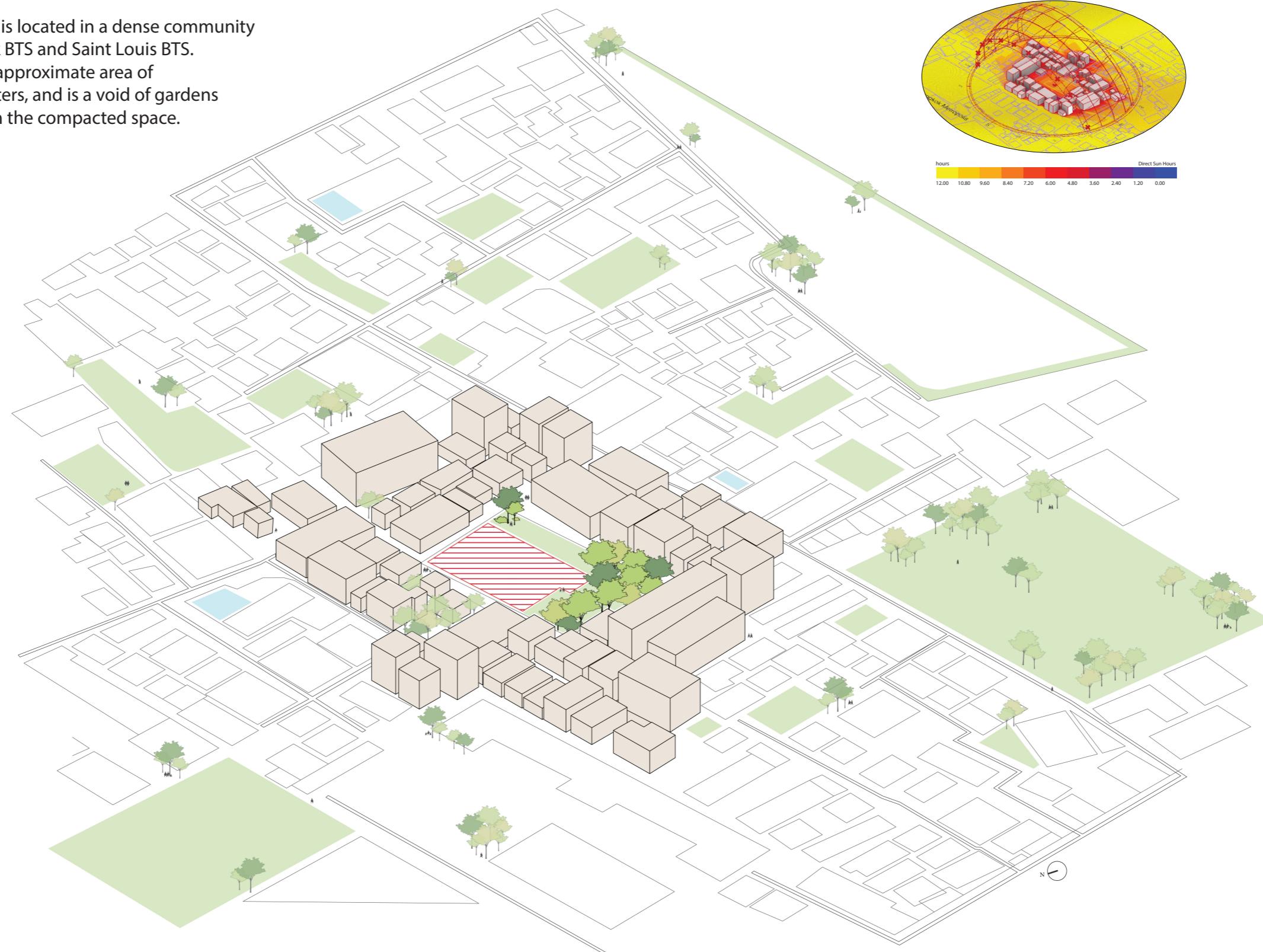
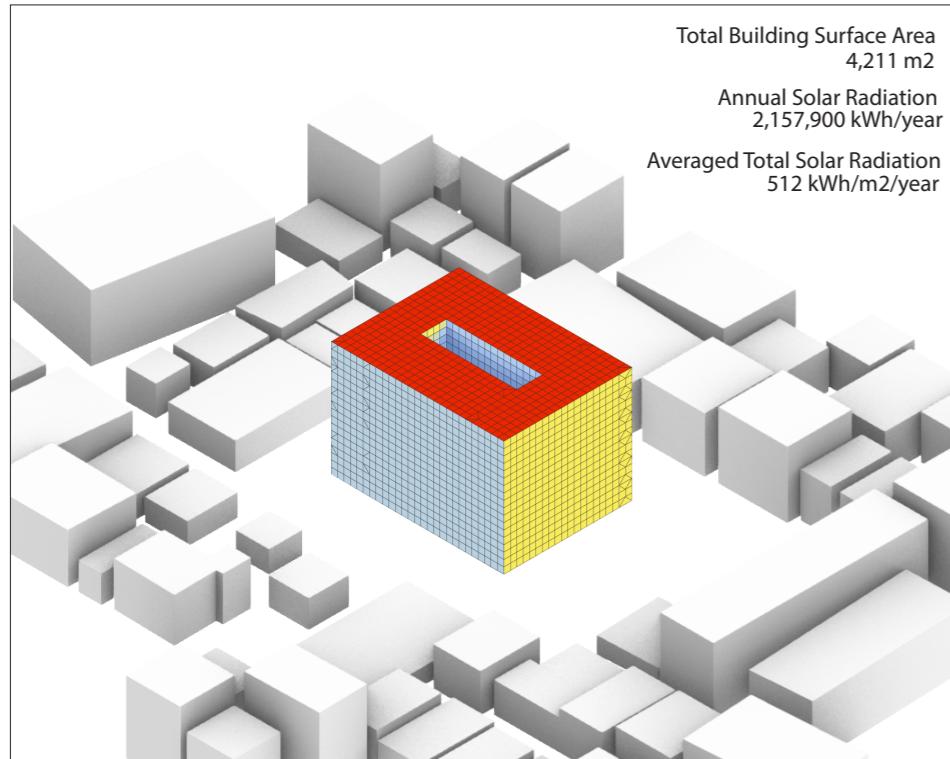


Submission Date : 08 OCTOBER 2024  
Pannicha Yampraipirom (Punch)  
6538060825 pannicha.y@cuinda.com

The selected site is located in a dense community between Surasak BTS and Saint Louis BTS. It expands in an approximate area of 1,200 square meters, and is a void of gardens and plants within the compacted space.



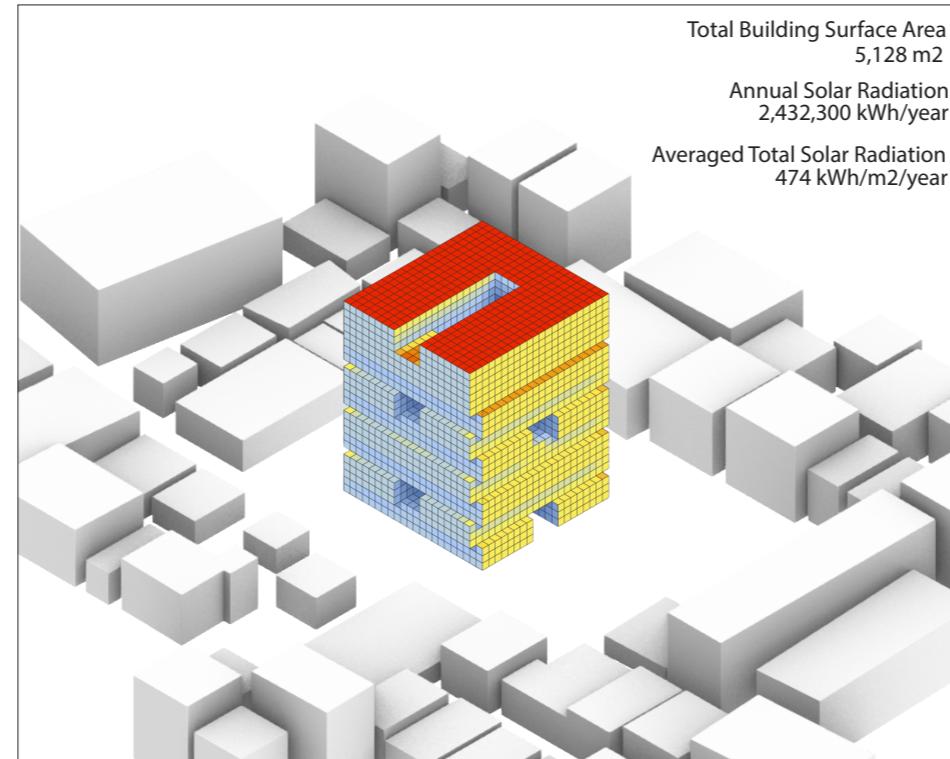
## Baseline



Prototype

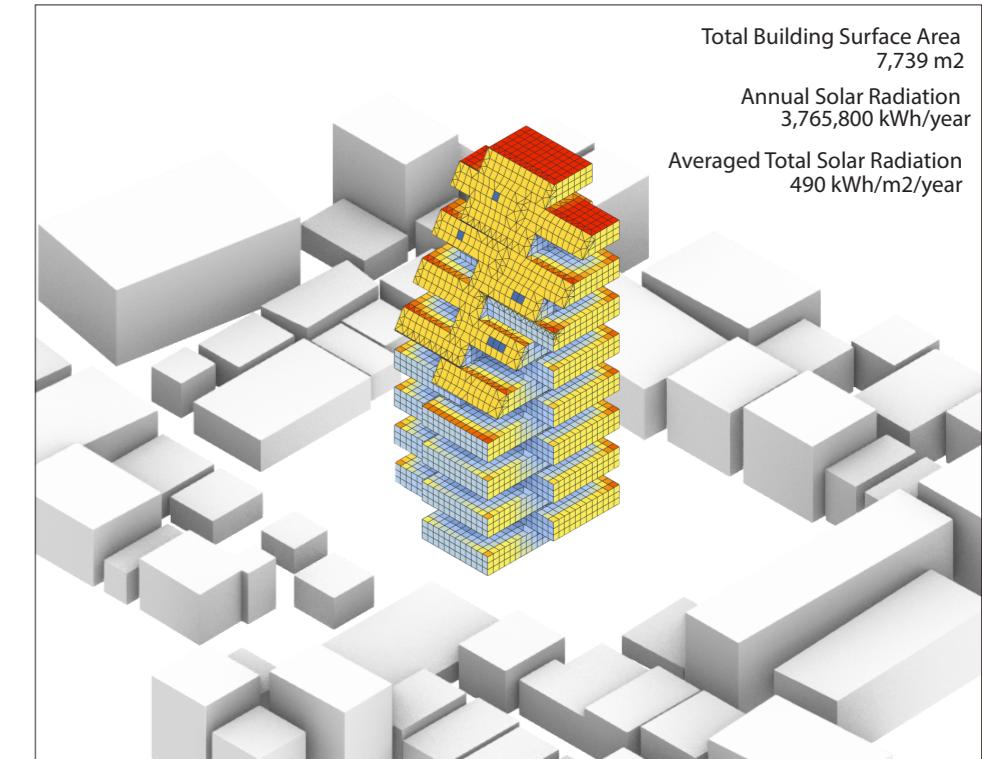
This design maintains the central courtyard but stacks units on all sides, potentially creating a more enclosed and less ventilated space.

## Design 1

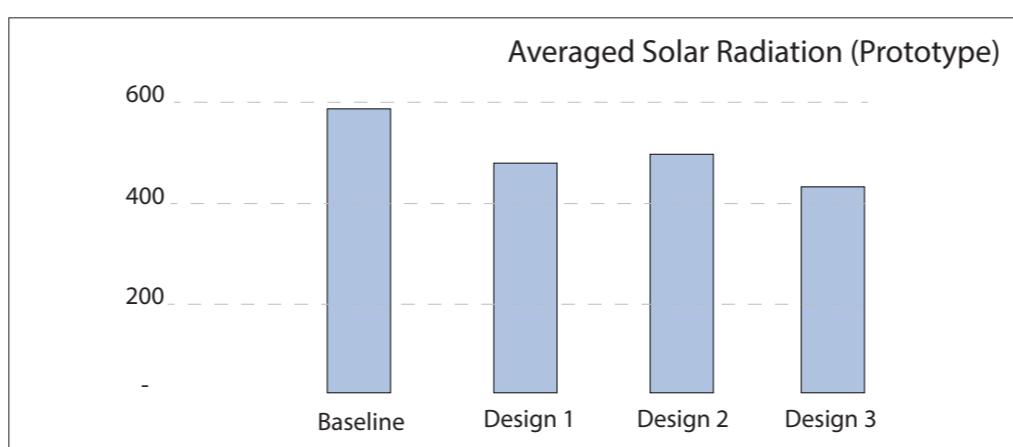


By rotating units and stacking them, this design aims to improve ventilation. However, it might introduce challenges in terms of structural stability and layout.

## Design 2



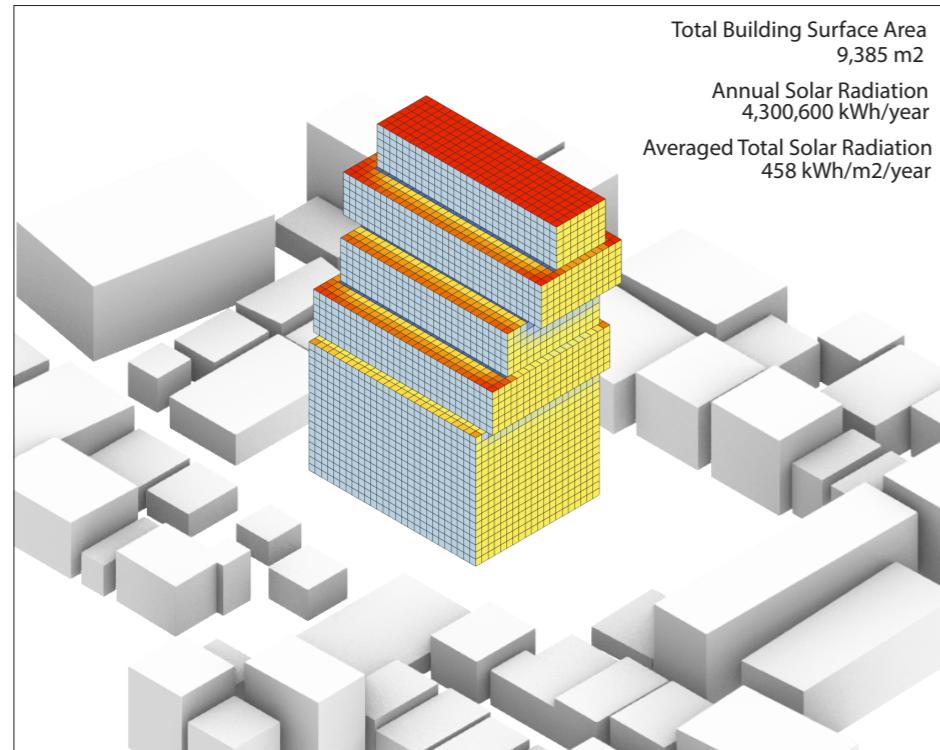
This design prioritizes ventilation by reducing the number of units per floor and creating a sloped setback. However, it might increase the overall height of the building and potentially require additional structural support.



Summary	
	Average Solar Radiation (kWh/m <sup>2</sup> /year)
Baseline	584 (Successful)
Design 1	474 (Successful)
Design 2	490 (Successful)
Design 3	414 (Successful)

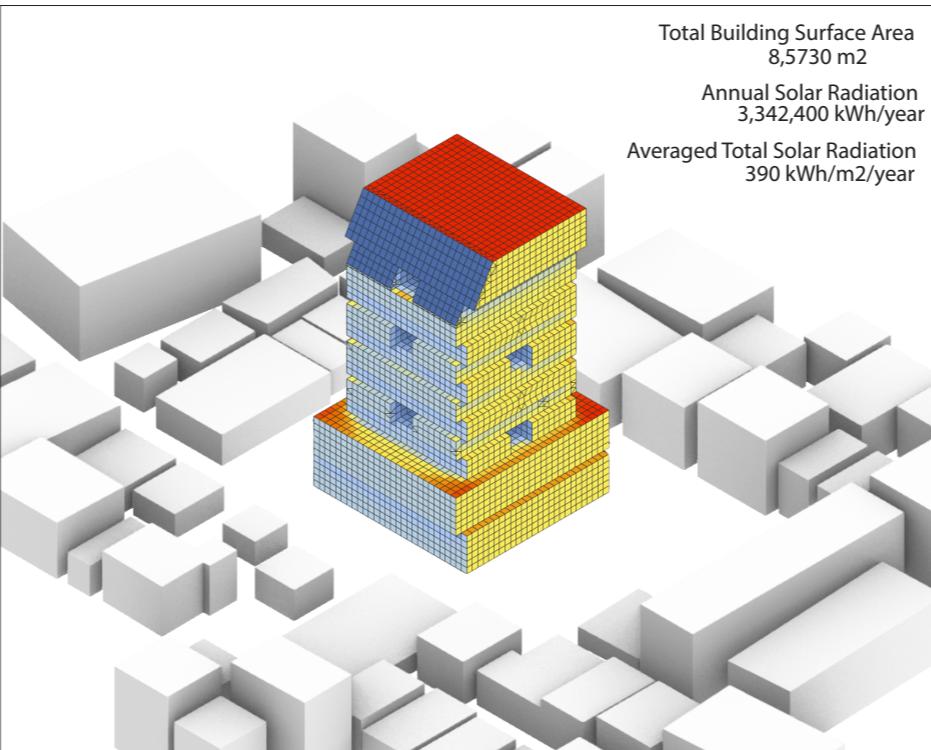
(Target Solar Radiation : 600 kWh/m<sup>2</sup>/year)

## Baseline



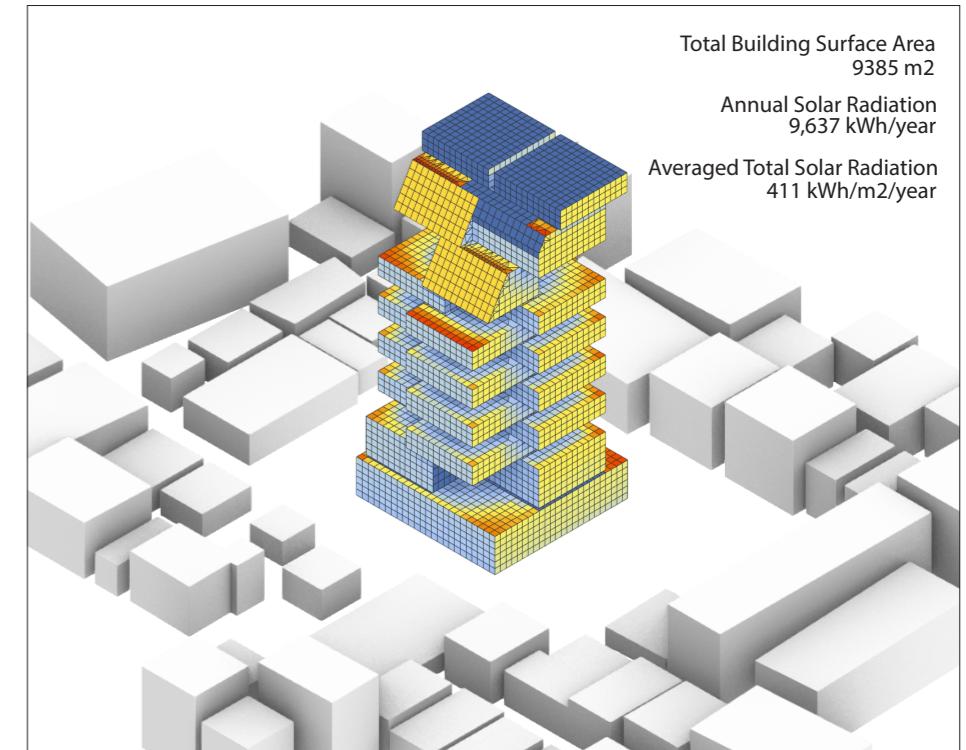
This design from stack each units on top each others and combine common area on the top as it allow individuals to get better views, however this creating a more enclosed and less ventilated space.

## Design 1

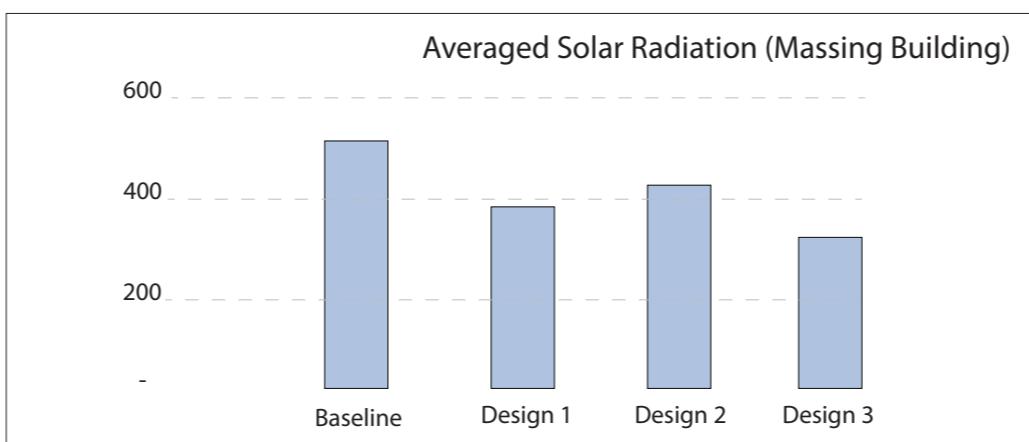


By rotating units and stacking them, this design aims to improve ventilation. Adding rectangular design of common area on the groudn floor create access to outdoor spaces.

## Design 2



This design prioritizes ventilation by reducing the number of units per floor and creating a sloped setback. Combine the common area in both on the upper levels and lower levels

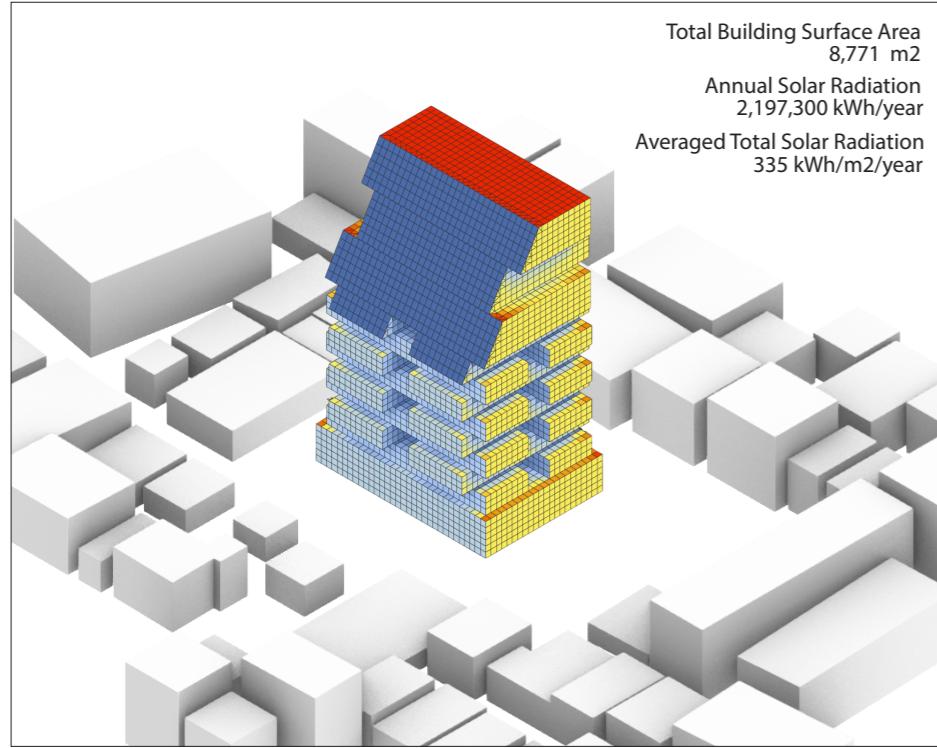


Summary	
	Average Solar Radiation (kWh/m <sup>2</sup> /year)
Baseline	458 (Successful)
Design 1	390 (Successful)
Design 2	411 (Successful)
Design 3	335 (Successful)

(Target Solar Radiation : 600 kWh/m<sup>2</sup>/year)

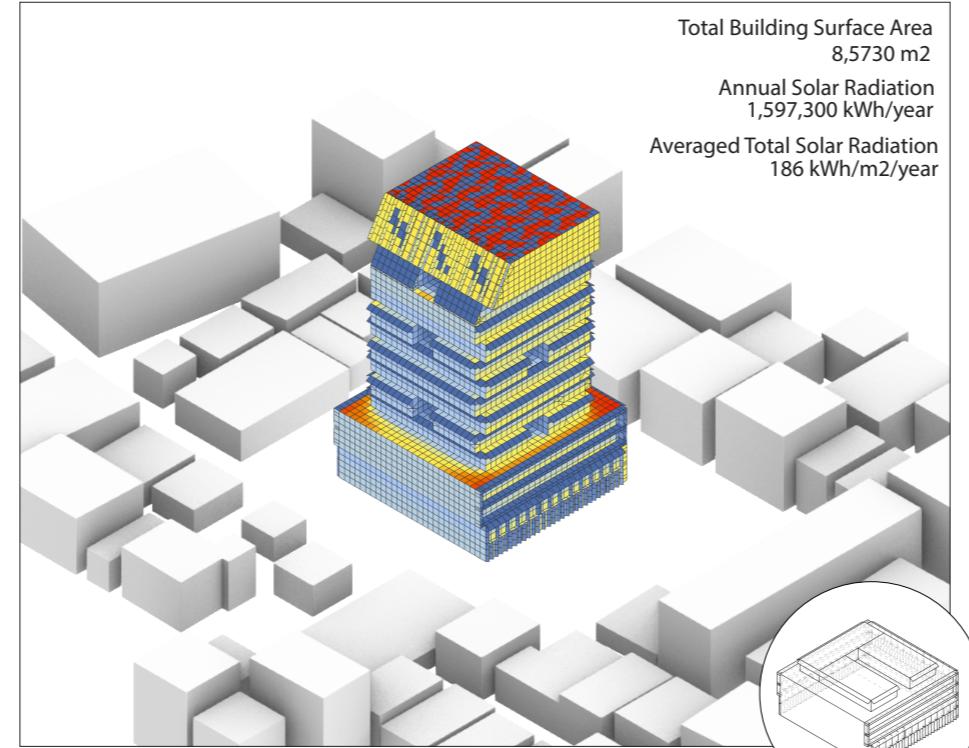
## Facade and Shading

### Baseline



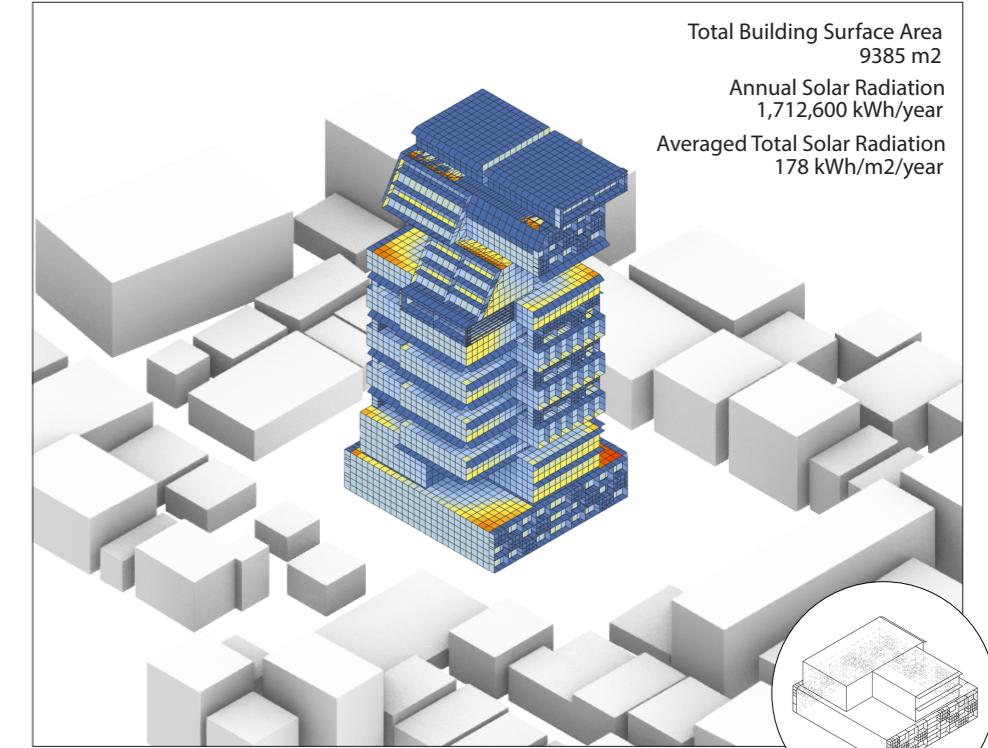
The design of a residential building featuring four rotated units per floor and vertical stacking make this get the lowest number of Averaged Solar Radiation, So I used this to become as baseline for adding shading and facade

### Design 1

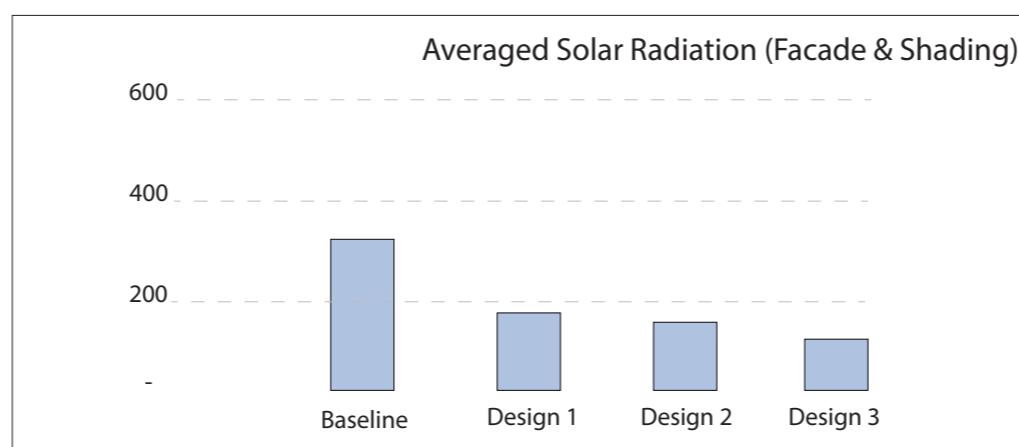


A horizontal facade design using large prefabricated panels. This approach enhances energy efficiency by minimizing overall sunlight while allowing for aesthetic versatility. Additionally, curtain walls are durable, built to withstand harsh weather conditions and requiring less maintenance.

### Design 2

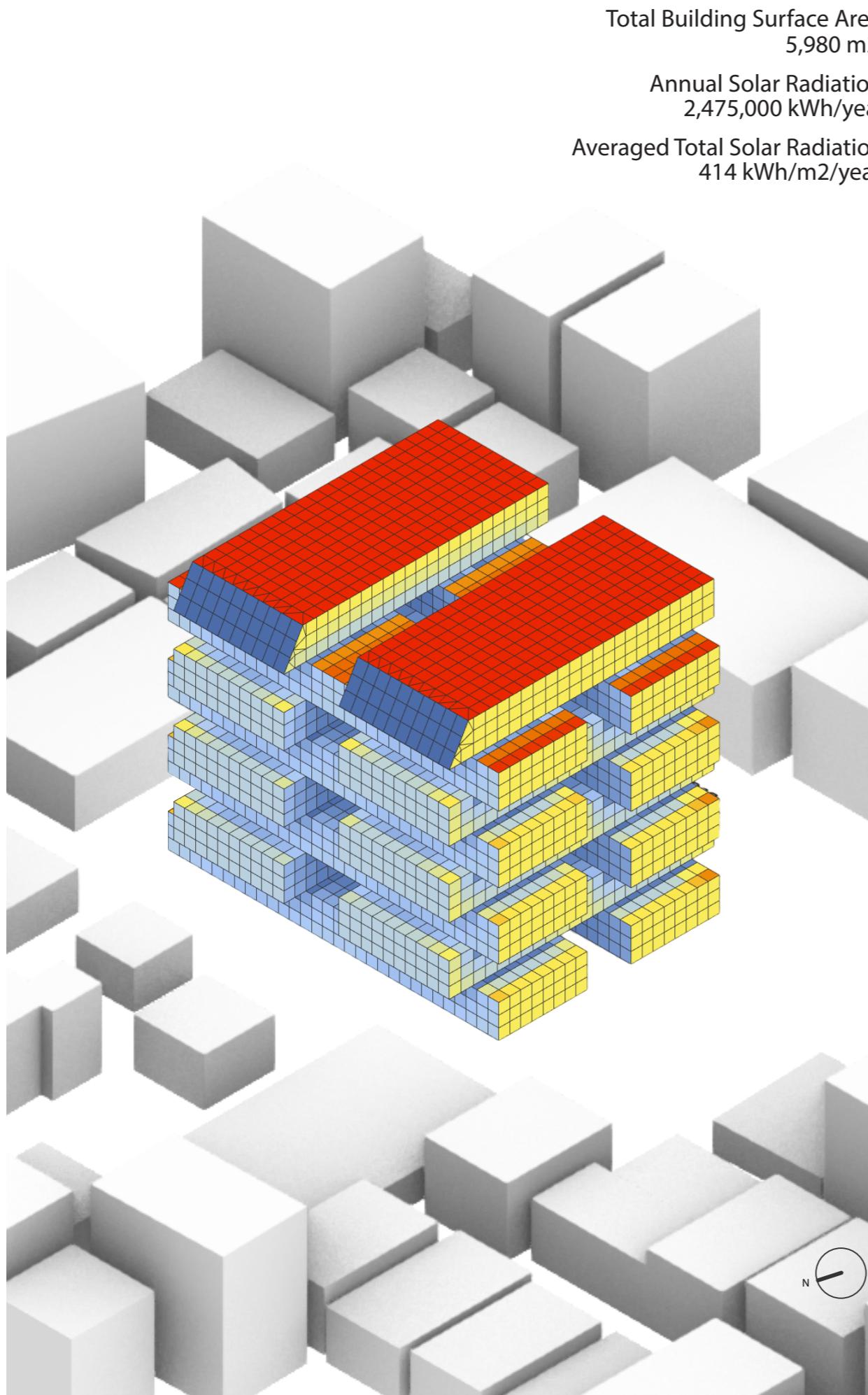


Used of geometric facade combining aesthetic appeal with functionality. This design helps reducing heat gain, while also ensuring privacy without sacrificing natural light. Additionally, the structural integrity provided by geometric shapes contributes to the strength and stability of the building.



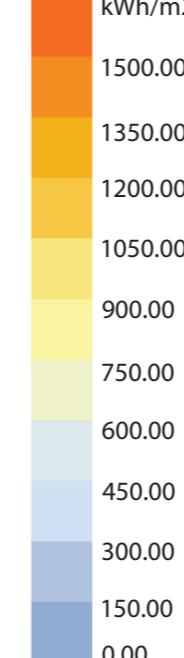
Summary	
	Average Solar Radiation (kWh/m <sup>2</sup> /year)
Baseline	335 (Successful)
Design 1	186 (Successful)
Design 2	178 (Successful)
Design 3	129 (Successful)

(Target Solar Radiation : 500 kWh/m<sup>2</sup>/year)

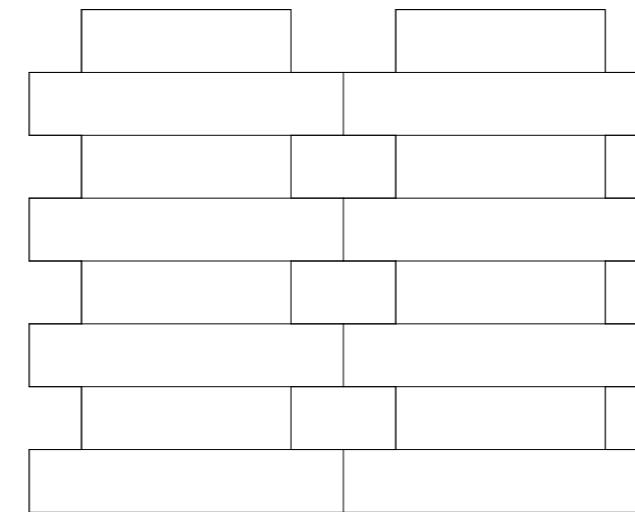
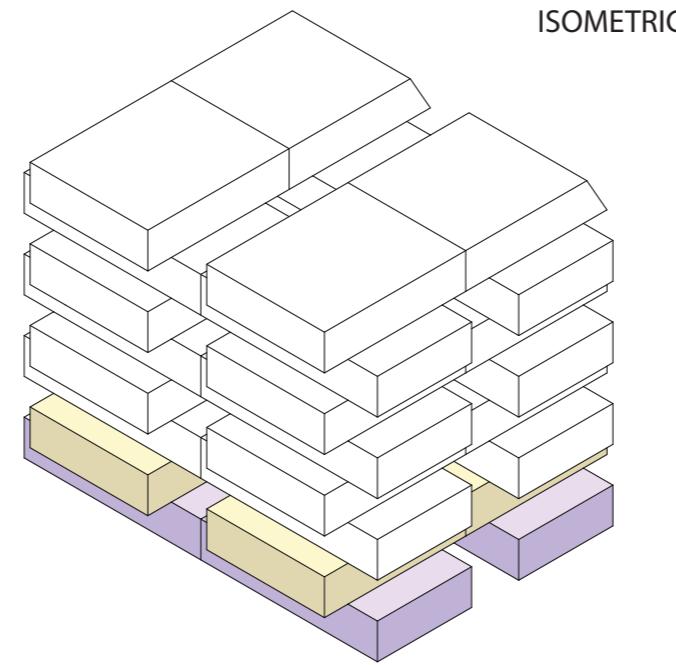
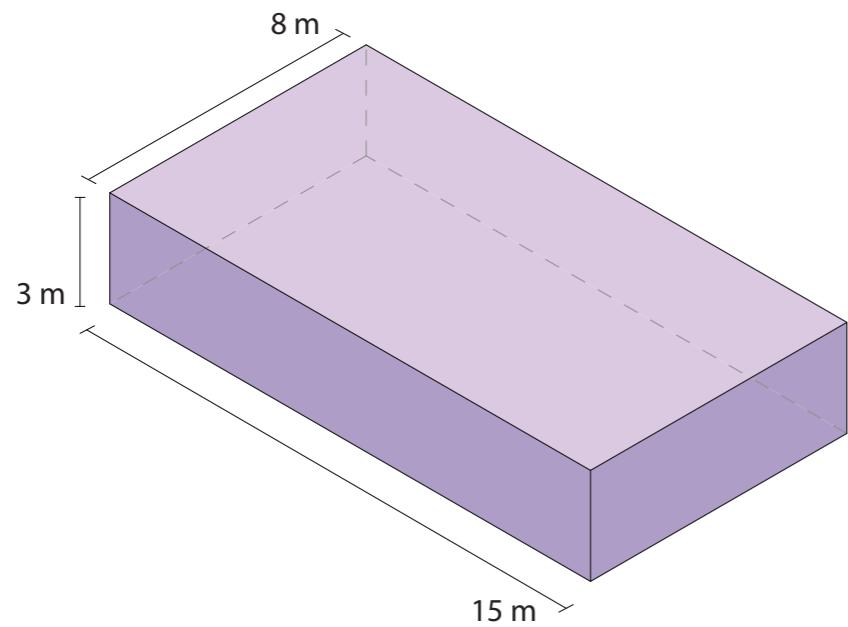
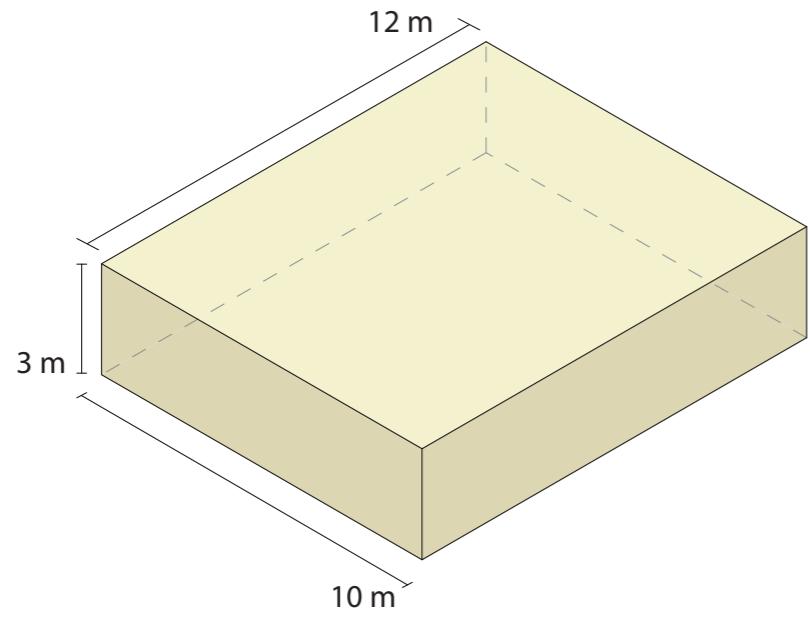


## Prototype Design 3 (Selected)

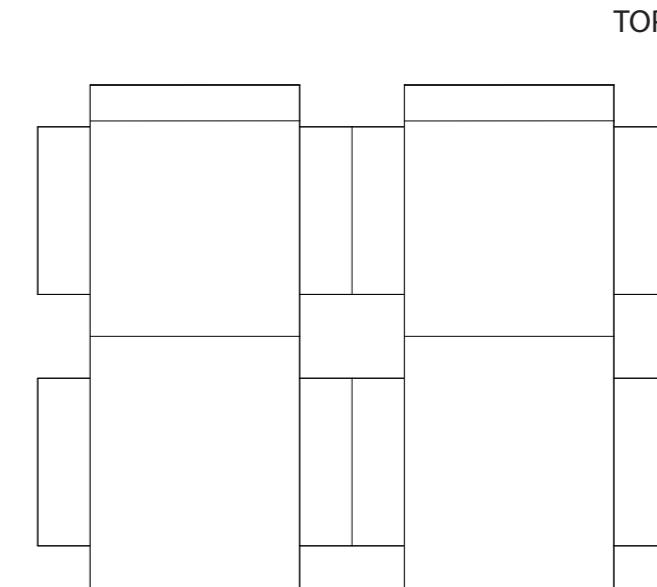
The design of unit residential building featuring four rotated units per floor and vertical stacking offers numerous benefits for residents. This configuration enhances ventilation, improving indoor air quality and reducing the need for artificial cooling. The north-facing orientation minimizes direct sunlight exposure, leading to lower solar heat gain and decreased energy costs, particularly in warmer months. Additionally, a wider front space creates an inviting atmosphere, providing an outdoor gathering area that fosters community engagement.



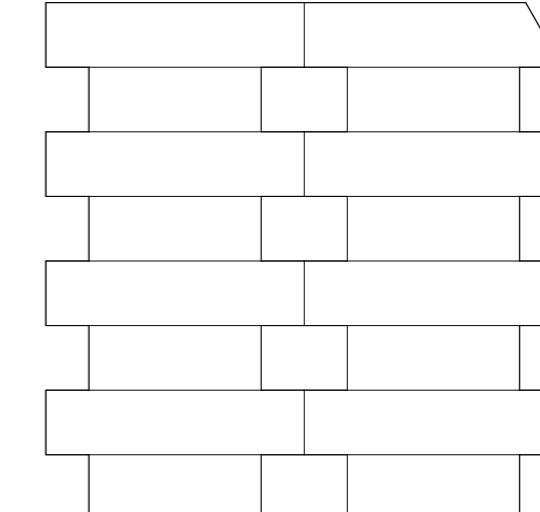
Summary	
	Average Solar Radiation (kWh/m <sup>2</sup> /year)
Baseline	584
Design 1	474
Design 2	490
Design 3	414



ISOMETRIC



TOP



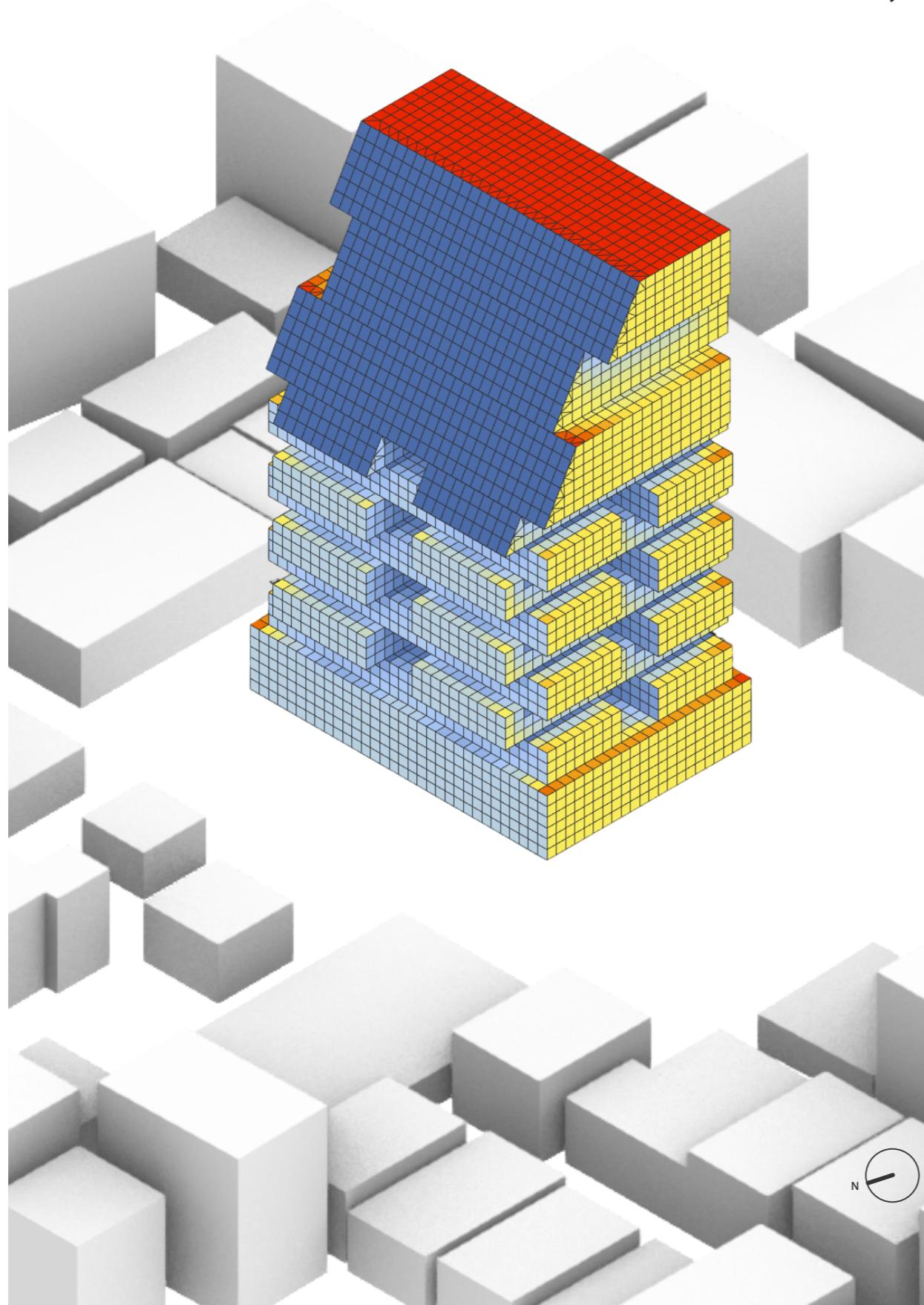
SIDE

FRONT

Total Building Surface Area  
8,771 m<sup>2</sup>

Annual Solar Radiation  
2,936,600 kWh/year

Averaged Total Solar Radiation  
335 kWh/m<sup>2</sup>/year



## Building Mass Design 3 (Selected)

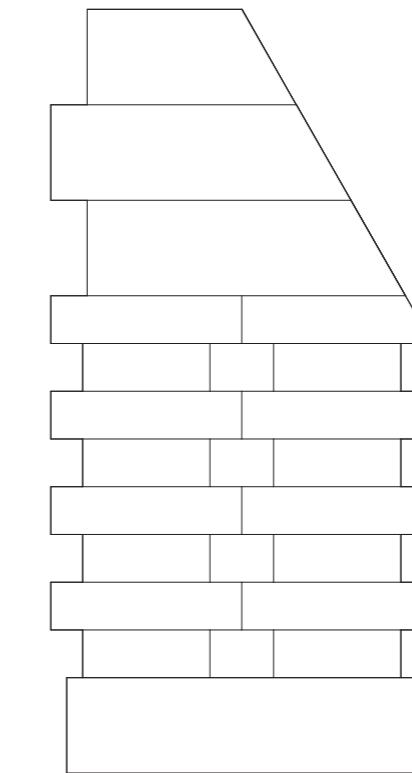
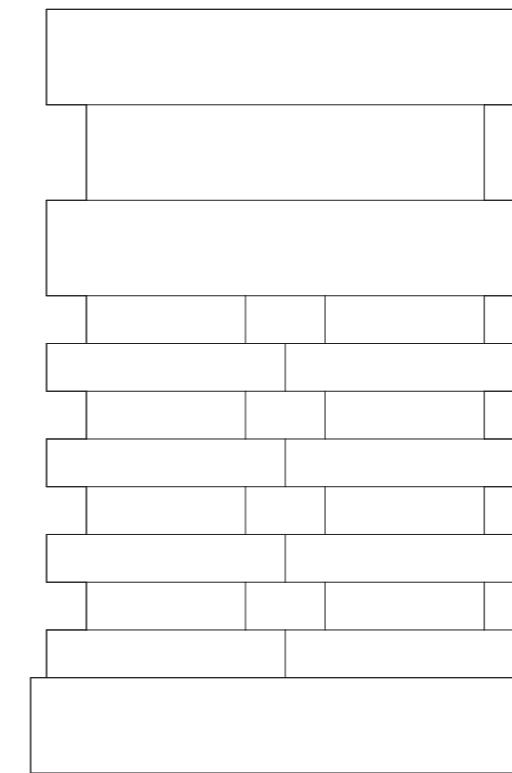
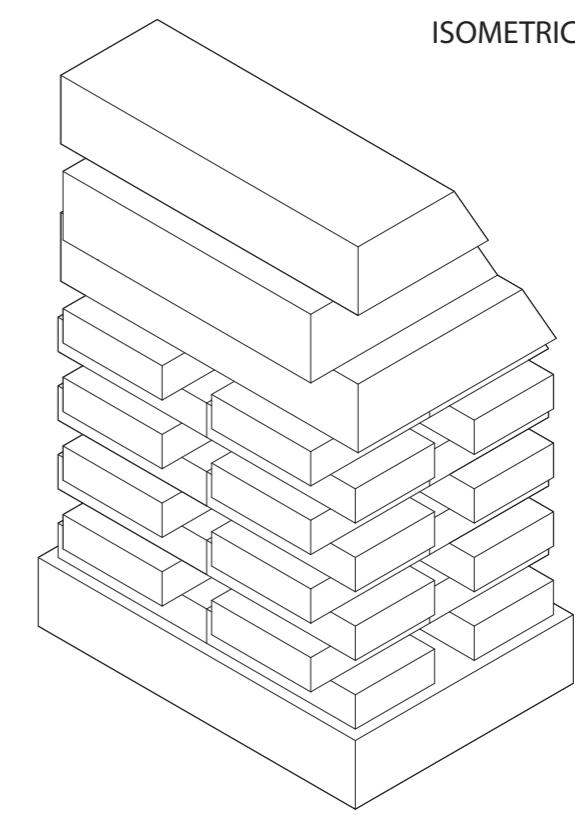
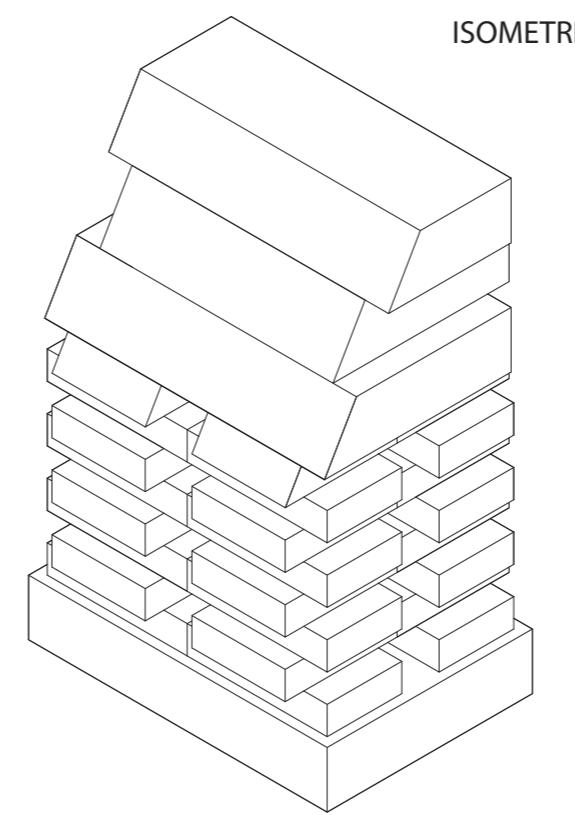
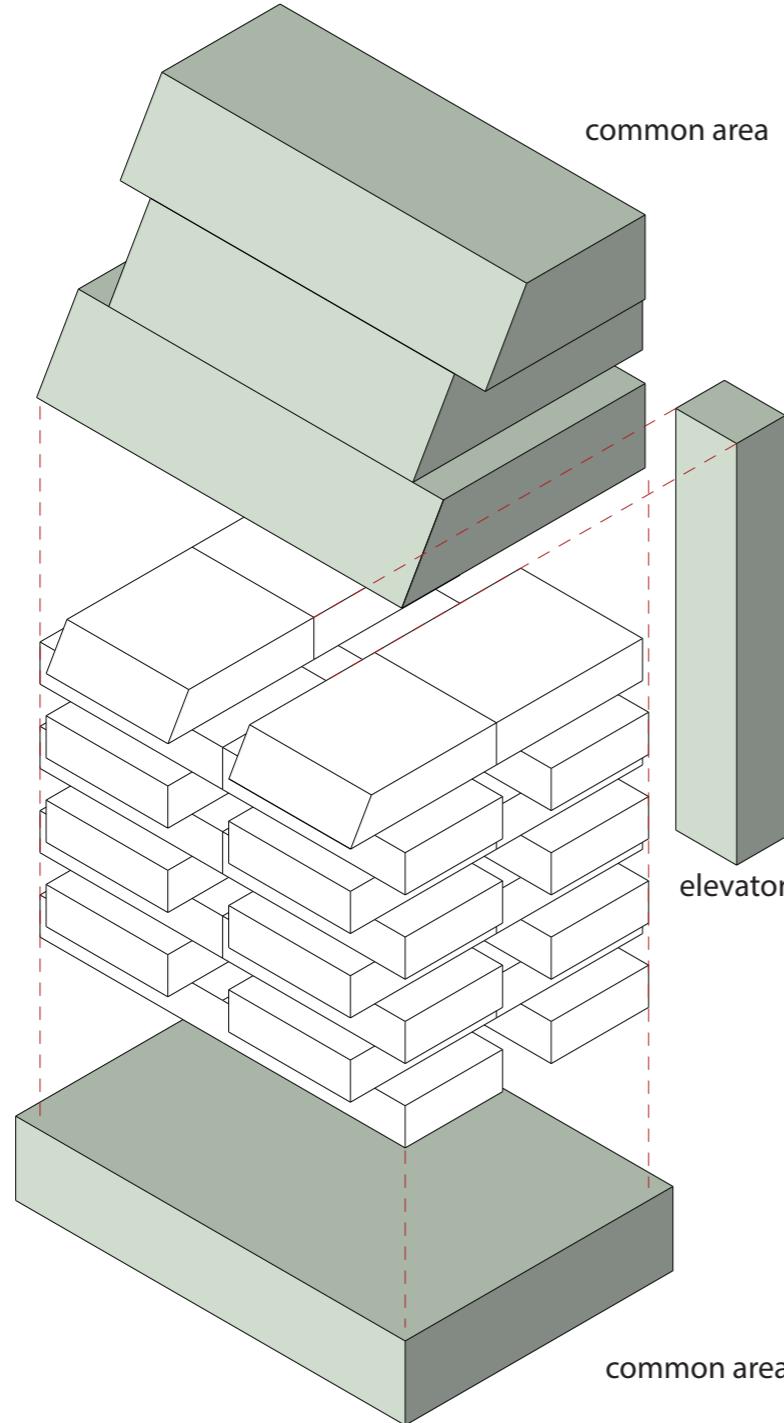
kWh/m<sup>2</sup>

1500.00	In this design, the common area is positioned on the lower levels, potentially providing access to outdoor spaces and views and the common area on the upper levels, potentially offering panoramic views. Also create a separation between the common area and the residential units.
1350.00	
1200.00	
1050.00	
900.00	
750.00	
600.00	
450.00	
300.00	
150.00	
0.00	

1500.00  
1350.00  
1200.00  
1050.00  
900.00  
750.00  
600.00  
450.00  
300.00  
150.00  
0.00

In this design, the common area is positioned on the lower levels, potentially providing access to outdoor spaces and views and the common area on the upper levels, potentially offering panoramic views. Also create a separation between the common area and the residential units.

Summary	
	Average Solar Radiation (kWh/m <sup>2</sup> /year)
Baseline	458
Design 1	390
Design 2	411
Design 3	335



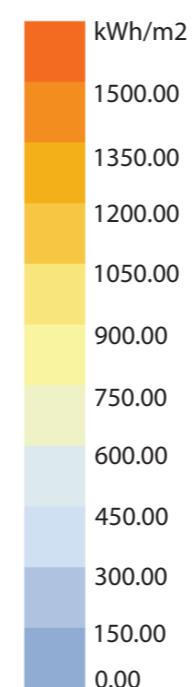
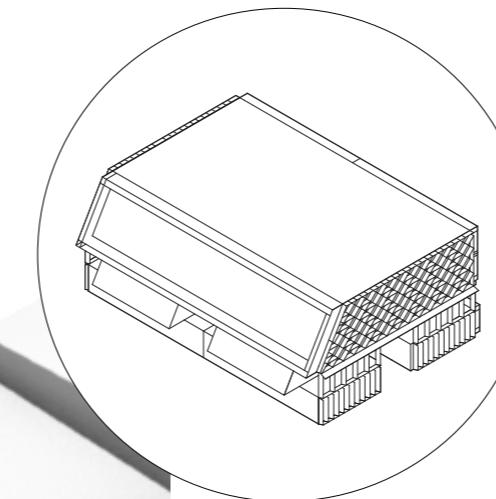
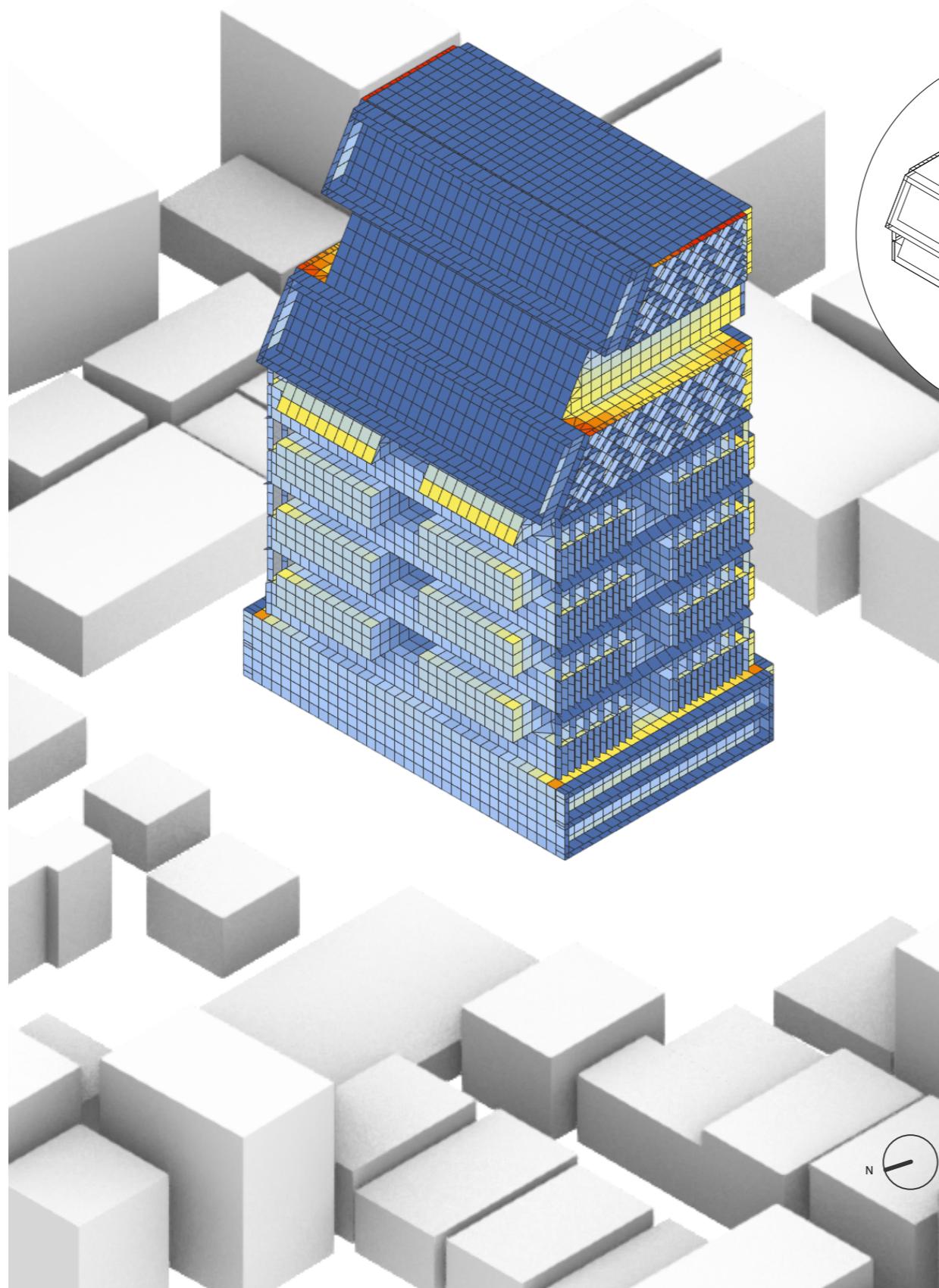
FRONT

SIDE

Total Building Surface Area  
8,771 m<sup>2</sup>

Annual Solar Radiation  
1,128,100 kWh/year

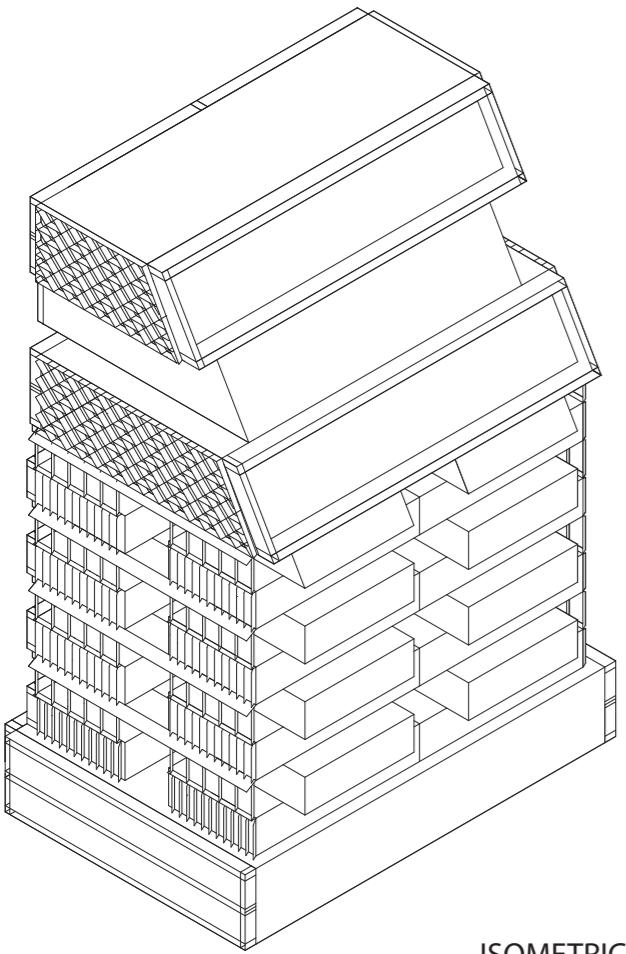
Averaged Total Solar Radiation  
129 kWh/m<sup>2</sup>/year



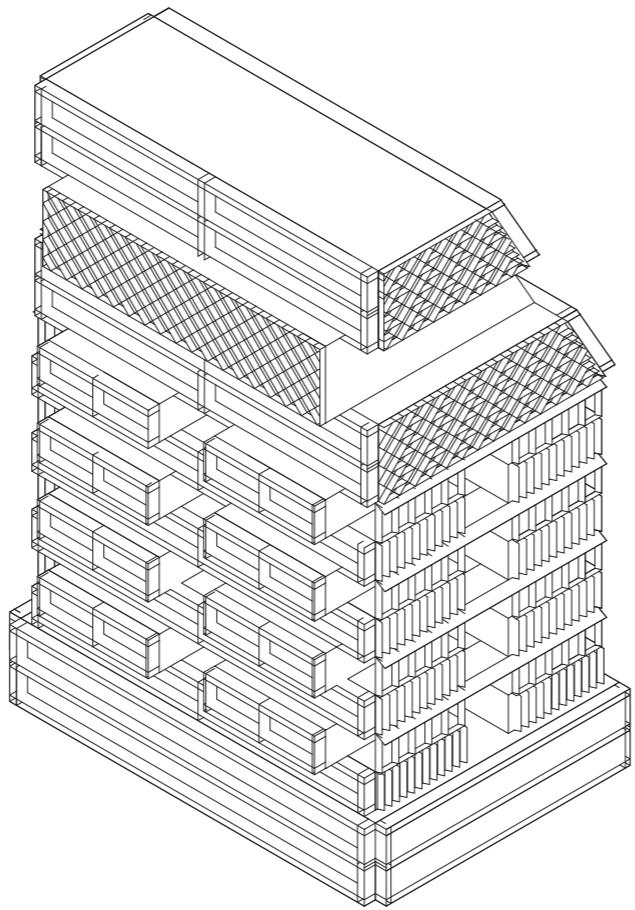
## Facade and Shading Design 3 (Selected)

The facade featuring a pattern of triangular windows exemplifies modern architectural design, offering both aesthetic and functional advantages. Visually, the unique triangular shape creates an eye-catching element that sets the building apart from traditional designs. This geometric pattern instills a sense of order and balance, enhancing the overall beauty of the structure. From a functional perspective, triangular windows can be strategically designed to reduce sunlight. Additionally, their orientation and size can facilitate effective ventilation, improving indoor air quality.

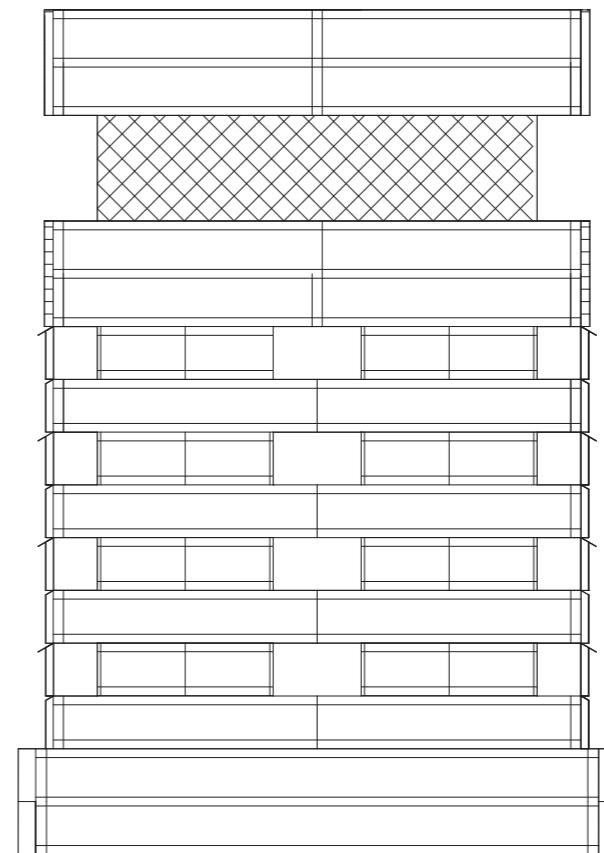
Summary	
	Average Solar Radiation (kWh/m <sup>2</sup> /year)
Baseline	335
Design 1	186
Design 2	178
Design 3	129



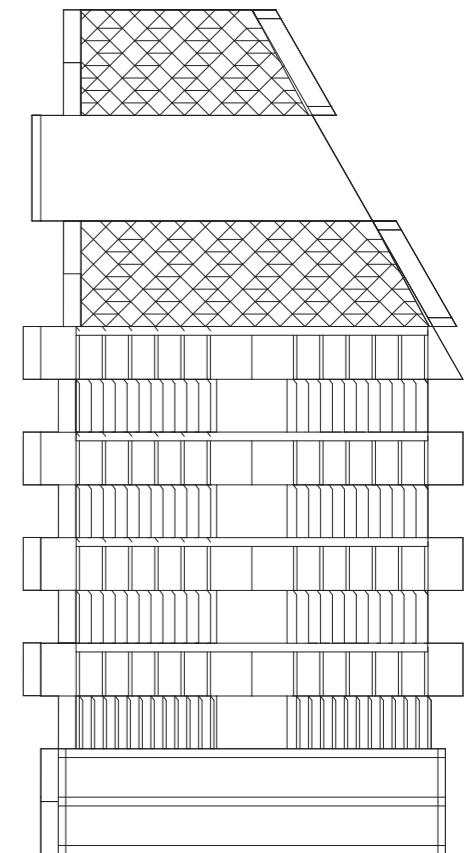
ISOMETRIC



ISOMETRIC



FRONT



SIDE