

## Exploded Diagram

### Canopy Level - Early Summer

- Atmospheric Collection**
- Warm agricultural air rises carrying moisture from evapotranspiration.
  - Water vapor accumulates within the 12-20 m collection zone beneath the canopy.

### Roof Level - Late Summer

- Maintenance & Cleaning**
- Sedimentation channels are opened to collect the debris of the previous year collected.
  - Maintenance access allows seasonal cleaning before peak collection periods.

### First Floor - Spring

- Storage & Distribution**
- Increased humidity improves condensation efficiency and water yield.
  - Water is stored and distributed to public collection points throughout the spine.
  - Patient wards, ICU, operating suites and sterile departments occupy this level.

### Ground Floor - Autumn

- Peak Collection Period**
- Seasonal humidity reaches its highest levels, maximizing water production.
  - Water collection towers operate at peak capacity.
  - Emergency, radiology, laboratories, therapy and outpatient clinics occupy this level.

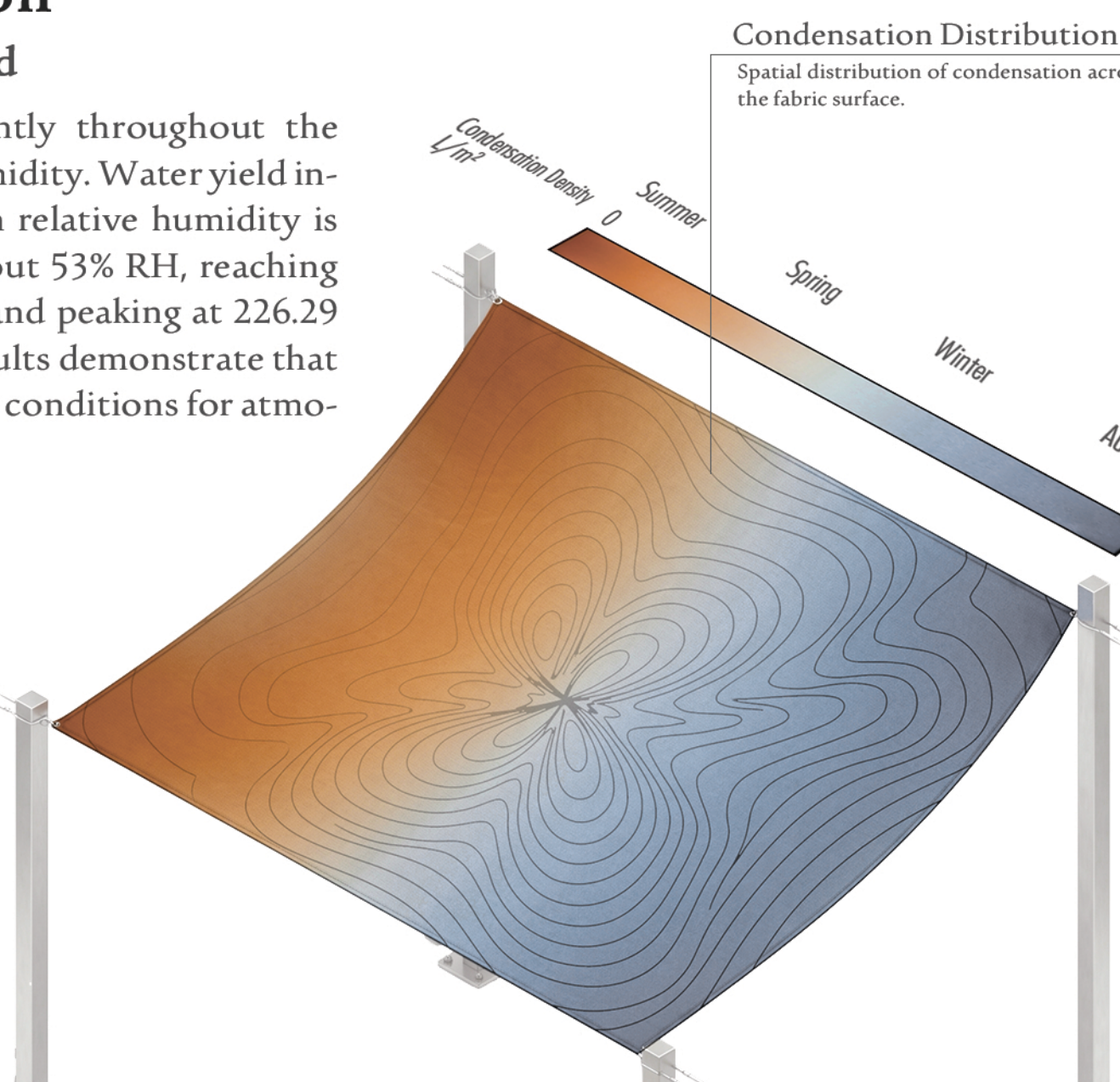
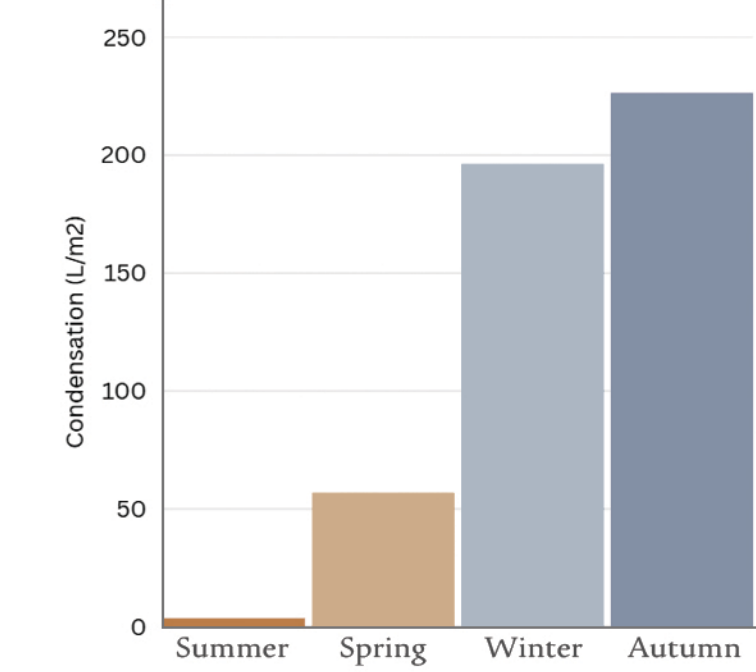
### Basement - Winter

- Central Storage**
- Highest annual collection volumes are filtered and transferred to central reservoirs.
  - Mechanical filtration and storage systems regulate water quality and distribution.
  - Service functions including laundry, morgue, plant rooms and water treatment systems are located below grade.

## Condensation Simulation

### Assessment of condensation yield

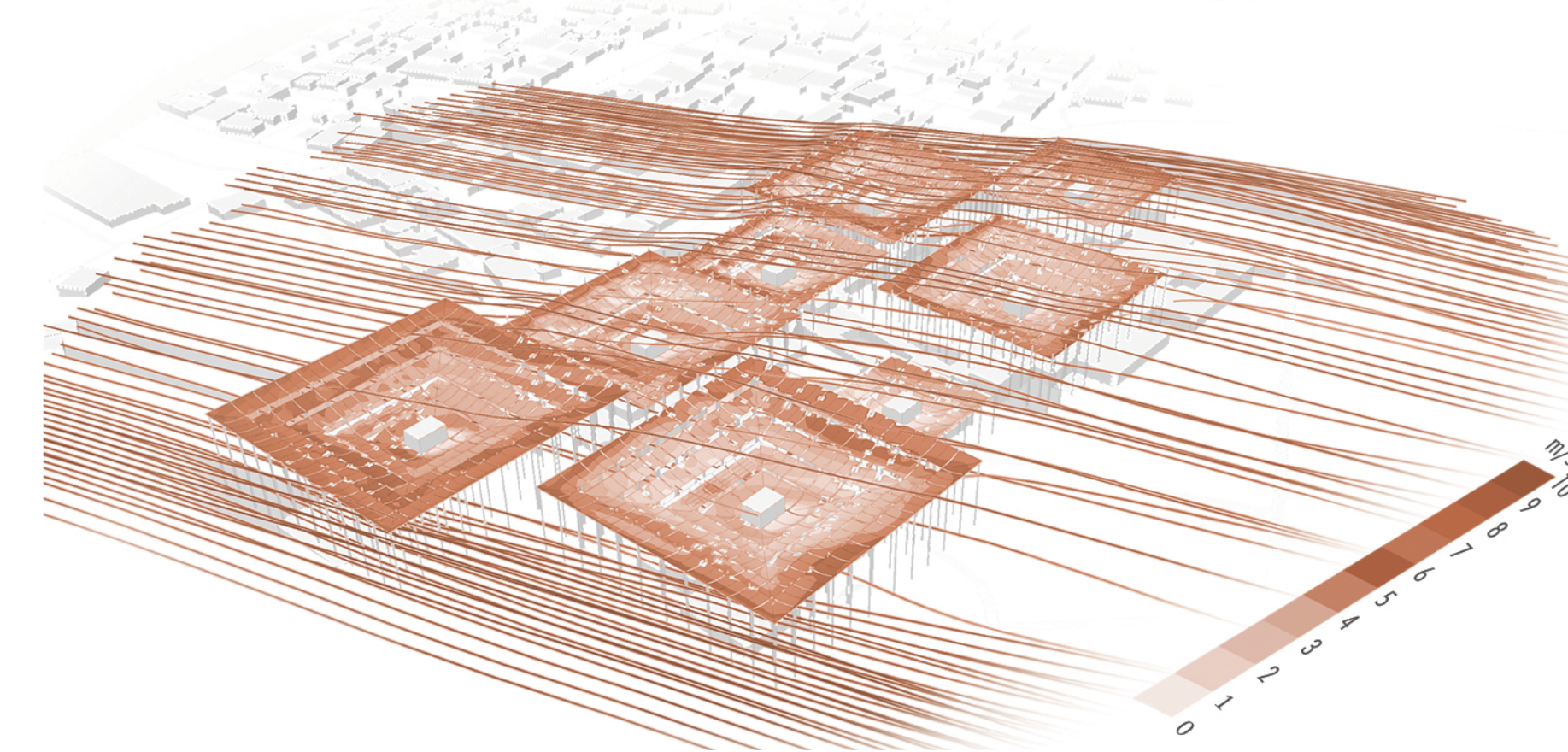
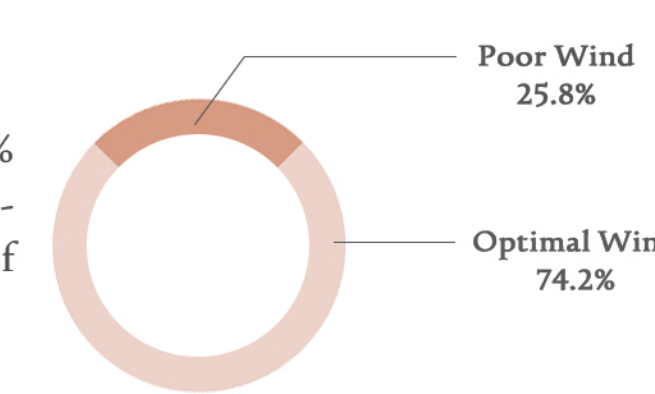
Condensation potential varies significantly throughout the year in response to changes in relative humidity. Water yield increases from 3.67 L/m<sup>2</sup> in summer, when relative humidity is about 38%, to 56.92 L/m<sup>2</sup> in spring, when relative humidity is about 68% RH, and peaking at 226.29 L/m<sup>2</sup> in winter at about 73% RH. The results demonstrate that cooler seasons provide the most favorable conditions for atmospheric water harvesting.



## Wind Simulation

### Assessment of annual wind conditions

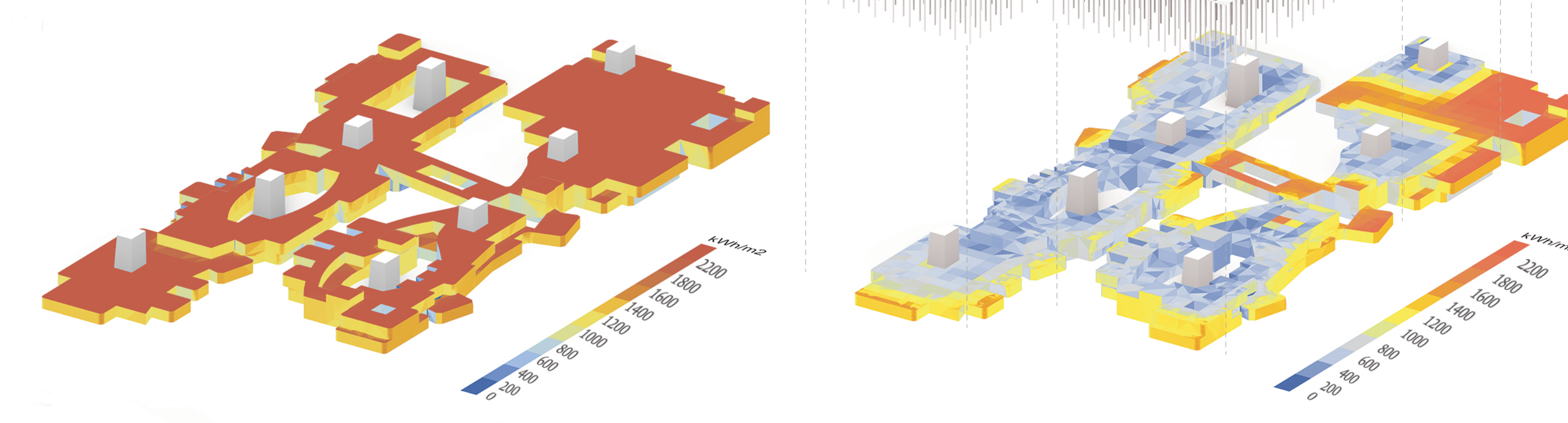
Annual wind speeds average approximately 4 m/s, with 74.2% of recorded conditions falling within the optimal range for atmospheric moisture condensation, supporting the viability of passive water harvesting throughout most of the year.



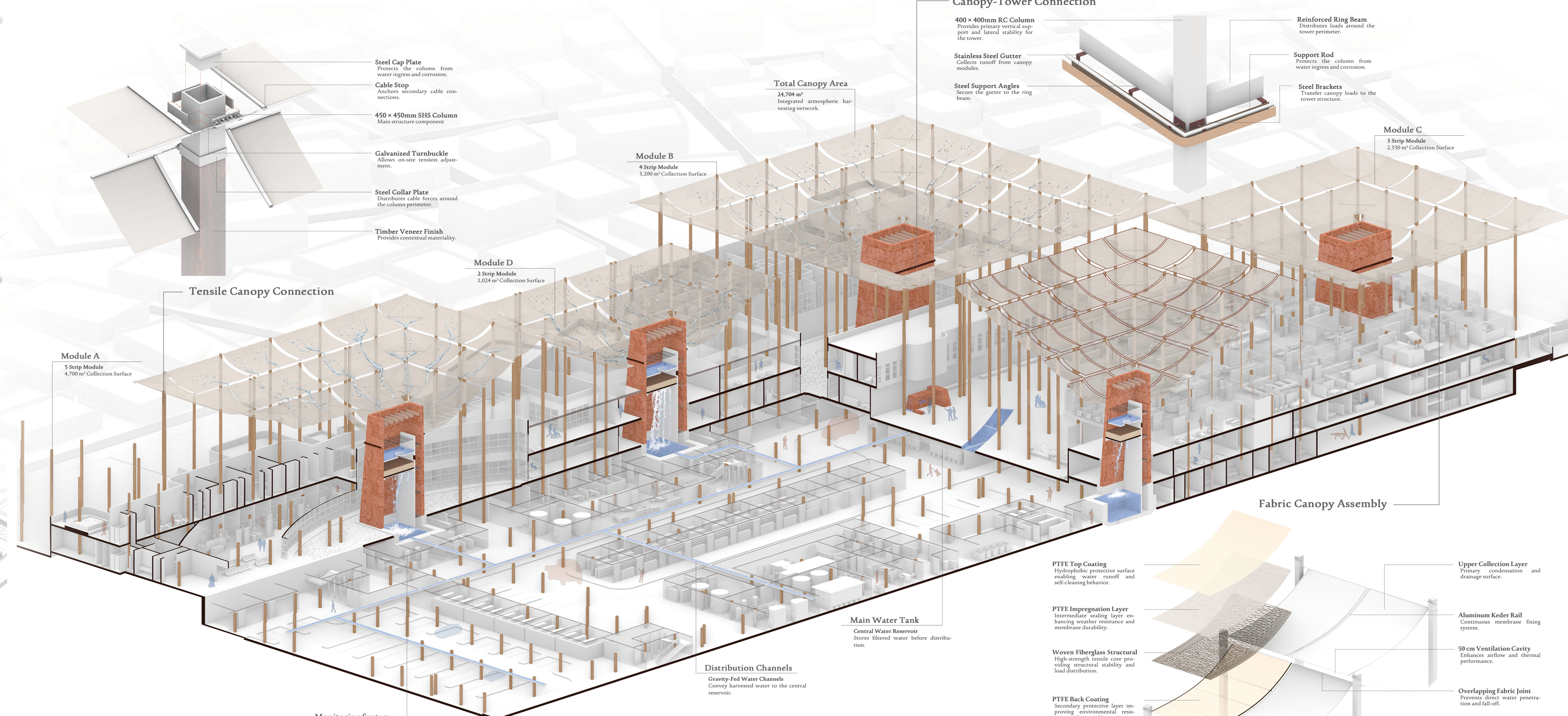
## Thermal Simulation

### Assessment of incident solar radiation

Solar exposure is reduced by 47.7% beneath the canopy, transforming the spine into a protected microclimate that mitigates heat gain and enhances occupant comfort in Farafra's desert environment.



## 3D Section



Elevation Scale 1:300