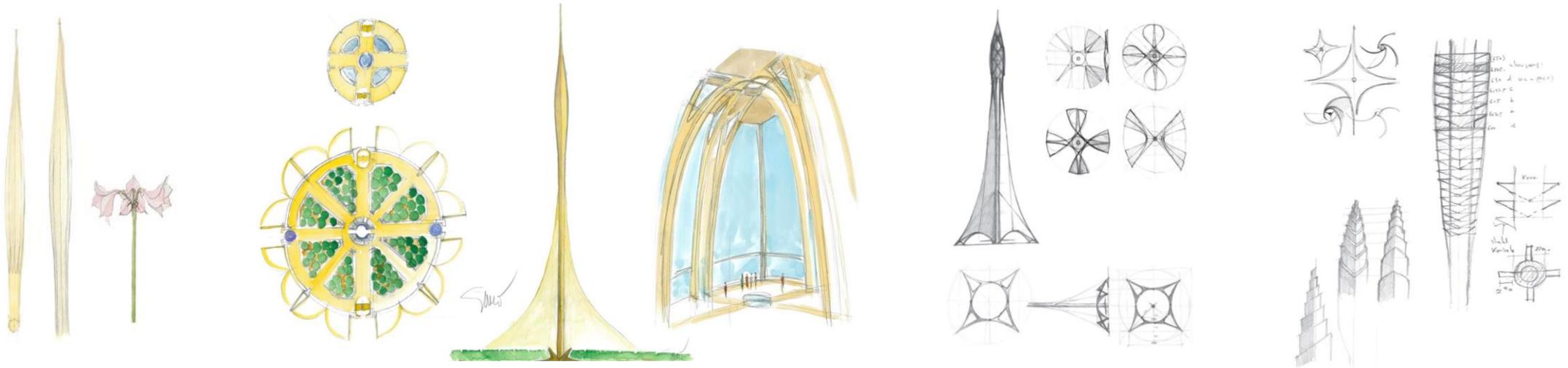
**Inspiration - Translation - Exploration - Analysis**

# Steven Holl



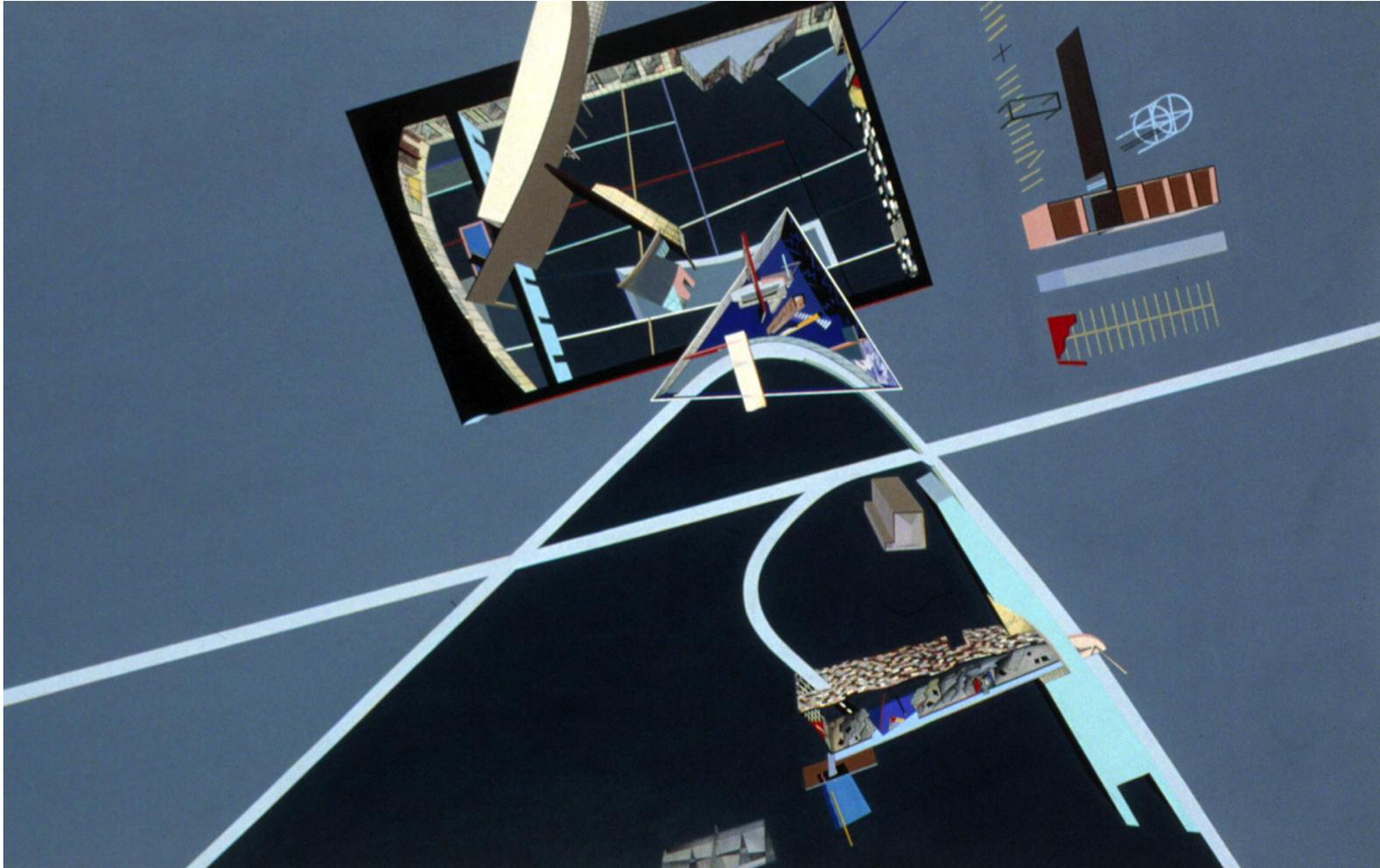
Hunters Point Library

# Santiago Calatrava



Dubai Creek Tower

# Zaha Hadid



Painting for the Irish prime ministers' residence



Painting for the Vitra Fire station

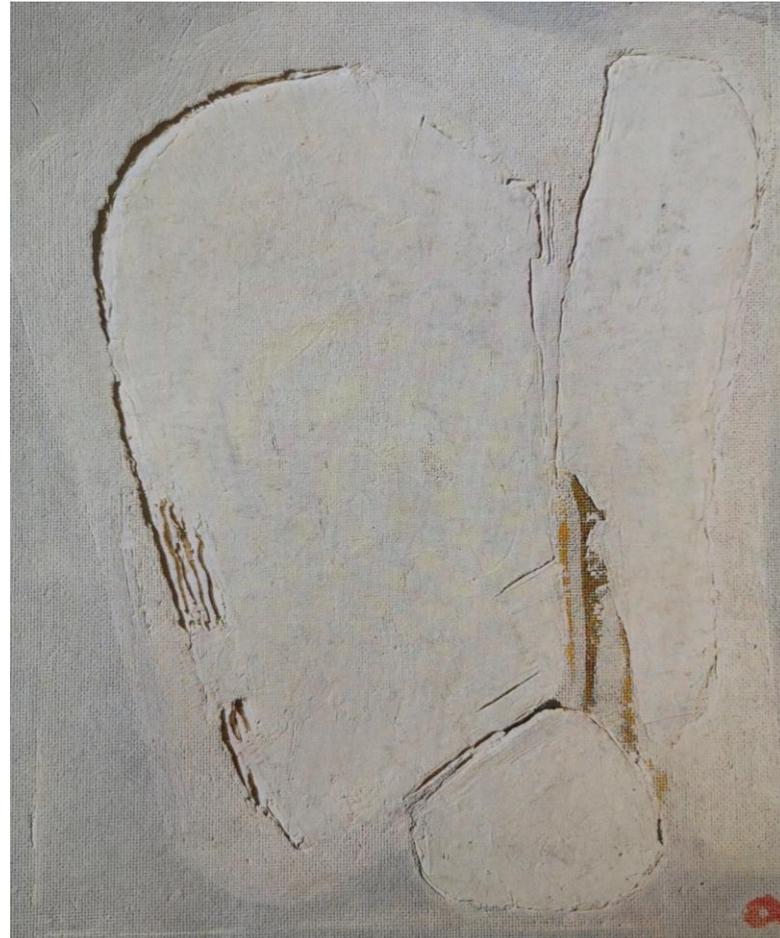


Initial sketch for the Vitra Fire station

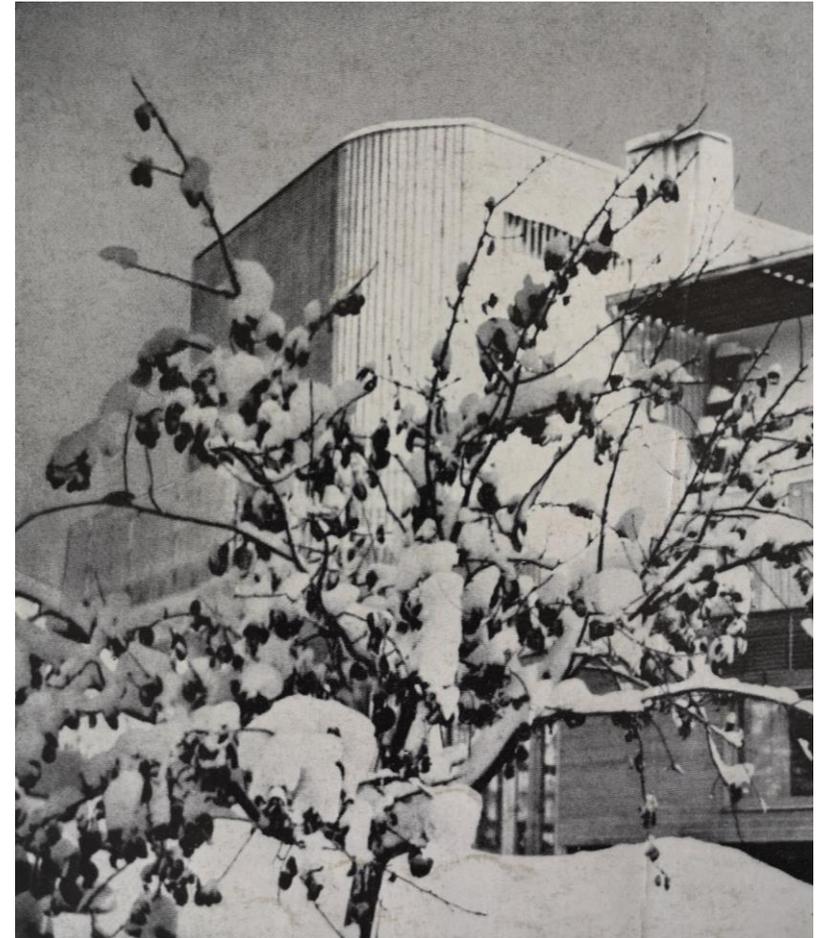
# Alvar Aalto



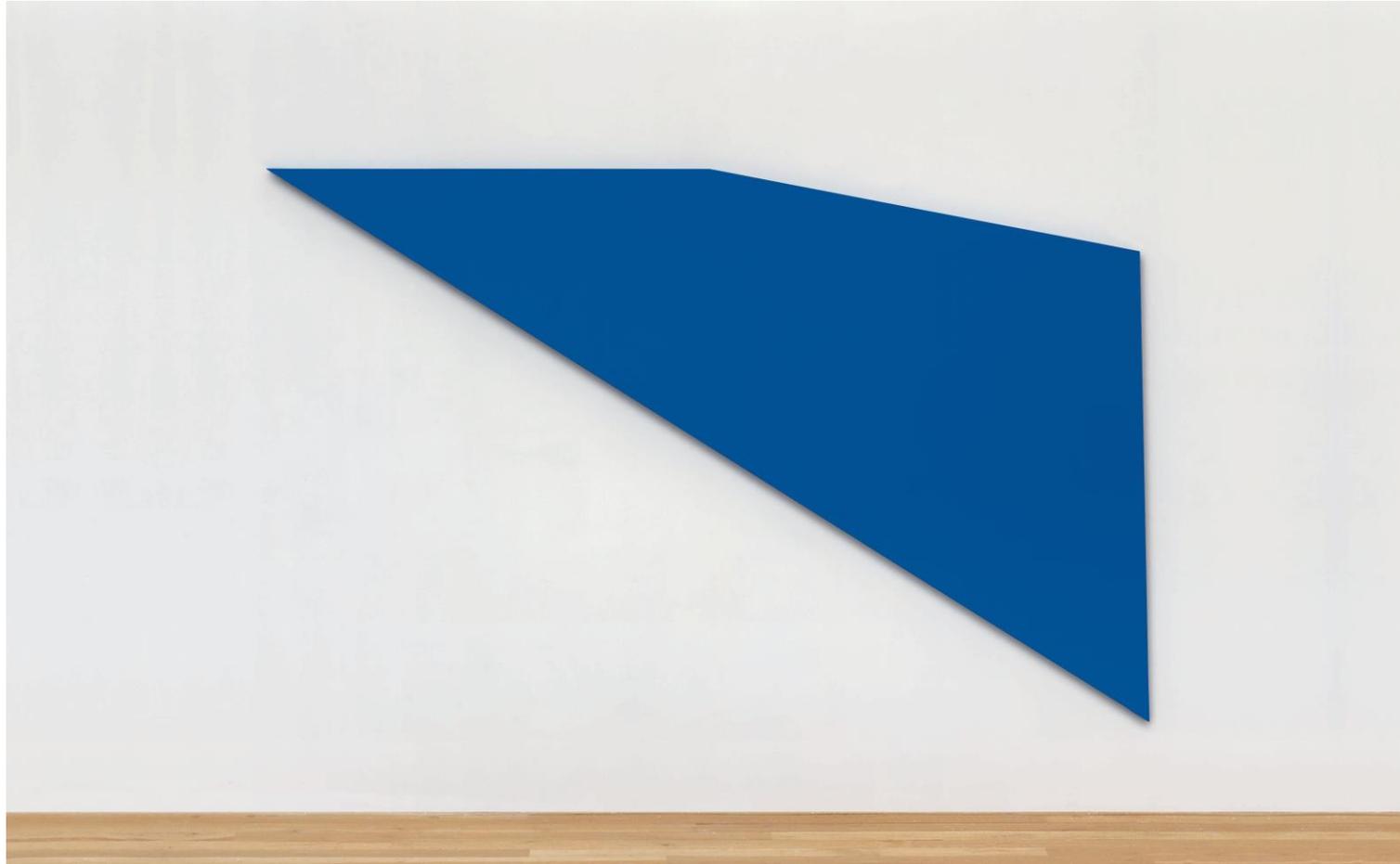
Helsinki Polytechnical University



Aalto Museum



# Abstract artist: Ellsworth Kelly



# Abstraction and formal reduction

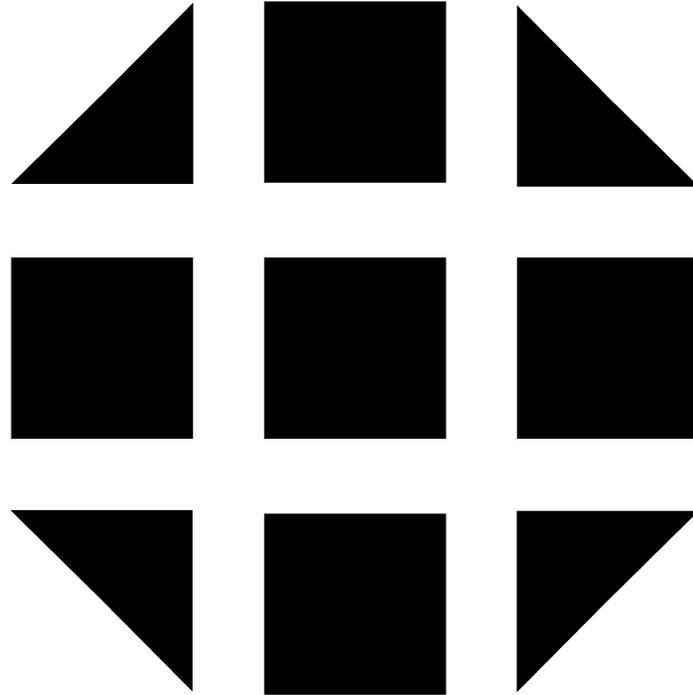
- Do not attempt to represent an accurate depiction of a visual reality
- Stimulate creativity and keep your mind open for further possibilities that can spark a new idea
- 'Translate' and interpret reality



Development of St. Nicholas Church

**Research to design**

- Site that addresses multiple contexts (social, cultural, historical, etc.)
- Paintings should contribute to the understanding of the building as a whole



# **ELBETITSA**

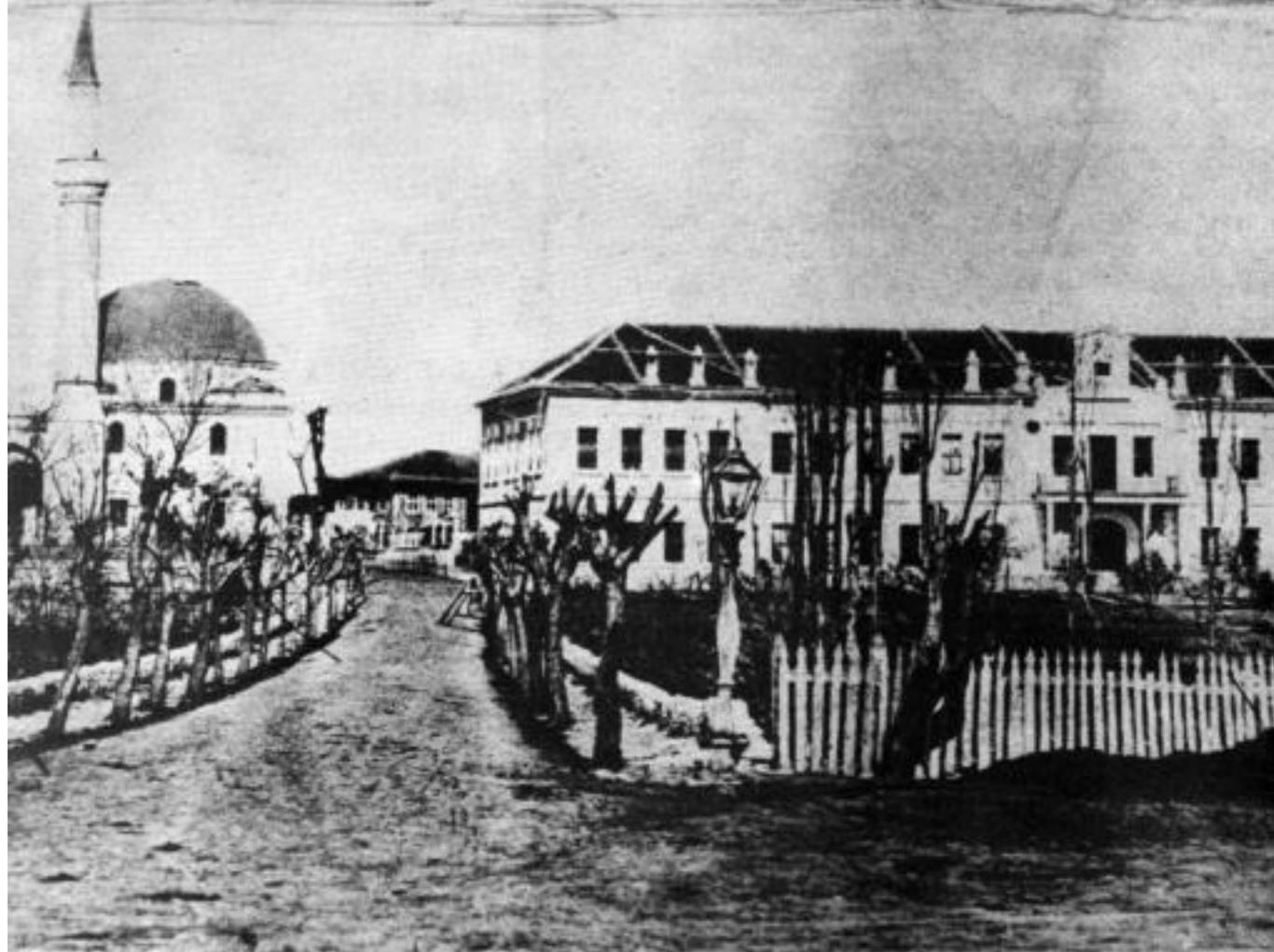
**A MANIFESTO FOR A NEW AGE**

'Rebuilding' the communist's former mausoleum in Bulgaria with an awareness and remembrance of the past and embracing a glowing new future.



# **History of the site**

# Ottoman Empire



# 1880 - 1944



**1949 - 1999**



**1949 - 1999**



**1999**



# 1999 - Today



# Problem statement

- Democracy was a step forward but since 1989, Bulgaria didn't make any other steps forward.
- Our society is deeply divided on topics affecting our recent past.
- There is no official state position to interpret the events and put them in some context.

All of this is reflected on this location of the former mausoleum. The location has become a symbol of this past. The 'emptiness' of the site is the proof for this.

**“We should remember the past because the less memory we have, the more the past comes.”**

**Georgi Gospodinov**

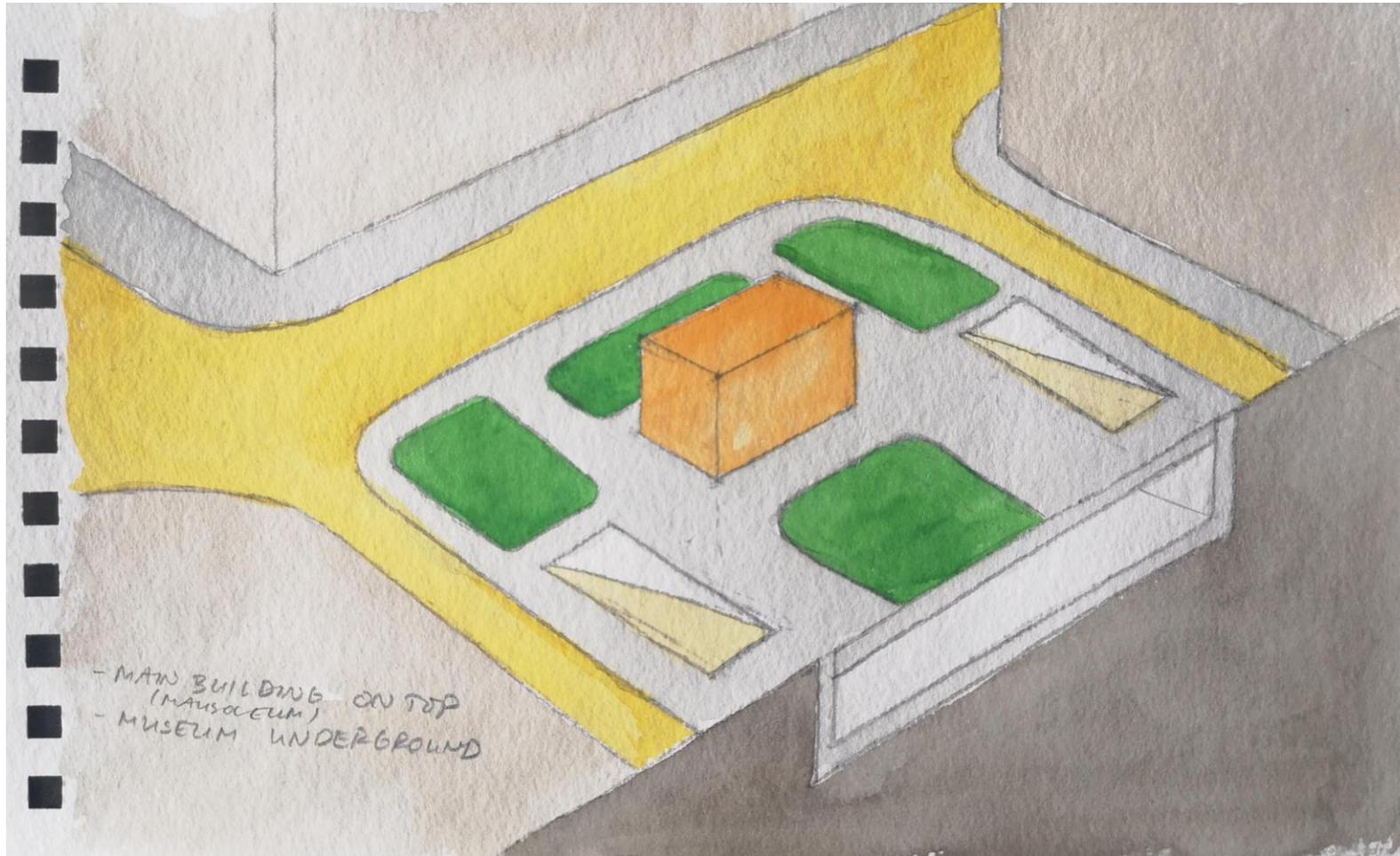
# Project vision

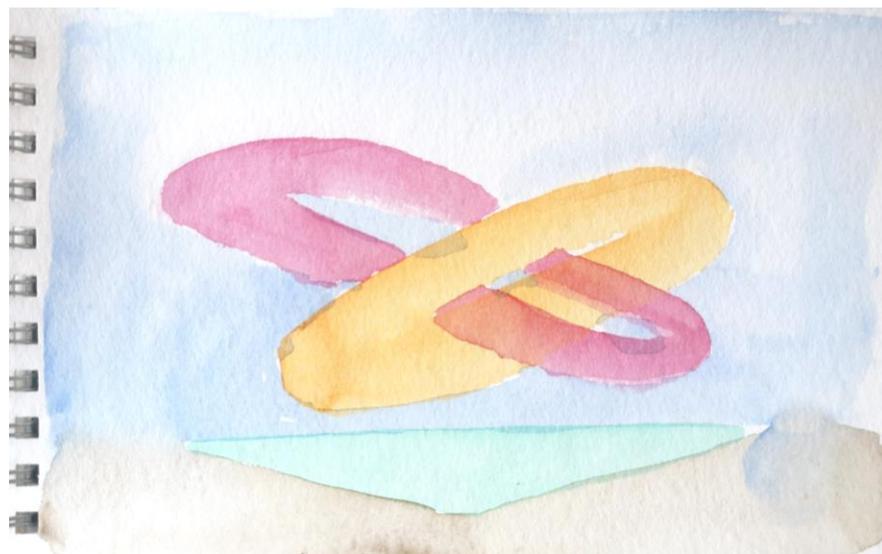
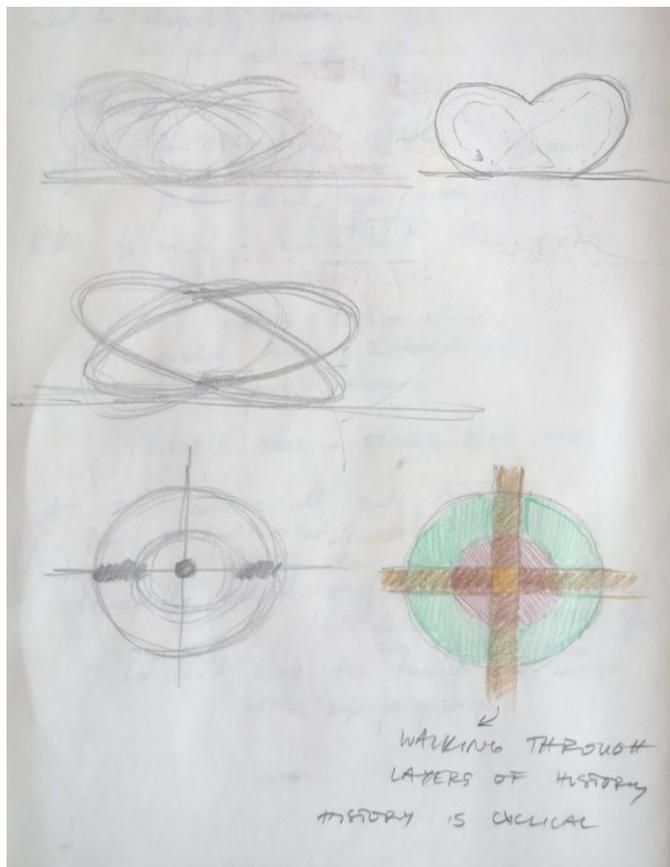
- Upbuild on top of the past, not neglect it.
- Address the events of the past with an awareness and remembrance
- Create a project that stimulates constructive discussion
- Embracing a glowing new future
  
- Focus on the social, historical, and cultural contexts

**Inspiration - Translation - Exploration - Analysis**

**Inspiration**

# Design vision



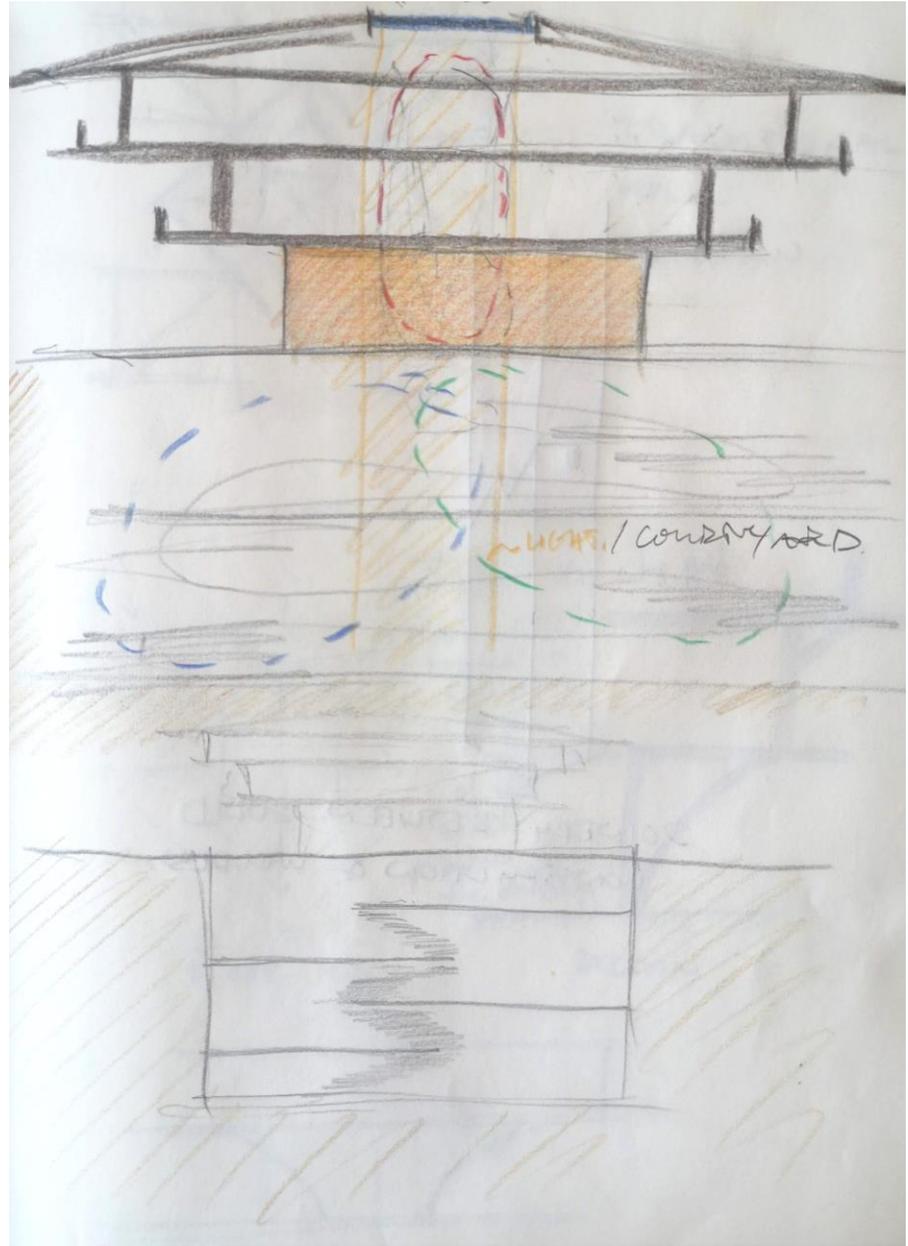




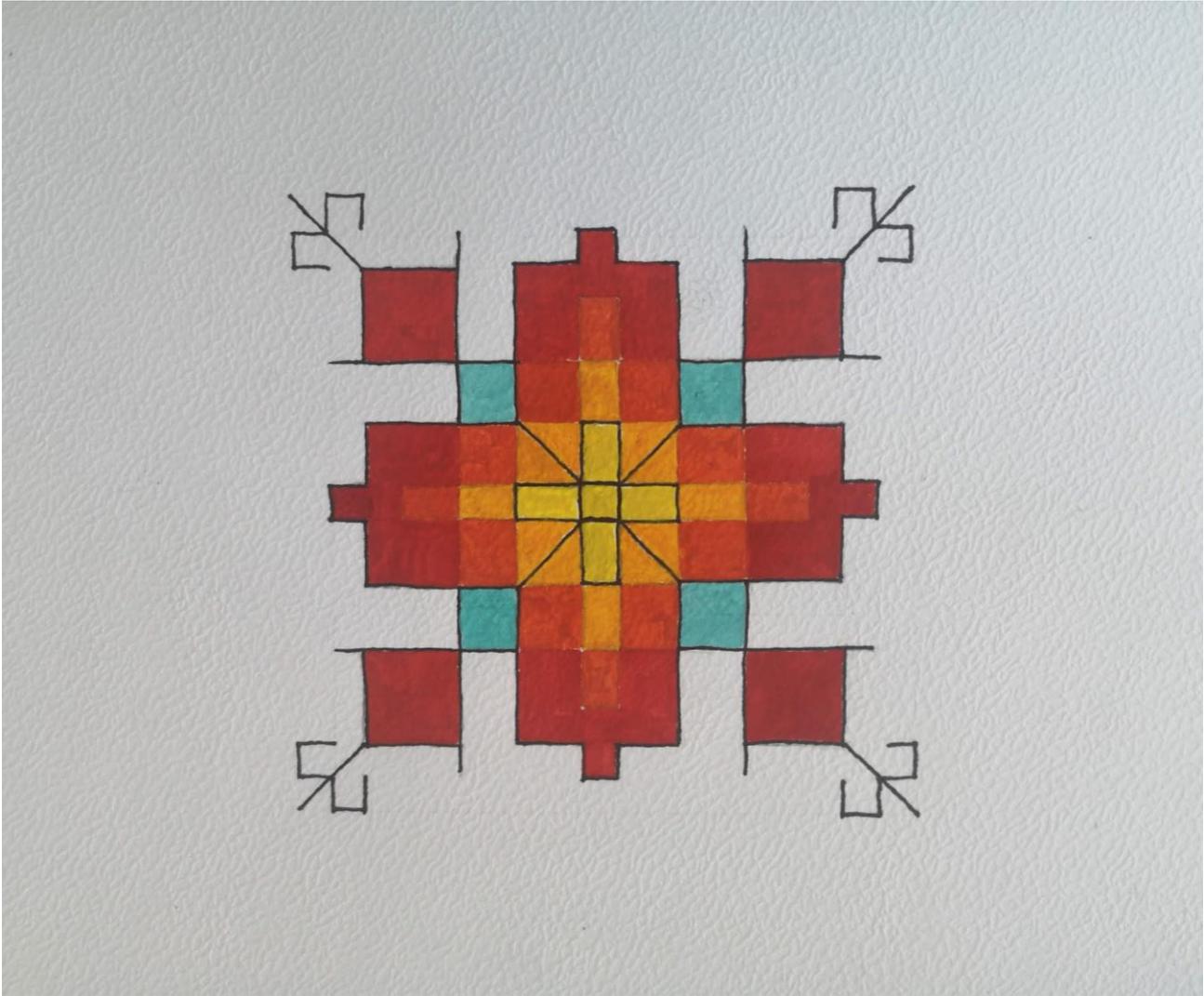
**The goal became to bring back the Bulgarian identity in  
a modern, contemporary way**



**How everything comes together**



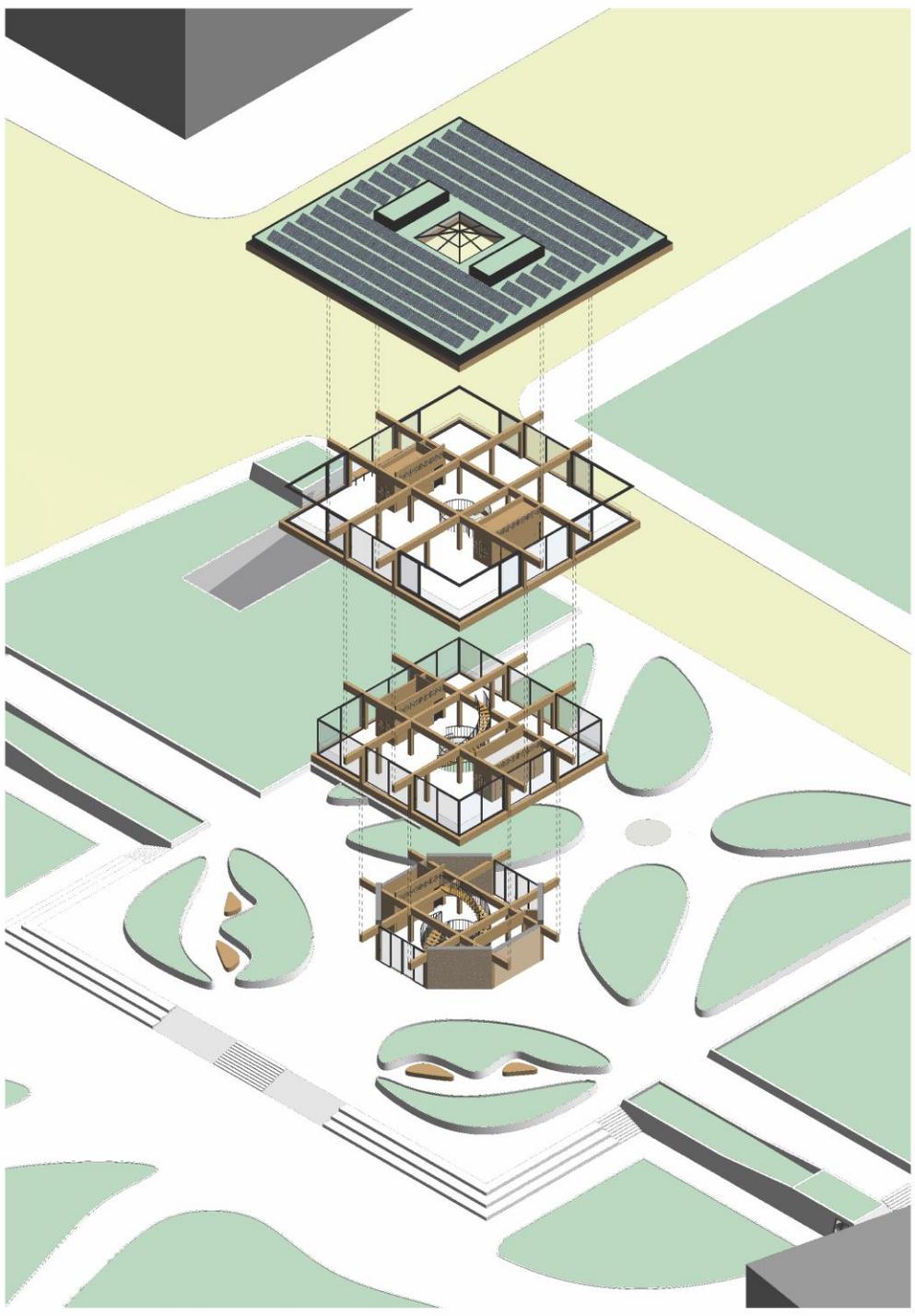




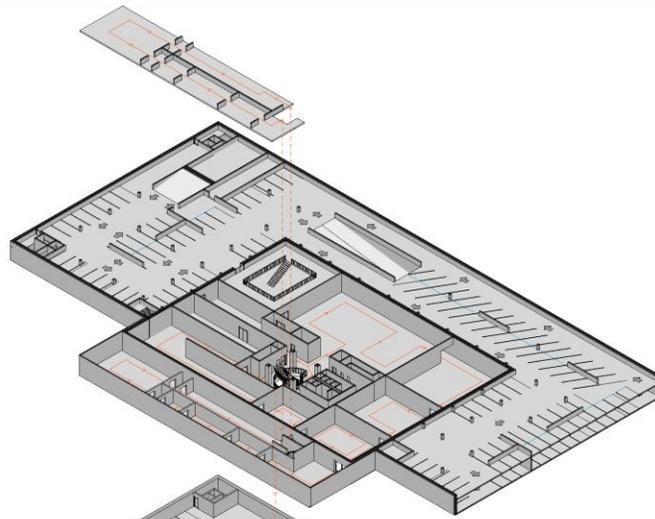
# **Translation to architecture**



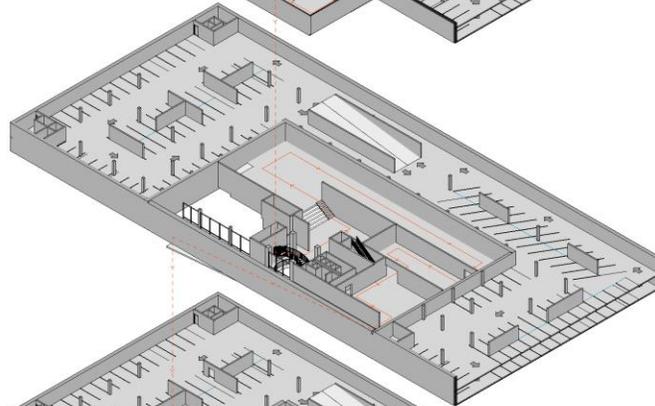




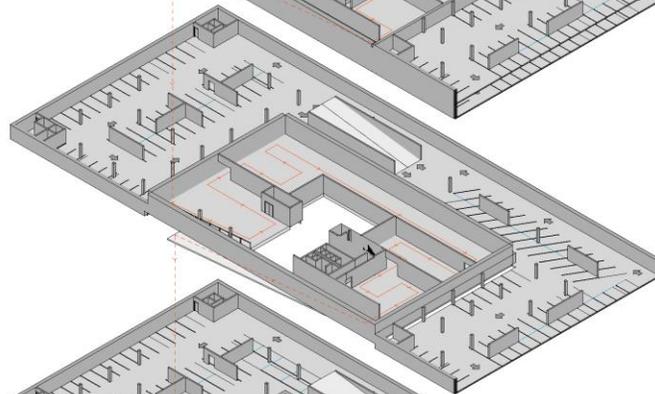
Level -0.5



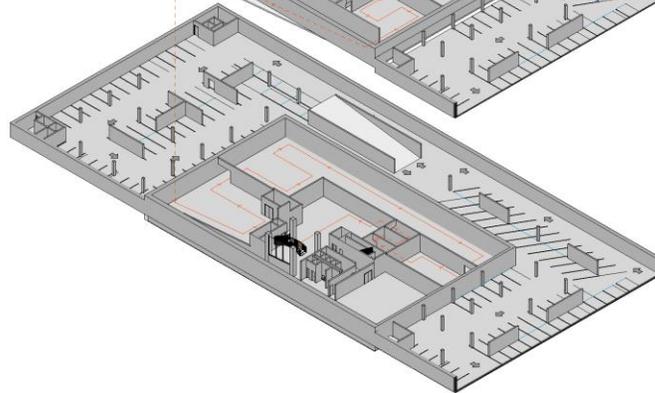
Level -1



Level -2 and -1.5

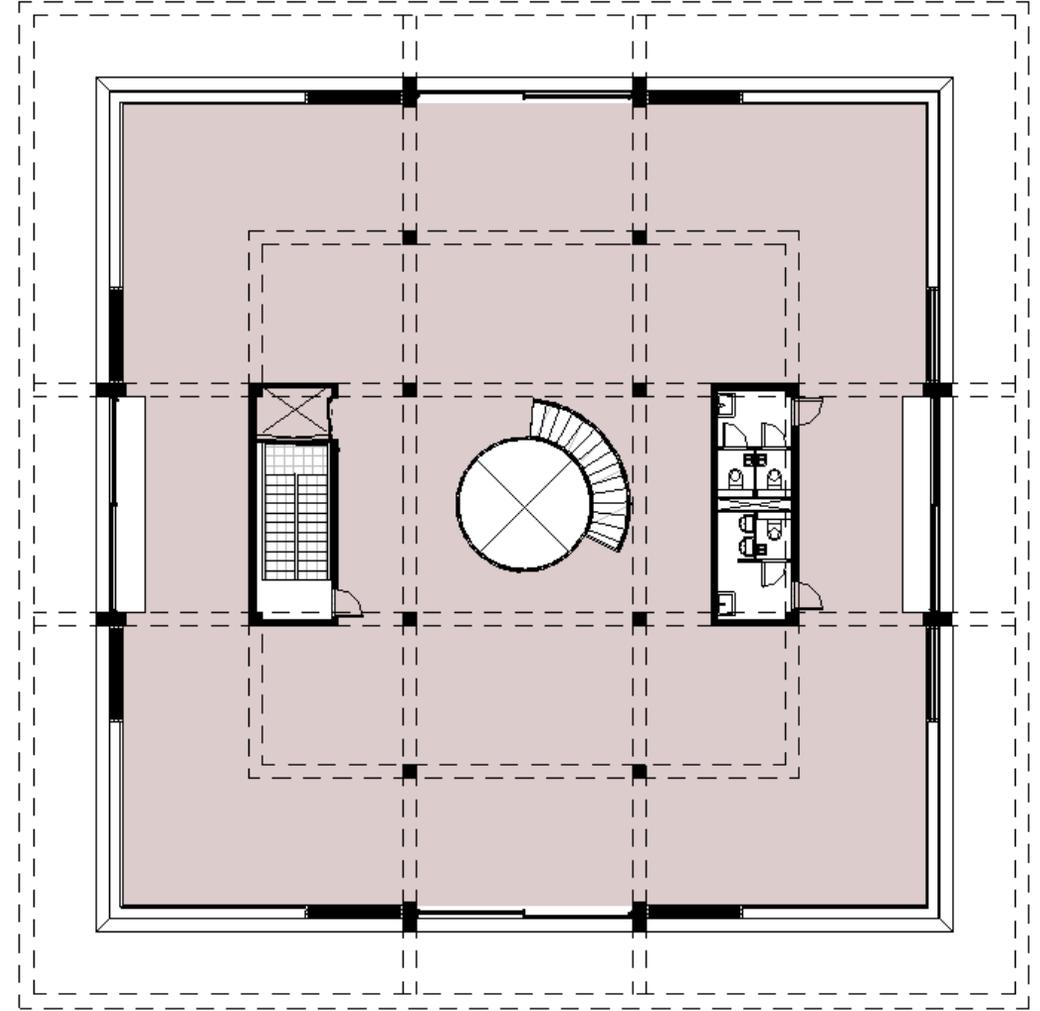
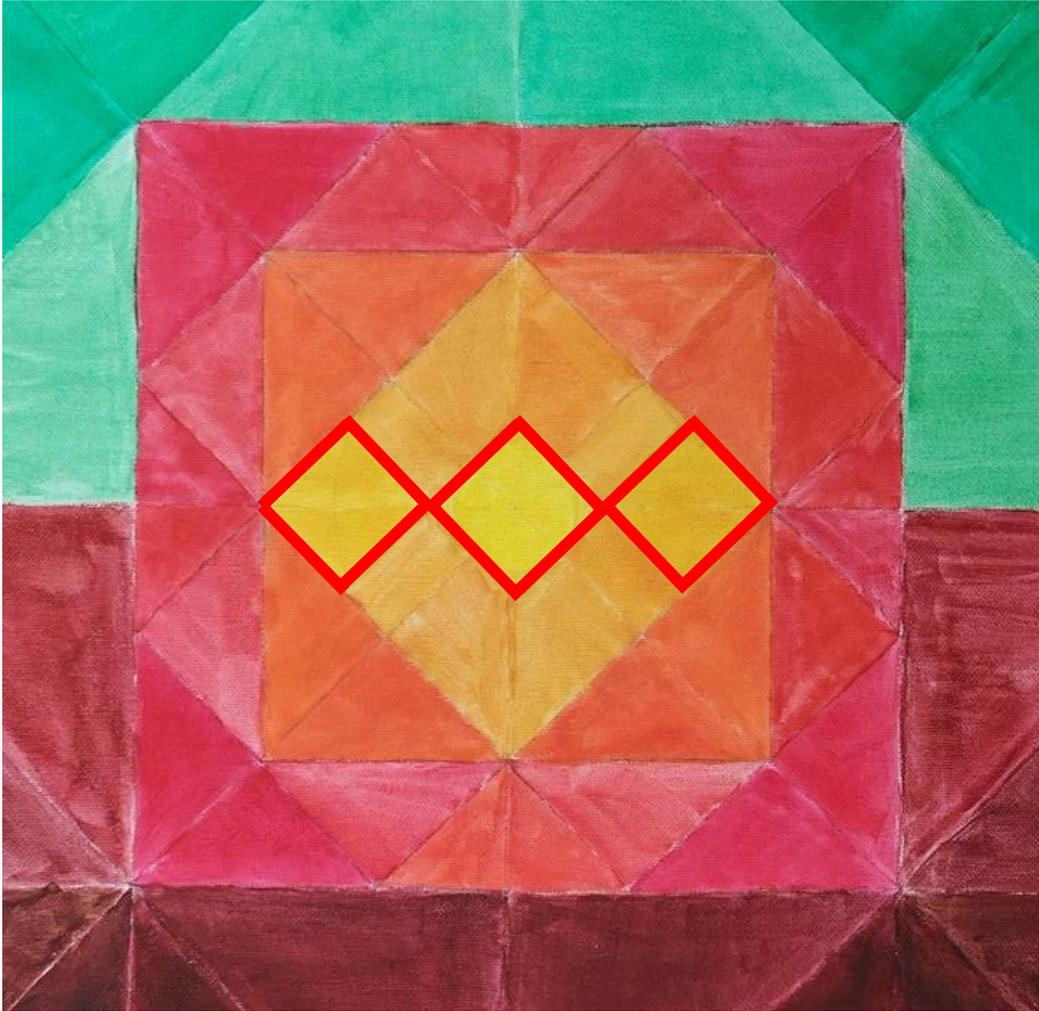


Level -2.5

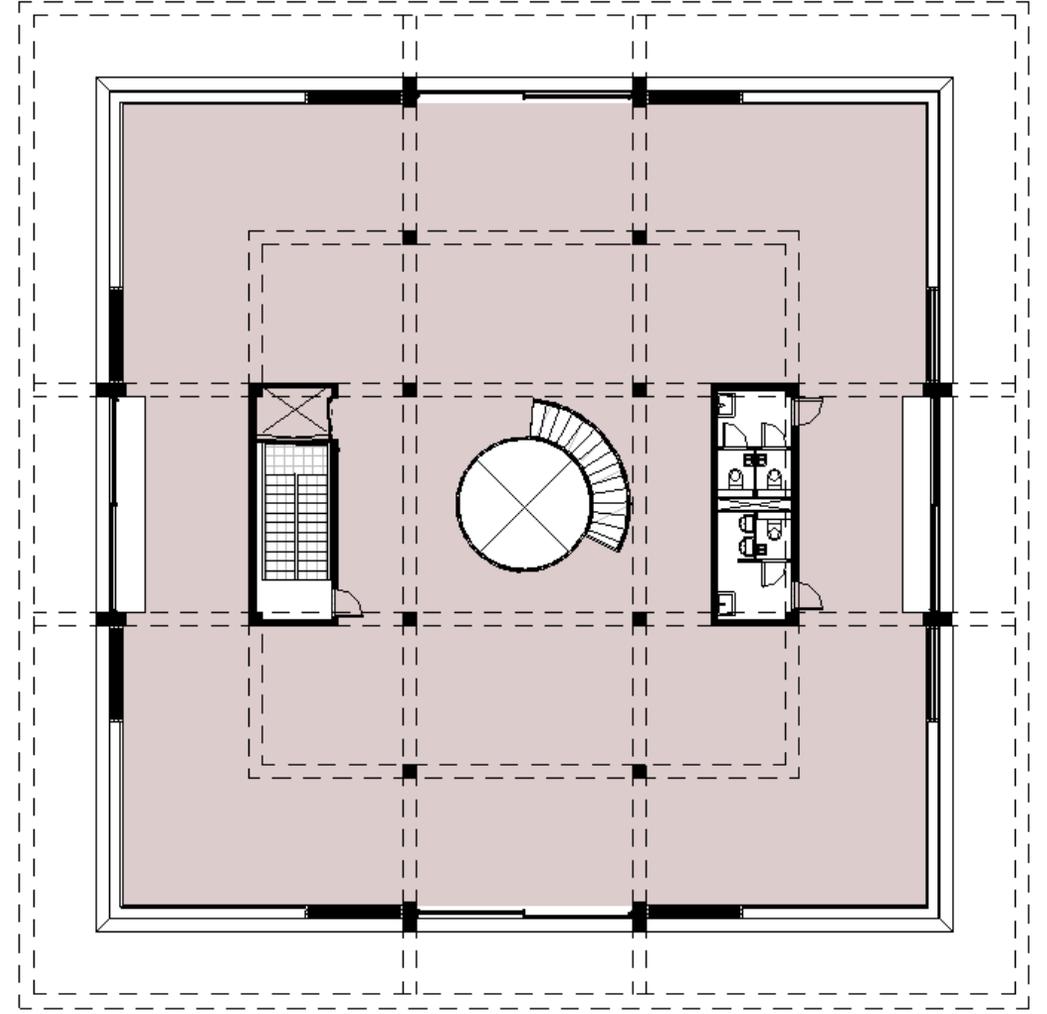
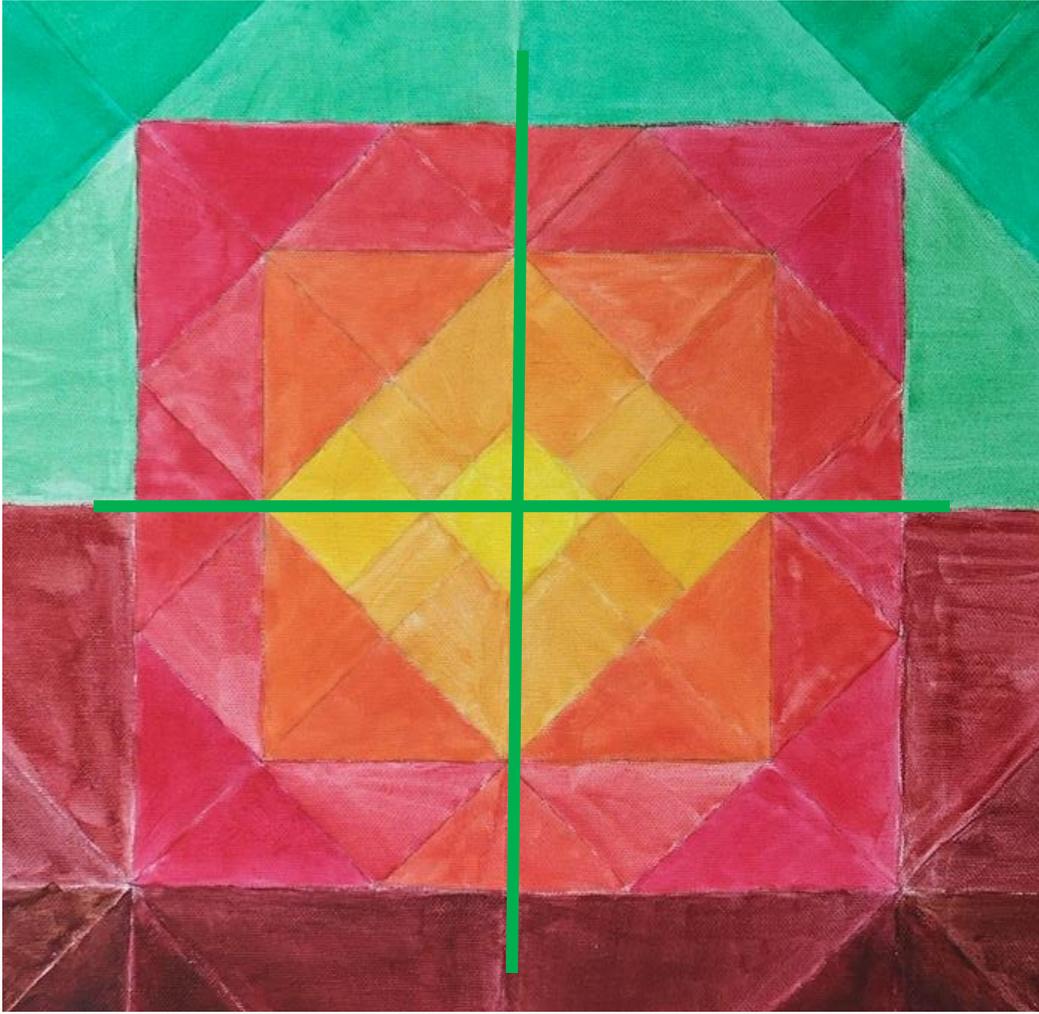


Level -3

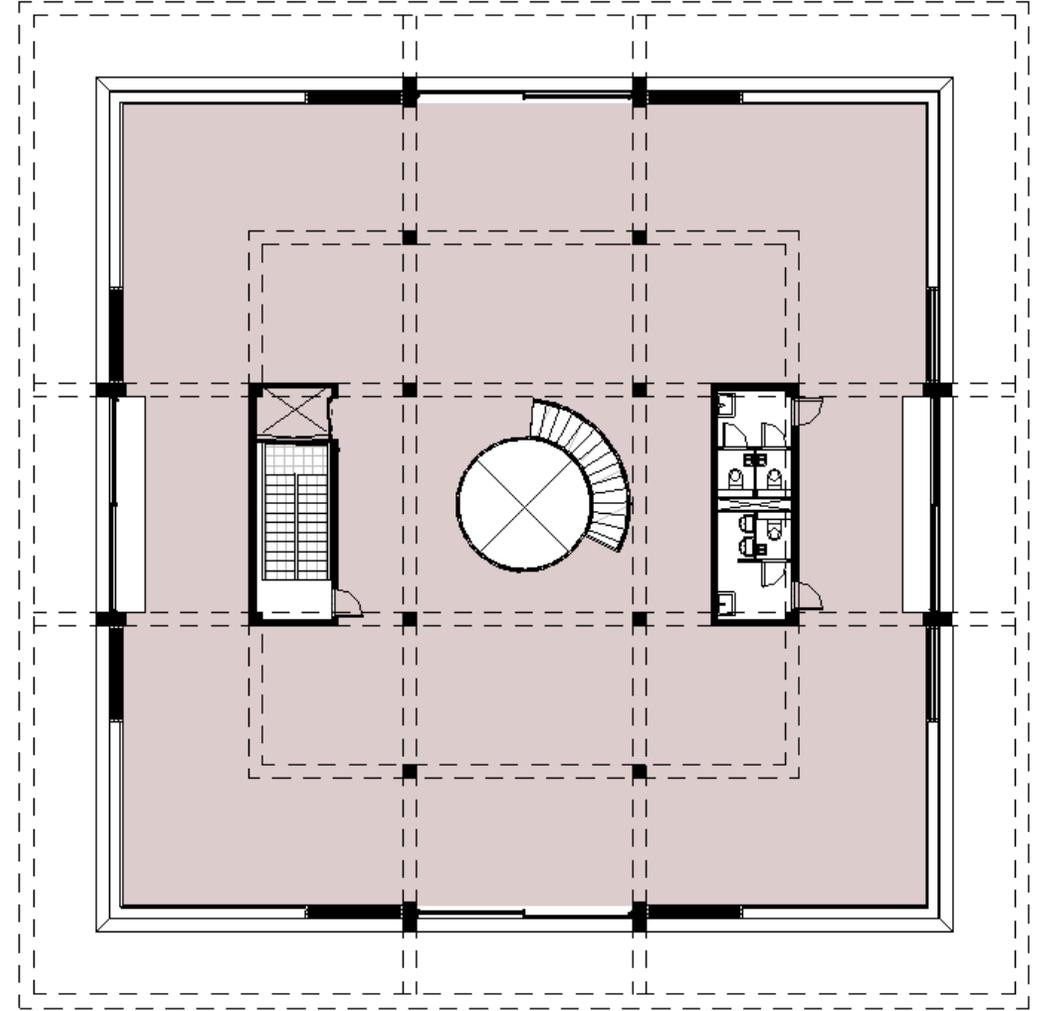




Level 2



Level 2



Level 2







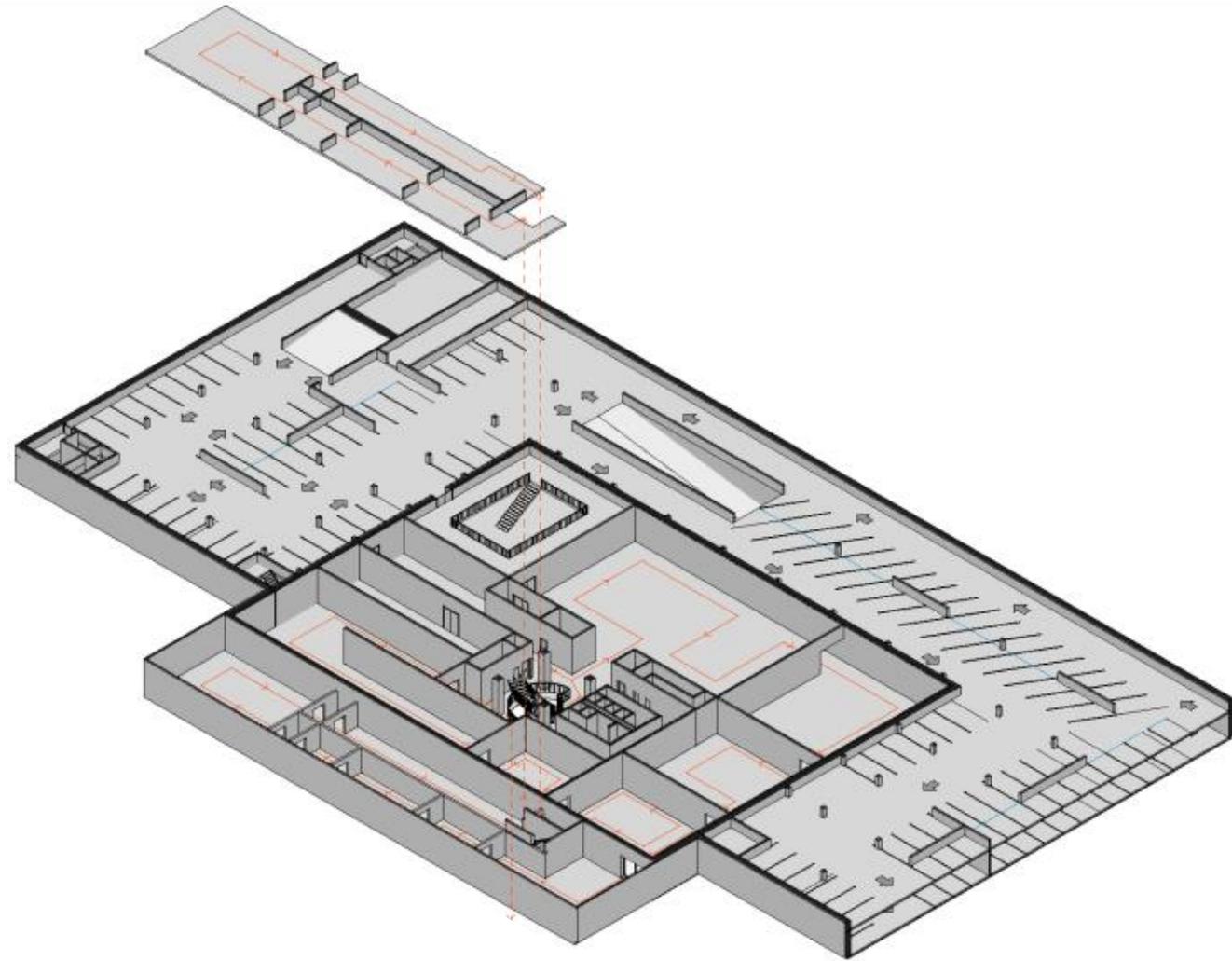




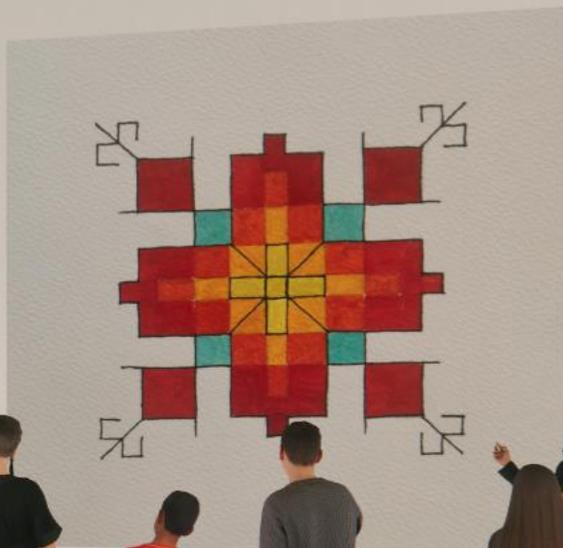


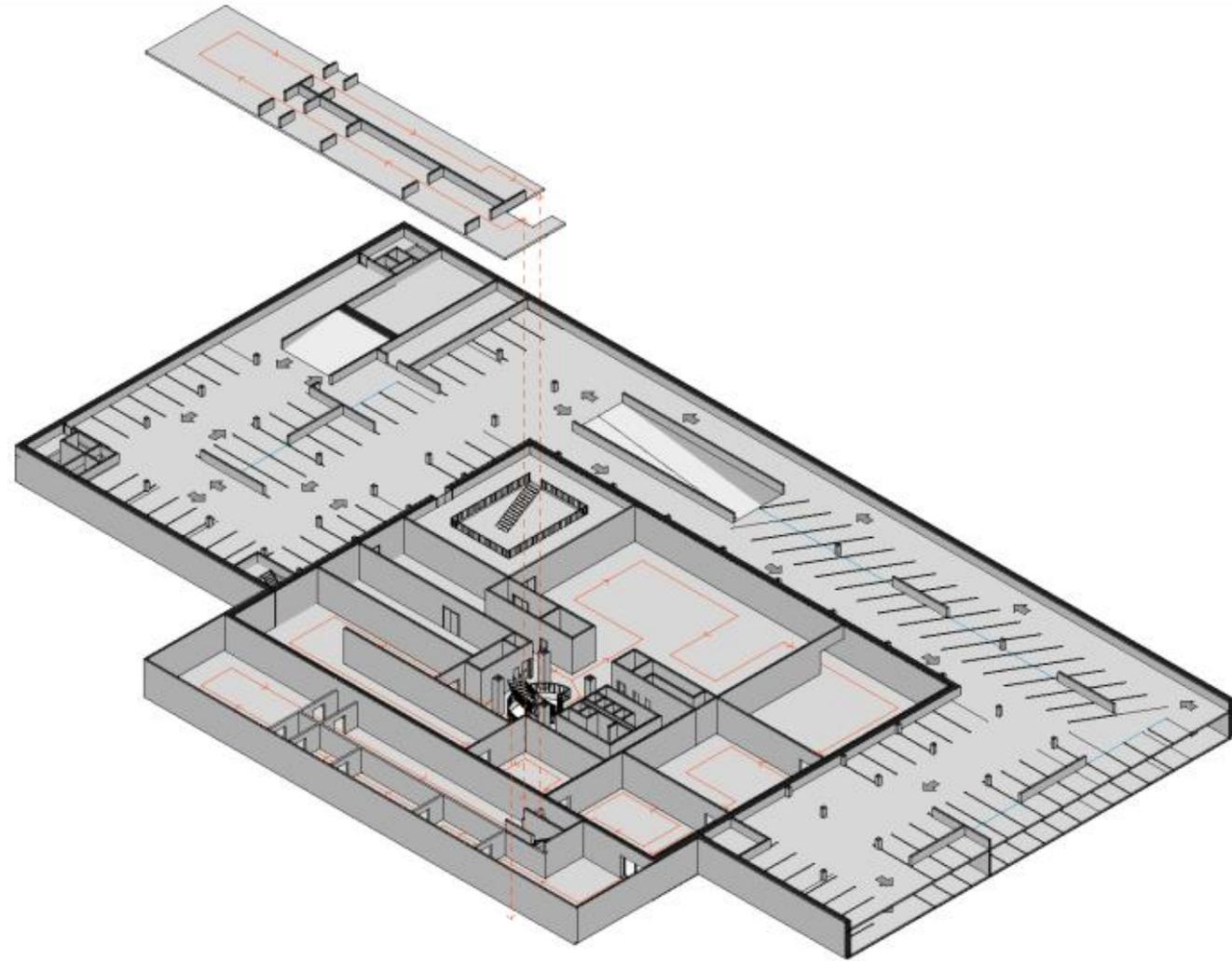


# **Underground museum**











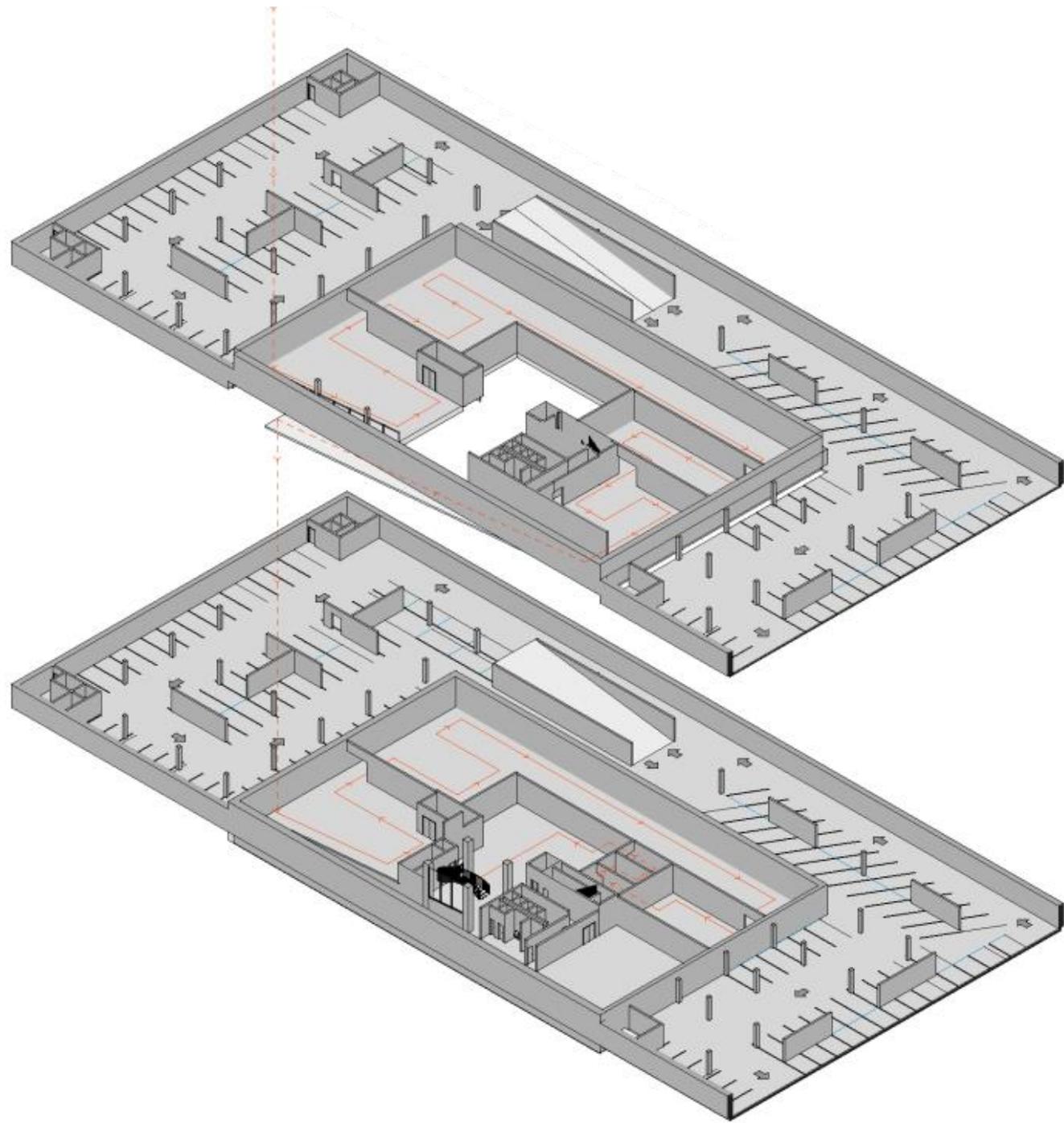




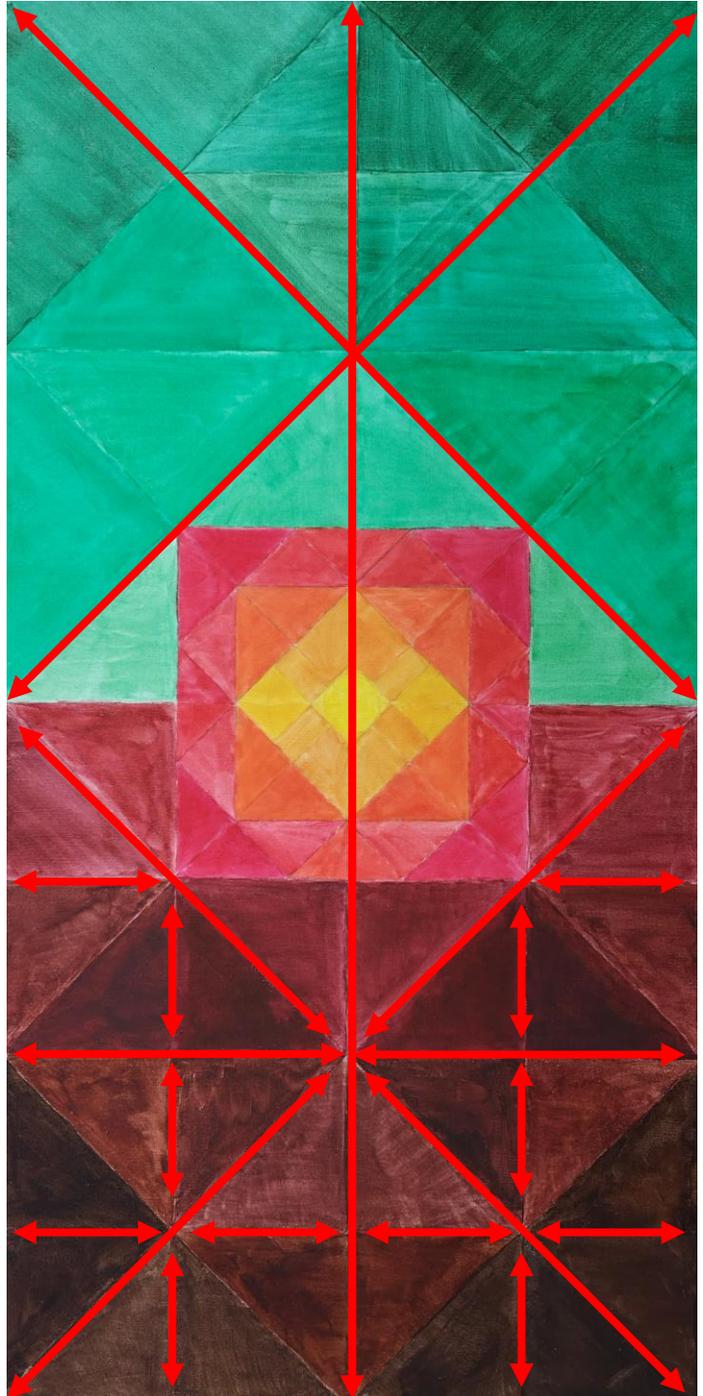
Lana Sator '18

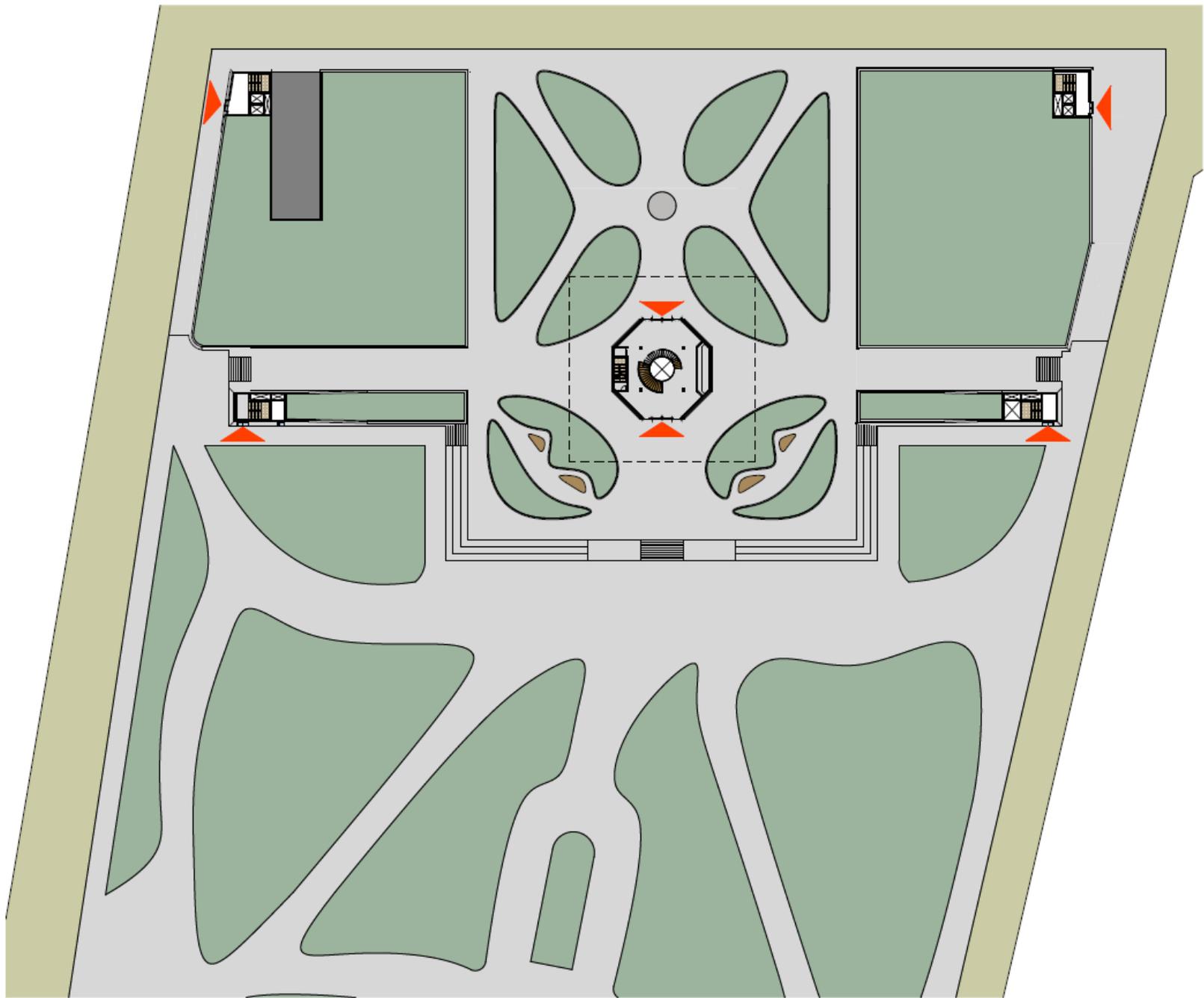


Lana Sator '18











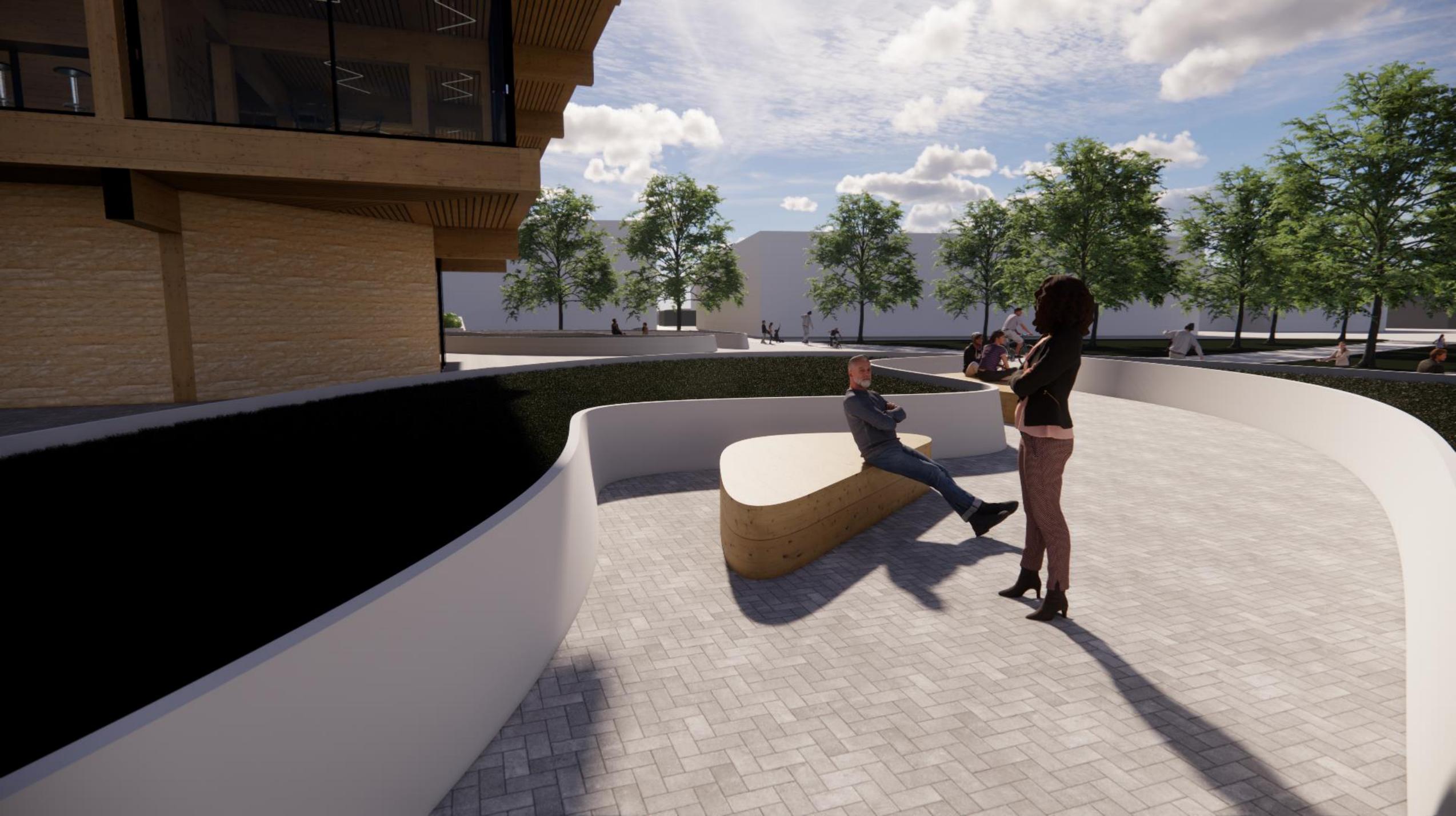
**1880 - 1944**

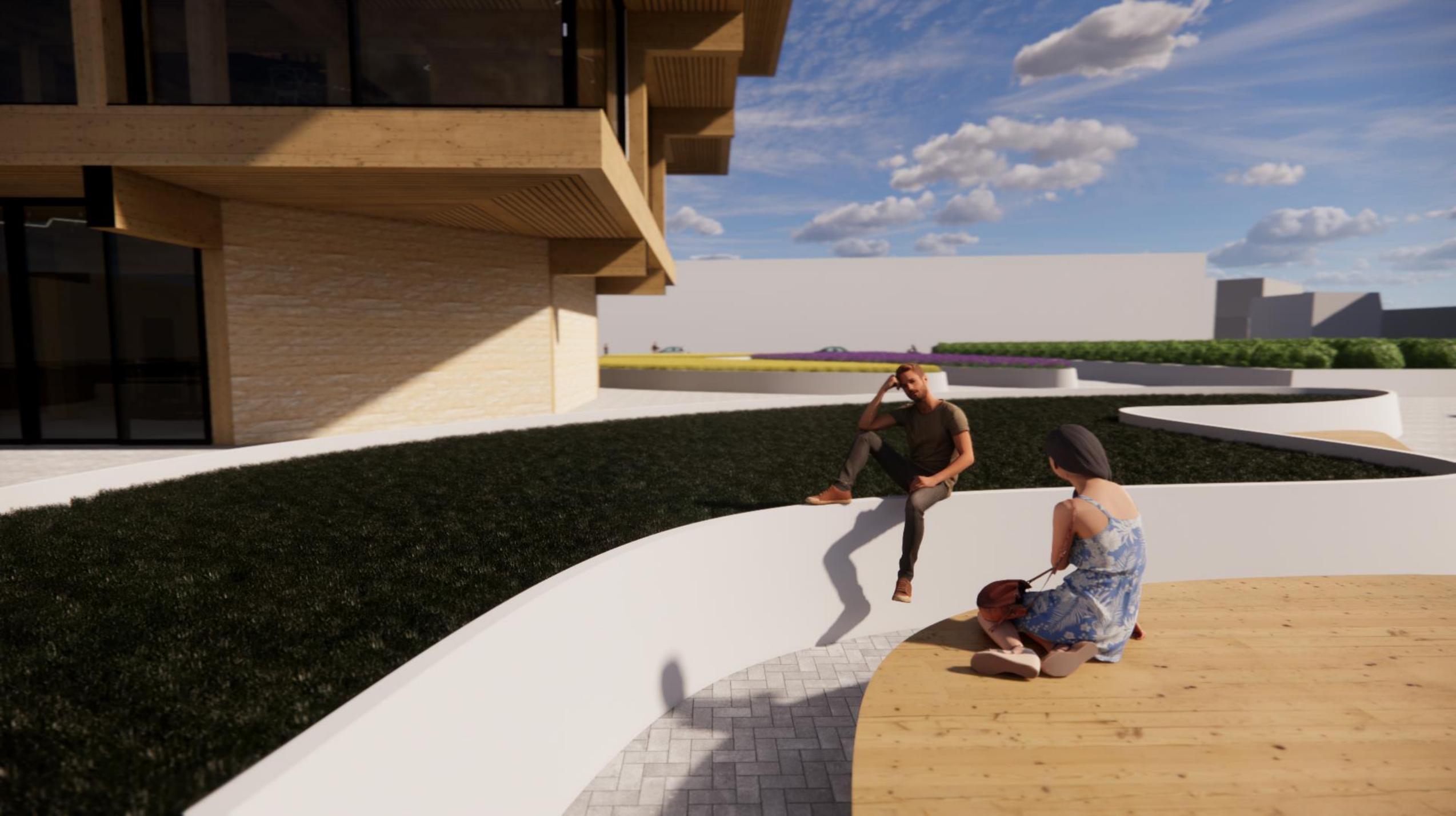












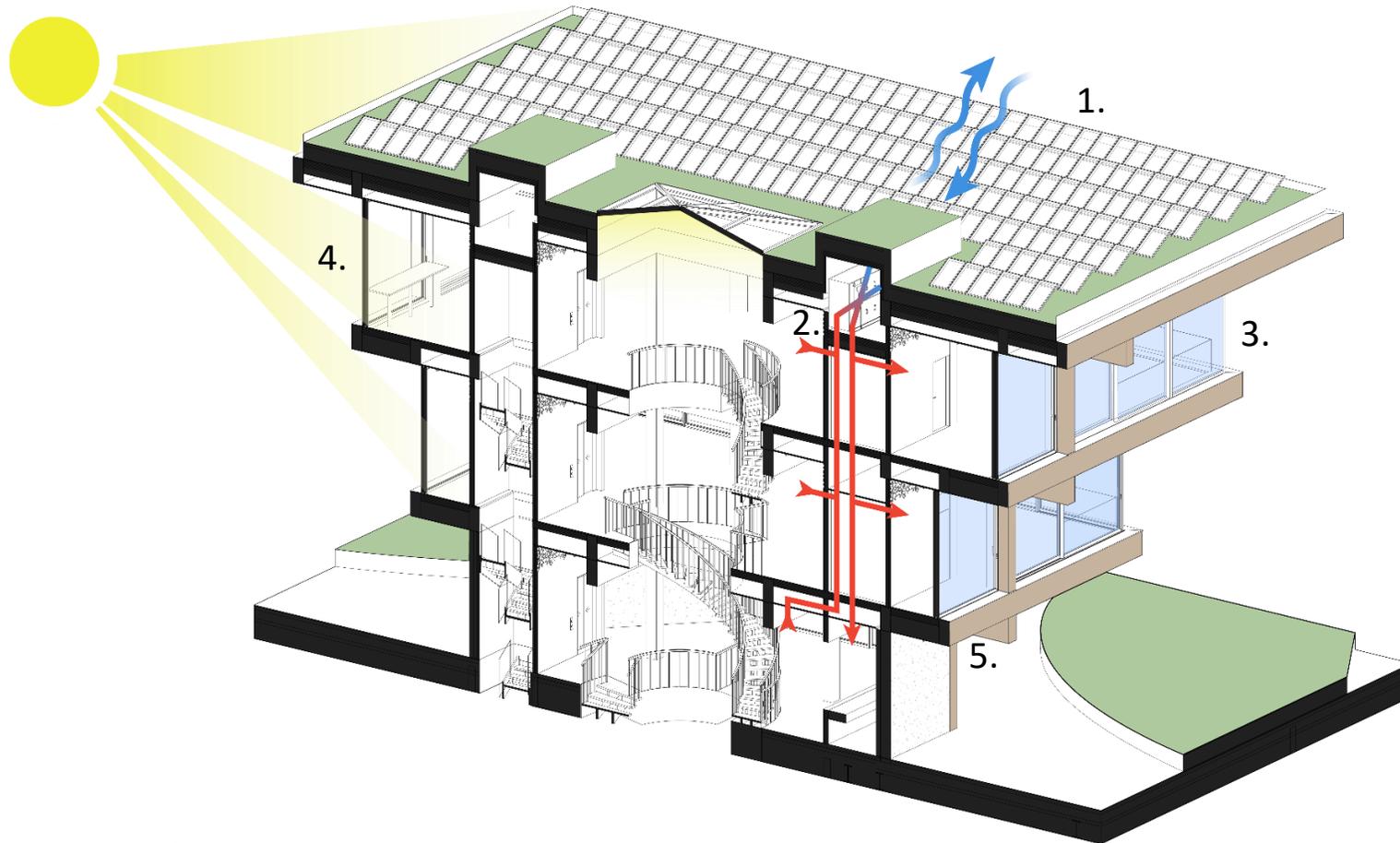


# **Technical realization and materialization**

**Sustainability**

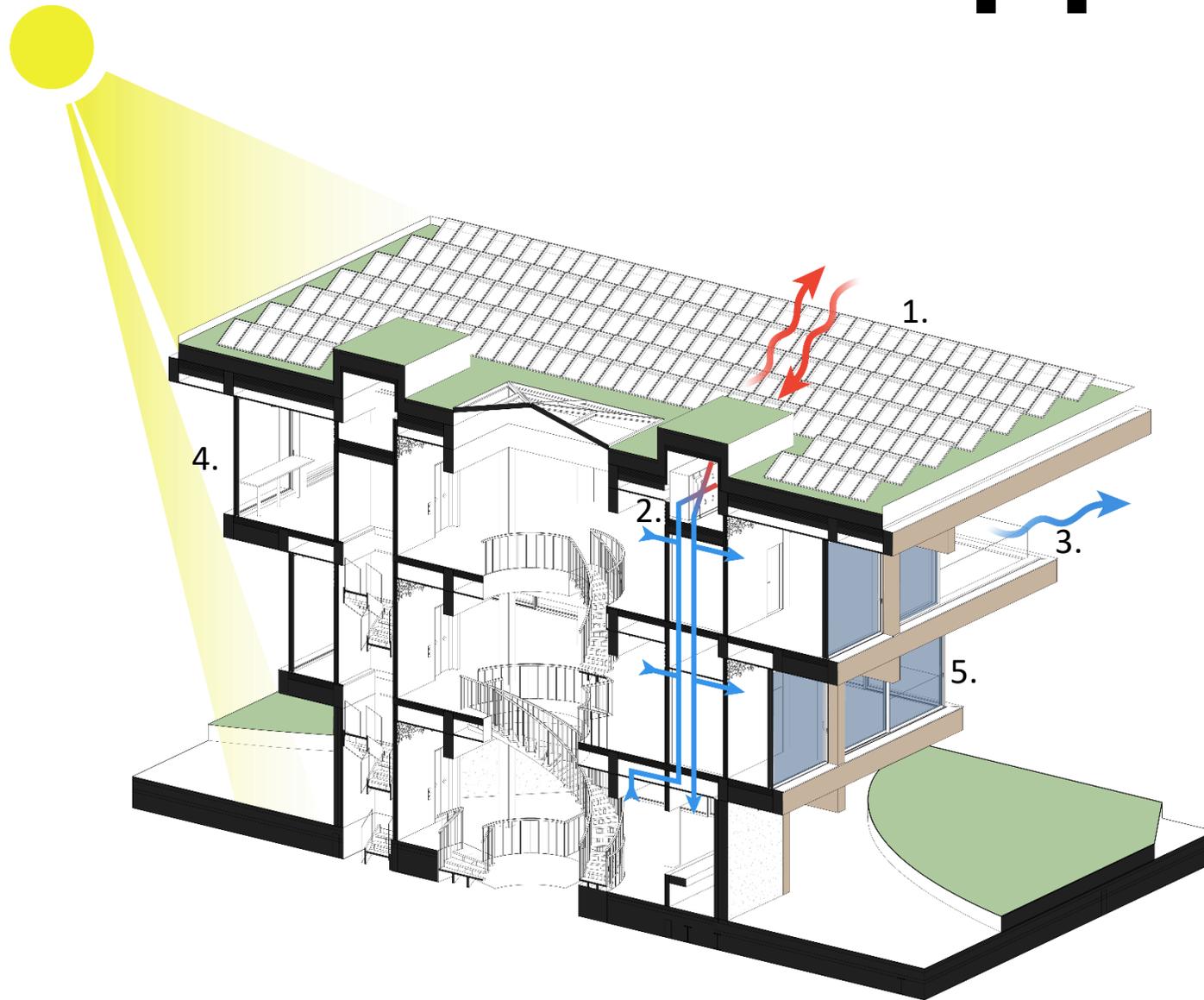
**Goal: as minimal mechanical services as possible and  
make them integrated**

# Winter - top part



1. PV panels – produce energy for the whole building
2. MVHR with air-to-air heat pump for heating
3. High-performance glazing  
 $U_g=0.53 \text{ W/m}^2\text{K}$   
 $g=0.42$
4. Maximize daylight and solar gains
5. Wooden structure

# Summer – top part



1. PV panels – produce energy for the whole building
2. MVHR with air-to-air heat pump for cooling (with bypass)
3. Additional night ventilation for cooling
4. Structure provides shading and minimizes solar loads
5. Dynamic glazing with liquid crystal technology

Specific building characteristics with reference to the treated floor area						
				Criteria	Alternative criteria	Fullfilled? <sup>2</sup>
	Treated floor area m <sup>2</sup>	850.00				
Space heating	Heating demand kWh/(m <sup>2</sup> a)	13	≤	15	-	yes
	Heating load W/m <sup>2</sup>	16	≤	-	10	
Space cooling	Cooling & dehum. demand kWh/(m <sup>2</sup> a)	5	≤	25	25	yes
	Cooling load W/m <sup>2</sup>	7	≤	-	11	
	Frequency of overheating (> 25 °C) %	-	≤	-	-	
	Frequency of excessively high humidity (> 12 g/kg) %	0	≤	10	-	
Airtightness	Pressurization test result n <sub>50</sub> 1/h	1	≤	0.6	-	yes
Non-renewable Primary Energy (PE)	PE demand kWh/(m <sup>2</sup> a)	98	≤	-	-	-
Primary Energy Renewable (PER)	PER demand kWh/(m <sup>2</sup> a)	43	≤	30	43	yes
	Generation of renewable energy (in relation to projected building footprint area) kWh/(m <sup>2</sup> a)	211	≥	120	135	

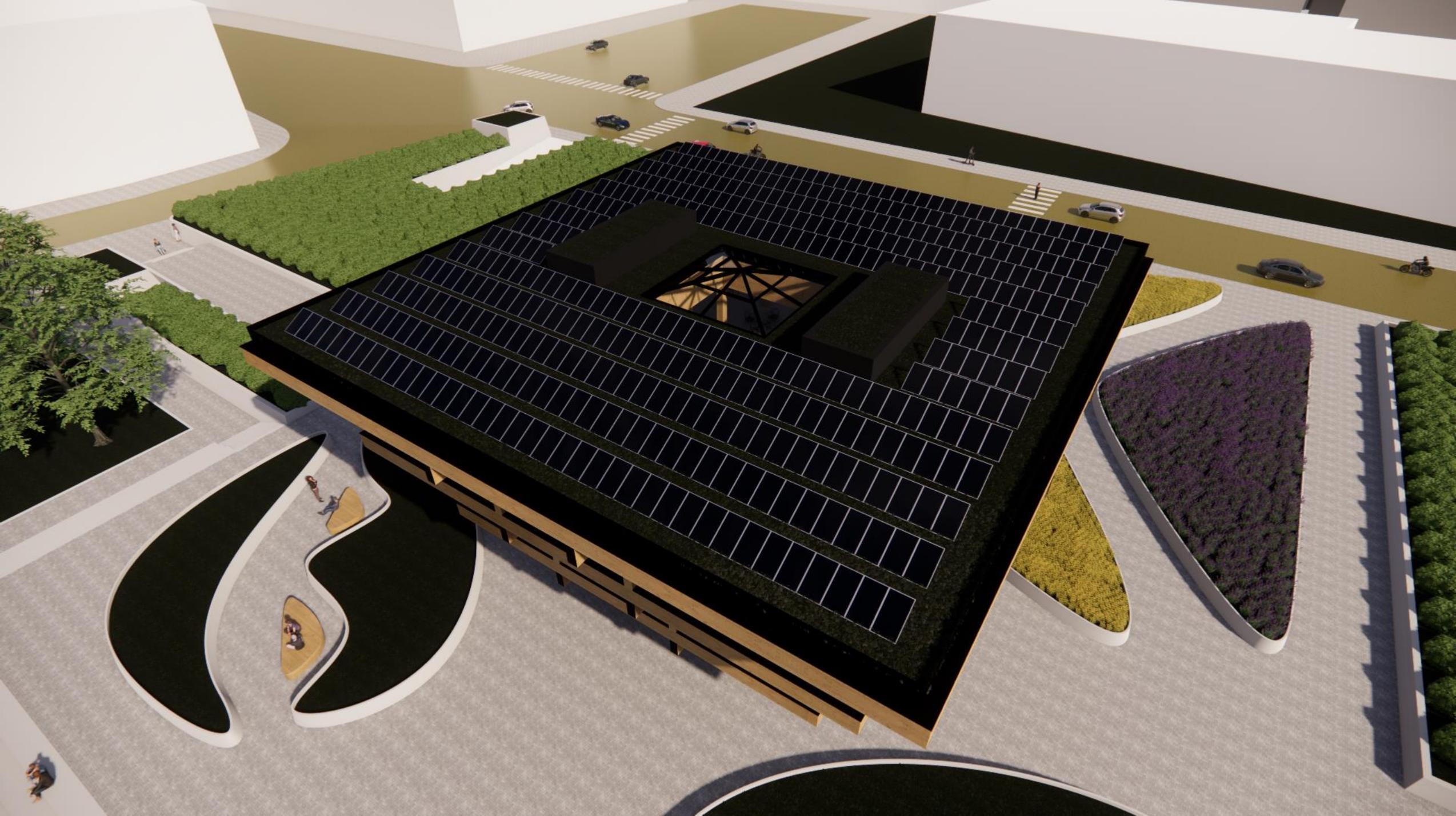
<sup>2</sup> Empty field: Data missing; '-': No requirement

I confirm that the values given herein have been determined following the PHPP methodology and based on the characteristic values of the building. The PHPP calculations are attached to this verification.

**Passive House Premium?** yes

Task:  First name: Anton Surname: Dobrevski Signature: \_\_\_\_\_

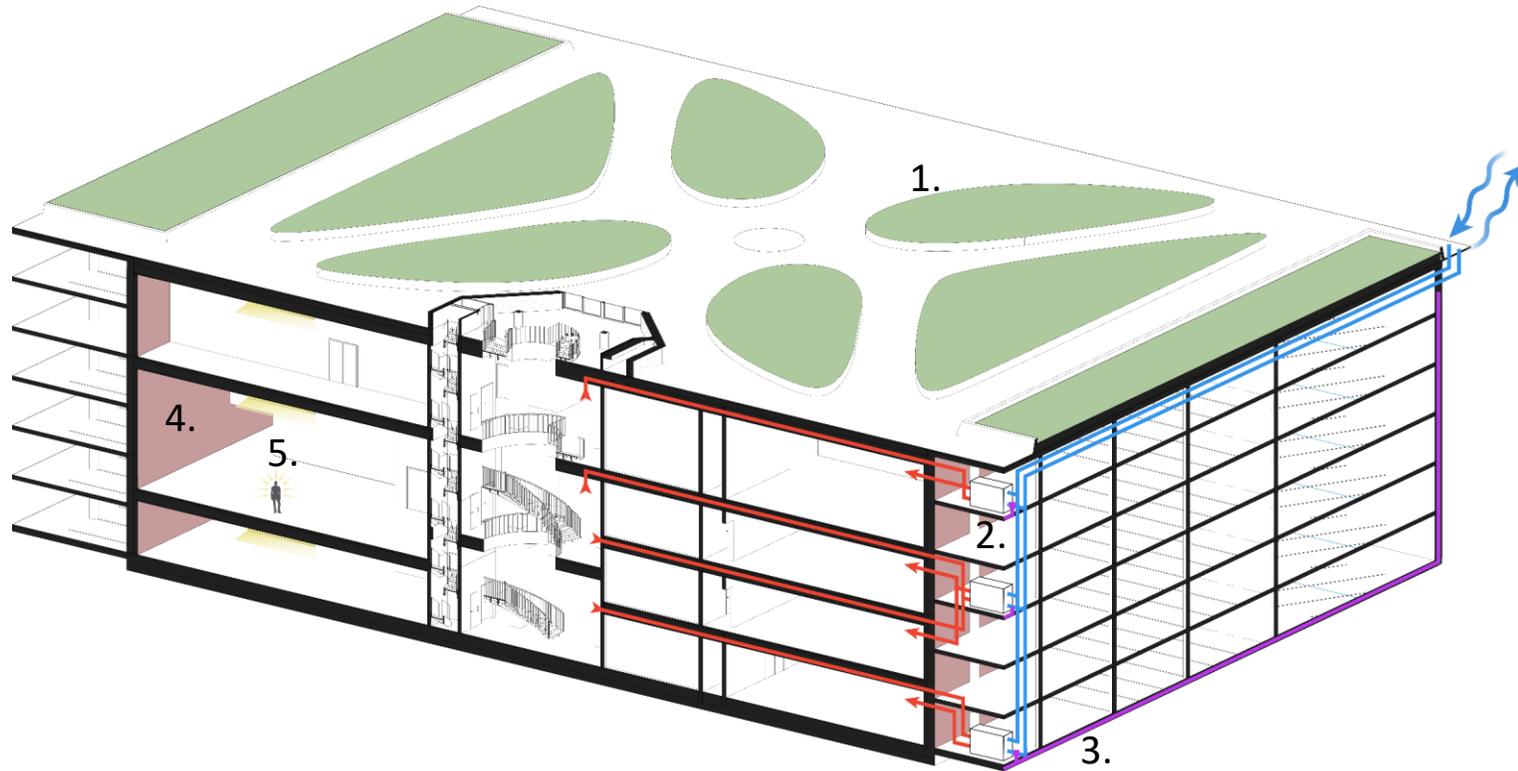
Issued on:  City:





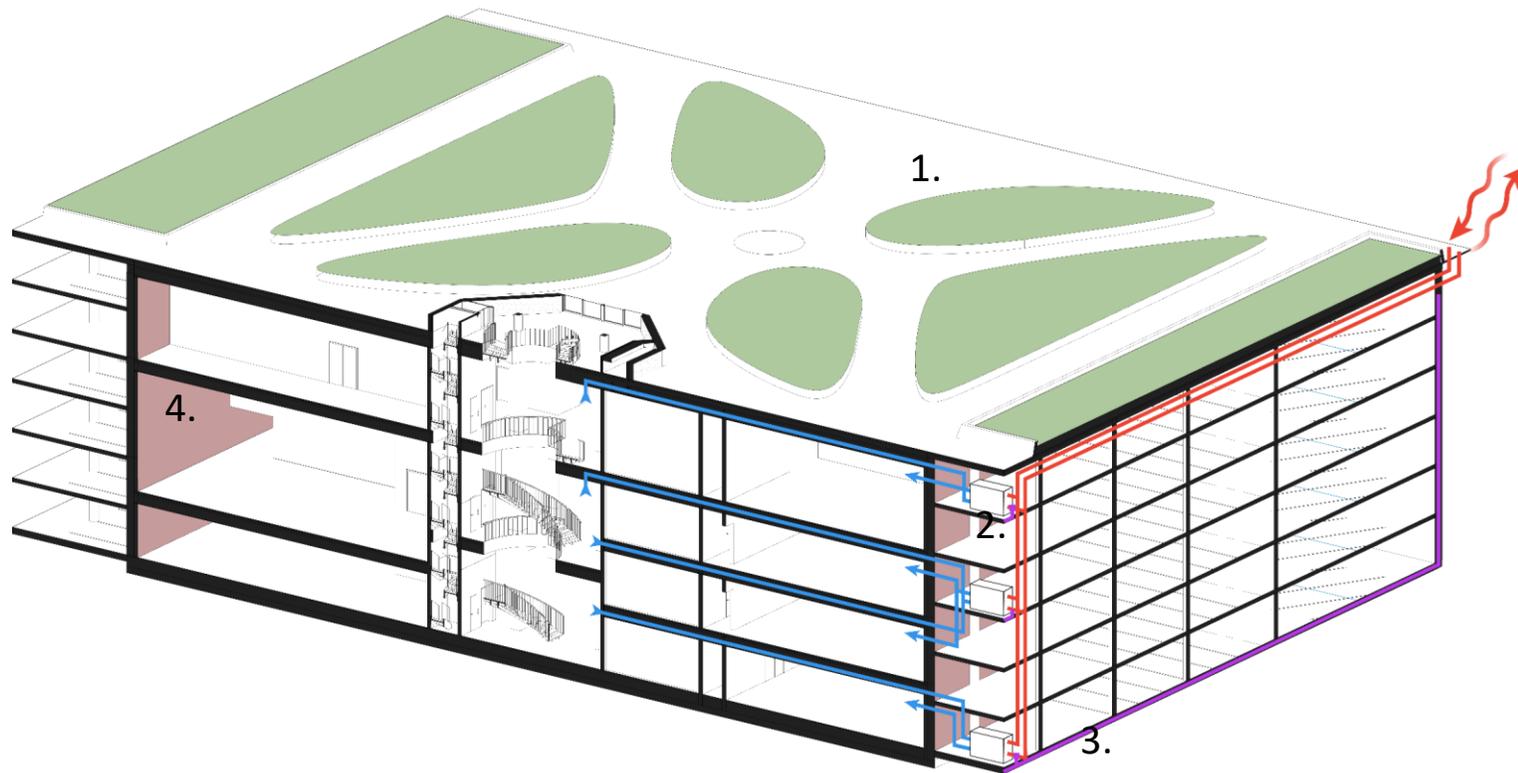


# Winter - lower part



1. Greenery - lower UHI effect and capture rainwater
2. MVHR
3. Brine-to-air subsoil heat exchanger for preheating the air
4. Bricks used as high thermal mass material
5. Building is heated solely via the internal heat gains (lights and people)

# Summer - lower part



1. Greenery - lower UHI effect and capture rainwater
2. MVHR with summer bypass
3. Brine-to-air subsoil heat exchanger for precooling the air
4. Bricks used as high thermal mass material

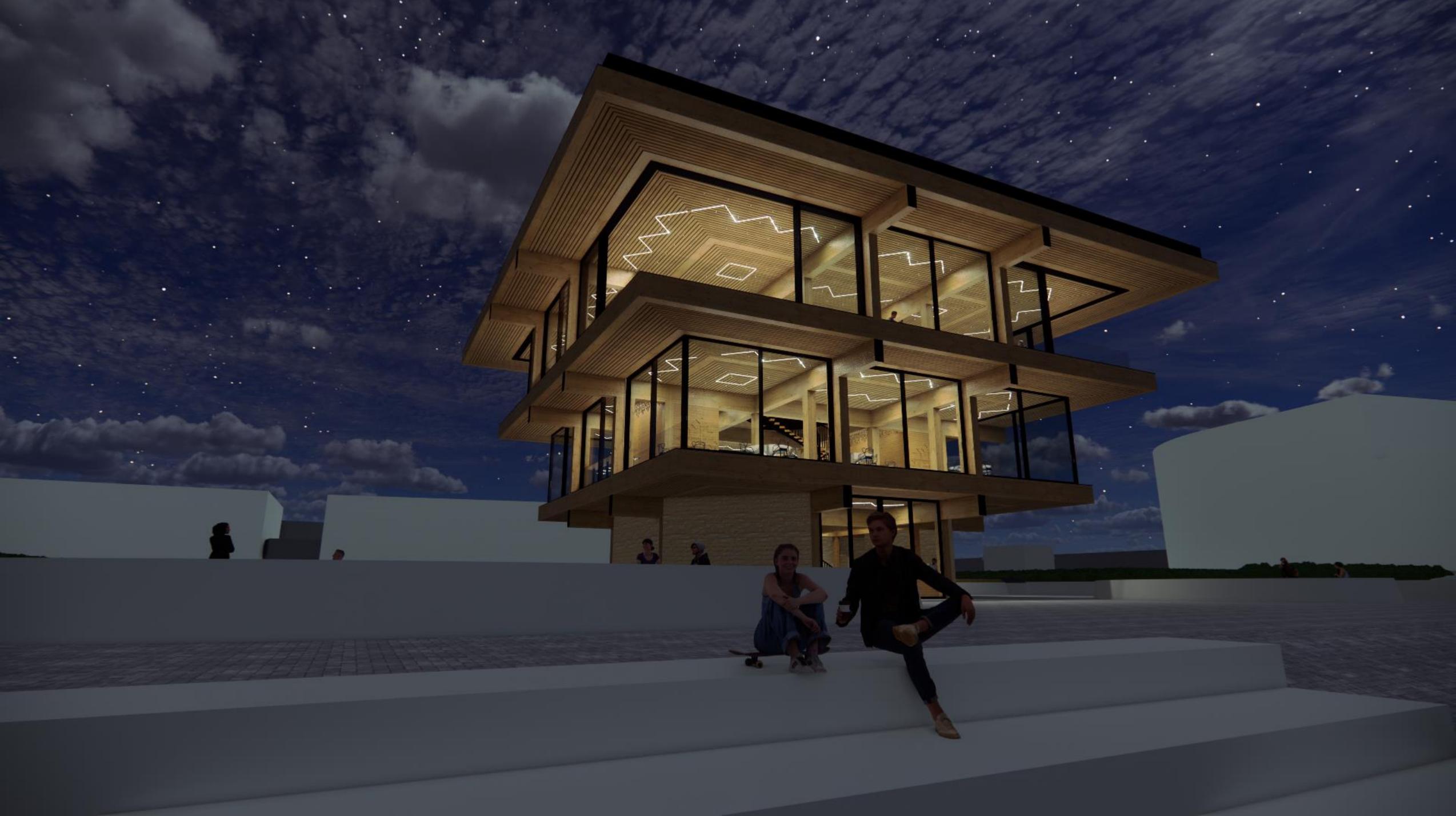
Specific building characteristics with reference to the treated floor area						
				Criteria	Alternative criteria	Fullfilled? <sup>2</sup>
<b>Space heating</b>	Treated floor area m <sup>2</sup>	6000.0				
	Heating demand kWh/(m <sup>2</sup> a)	0	≤	15	-	yes
	Heating load W/m <sup>2</sup>	-	≤	-	10	
<b>Space cooling</b>	Cooling & dehum. demand kWh/(m <sup>2</sup> a)	-	≤	-	-	-
	Cooling load W/m <sup>2</sup>	-	≤	-	-	-
	Frequency of overheating (> 25 °C) %	0	≤	10		yes
	Frequency of excessively high humidity (> 12 g/kg) %	0	≤	20		yes
	<b>Airtightness</b>	Pressurization test result n <sub>50</sub> 1/h	0	≤	0.6	
<b>Non-renewable Primary Energy (PE)</b>	PE demand kWh/(m <sup>2</sup> a)	143	≤	-		-
	PER demand kWh/(m <sup>2</sup> a)	58	≤	60	-	yes
<b>Primary Energy Renewable (PER)</b>	Generation of renewable energy (in relation to projected building footprint area) kWh/(m <sup>2</sup> a)	-	≥	-	-	

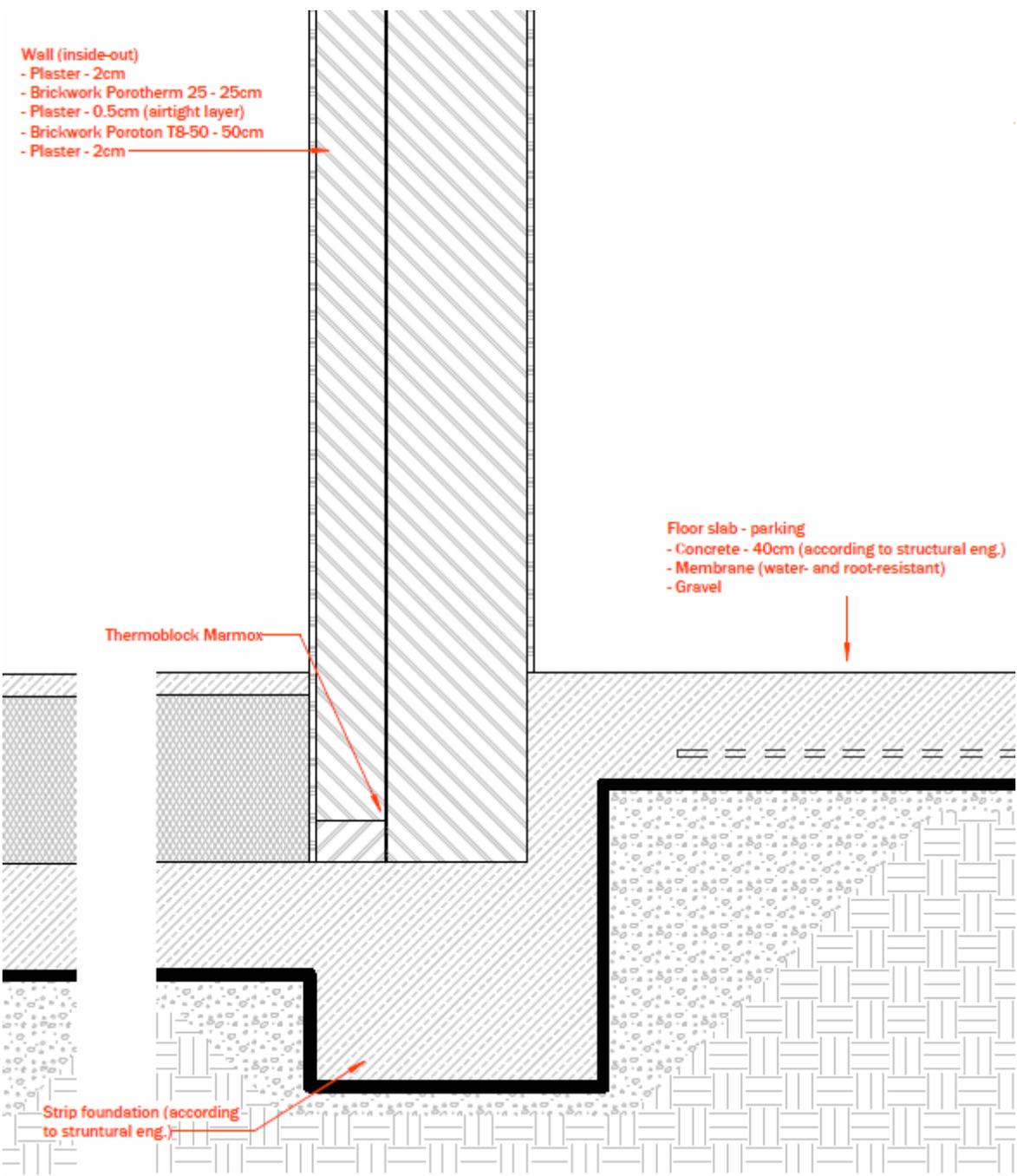
<sup>2</sup> Empty field: Data missing; '-': No requirement

I confirm that the values given herein have been determined following the PHPP methodology and based on the characteristic values of the building. The PHPP calculations are attached to this verification.

Task:  First name:  Surname:  Issued on:  City:

Passive House Classic?  Signature:





# Top-bottom symbiosis

## Primary energy demand

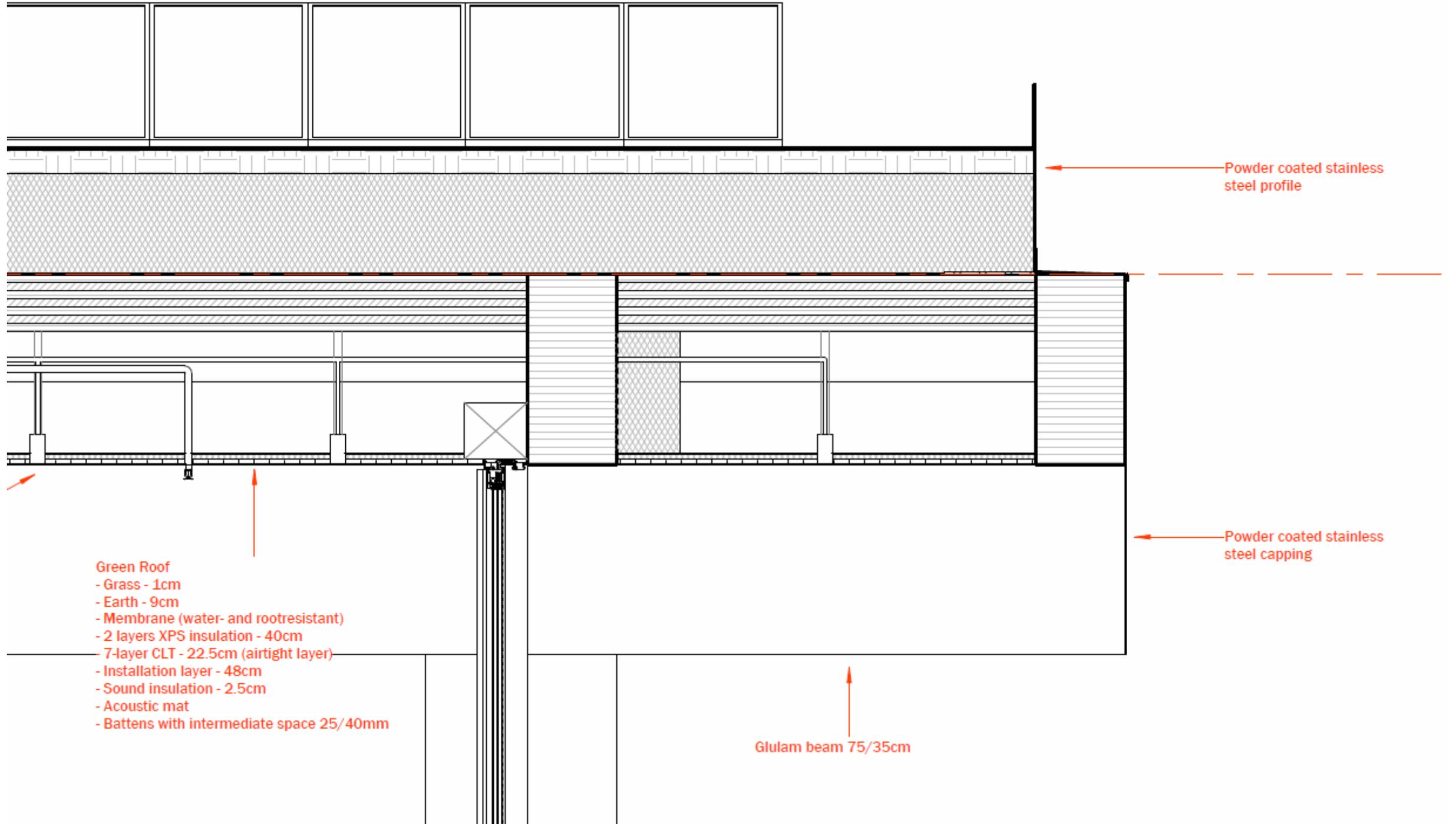
- Top – 36550 kWh/a
- Bottom – 348000 kWh/a
  
- TOTAL – 384550 kWh/a

## Energy generation

- 154000 kWh/a (40% of the total energy consumption)

# **Details and the Elbetitsa**





Powder coated stainless steel profile

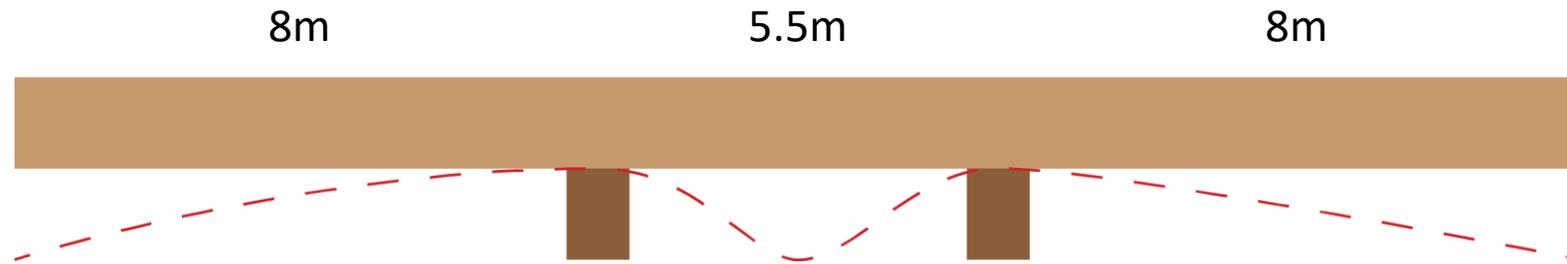
Powder coated stainless steel capping

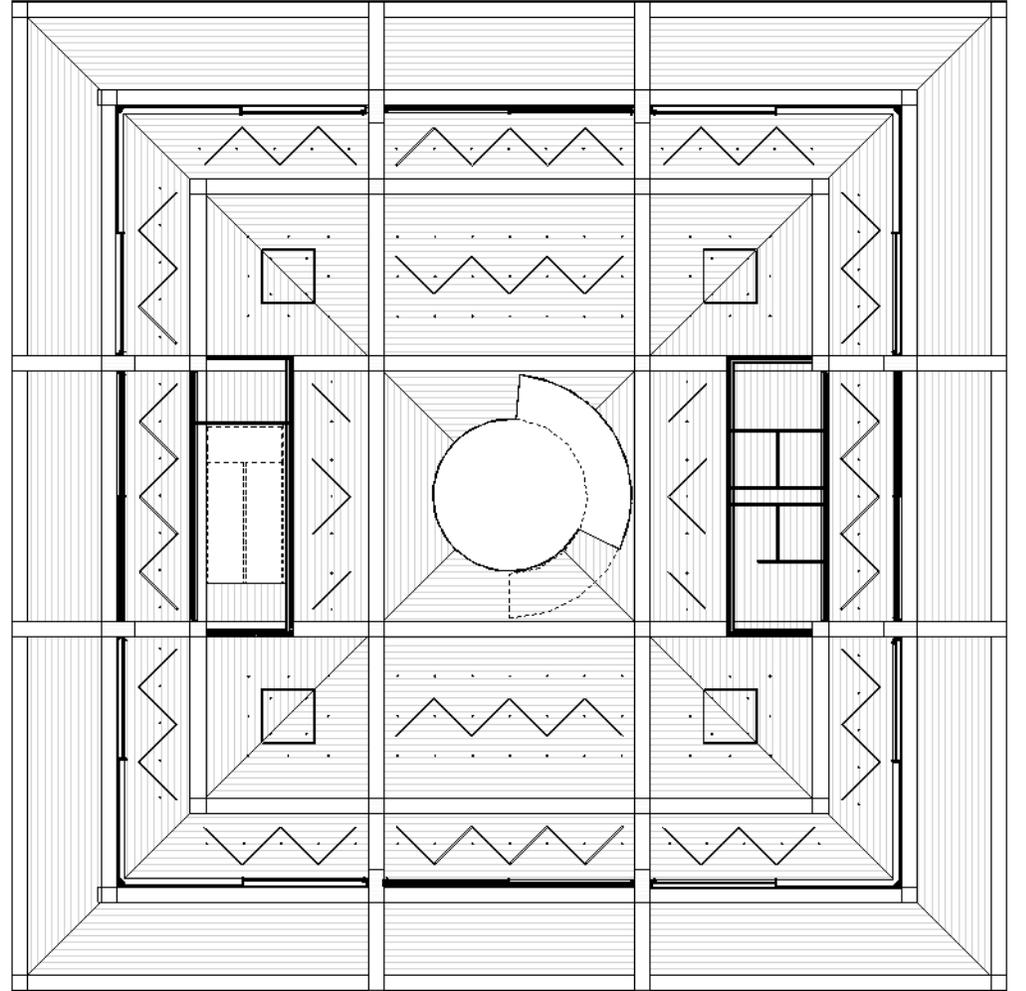
- Green Roof**
- Grass - 1cm
  - Earth - 9cm
  - Membrane (water- and rootresistant)
  - 2 layers XPS insulation - 40cm
  - 7-layer CLT - 22.5cm (airtight layer)
  - Installation layer - 48cm
  - Sound insulation - 2.5cm
  - Acoustic mat
  - Battens with intermediate space 25/40mm

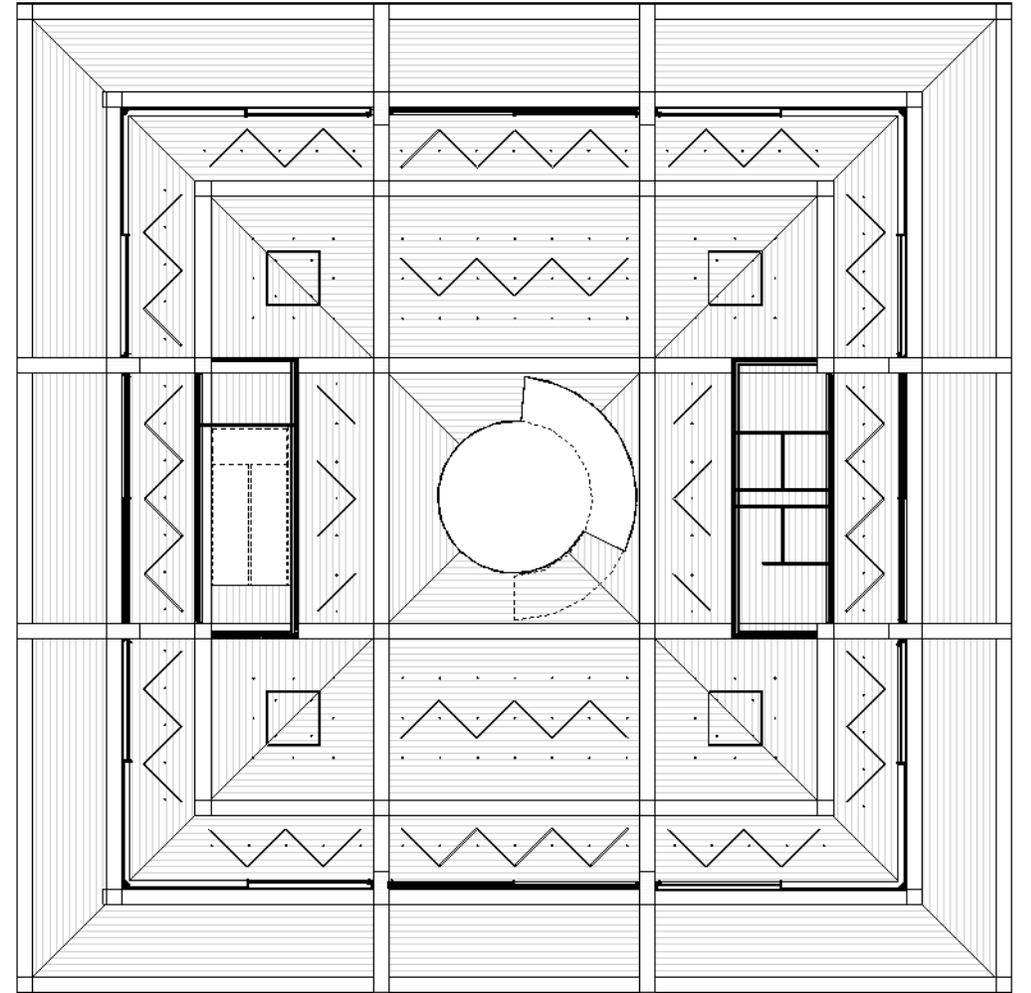
Glulam beam 75/35cm

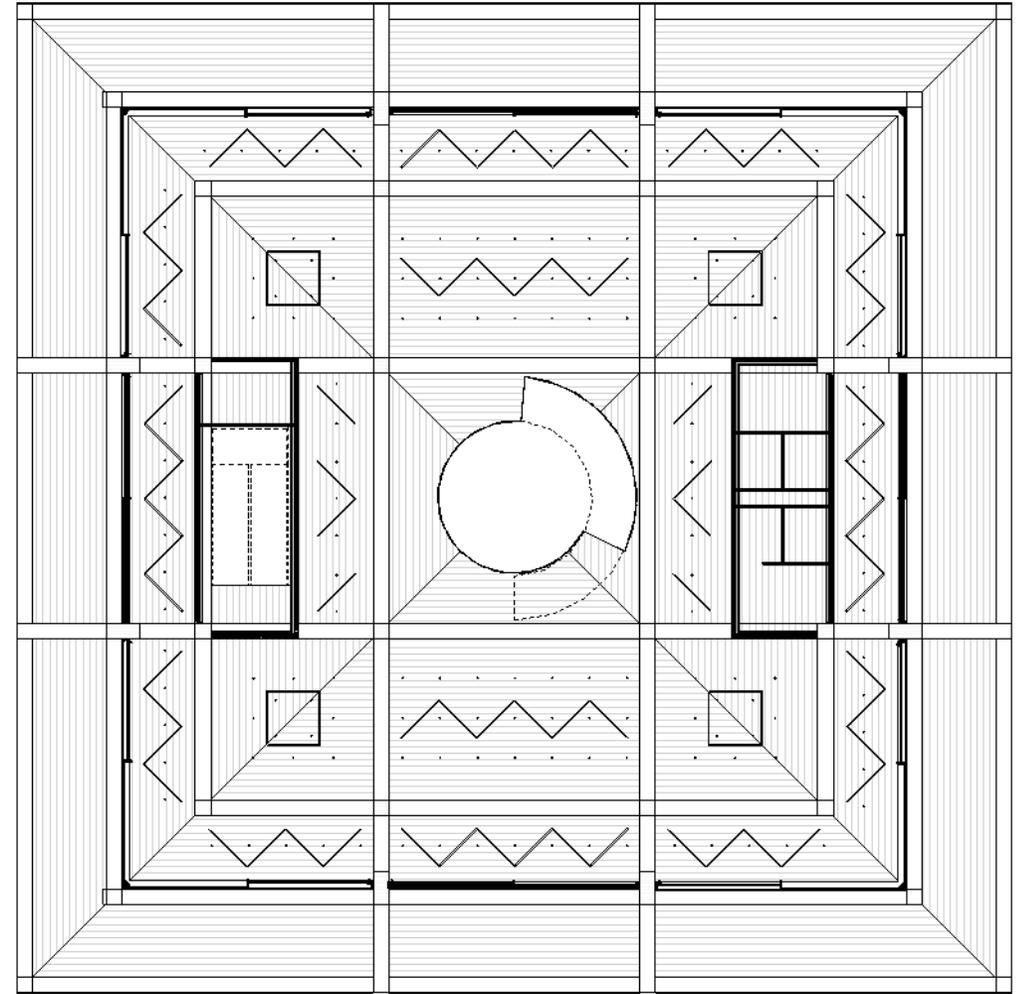


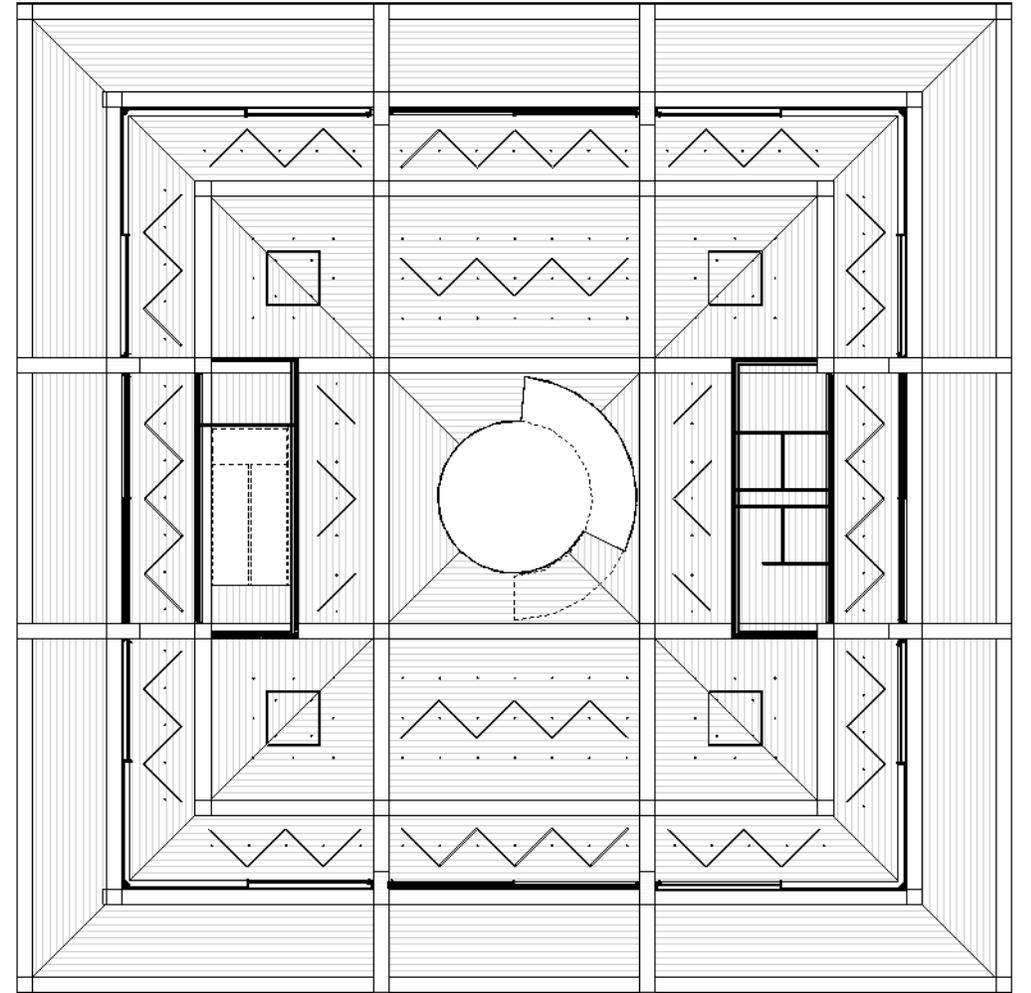
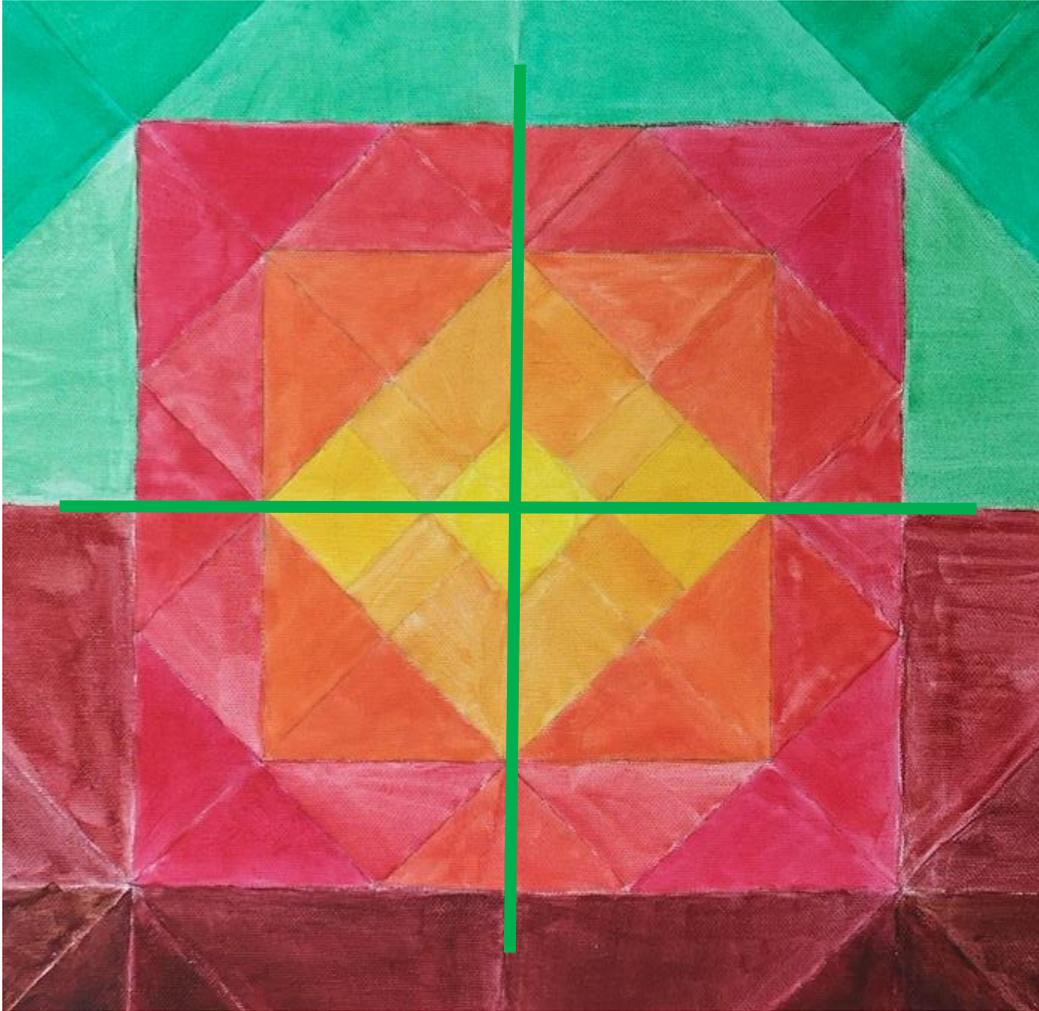
# Structural load of a secondary beam





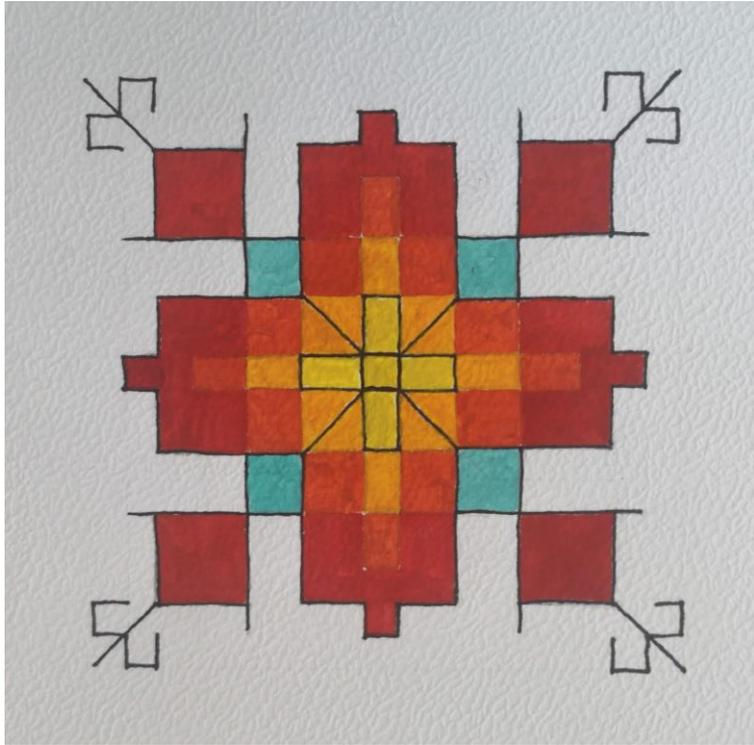














**Thank you!**