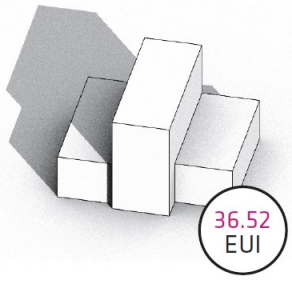
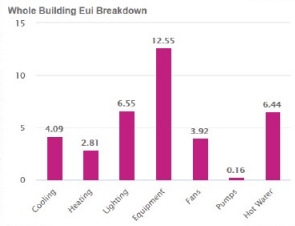
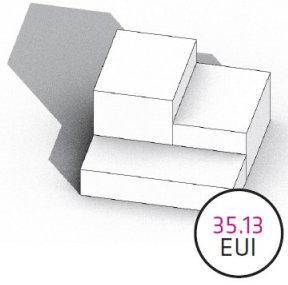
BUILDING ANALYTICS

05a | Massing 01

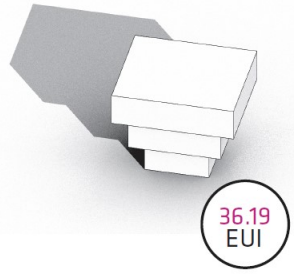


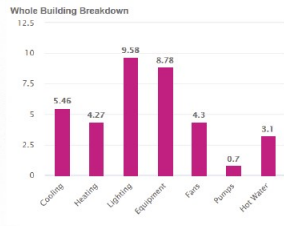


05b | Massing 02

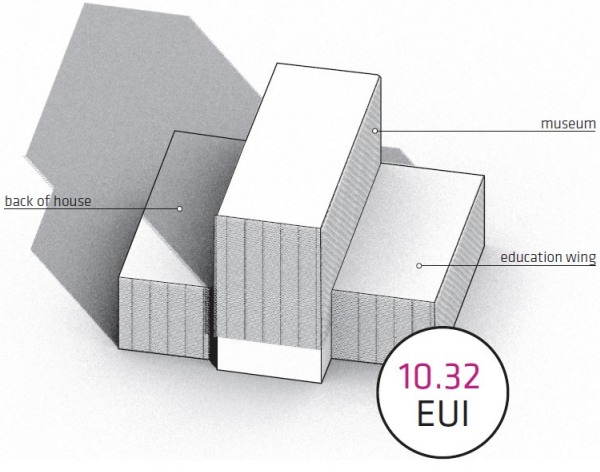


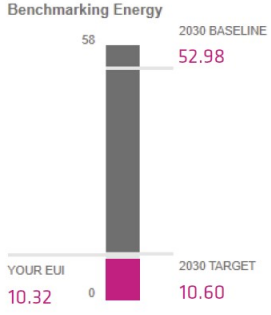
05c | Massing 03

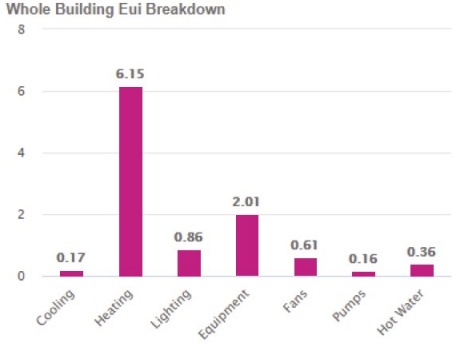




05d | Optimized Massing 01







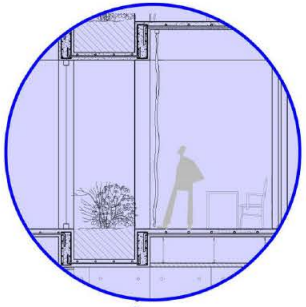
Optimization parameters

Envelope
- Increased roof and wall r-value (roof r=40, wall r=20)
- Decreased glazing u-value (u=.25)
- Added exterior blinds

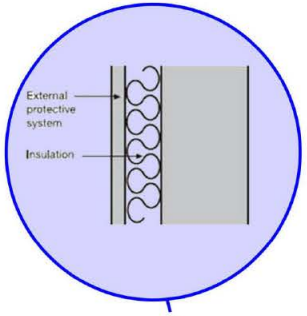
Usage and Schedules
- Added daylight and occupancy sensors
- Adjusted LPD to 50% of code and turned off during unoccupied hours
- Decreased appliance use (W/sqft=.25) and turned off during unoccupied hours

Building System
- Changed system to VAV/Heat Pump
- Added heat pipes for heat recovery
- Specified advanced energy management system
- Adjusted CFM per use
- Set domestic hot water to district heating through Seattle steam
- Adjusted hot water demand accordingly

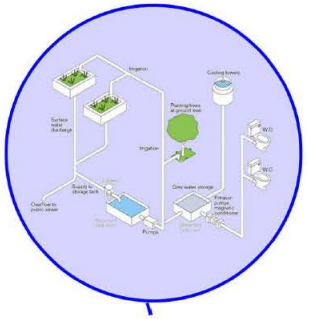
Doble filter facede: vegetation wall + operable curtains in the terrace of each unit.



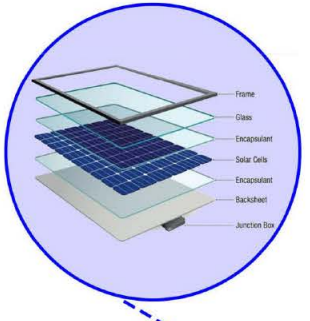
Insulated structural concrete walls.



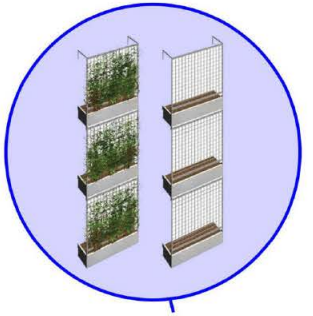
Water caption system in the central couryard, rain water will be directed into the center of the project.

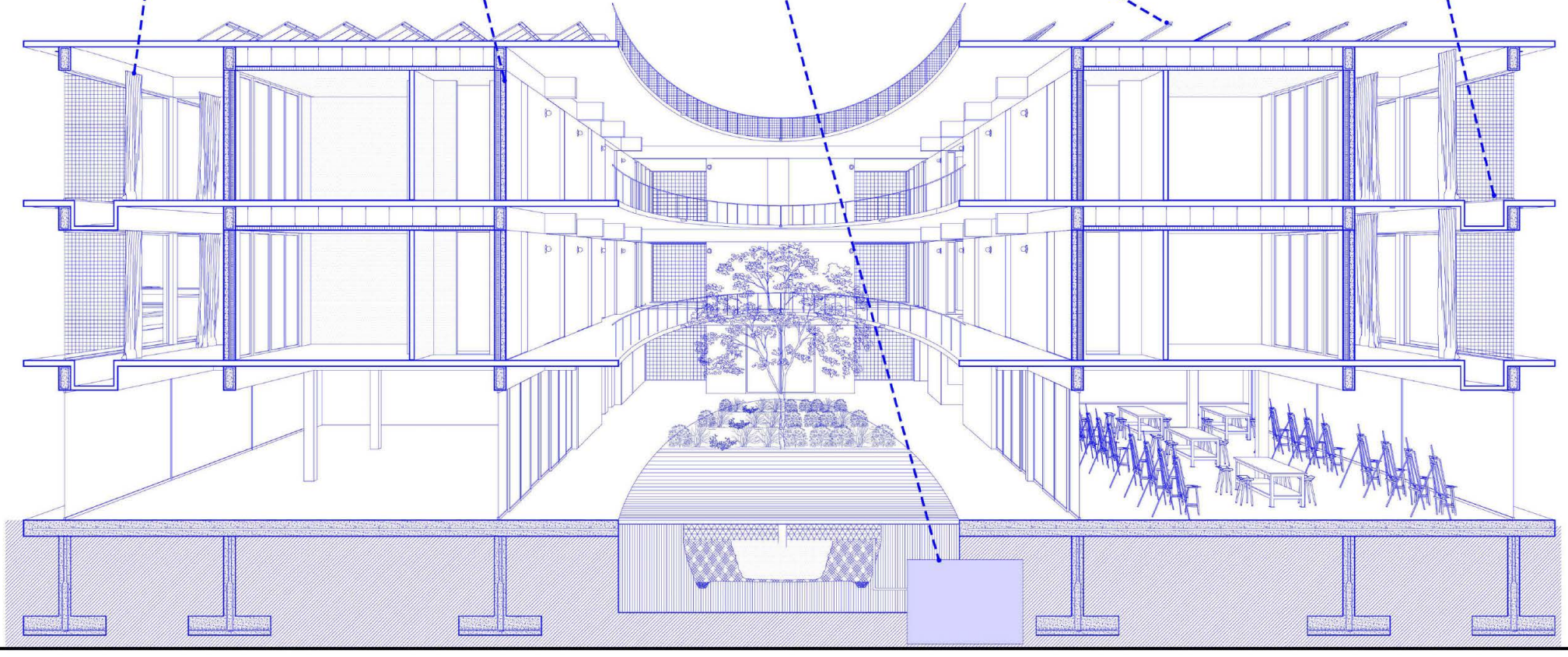


Photovoltaic panels in the rooftop.

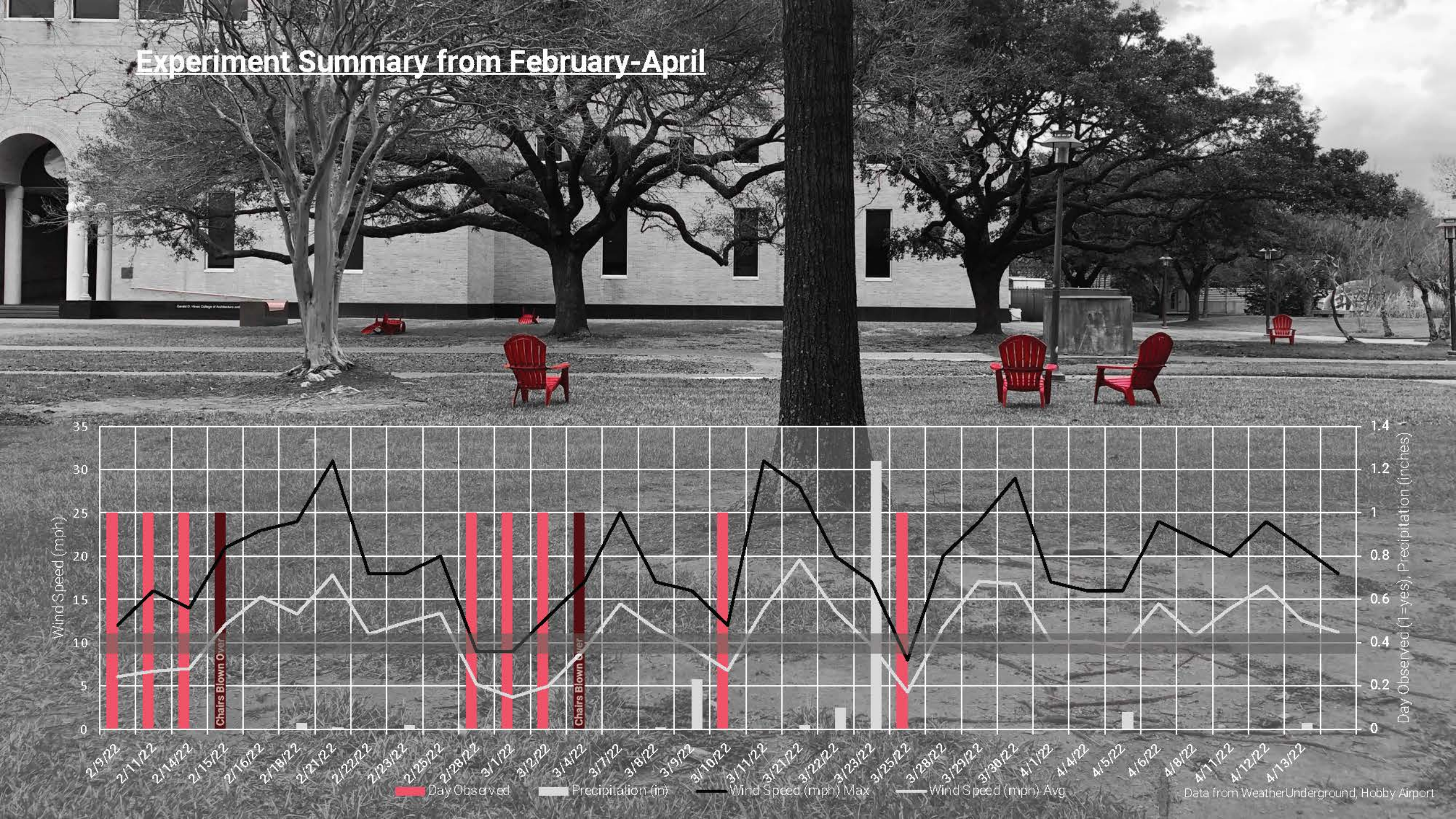


Green facade with a metal mesh.

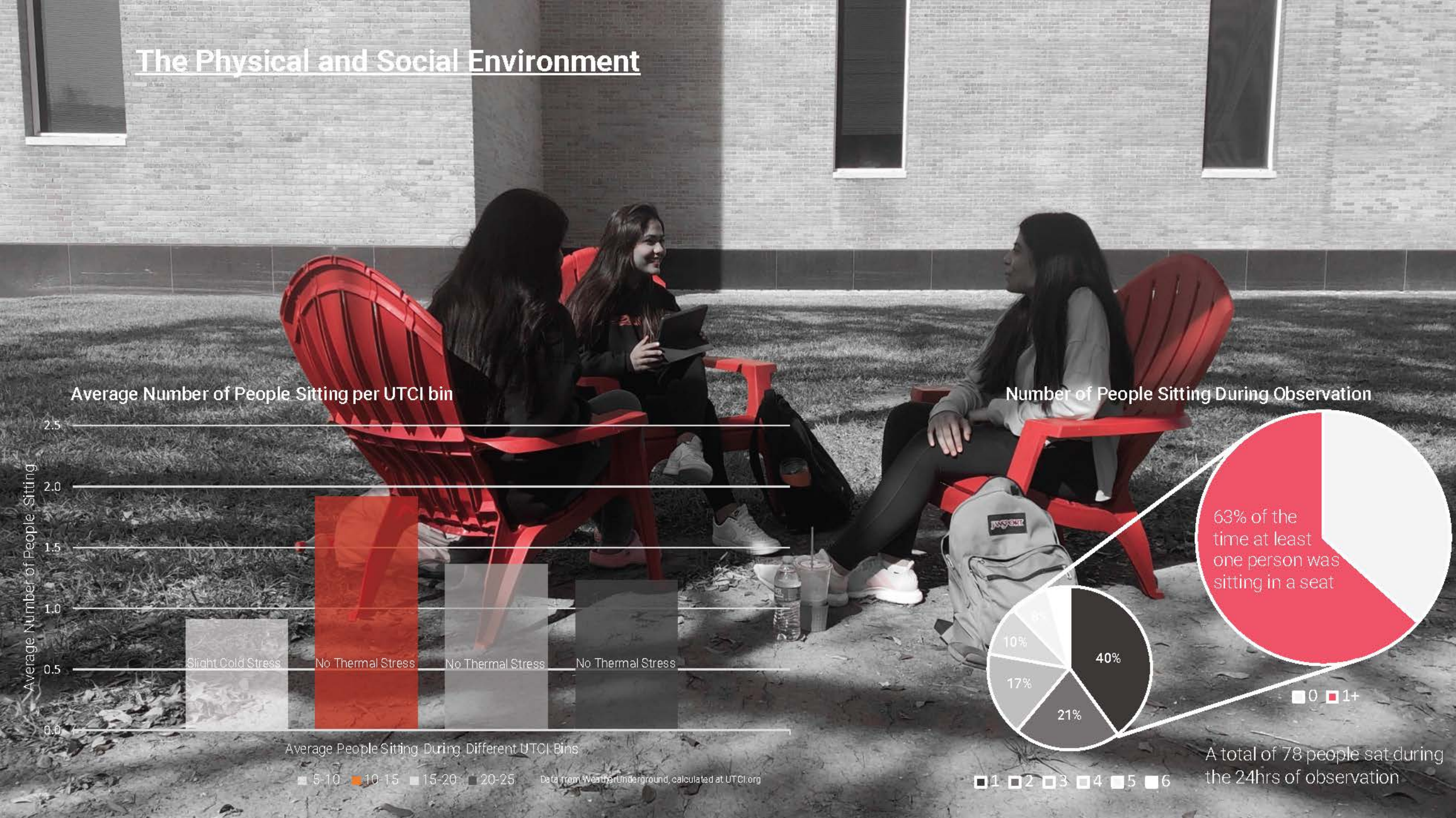


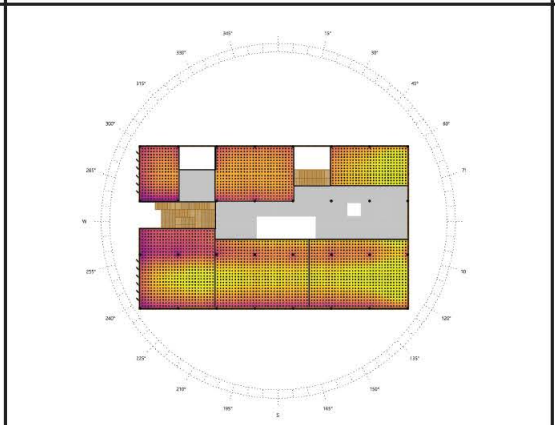
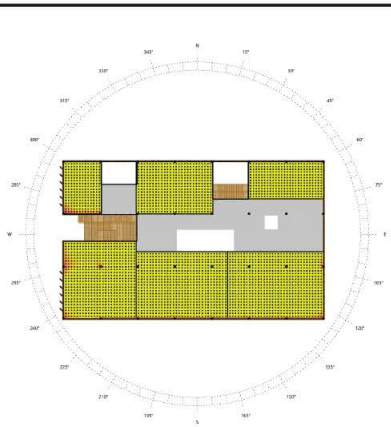
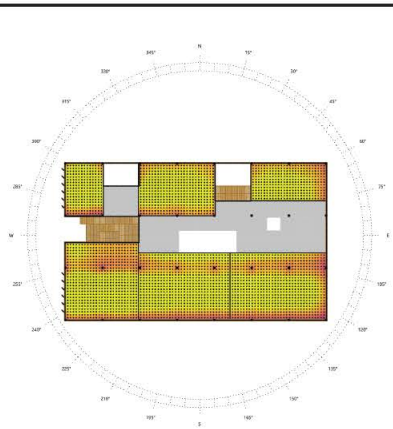
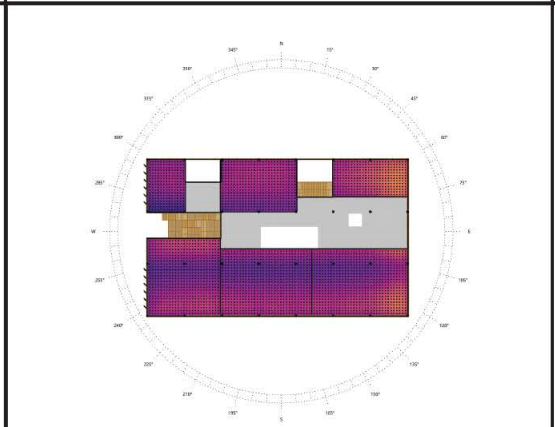
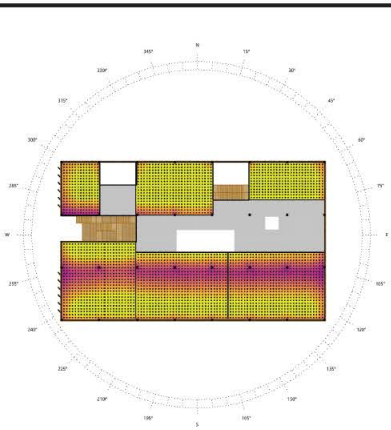
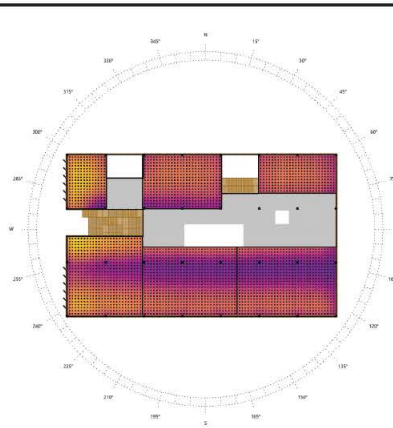
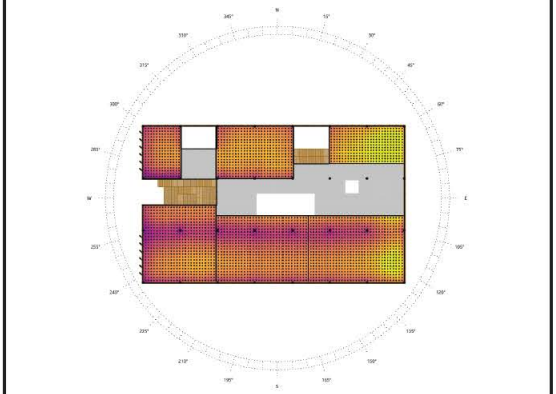
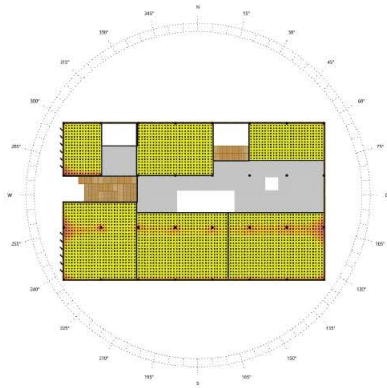
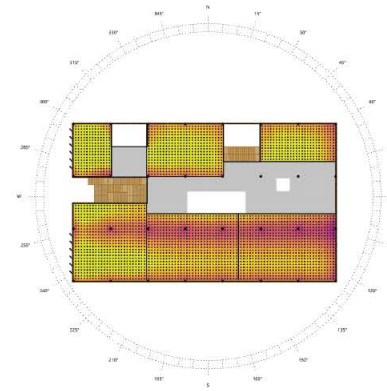


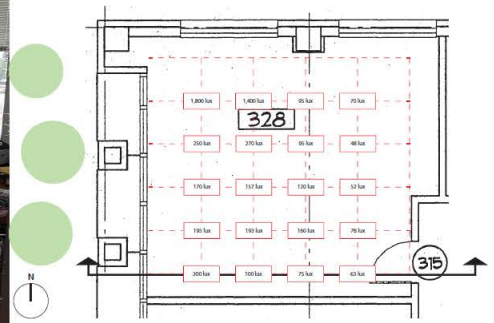
Experiment Summary from February-April

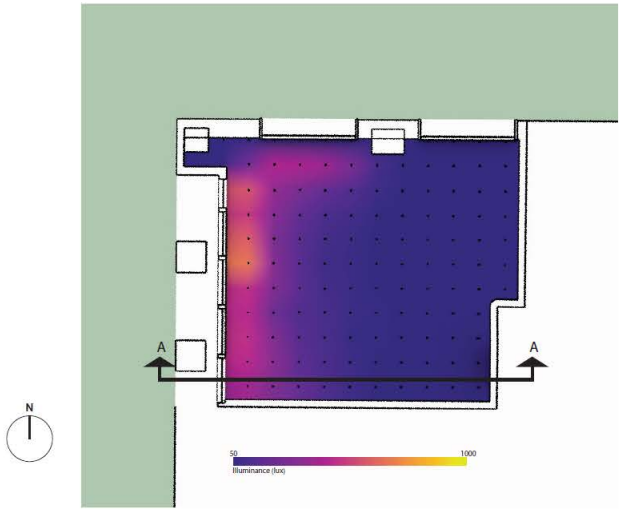


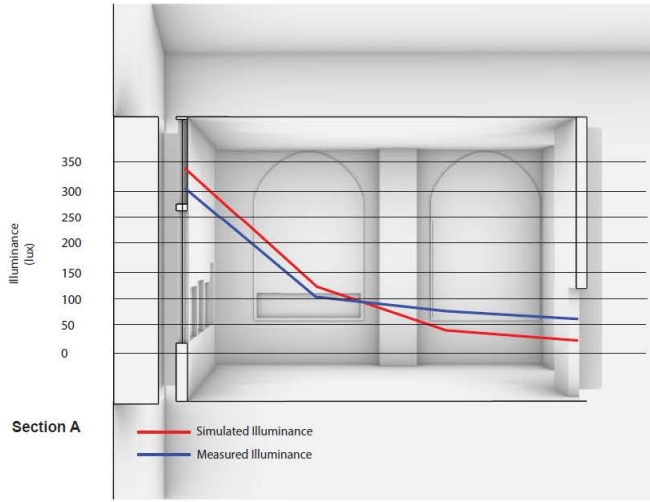
The Physical and Social Environment

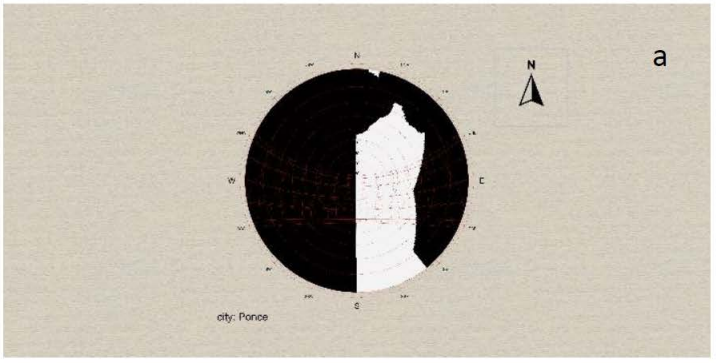


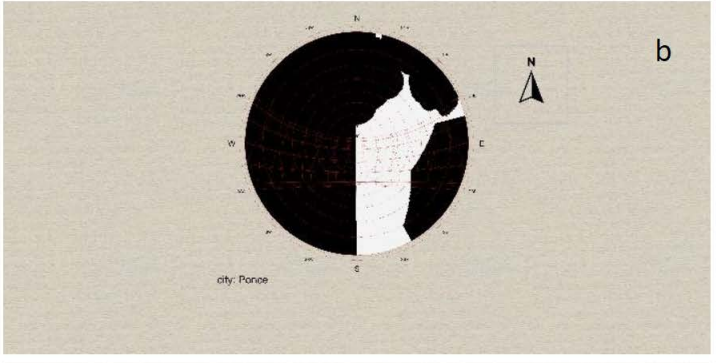
	9am	12pm	3pm
Summer Solstice			
Winter Solstice			
Fall Equinox			


328
315
N


A
A
N
50
1000
Illuminance (lux)


Illuminance (lux)
350
300
250
200
150
100
50
0
Section A
Simulated Illuminance
Measured Illuminance





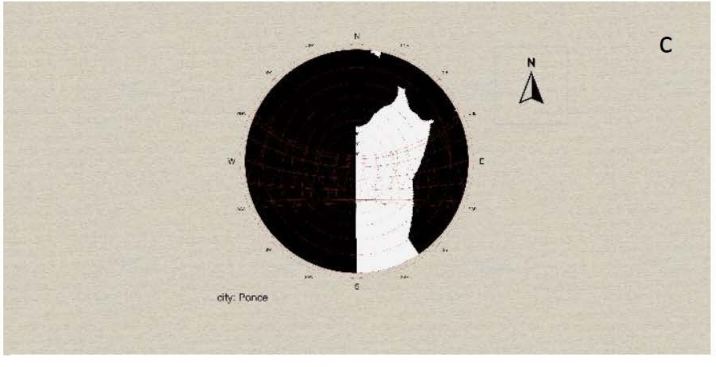
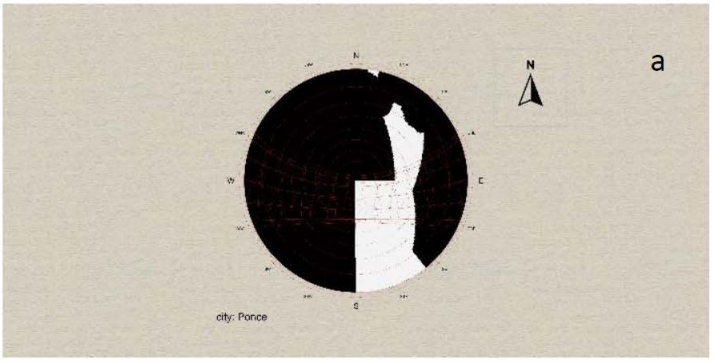
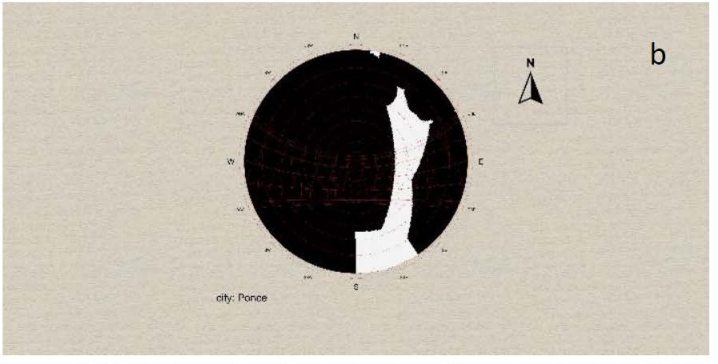


Fig.9 Outcomes of points 0 (a), 1 (b) and 2 (c) with no shading devices.





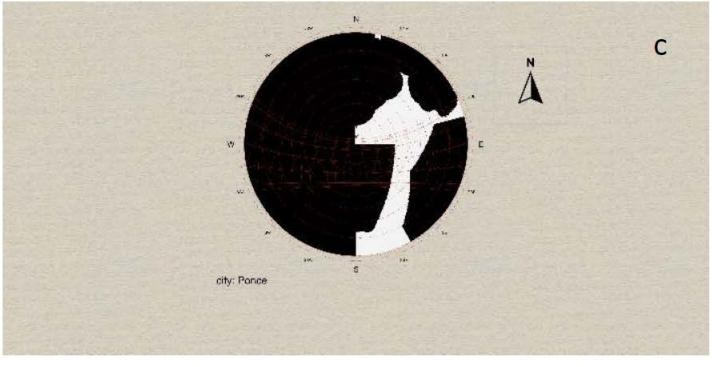
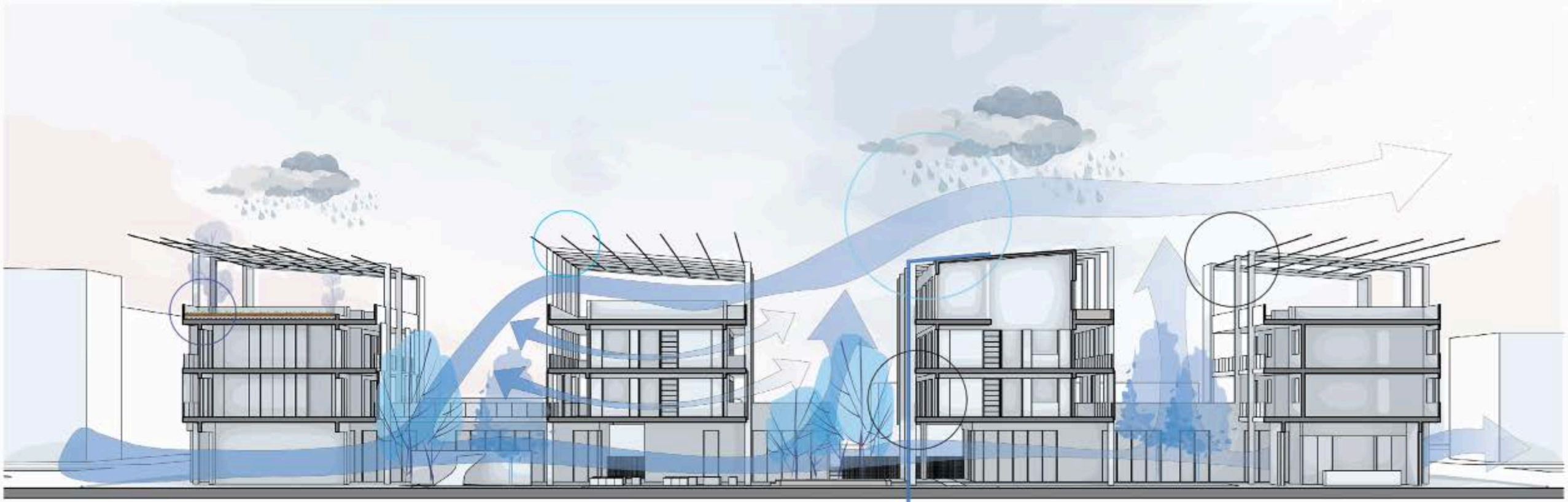
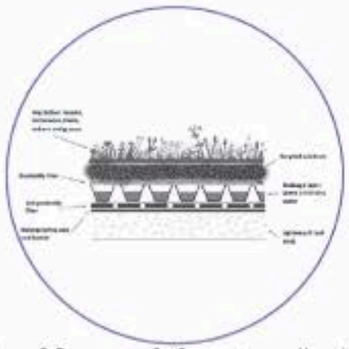


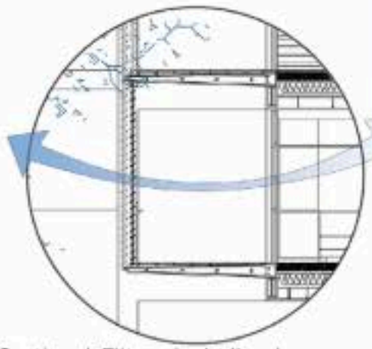
Fig.10 Outcomes of points 0 (a), 1 (b) and 2 (c) with shading 1 (horizontal).





Use of Green roofs for water collection and as a thermal insulation barrier

Roof PV Panels act as shading as well as power generation.

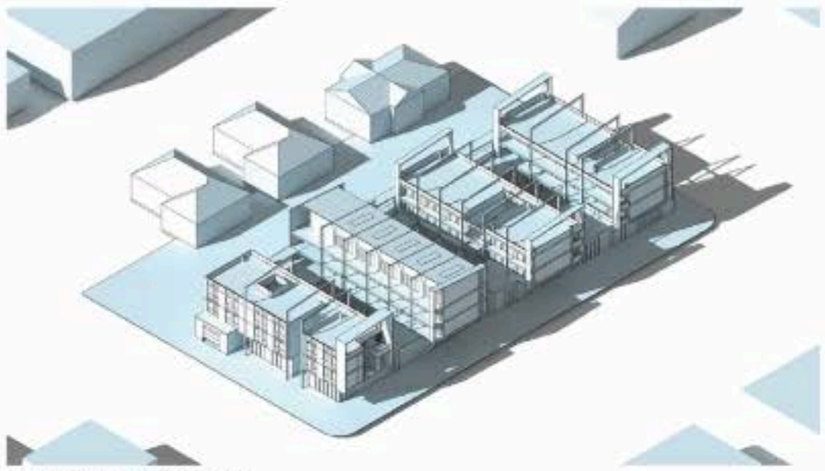


Sectional Filters including louver system, glass, and shading devices

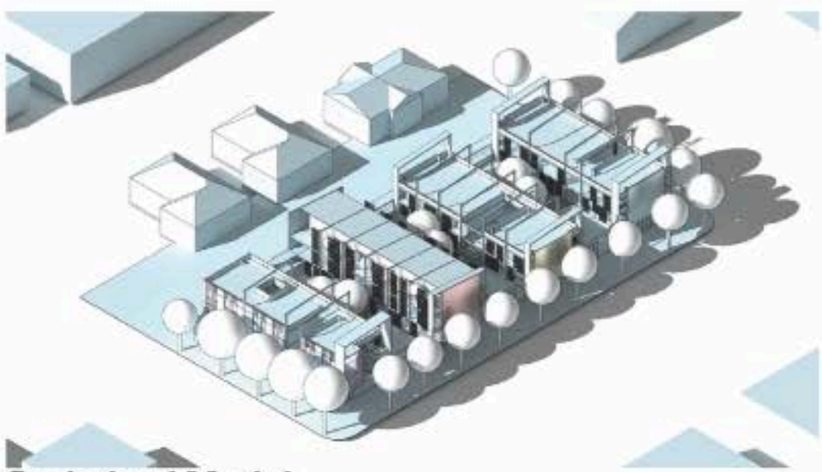
Water collection, filtration and recycling to lessen fresh water consumption.

Drapes used as adjustable shading in a third roof condition.

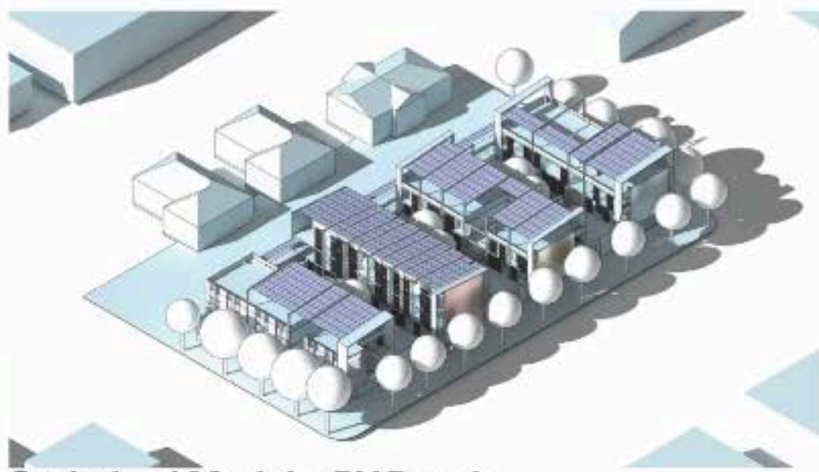
INC.Space Environmental Section Diagram



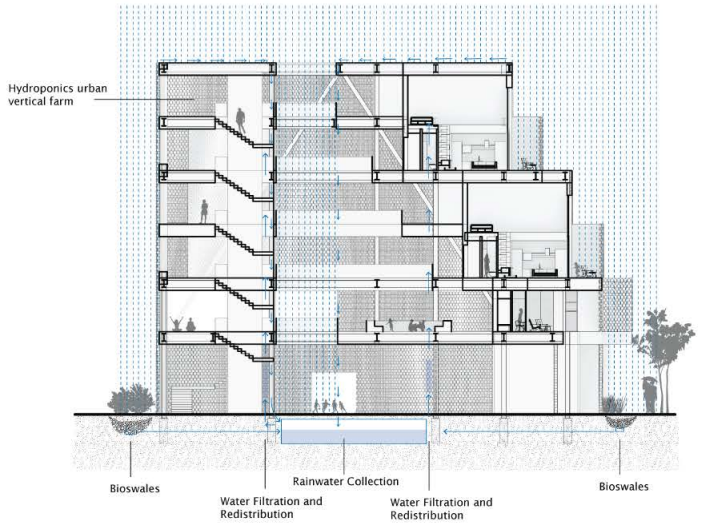
Baseline Model

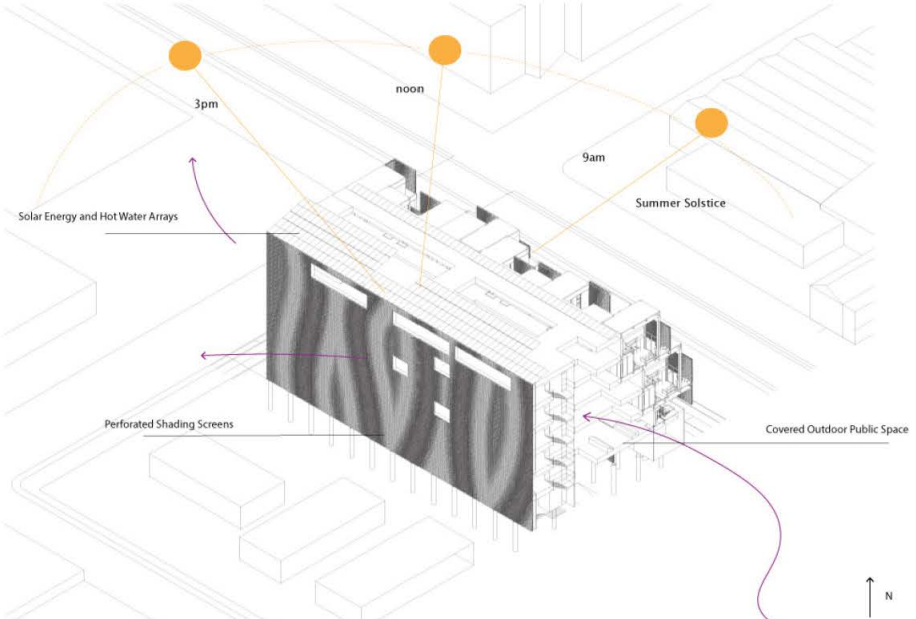


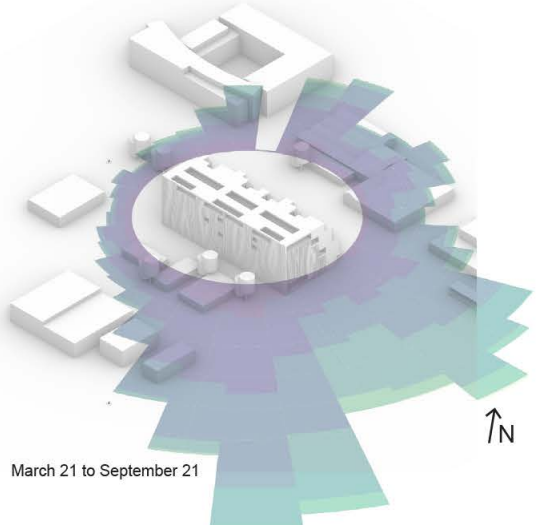
Optimized Model



Optimized Model + PV Panels


Hydroponics urban vertical farm
Bioswales
Water Filtration and Redistribution
Rainwater Collection
Water Filtration and Redistribution
Bioswales


3pm
noon
9am
Summer Solstice
Solar Energy and Hot Water Arrays
Perforated Shading Screens
Covered Outdoor Public Space
N


N
March 21 to September 21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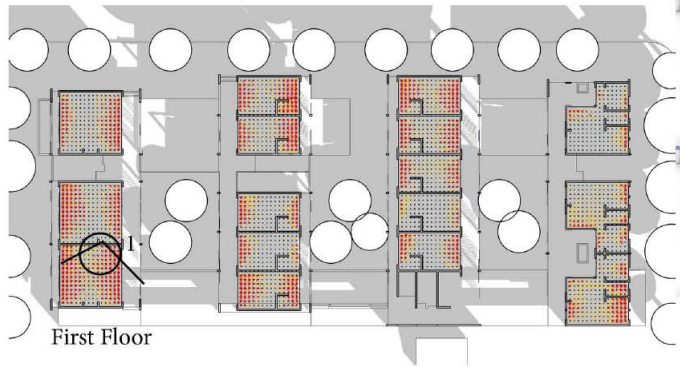
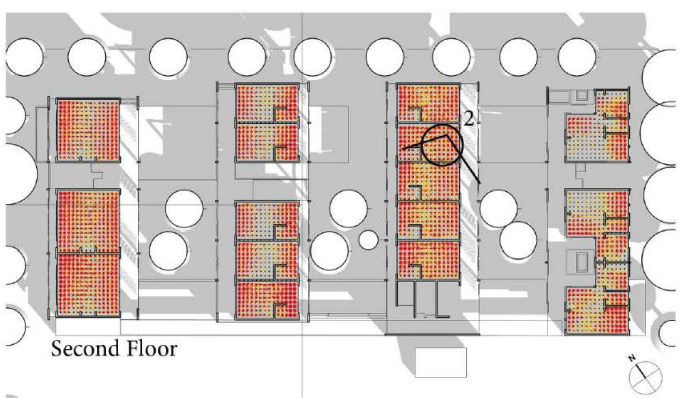
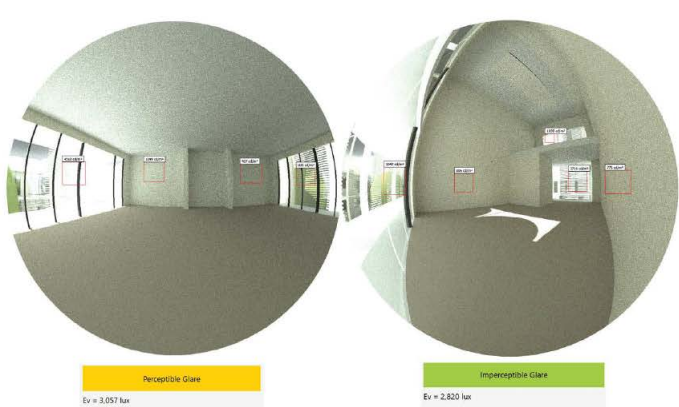
Amsterdam, Netherlands / +52.4 / Team 35
London, United Kingdom / 51.5 / Team 20
Paris, France / +48.9 / Team 23
Seattle, Washington/ +47.6062° N / Team 33
Zurich, Switzerland/ +43.37 °/ Team 11
Nice, France/ +43.7384°N / Team 31
Toronto, Canada / +43.6 / Team 33
Milan, Italy / +45.43 / Team 10
Chicago, Illinois / +41.8781° / Team 25
Marseille, France / +43.3 / Team 6
Beijing, China / +39.9 / Team 32
Rome, Italy / +41.9 / Team 34
Boston, Massachusetts/ +42.3601° / Team 7
Barcelona, Spain/ +41.3874° / Team 29
Tokyo, Japan / +35.67/ Team 1
Madrid, Spain / +40° / Team 7
Athens,Greece/ +41.9 / Team 4
San Diego, California /32.71 / Team 15
Palermo, Sicilia, Italy/38.06/Team 16
Istanbul, Turkey/ Team 2
Pensacola, Florida / 30.4 / Team 28
Cairo, Egypt / +30.0444° / Team 21
Miami, Florida / 25.8 / Team 3
Dhahran, Saudi Arabia / +26.2361° / Team 24
Honolulu, / 21.31 / Hawaii Team 18
Dubai, United Arab Emirates / +25.2048° / Team 24
Leon, Guanajuato / 21.12 / Team 8
Mexico City, Mexico / 19.43 / Team 5
Belize city, Belize/ 17.50/ Team 22
Caracas, Venezuela/10.5/ Team 17
Bogota, Colombia /4.6/ Team 13
Sao Paulo, Brazil / -23.6 / Team 26
Santiago, Chile/ -33.4/Team 9 (Miles, Angela, Jailyn)
Buenos Aires, Argentina / -34.6 / Team 14 (Isabel, Ileana, Jaime)



First Floor



Second Floor



GLARE VIEW 1

GLARE VIEW 2