

**Lucie Formanová**



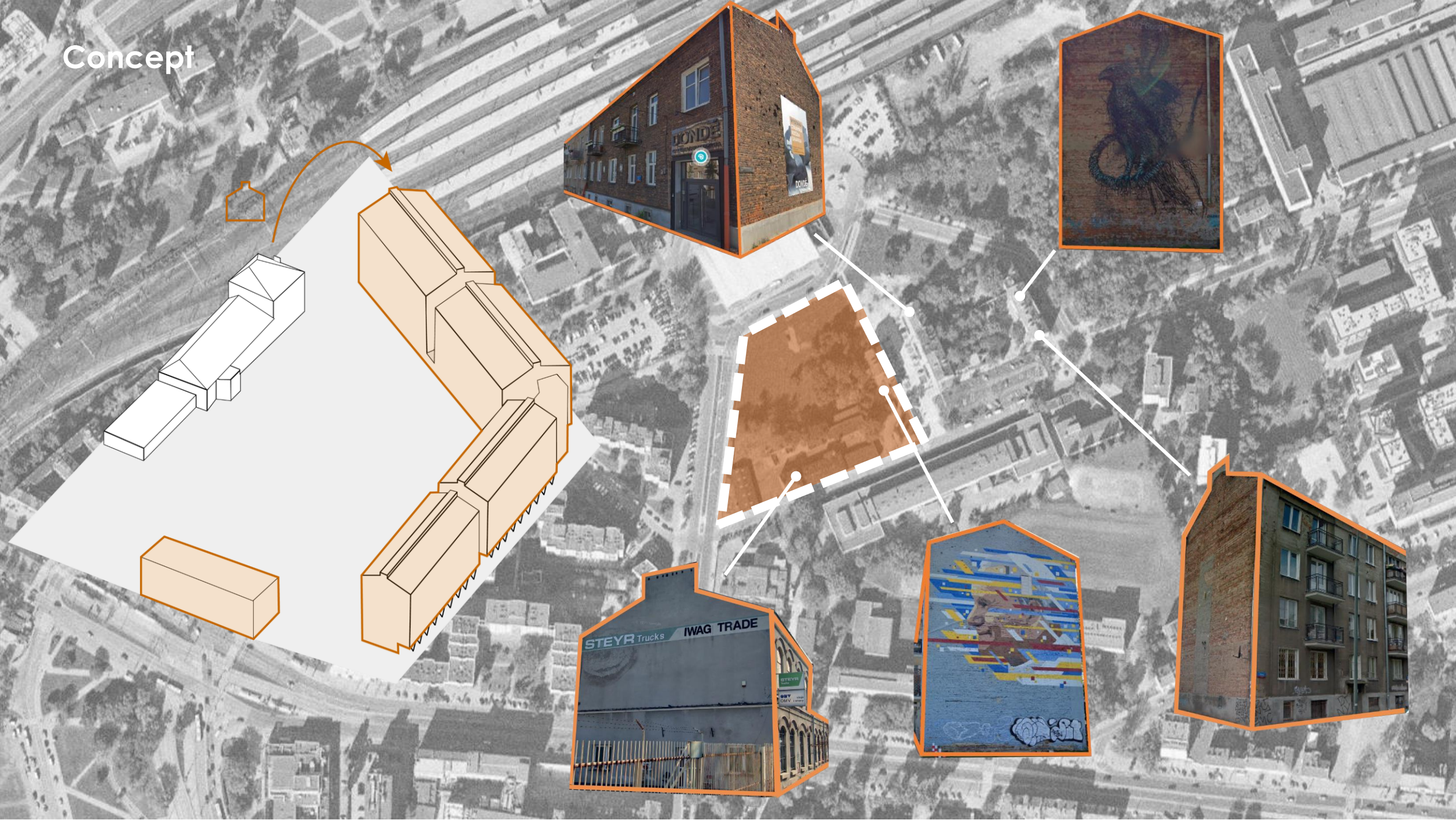
**Jan Suchý**



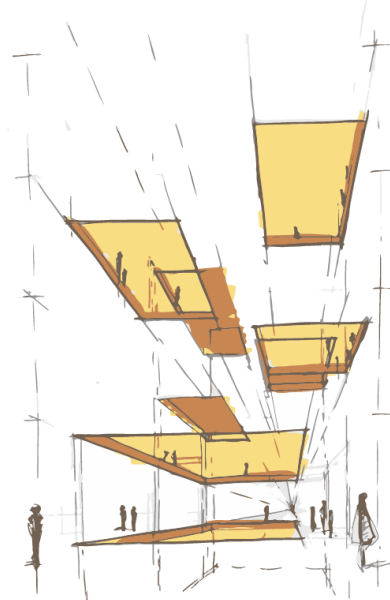
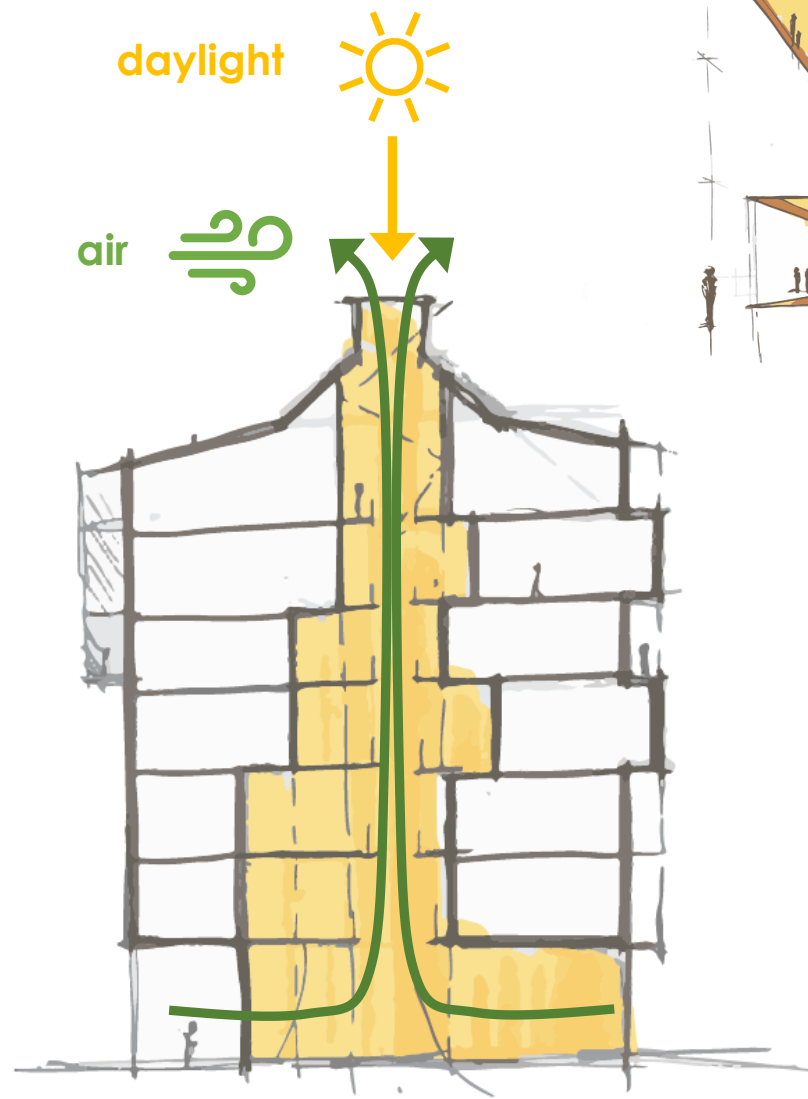
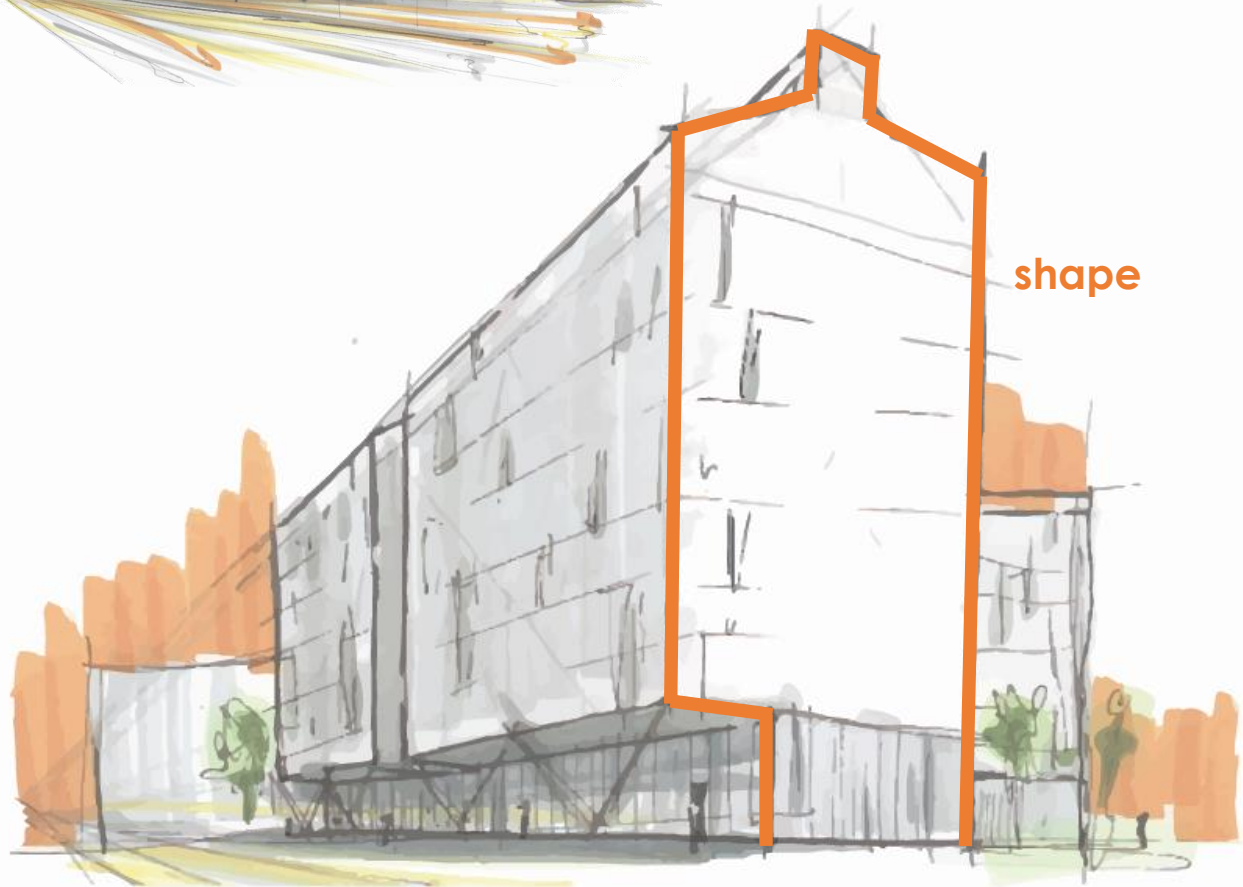
**CZECHIA/TEAM 13**



Concept











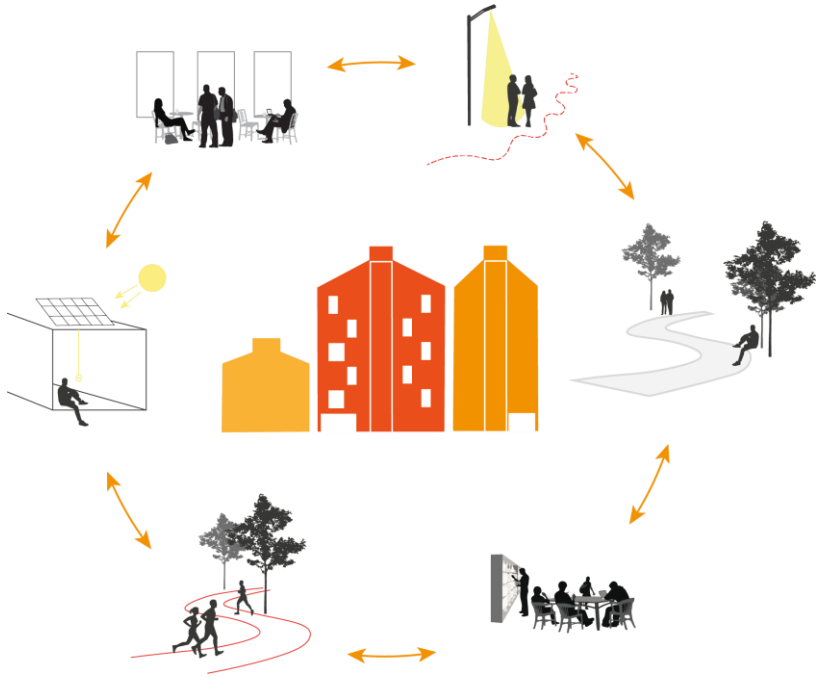
A.703

A.704

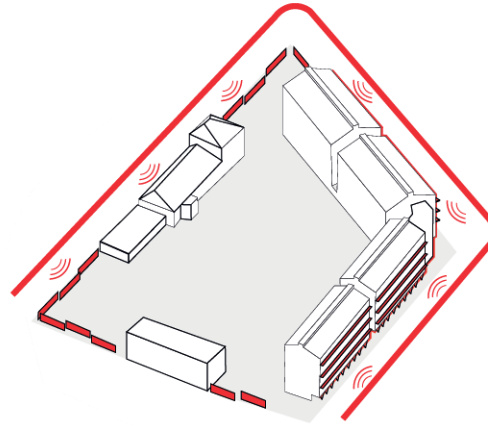
A.718

A.717

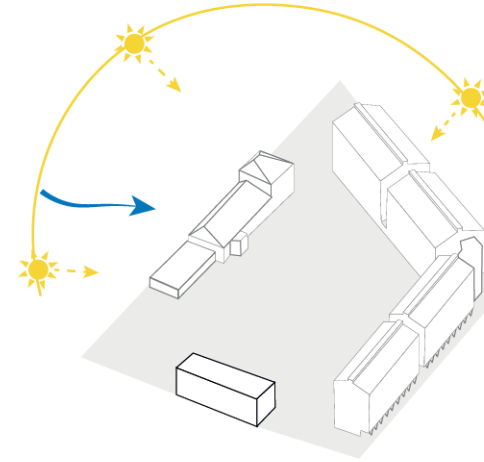
**principles**



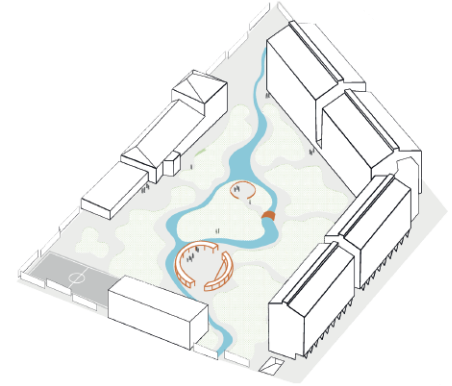
**noise**



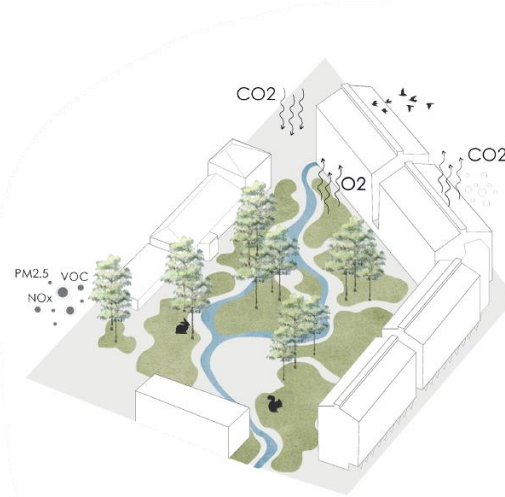
**orientation**



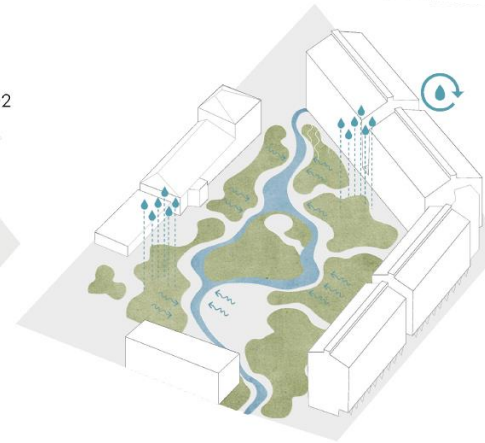
**space**



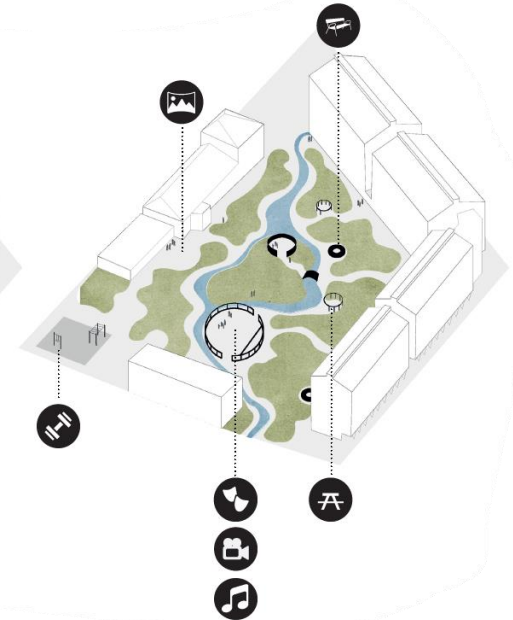
**pollution**



**rain water**



**function**





# Axonometry

















# First floor

Entrance hall

Cafeteria

Bike shed

Bar

Statue

Music room

Bike shed

Supplies shop

Office building

Old factory

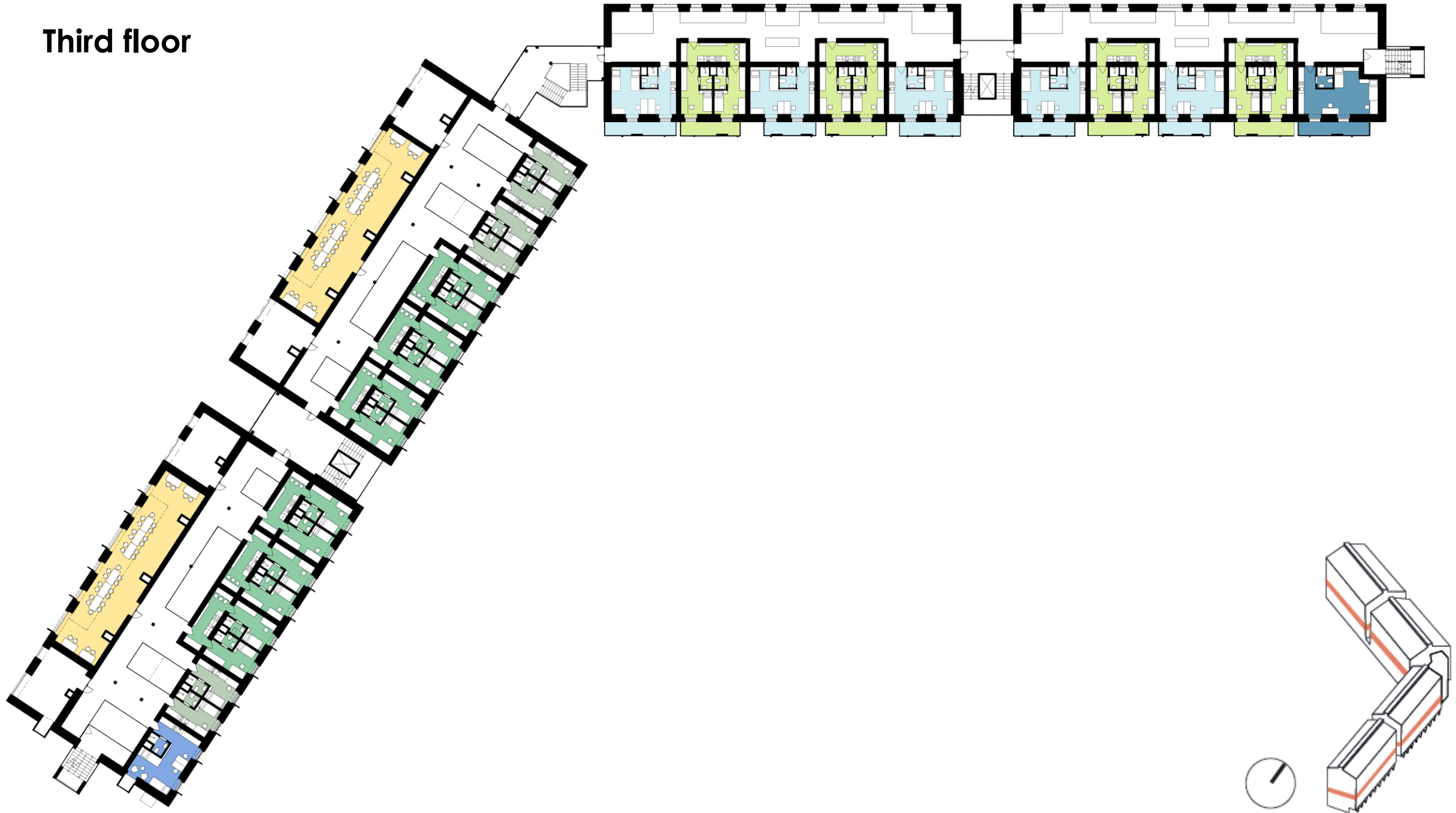


Second floor

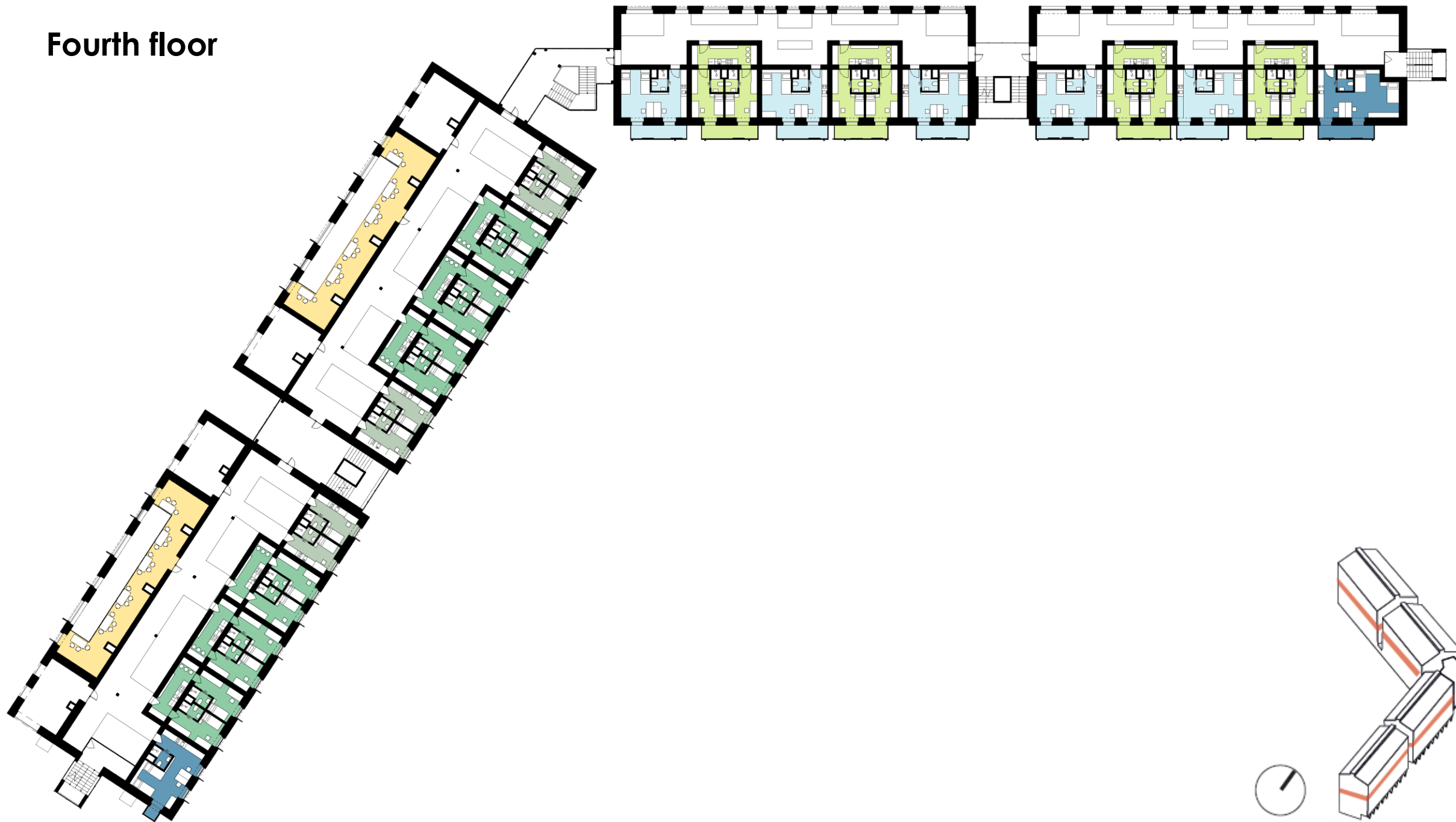




# Third floor

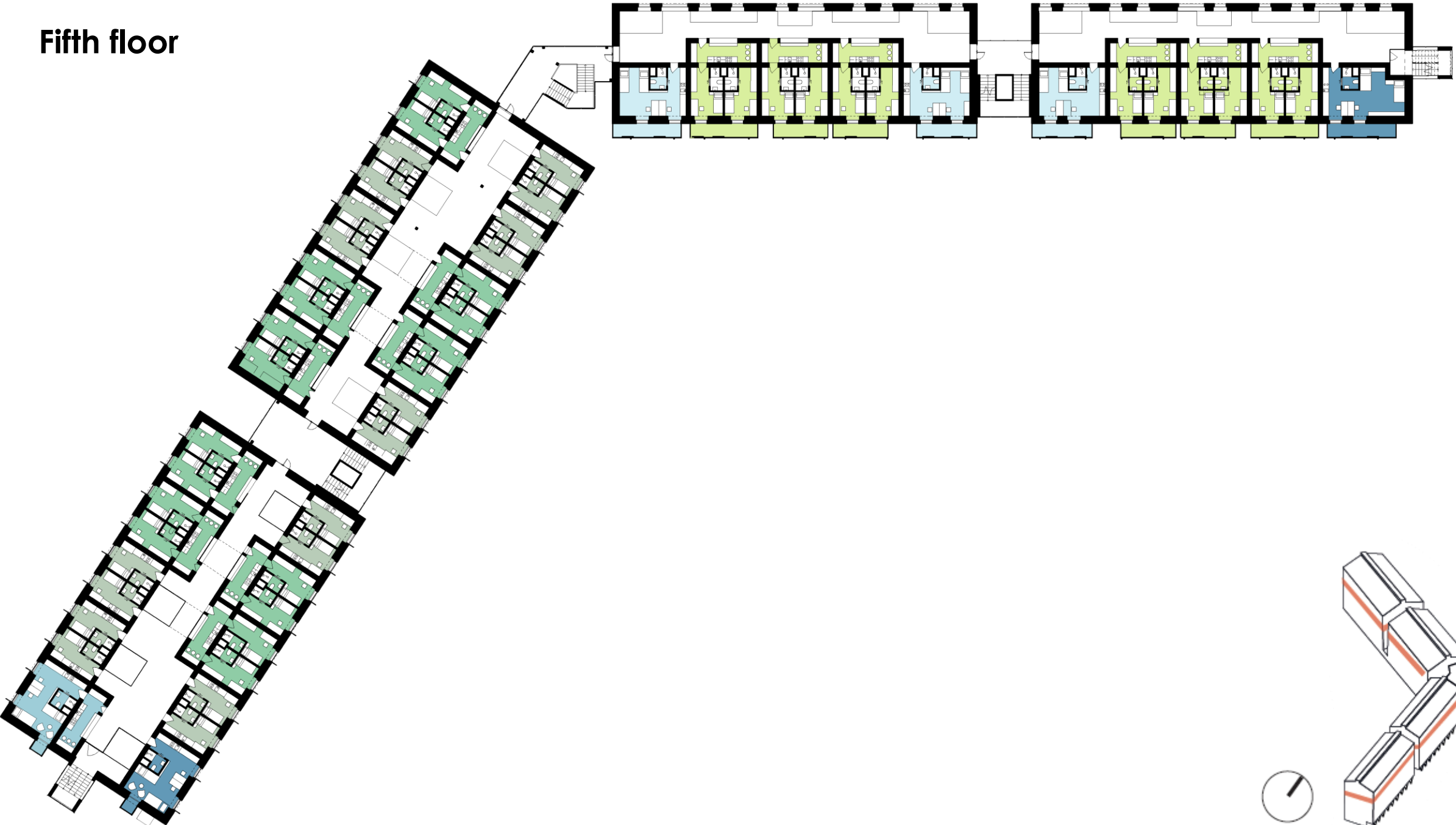


Fourth floor





Fifth floor



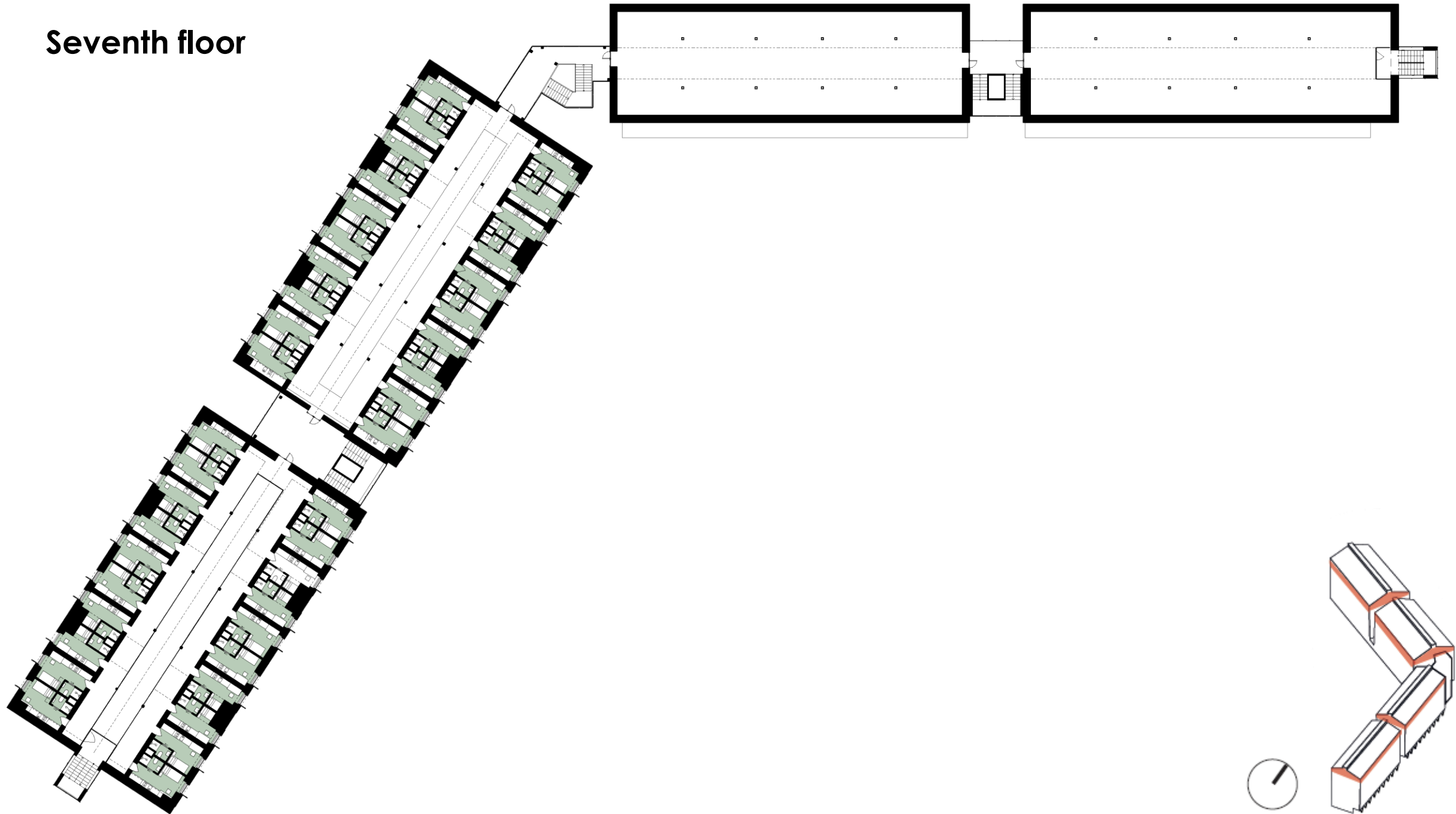


Sixth floor





# Seventh floor

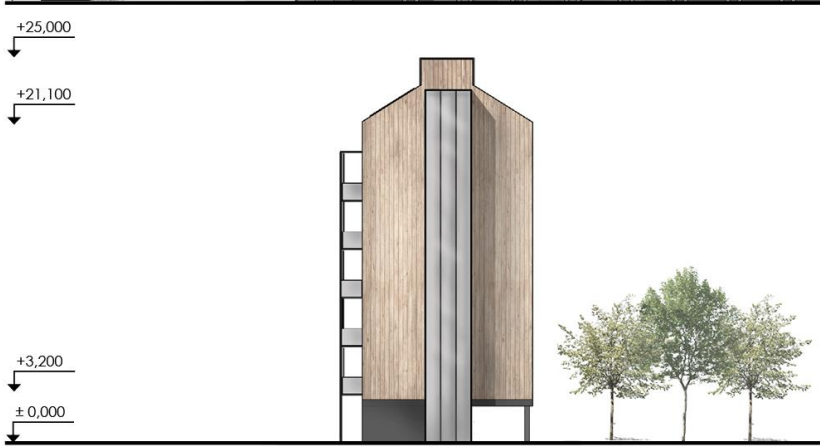






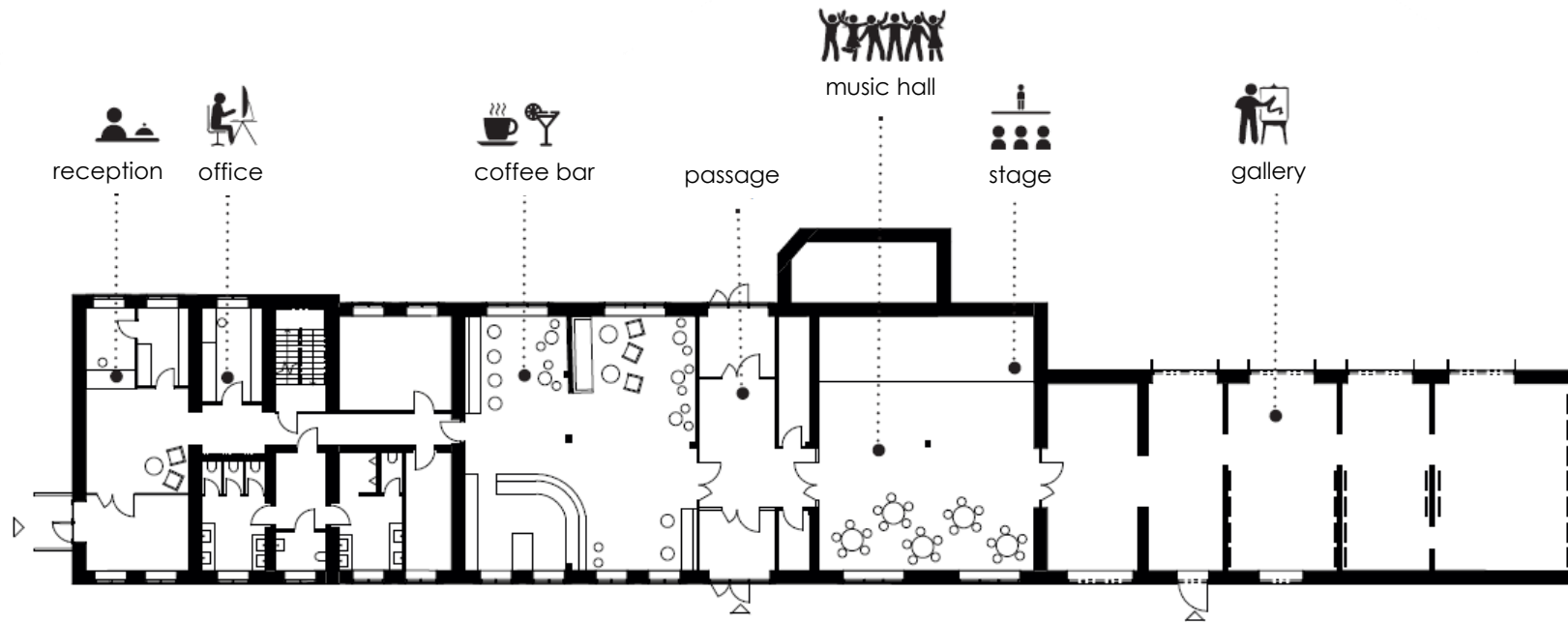




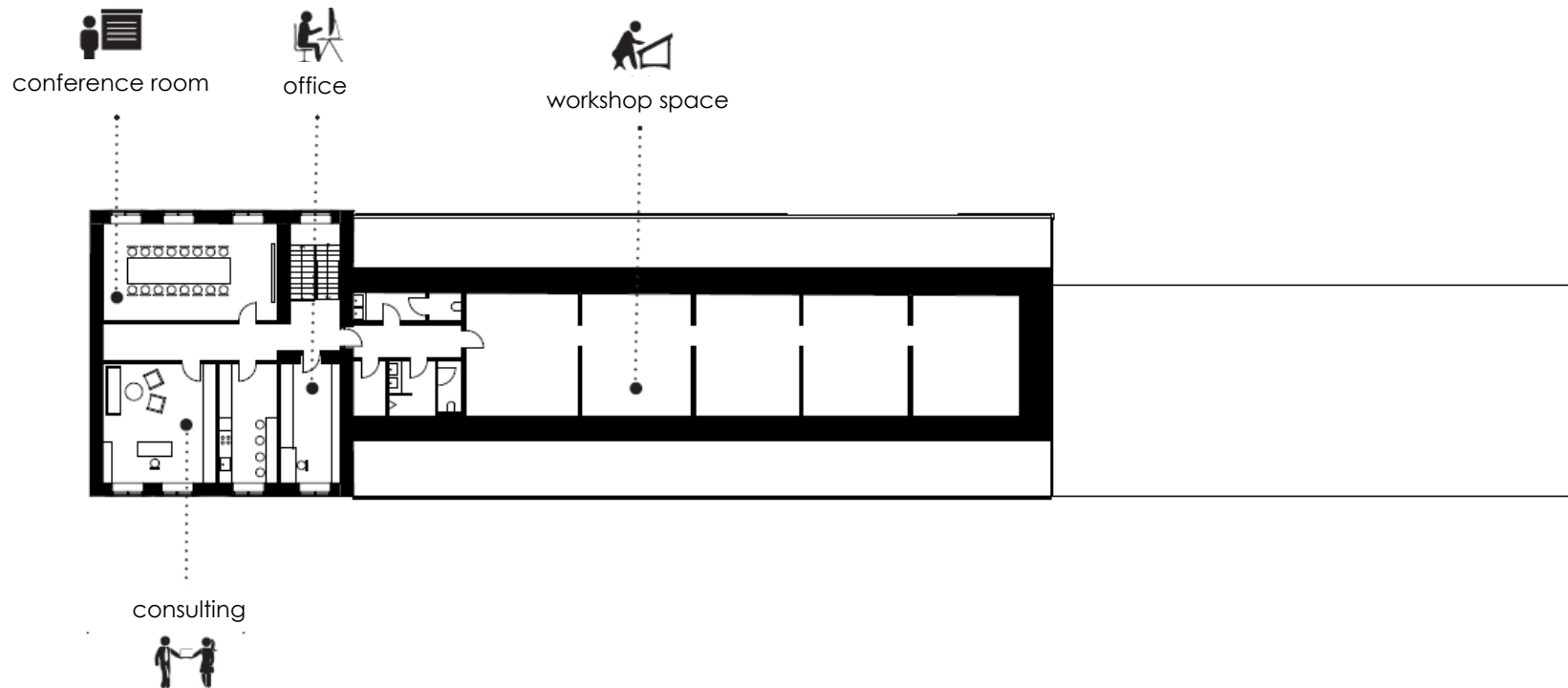


# Factory

## First floor



## Second floor





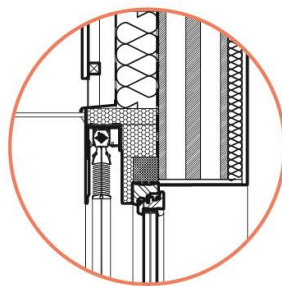






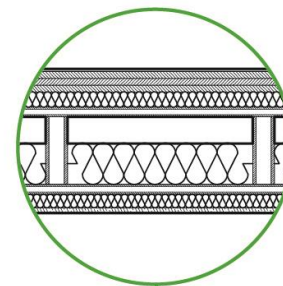
Fixed shading element  
Exterior sunblind

Shading eliminates summer  
overheating  $25^{\circ}\text{C}$  in every room  
is less than 900 h per year



$$U_{\text{wall}} = 0,17 \text{ W/m}^2\text{K}$$

**RigiStabil ActivAir** slabs  
decomposing formaldehyde  
emissions.



Ceiling with light floating floor  
with marmoleum containing 97%  
of natural additives.

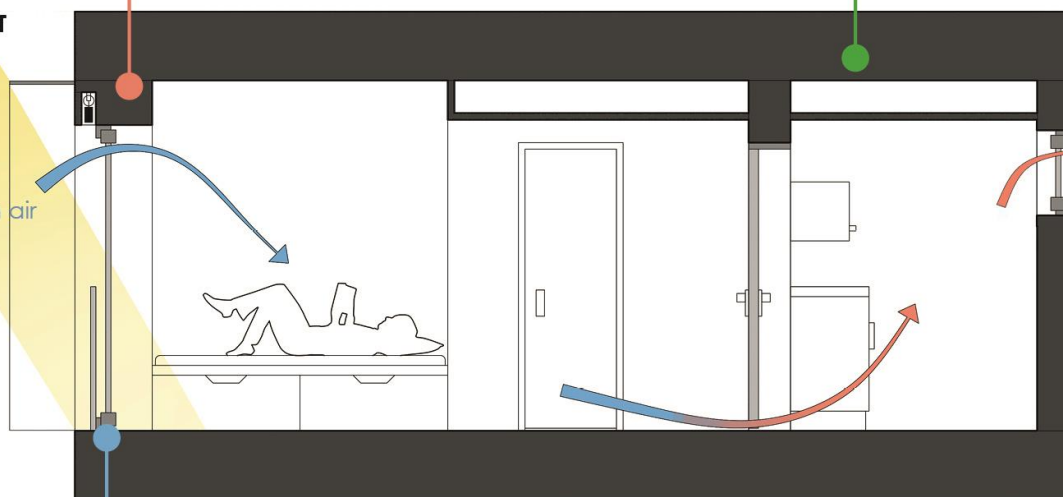
$$R'_{\text{w}} = 61 \text{ dB}$$
$$L'_{\text{n,w}} = 48 \text{ dB}$$

Soffit from **RigiStabil ActivAir** slab  
decomposing formaldehyde  
emissions.

Summer sun

EXT

Supply fresh air



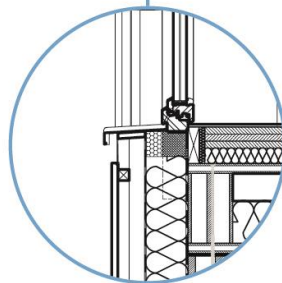
INT hallway

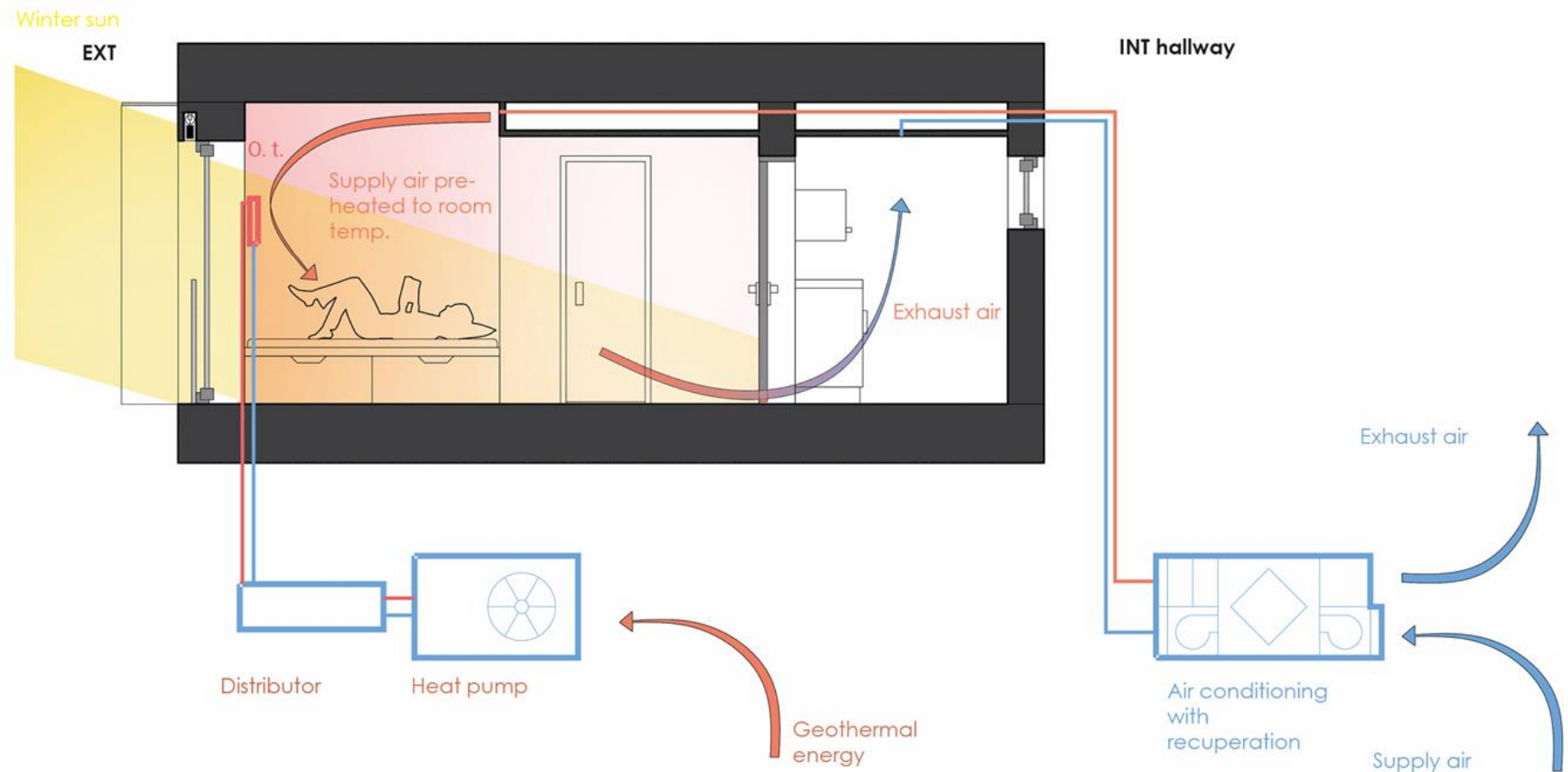
Exhaust air blown  
naturally to  
hallway

Glosing 4 - 14 - 4 - 14 - 4 mm  
- Viewclear  
- Planitherm XM  
- Planitherm XM  
Dřevěný rám

$$g=55\%$$

$$U_g = 0,6 \text{ W/m}^2\text{K}$$
$$U_w = 0,8 \text{ W/m}^2\text{K}$$

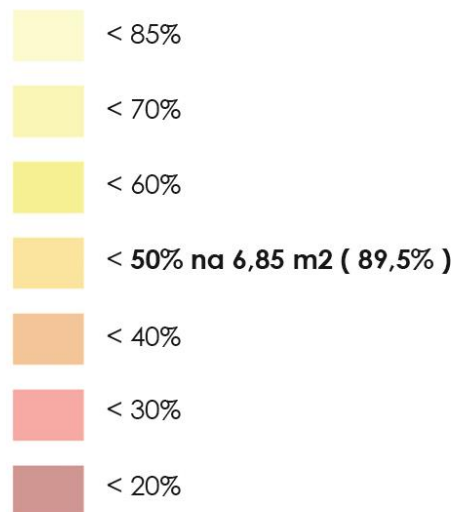






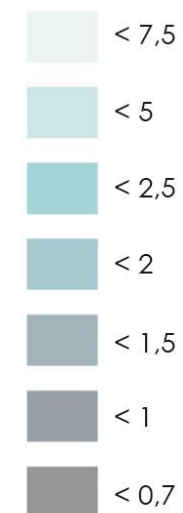
# Daylight

## Autonomy



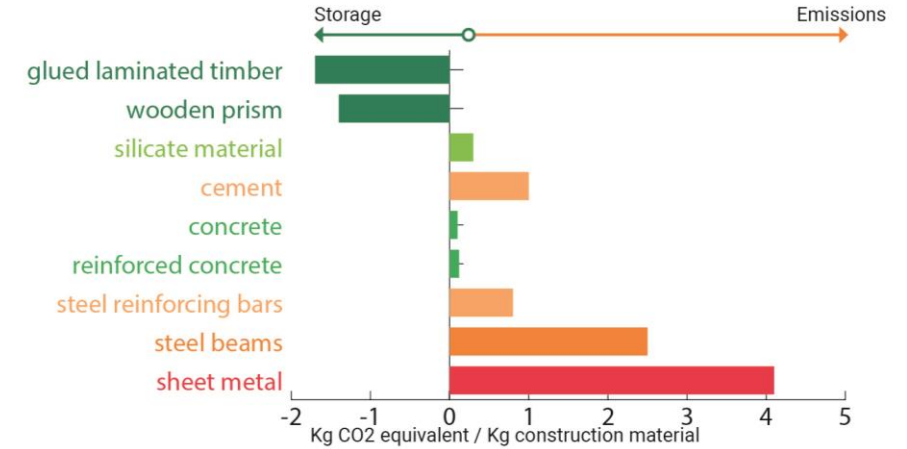
Temperature above **25°C** is in room for **780 h**. Demand is 900 h at maximum.

## Daylight factor



Průměrný DF = 3,7

# Materials

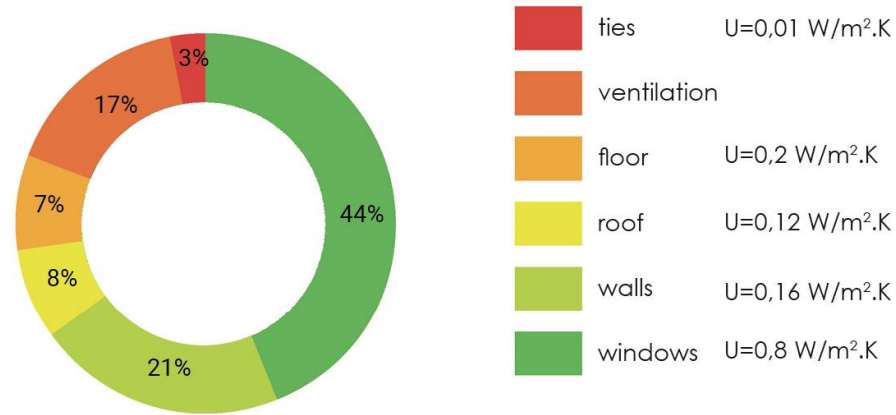


Cradle to grave (A1-A4, B4-B5, C1-C4)	kg CO <sub>2</sub> e/m <sup>2</sup>
( < 350 ) A	494
( 350-450 ) B	
( 450-550 ) C	
( 550-650 ) D	
( 650-750 ) E	
( 750-850 ) F	
( > 850 ) G	





### Heat loss



### Energy performance certificate

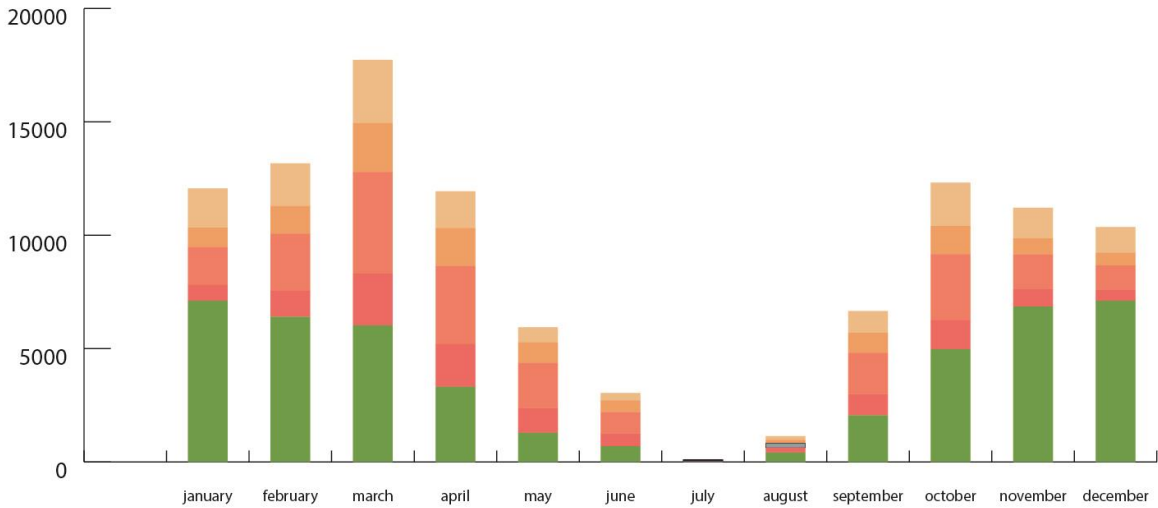
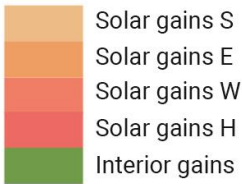


### Coefficient, overall heat transfer

$$U_{em} = Ht / A = 0,34 \text{ W/m}^2\text{K}$$
$$U_{em,n} \text{ podle } \check{C}SN 73 0540-2 = 0,61 \text{ W/m}^2\text{K}$$

$$U_{em} / U_{em,n} = 0,34 / 0,61 = 0,56$$

### Thermal gains



# Heat balance of the building

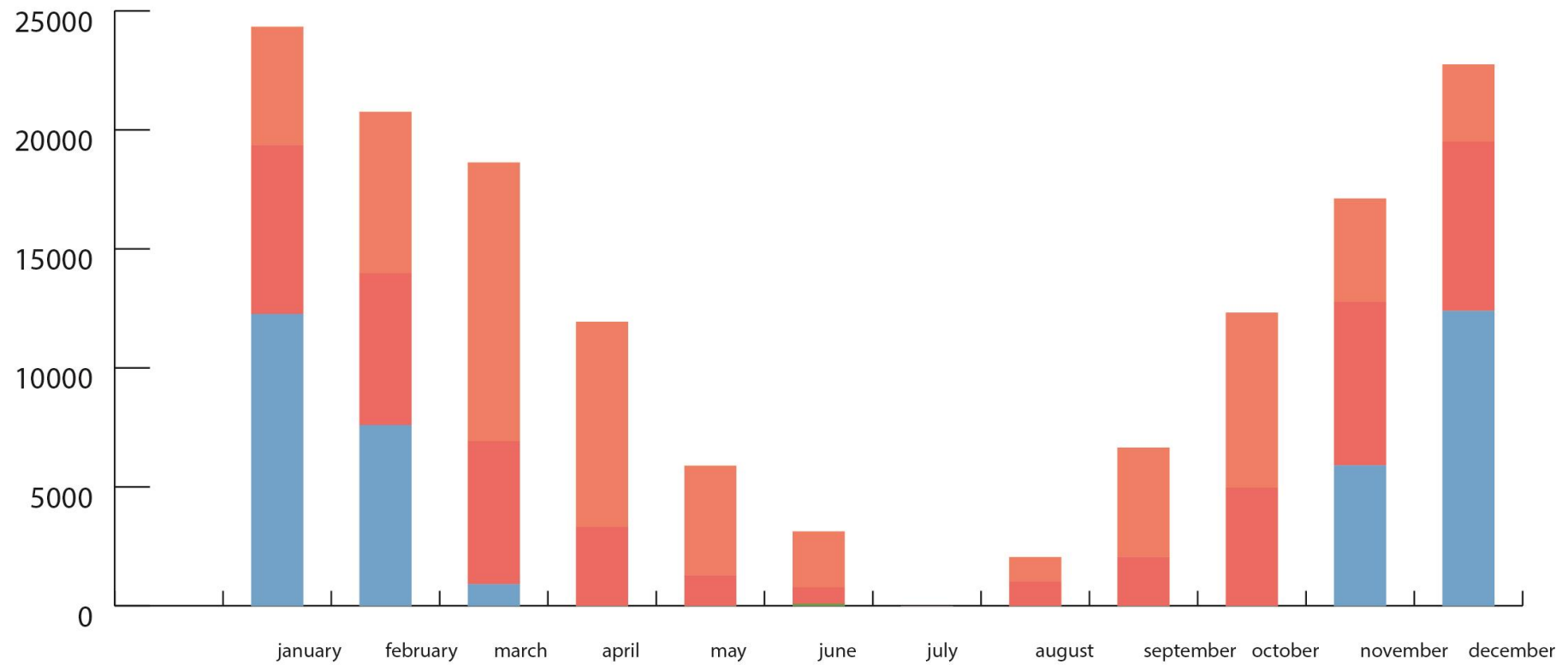
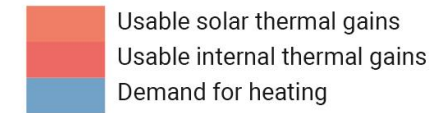
## Heat demand for heating

$e_A = 10,25 \text{ kWh}/(\text{m}^2.\text{a}) < 15 \text{ kWh}/(\text{m}^2.\text{a})$

## Coefficient, overall heat transfer

$U_{em} = 0,34 \text{ W}/\text{m}^2\text{K}$

Design of construction was optimized so heat demand of the building is under  $15 \text{ kWh}/(\text{m}^2.\text{a})$ .





Thank you for your attention.

