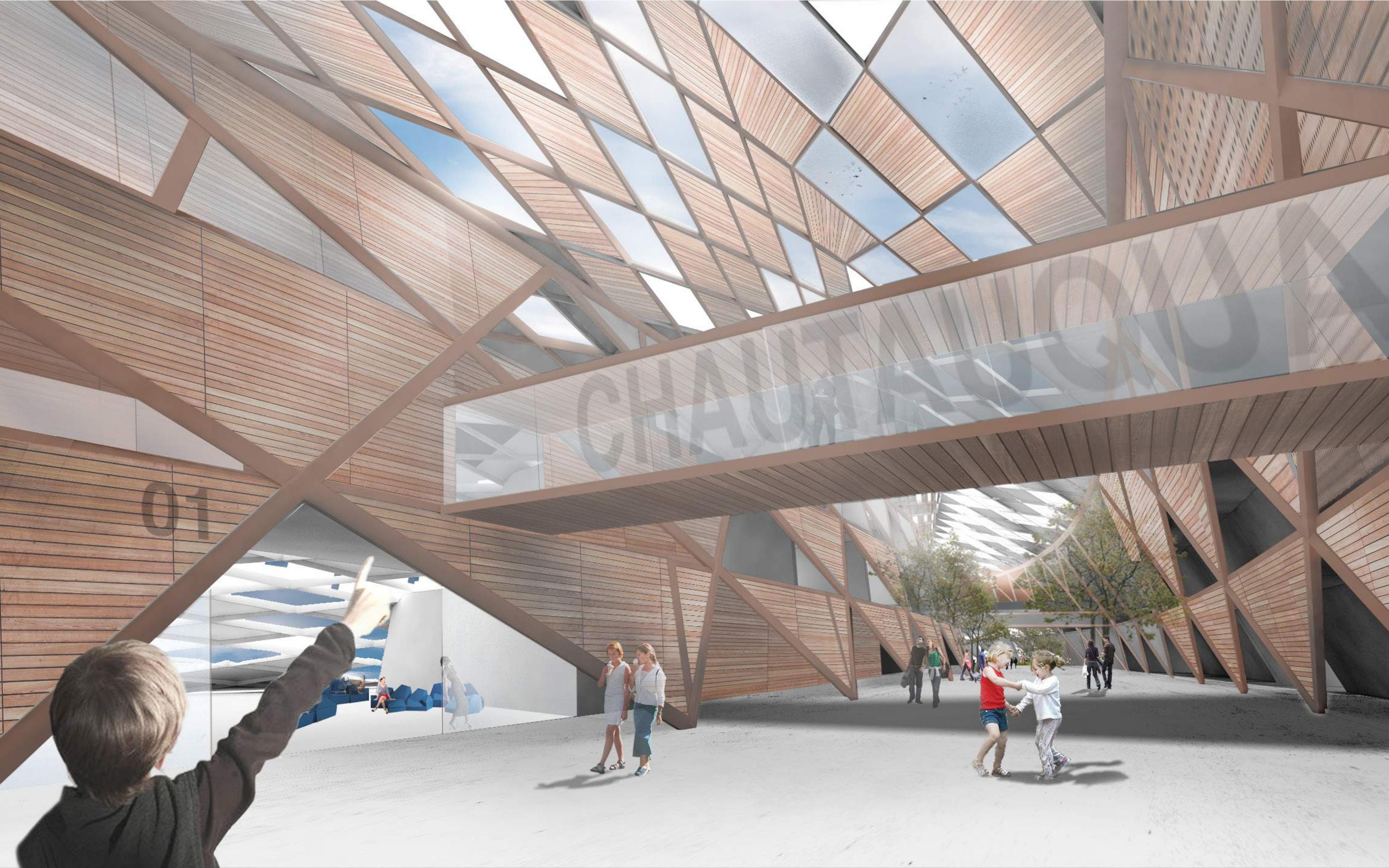


An aerial photograph of Seattle, Washington, showing the city skyline on the left, the Elliott Bay waterfront, and the industrial area with the Great Northern Railway Bridge and the Alaskan Way Viaduct on the right. The text "SEATTLE" is overlaid across the center of the image.

SEATTLE

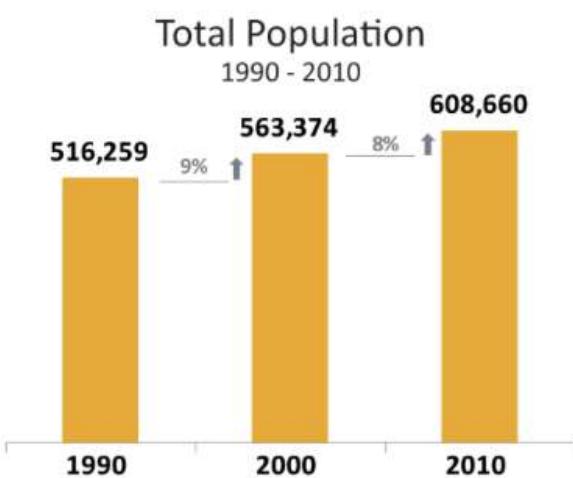
EVAN OSKIERKO-JEZNACKI // NICCOLO BENGHI // SPRING 2016 // MEBD STUDIO



Demographics & Housing*

*2010 Census

Culture



Age Groups in Seattle



population: 608,660 (metropolitan area 3,439,809)

Number of households: 283,510

Average household size: 2.06

Average family size: 2.87

White - 69.5%

Black or African American - 7.9%

Amer. Indian & Alaska Native - 0.8%

Asian - 13.8%

Native Hawaiian & Other Pac. Islander - 0.4%

Other race - 2.4%

Two or more races - 5.1%

Hispanic or Latino ethnicity (of any race): 6.6%

Persons of color: 33.7%

Seattle has **the highest per-capita music and dance attendance in the country**, with 80 live music clubs (not counting the movable dance clubs and shows) and 15 symphony orchestras. (Ray Charles, Quincy Jones, Jimi Hendrix and Ernestine Anderson all lived in Central and South Seattle over the years).

Seafair is a massive two-month summer festival that showcases the traditions and diversity of Puget Sound with parades, festivals, triathlons, hydroplane races and air shows.

Alki Beach is one of the city's longest white sand beaches, 2 miles along the west side of West Seattle.

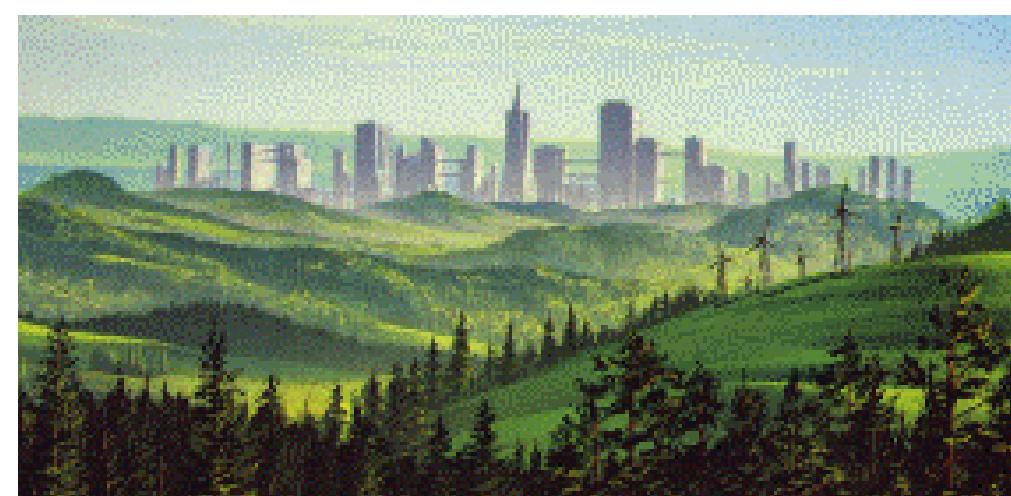


The seminal utopian described the first ecological utopias and was **influential on the counterculture and the green movement in the 1970s and thereafter**. The “leading edges” (his main ideas for Ecotopian values and practices) were patterns in actual social experimentation taking place in the American West.

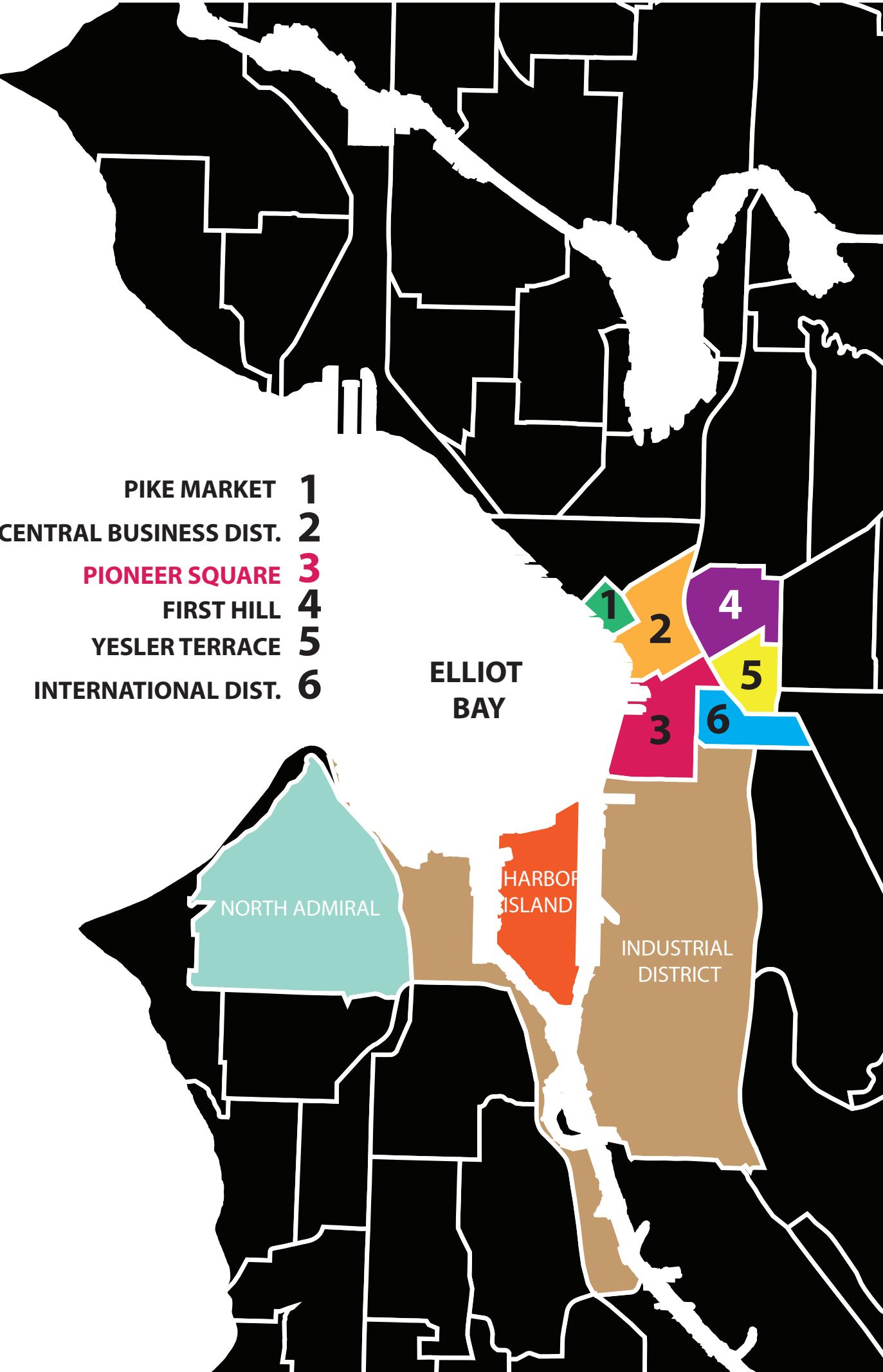
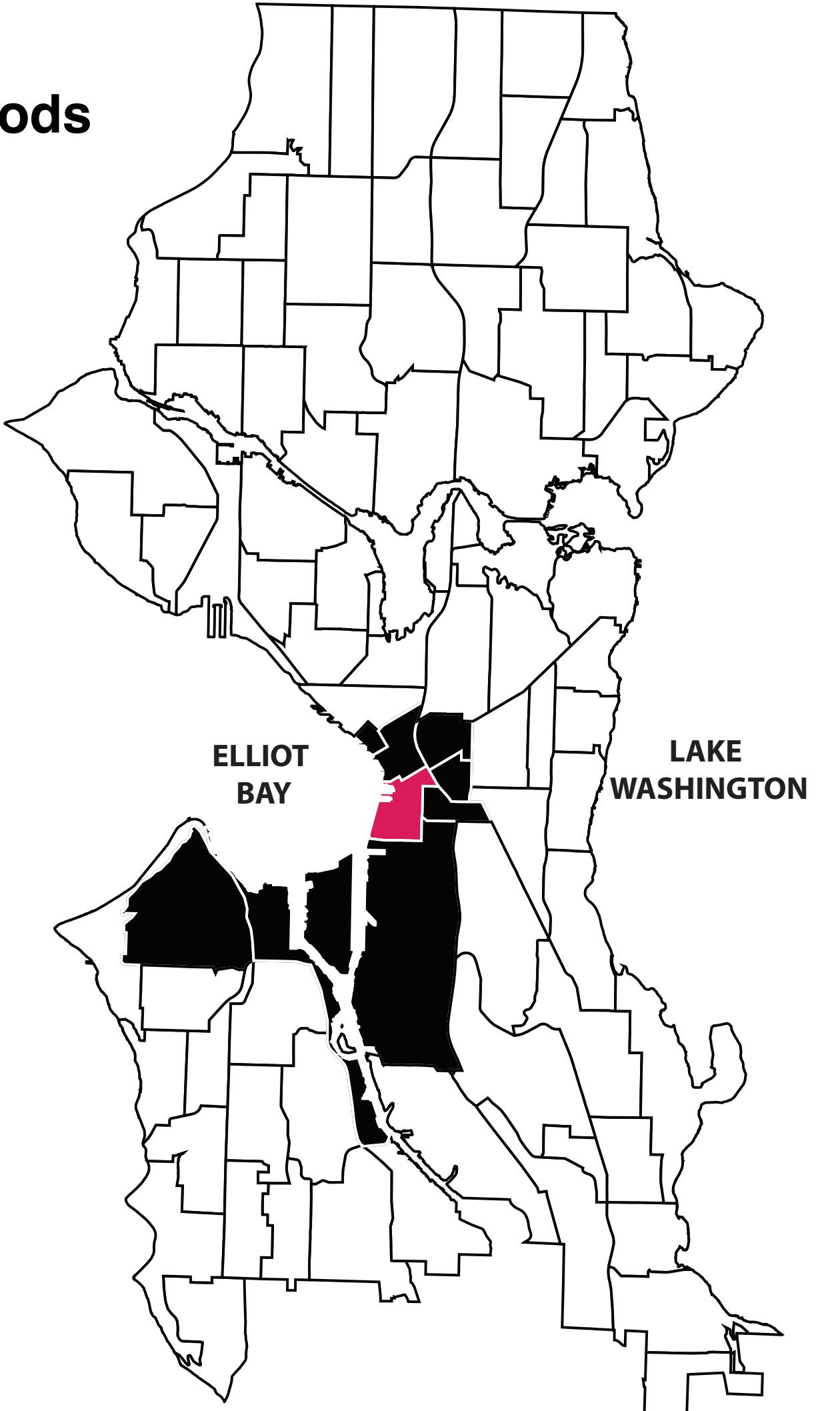


Cost of living index

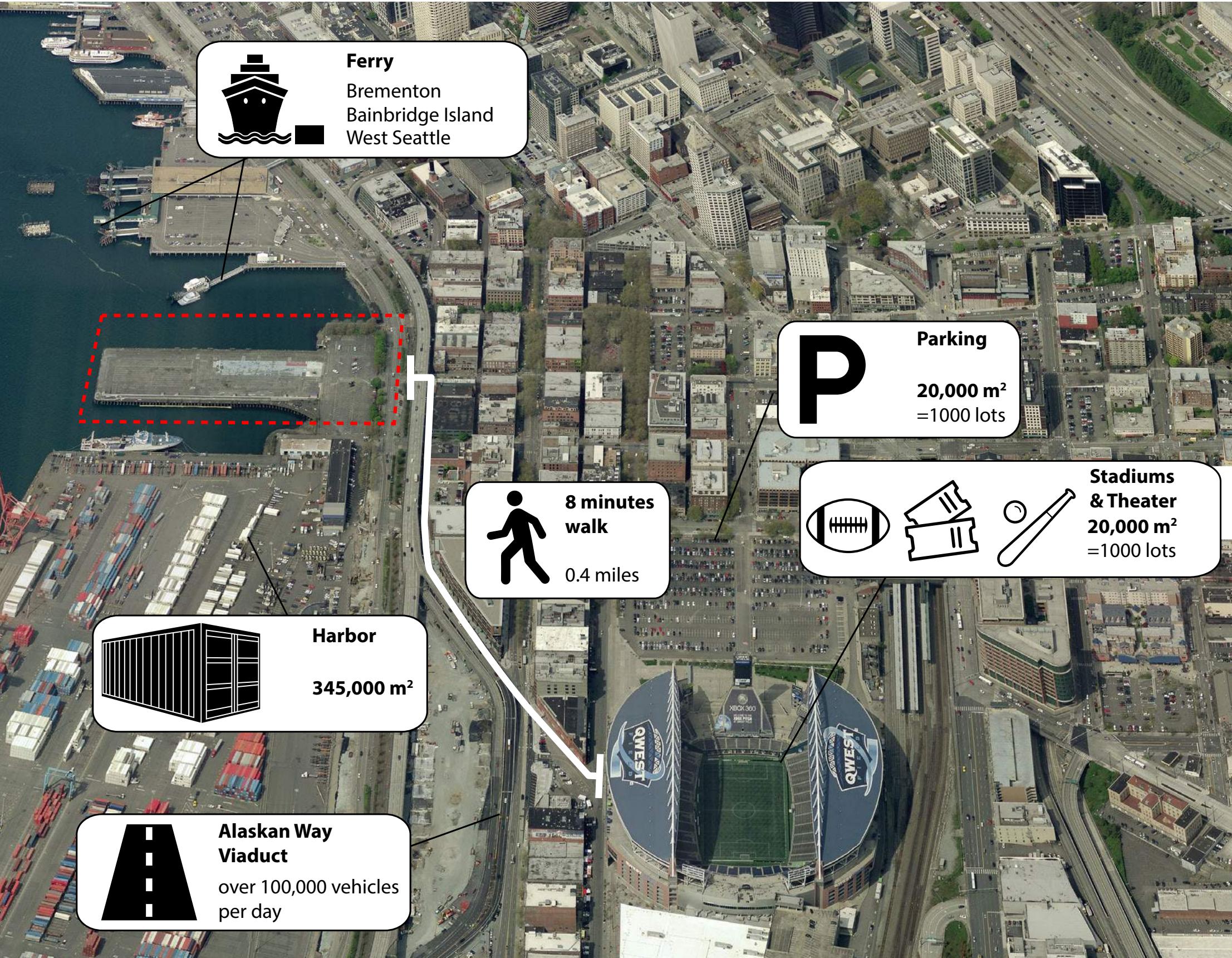
- 1) New York
- 10) Philadelphia
- 12) SEATTLE
- 25) Toronto
- 56) Quebec



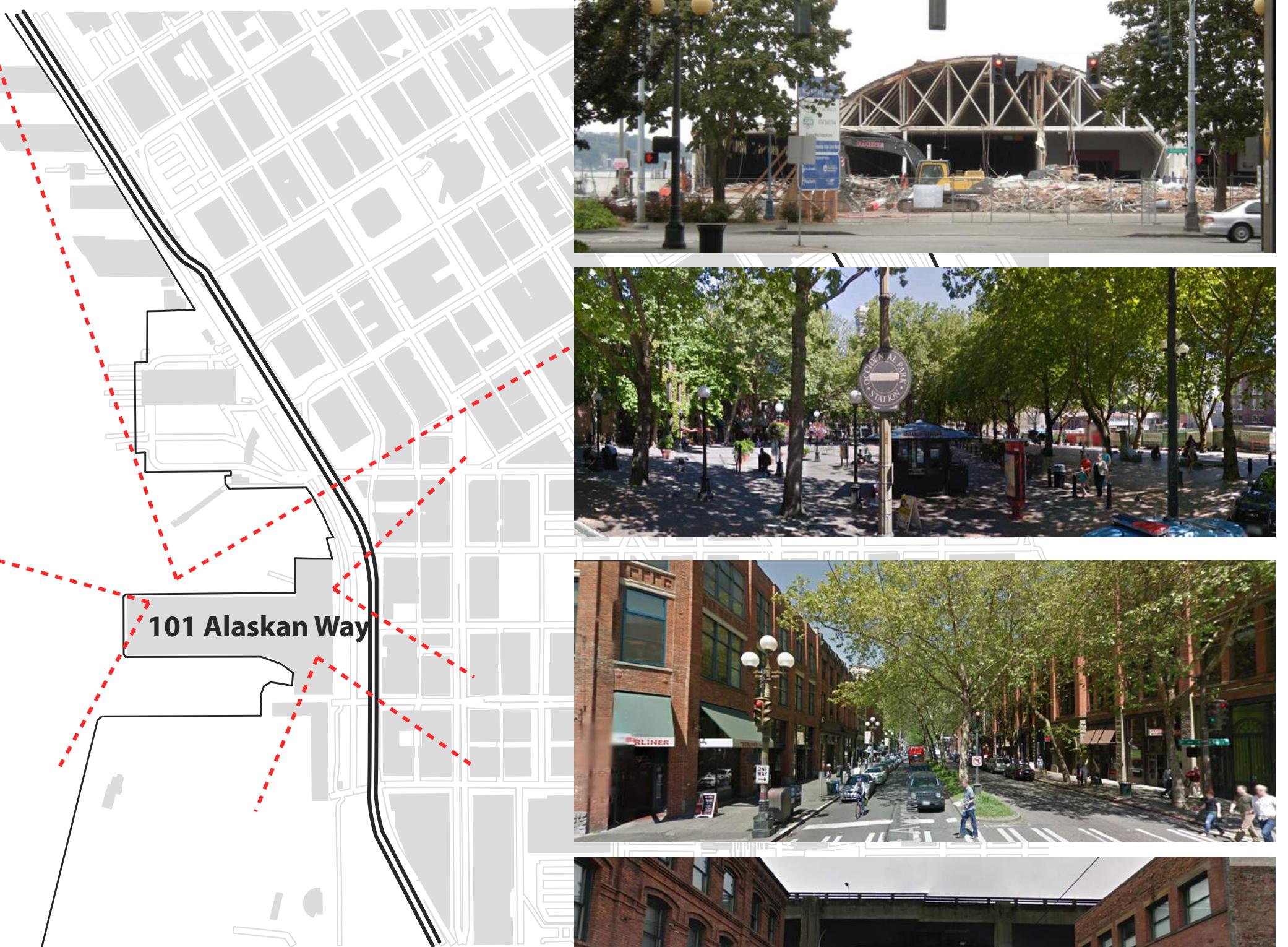
Neighborhoods



Elliott Bay Area



Existing Site Conditions

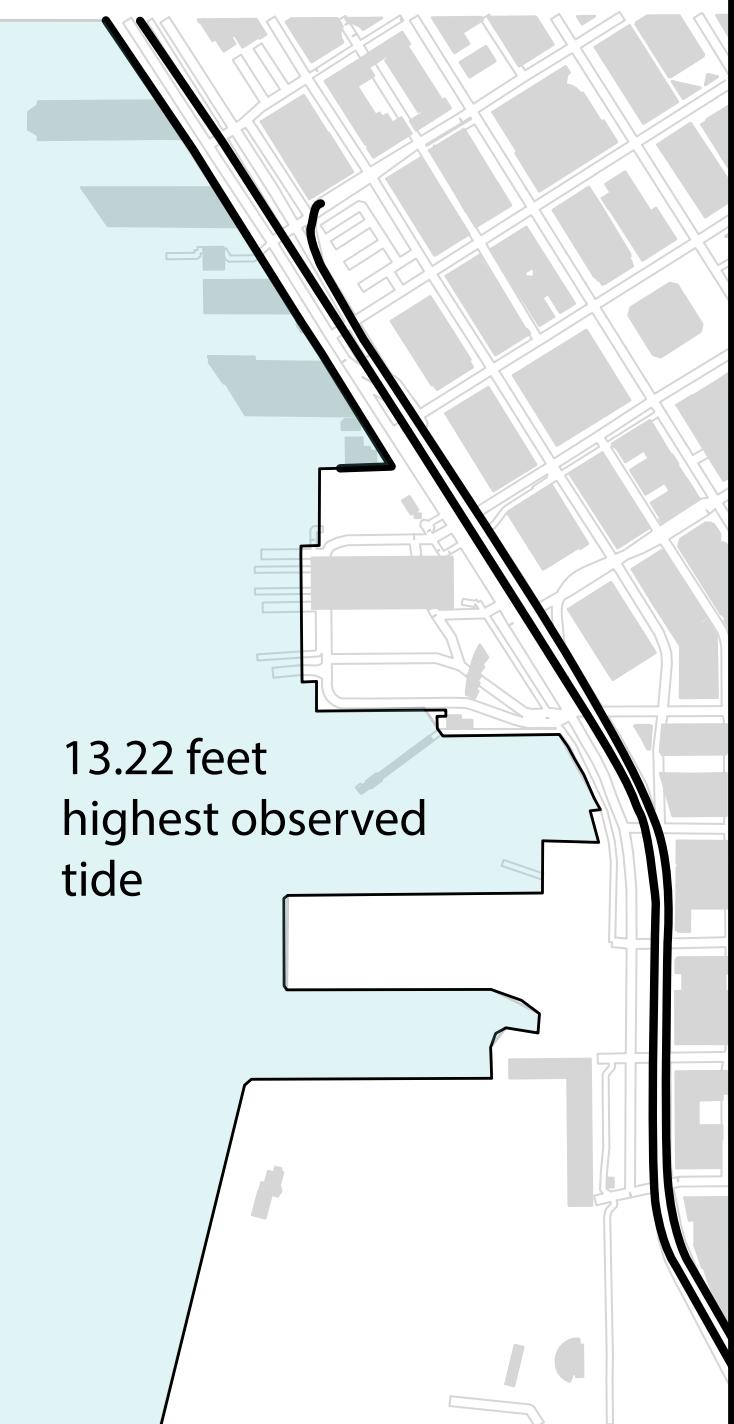


Existing Site Conditions

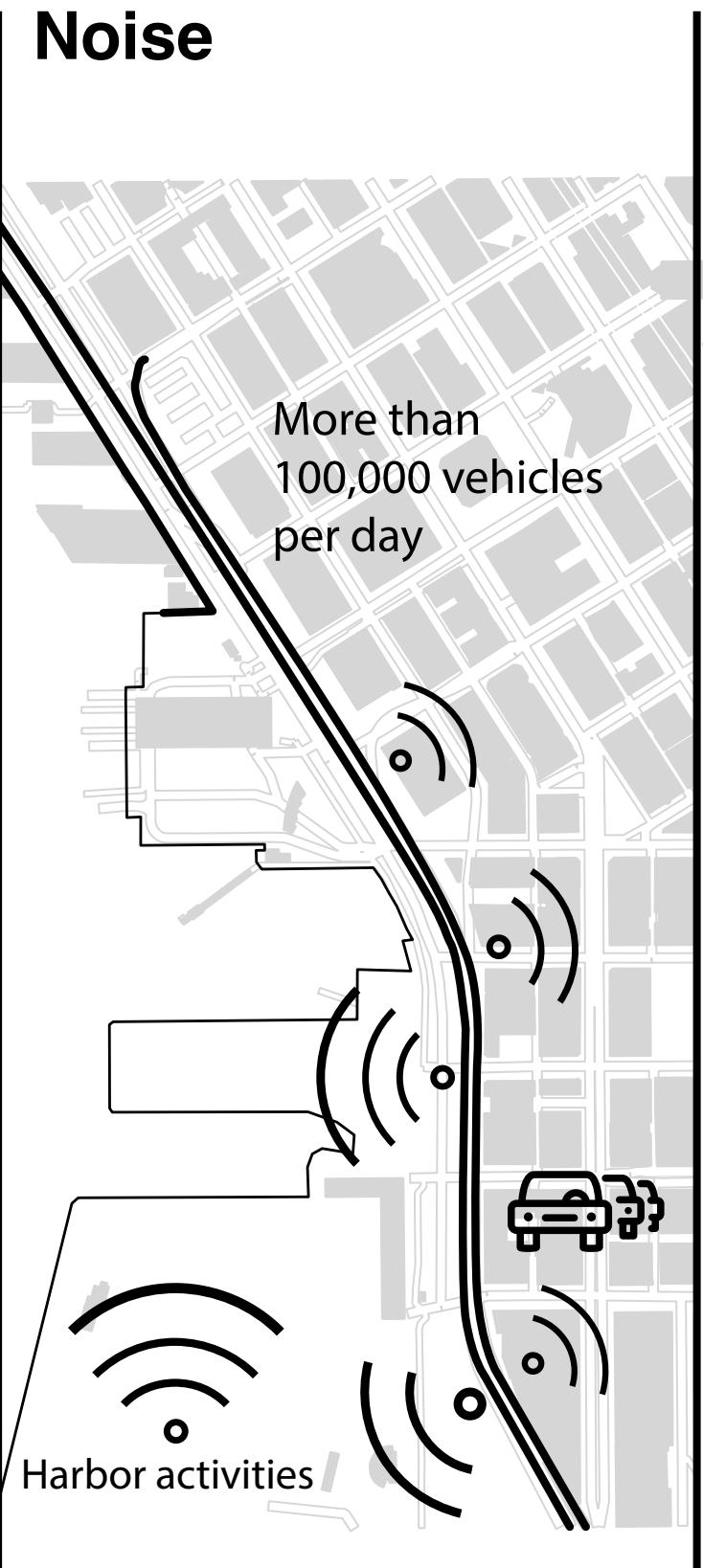


Environmental Issues

Tides



Noise

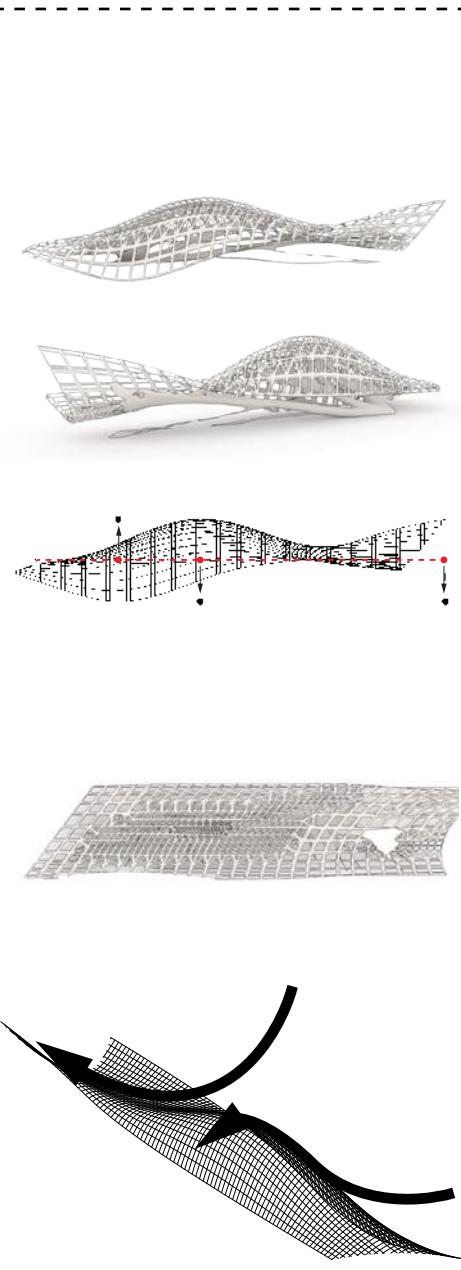


Rainwater Runoff

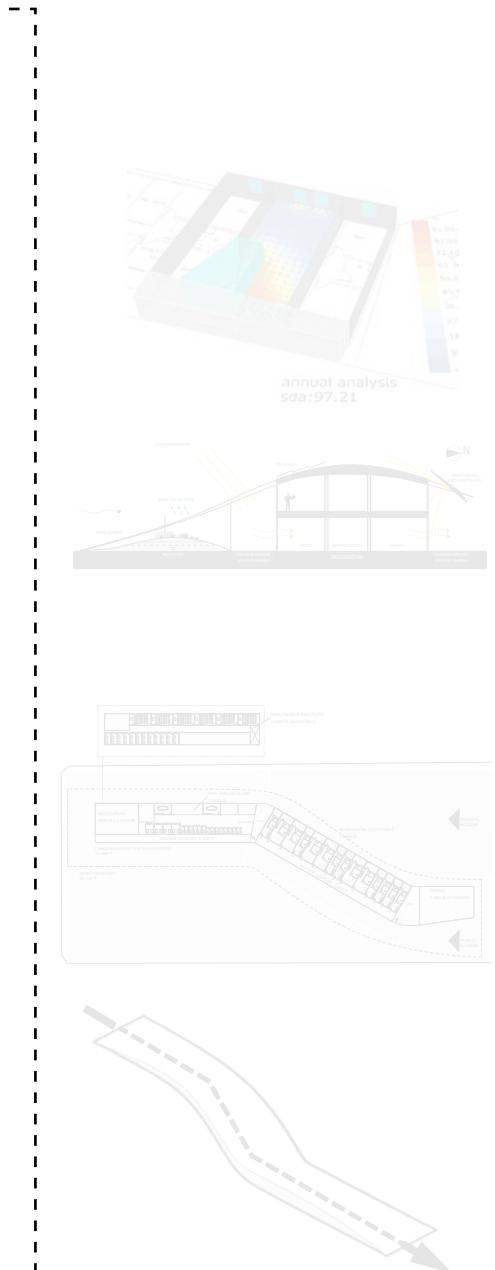
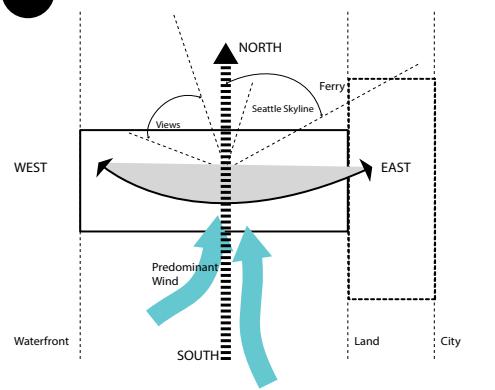


Design Narrative

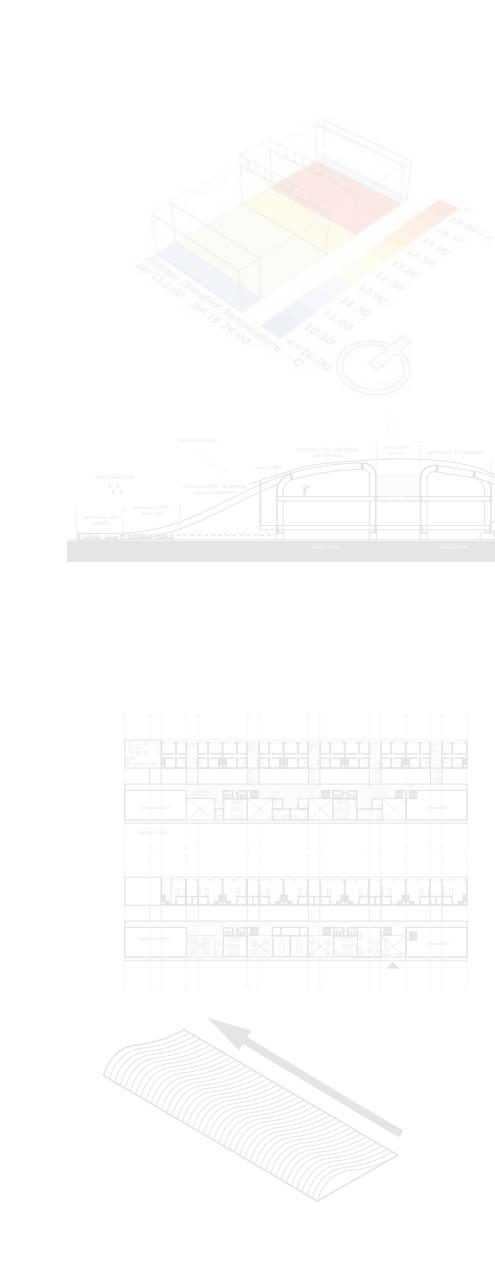
Sandboxing



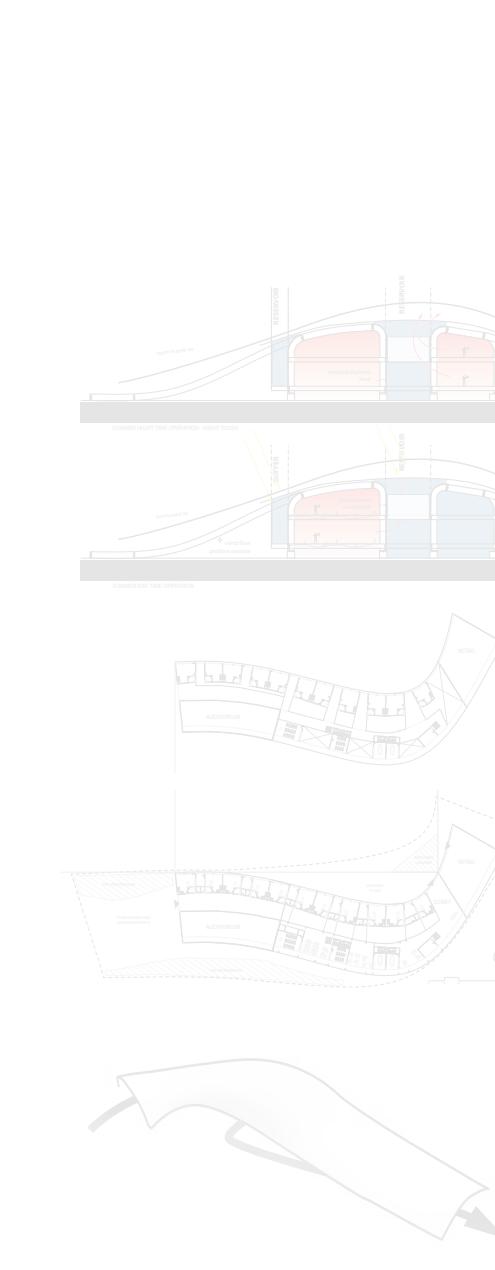
FORCE FLOW



THE KINK



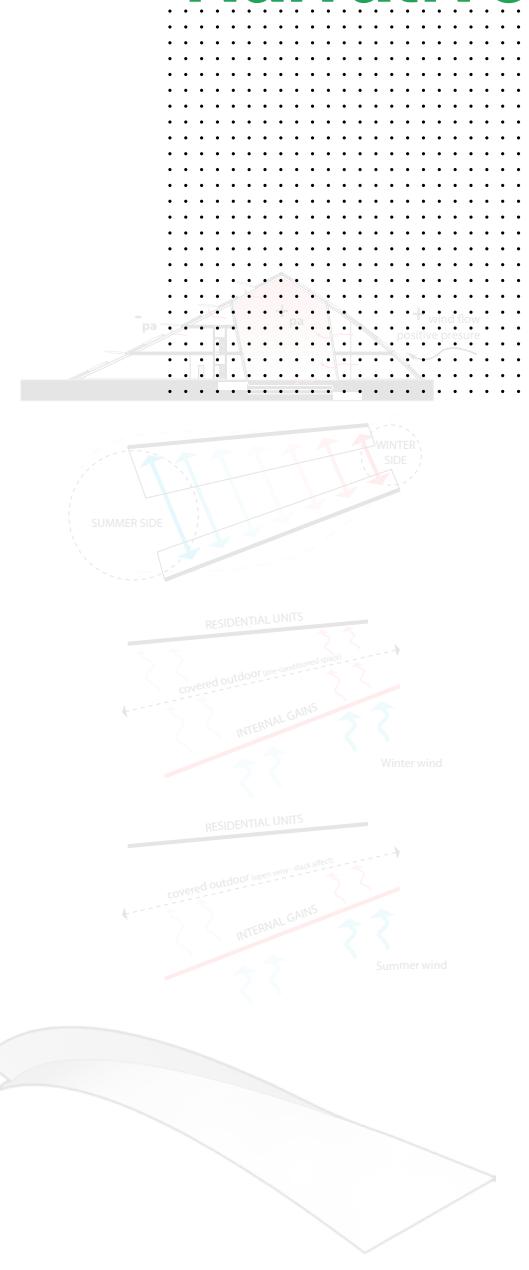
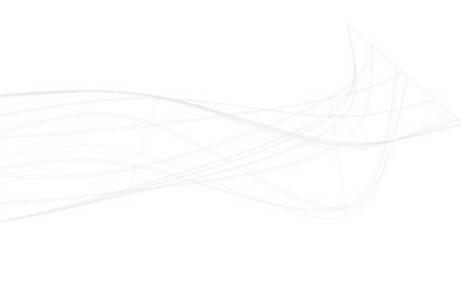
BREAD LOAF



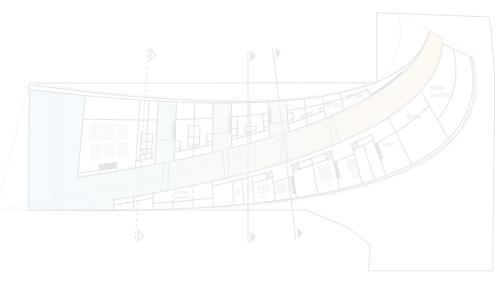
THE WING



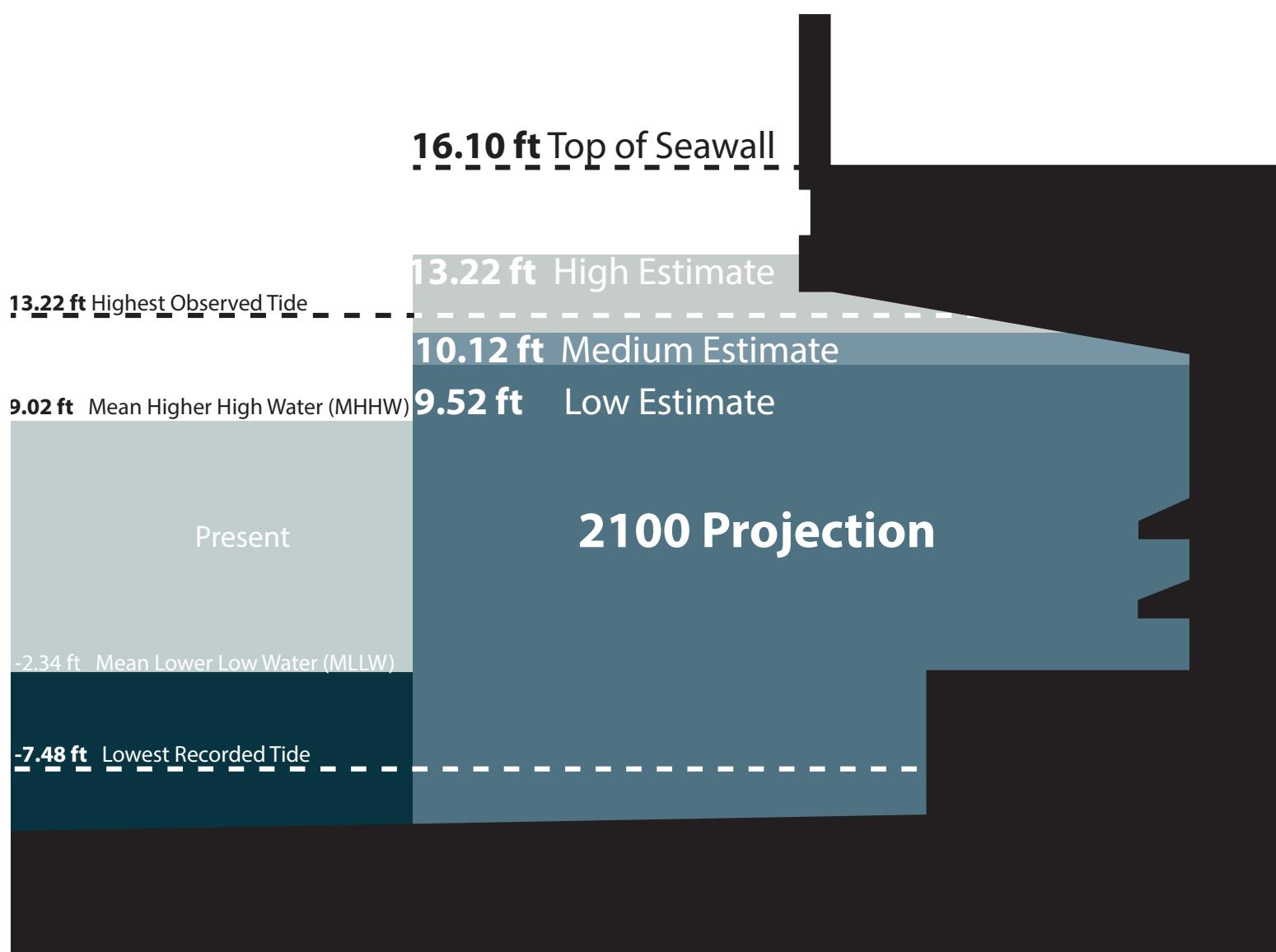
THE SWITCHER



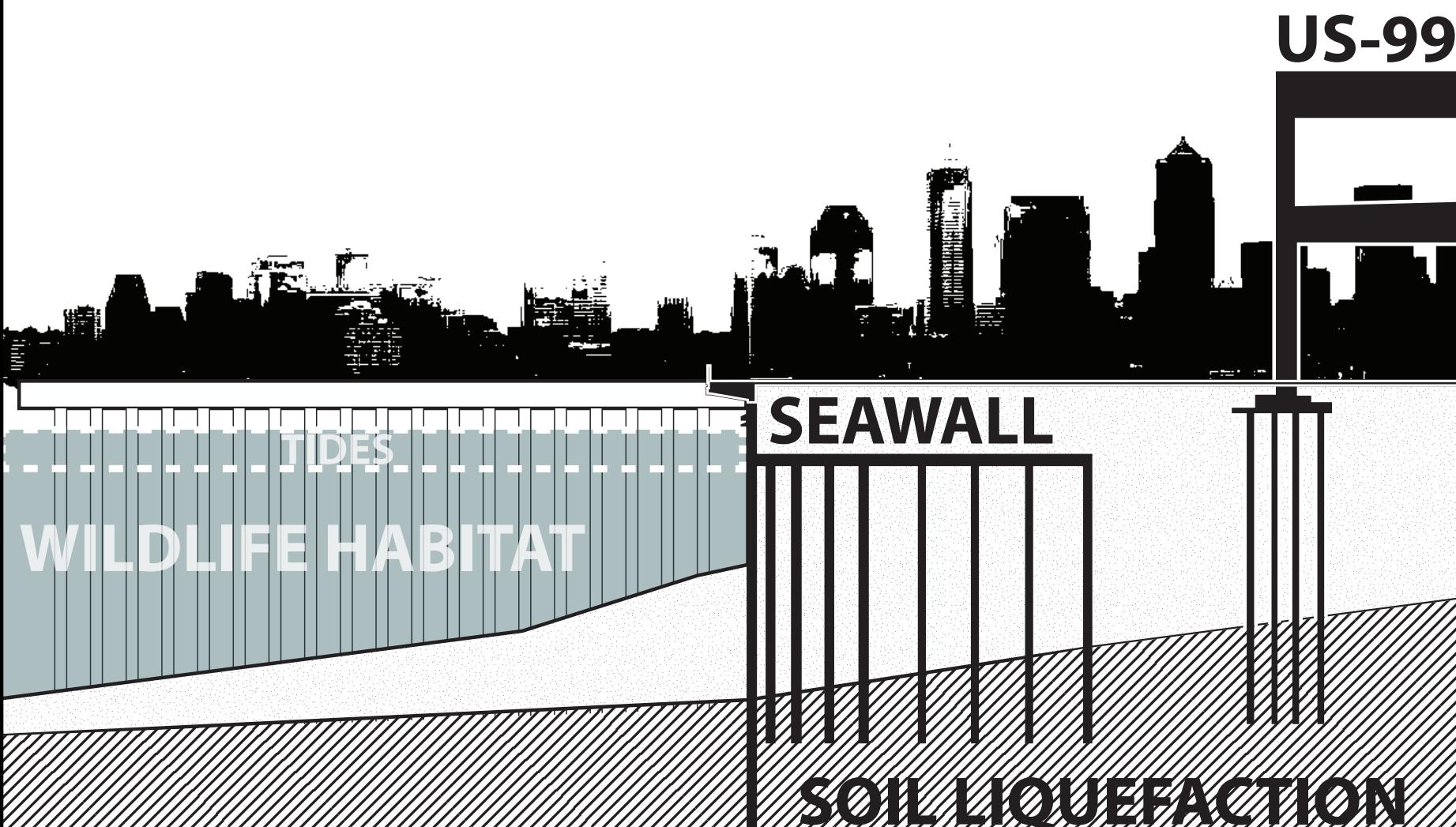
3/4



Rising Sea Levels



Soil Liquefaction and Habitat Preservation



WATER EDGE

WATER EDGE



WATER EDGE

WATER EDGE

WATER EDGE

Program Analysis

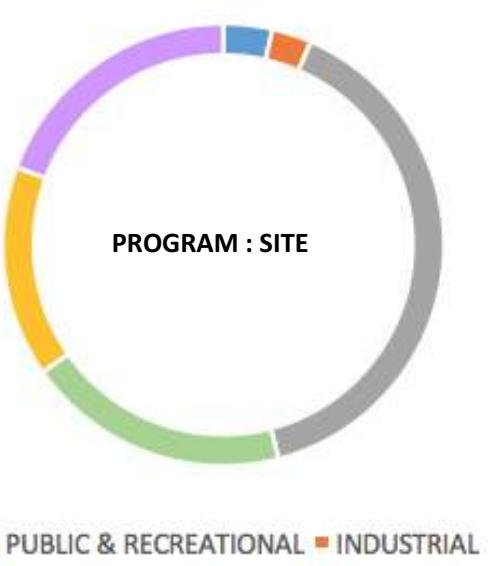
Neighborhood Program
Analysis Boundary
(1-square mile)



■ PUBLIC ■ ADMINISTRATION ■ RESEARCH ■ RESIDENTIAL

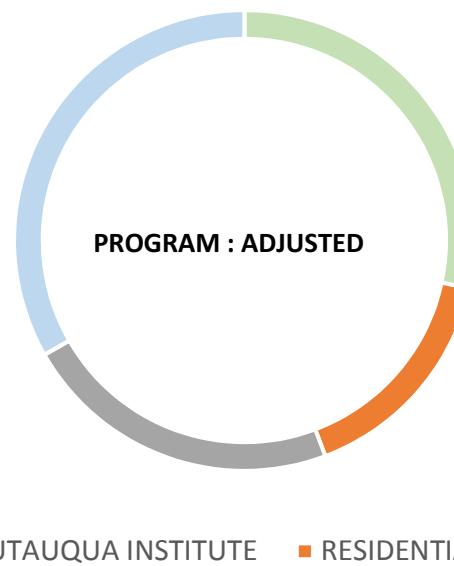
PROGRAM	NUMBER	SF/EACH	SF TOTAL	%
LOBBY	1	700	700	
RETAIL	1	5000	5000	9.1
TOILETS	6	250	1500	
CIRCULATION	1	2500	2500	
MECHANICAL	1	2000	2000	
TRASH	1	400	400	
BYCICLE	1	400	400	
PUBLIC		12500	23	
DIRECTOR AND STAFF	1	800	800	
TEAM OFFICE	8	75	600	
CONFERENCE ROOM	2	500	1000	
SMALL OFFICE	6	100	600	
LARGE OFFICE	4	250	1000	
FILES, SERVERS, COPIERS,KITCHEN	1	1000	1000	
ADMINISTRATION		5000	9.1	
RESEARCH DIRECTOR & STAFF	1	2500	2500	
RESEARCH OFFICES	12	200	2400	
SMALL CLASSROOMS	6	650	3900	
AUDITORIUM	1	3000	3000	
CONFERENCE AND WORKROOM	1	1000	1000	
RESEARCH		12800	23	
RESIDENTIAL	1	25000	25000	45
FINAL TOTAL		55300	100	

■ PUBLIC ■ ADMINISTRATION ■ RESEARCH ■ RESIDENTIAL



■ PUBLIC & RECREATIONAL ■ INDUSTRIAL ■ RETAIL

■ PUBLIC & RECREATIONAL ■ INDUSTRIAL ■ RETAIL

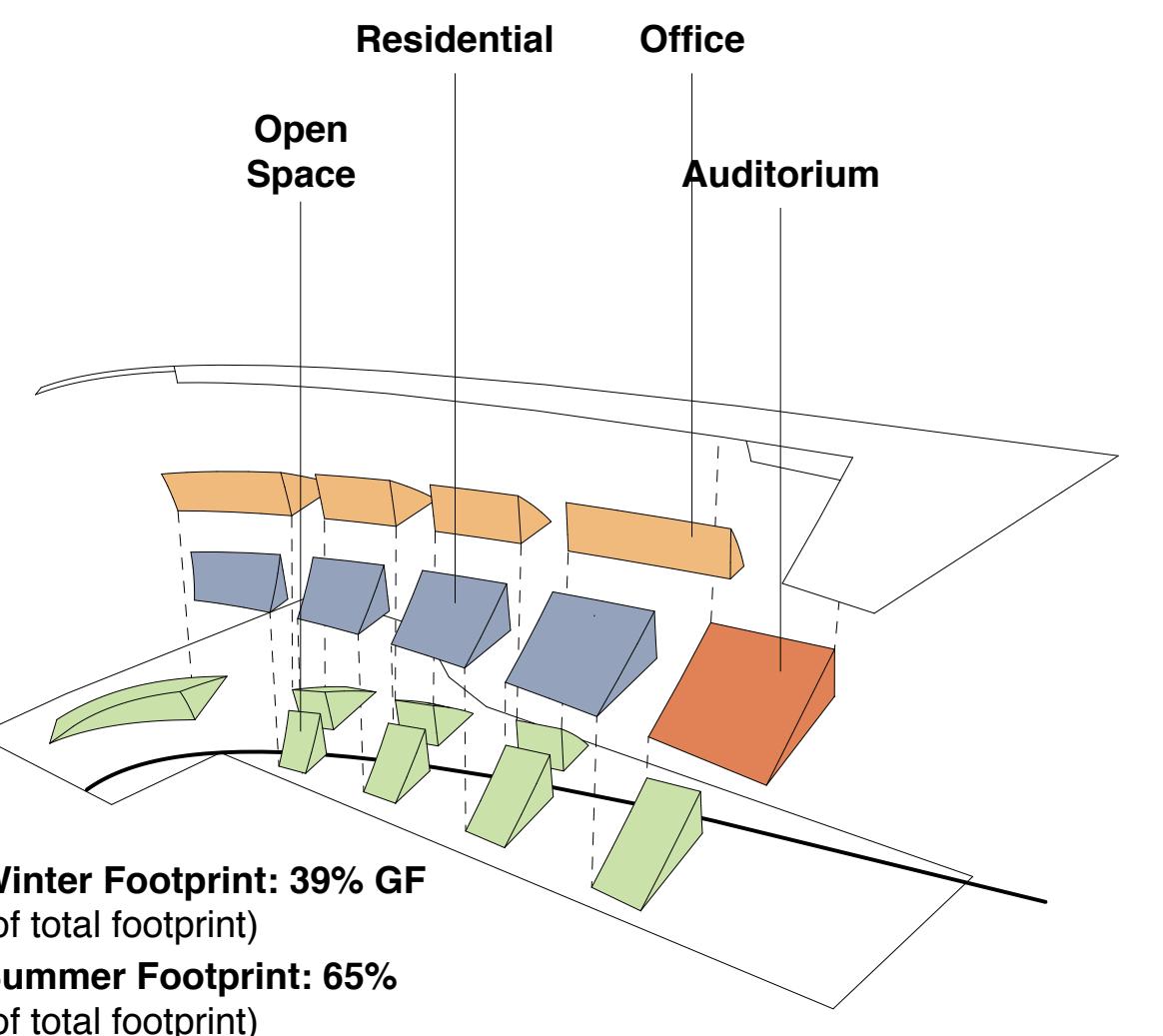


■ CHUTAUQUA INSTITUTE ■ RESIDENTIAL ■ EXTRA

■ CHUTAUQUA INSTITUTE ■ RESIDENTIAL ■ EXTRA



■ CHUTAUQUA INSTITUTE ■ RESIDENTIAL ■ EXTRA

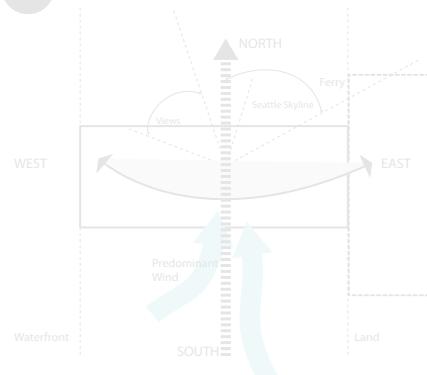


Environmental Concept - Step 1

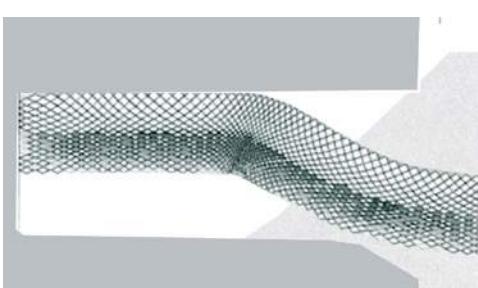
Design
Narrative



FORCE FLOW



THE KINK



BREAD LOAF



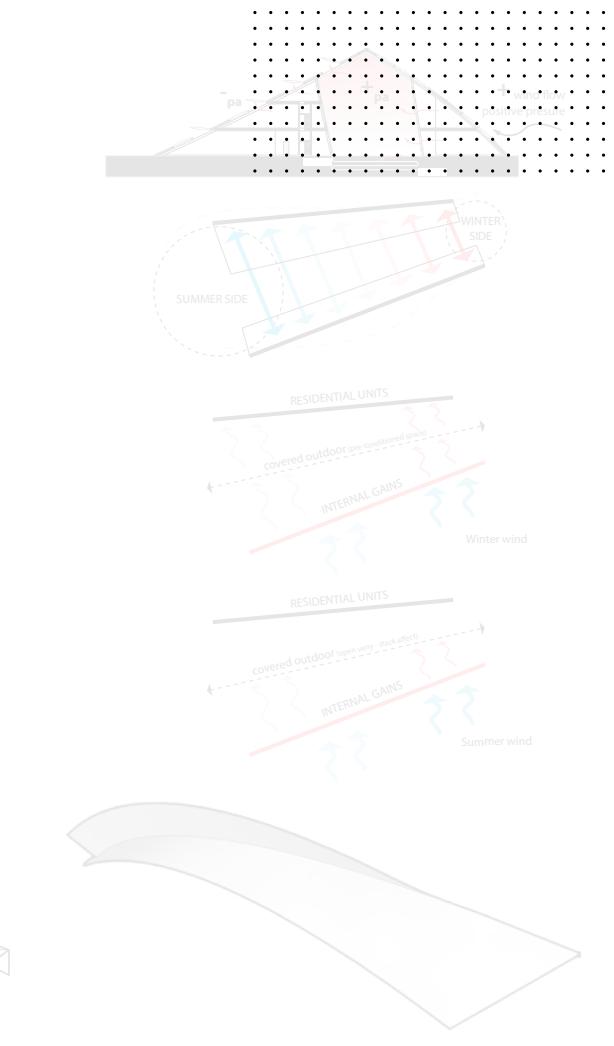
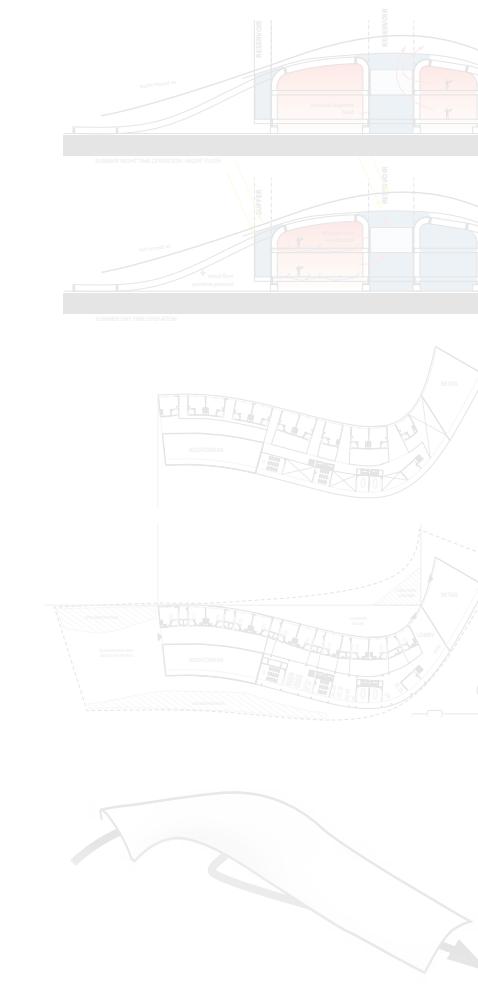
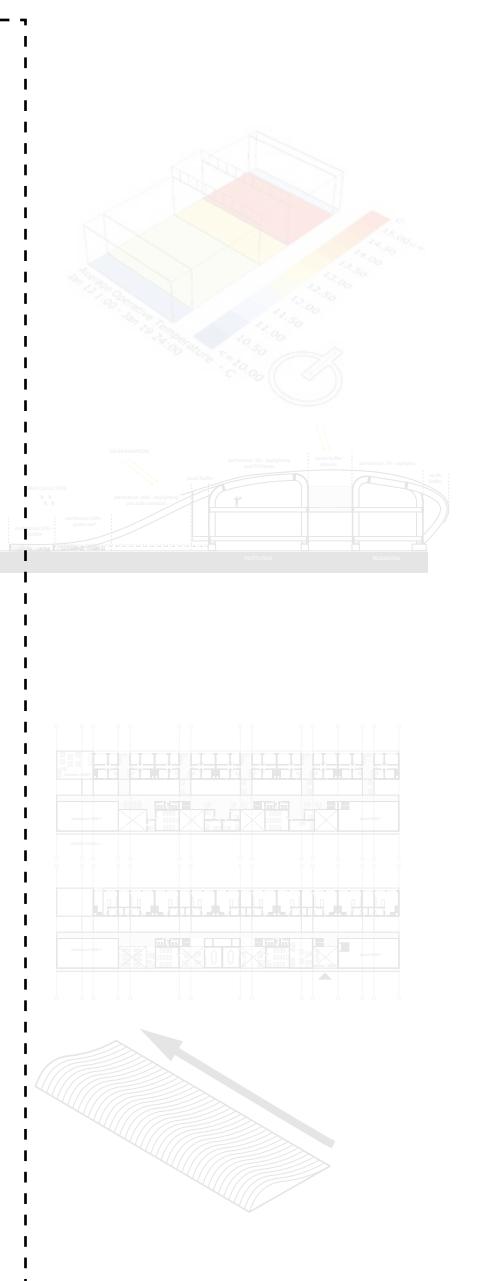
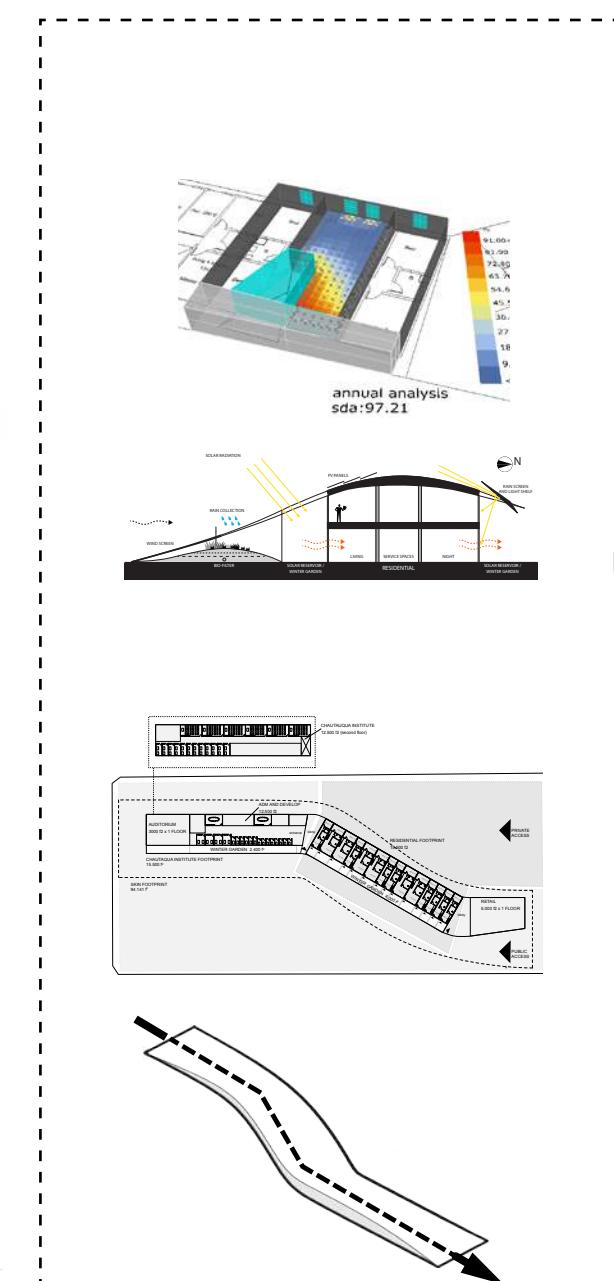
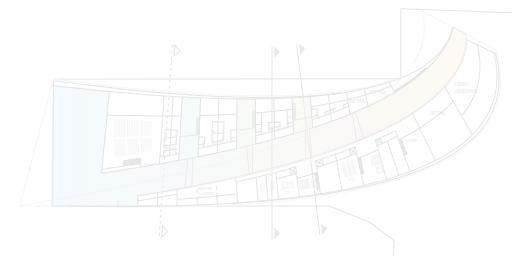
THE WING



THE SWITCHER

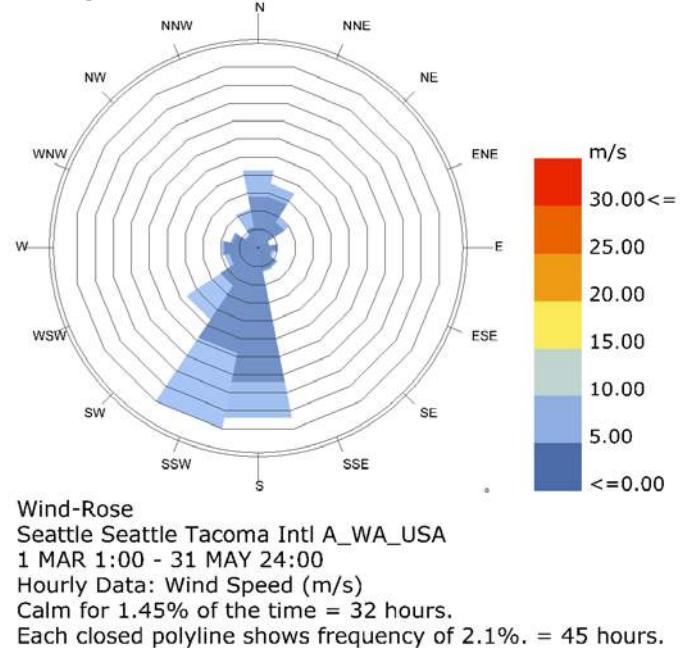


3/4

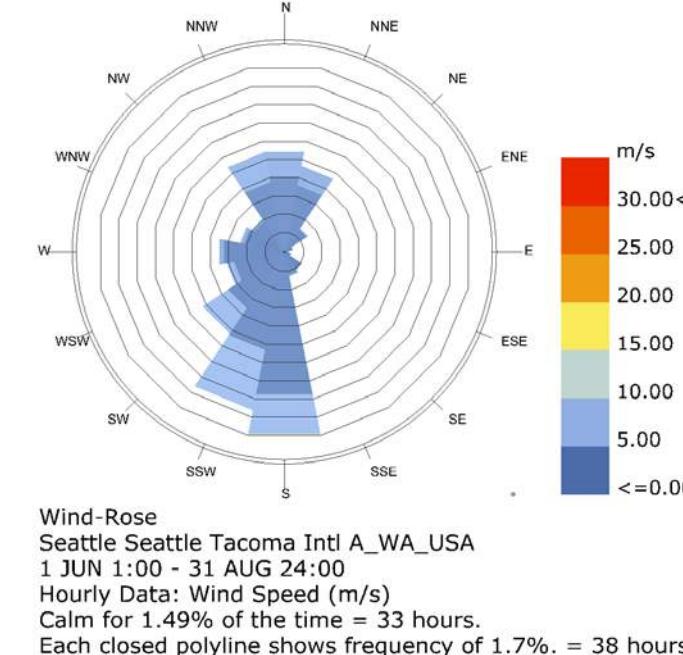


Wind Speed and Direction

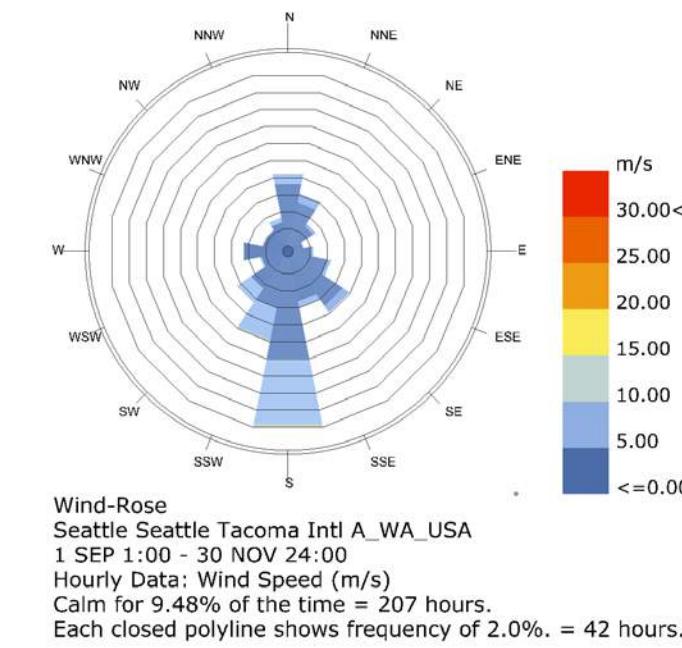
Spring



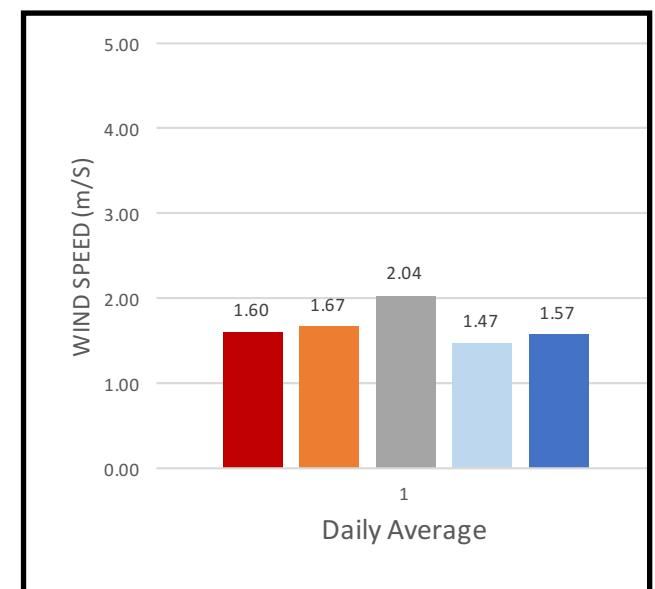
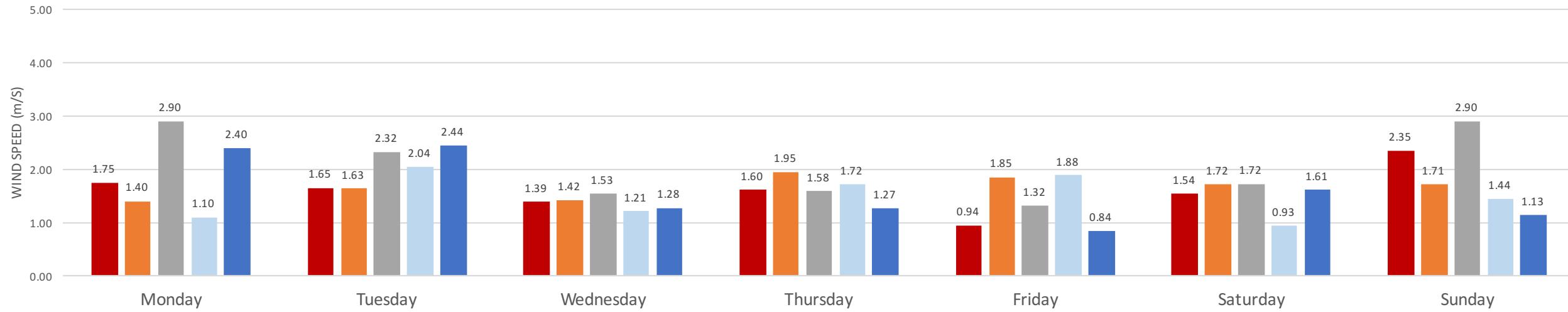
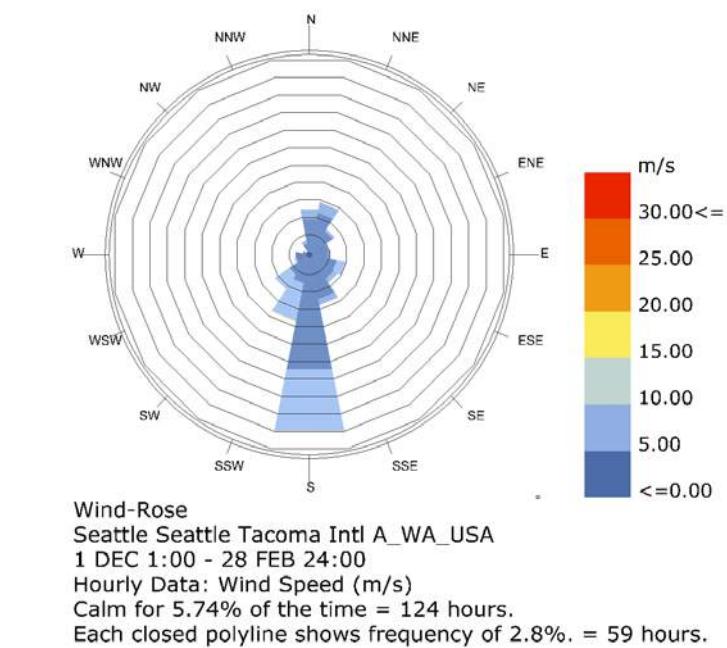
Summer



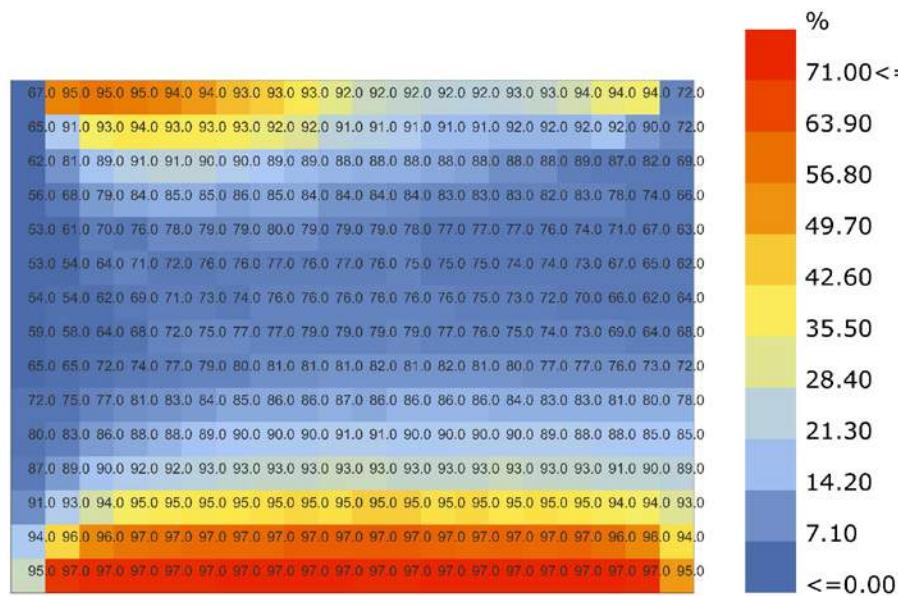
Fall



Winter

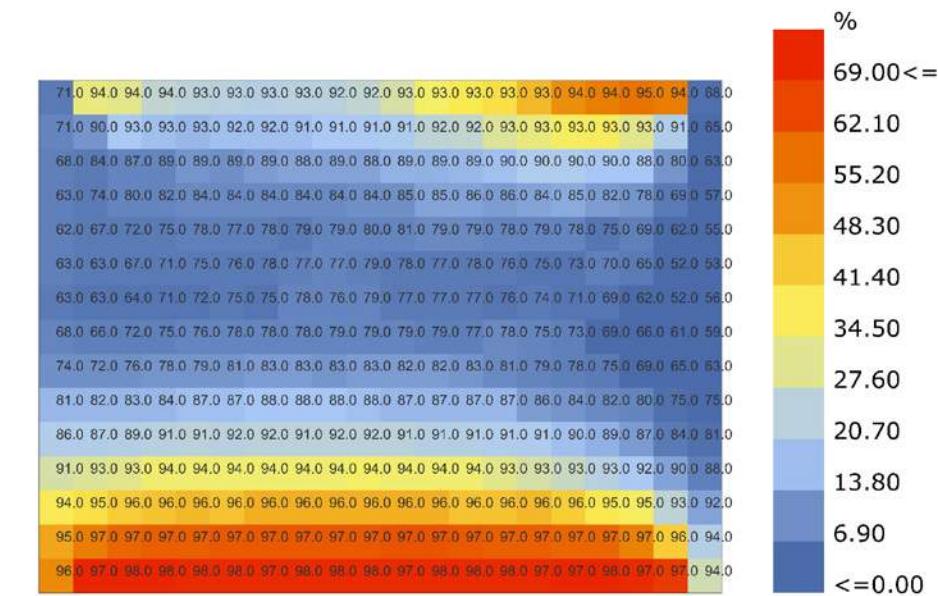
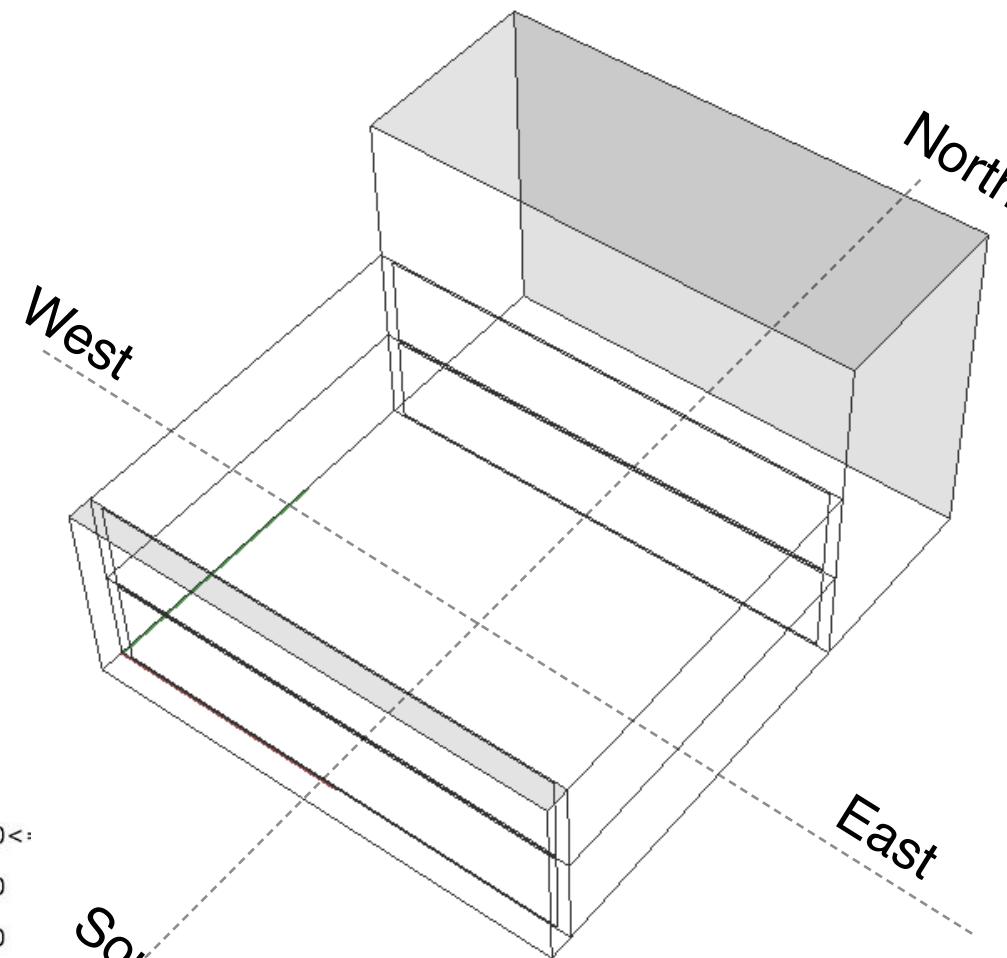


Daylighting Analysis



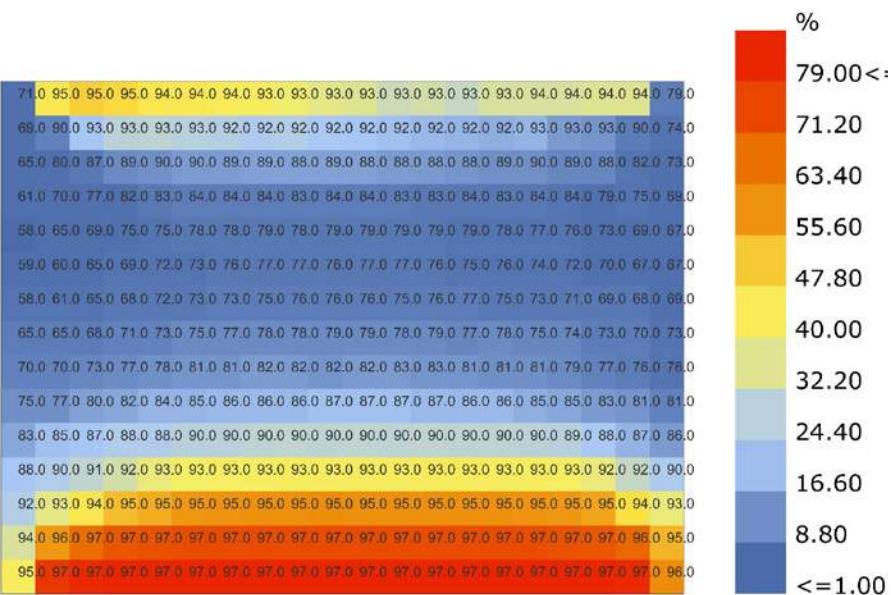
annual analysis
sda:100.00

West



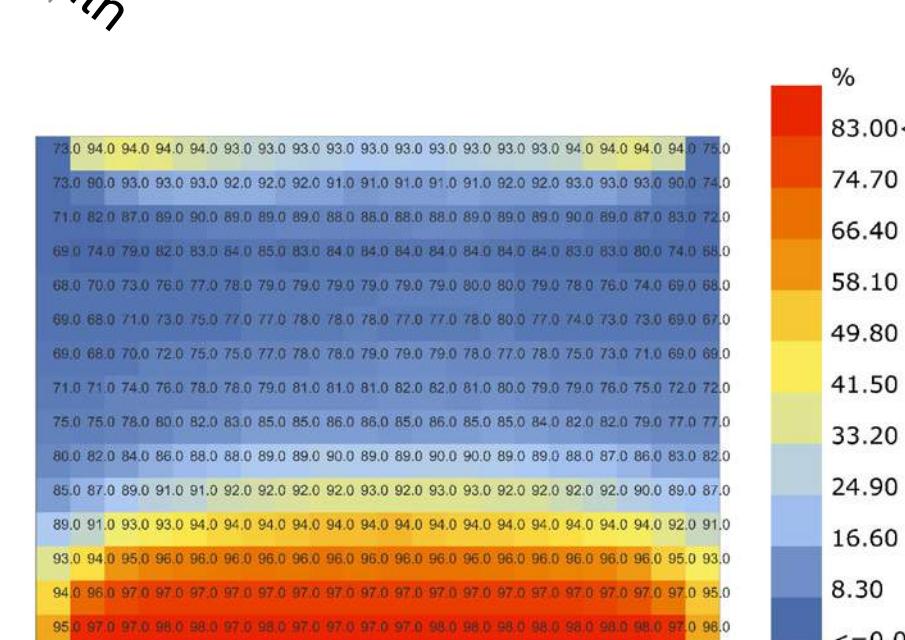
annual analysis
sda:100.00

East



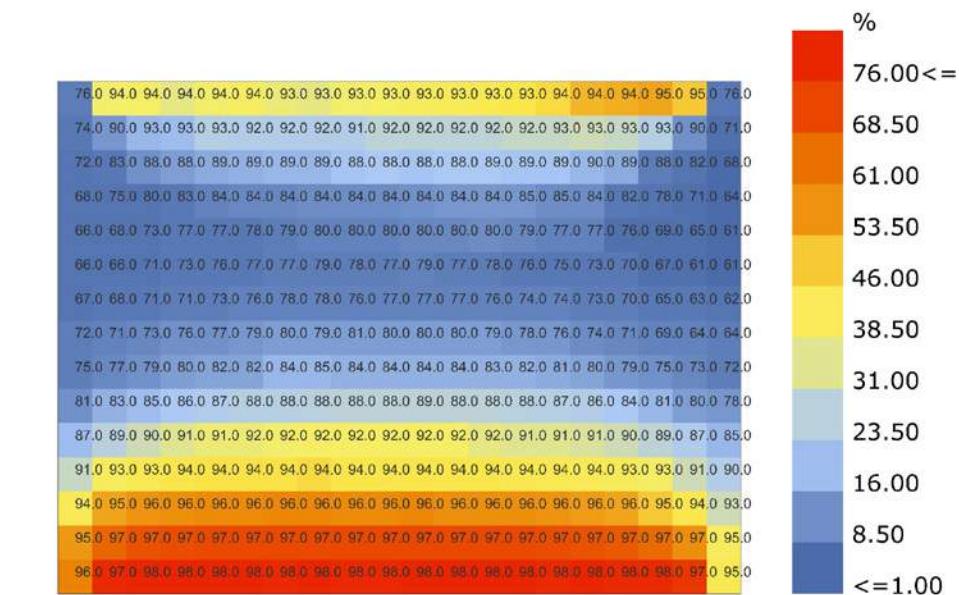
annual analysis
sda:100.00

South West



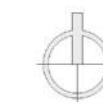
annual analysis
sda:100.00

South



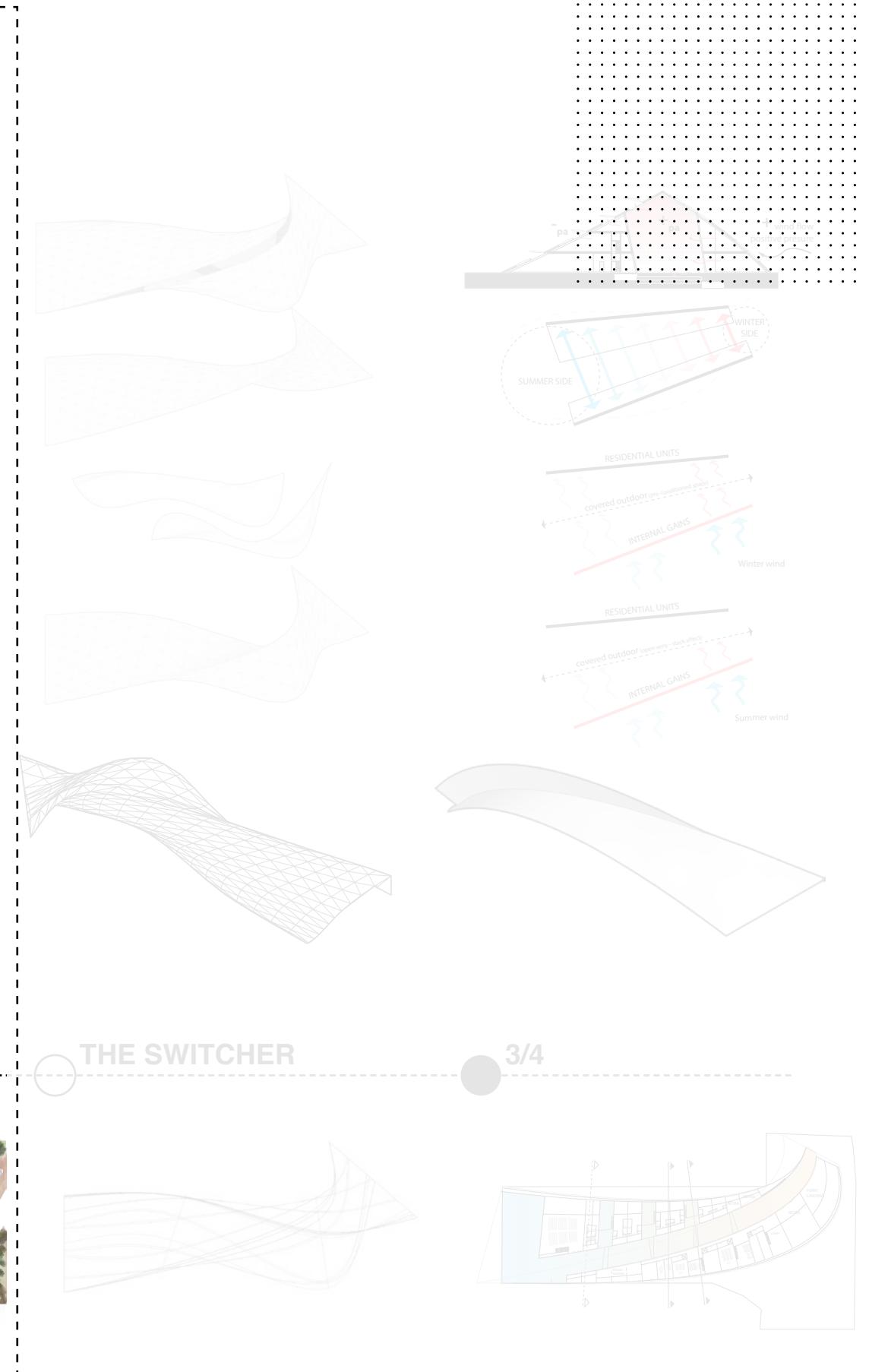
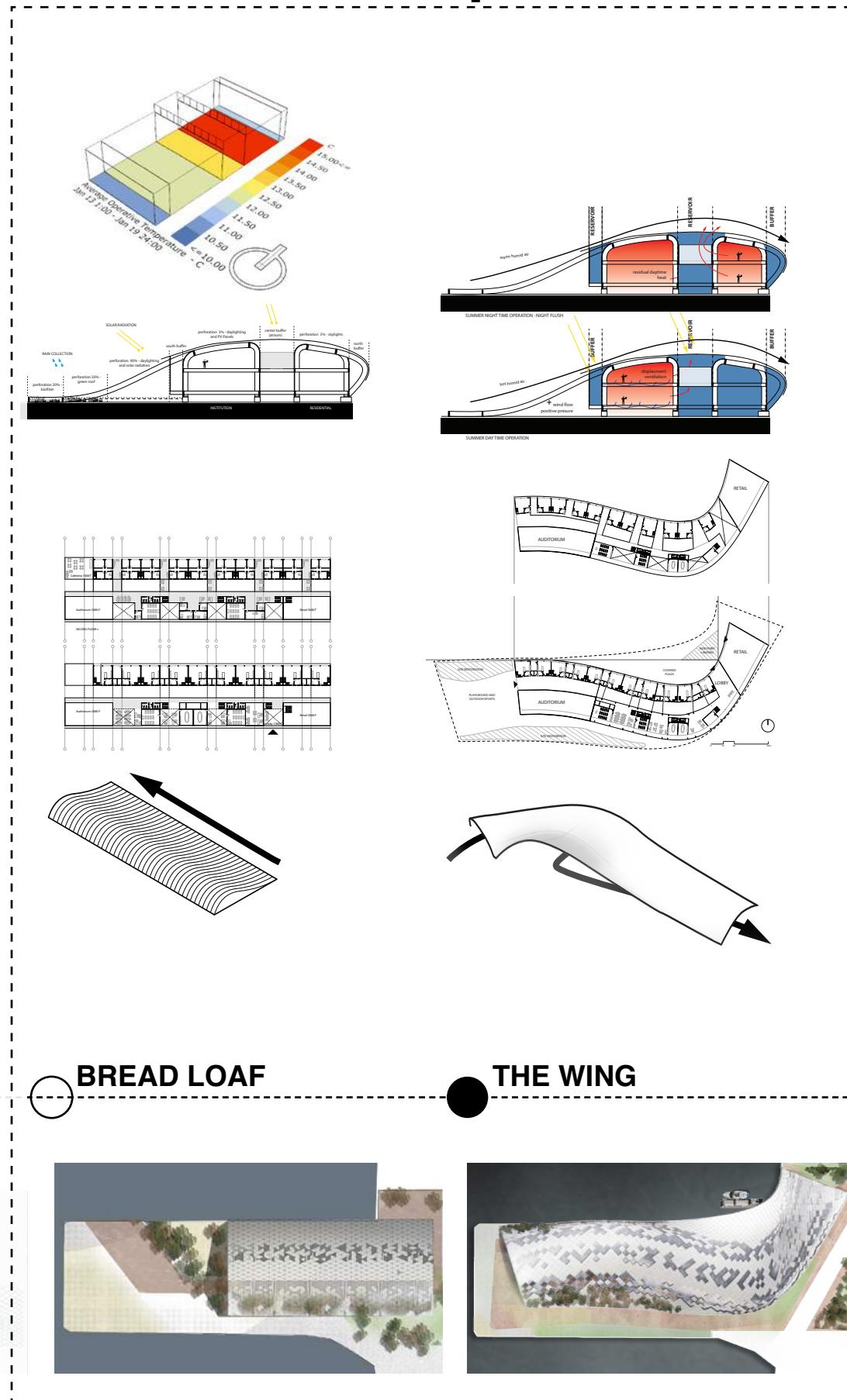
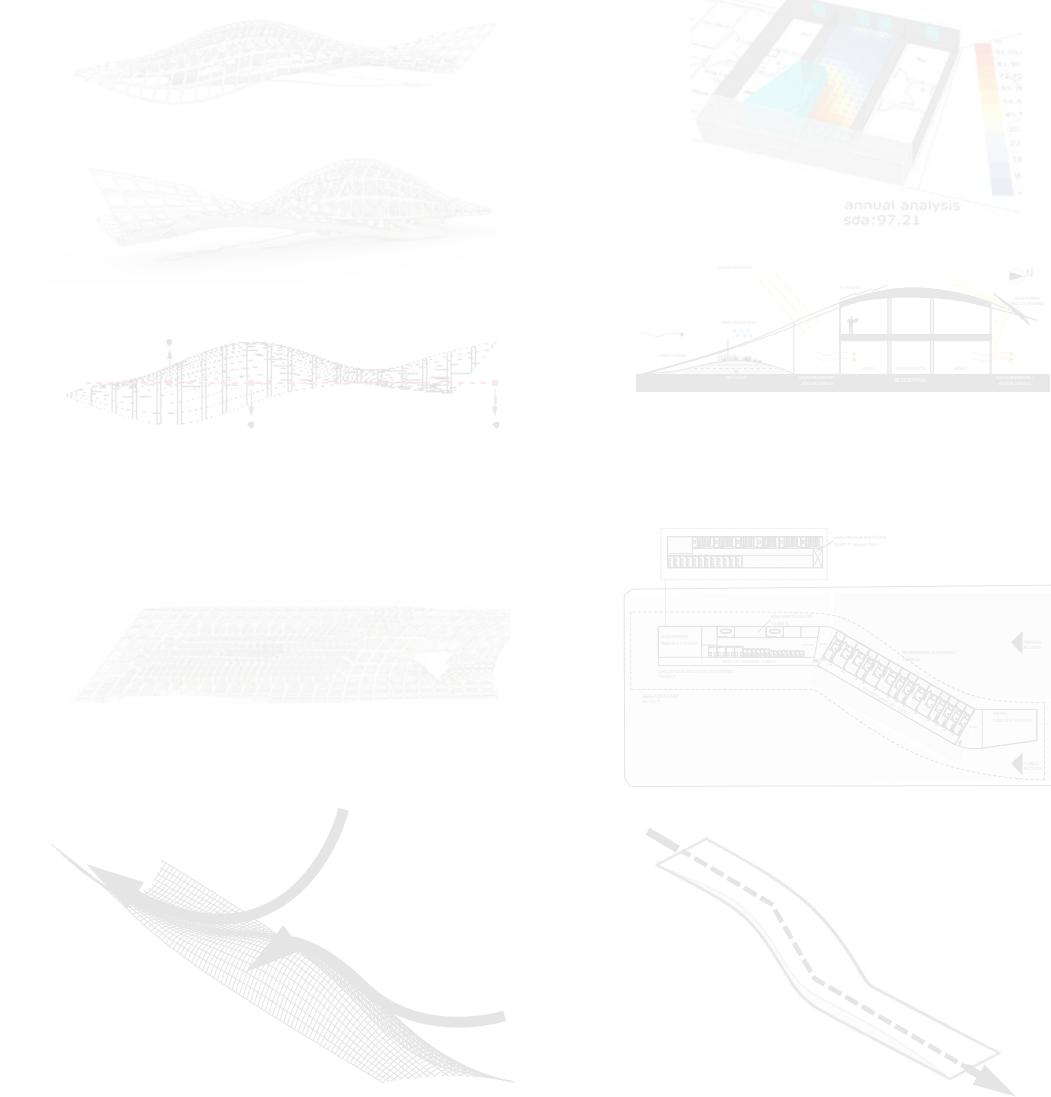
annual analysis
sda:100.00

South East

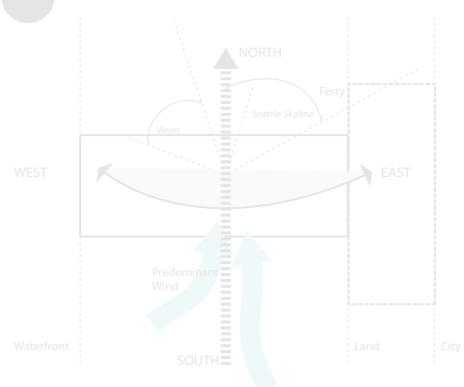


Design Narrative

Environmental Concept - Step 2



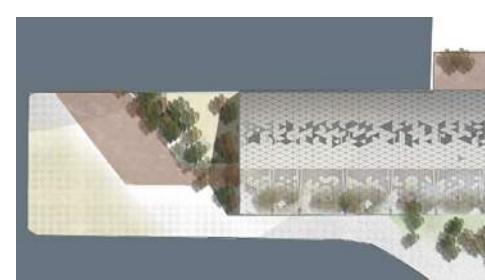
FORCE FLOW



THE KINK



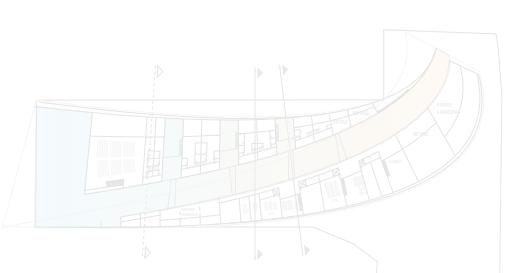
BREAD LOAF



THE WING



3/4

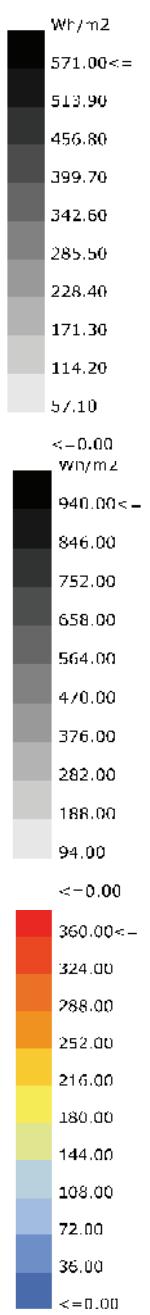


BROWNFIELD REMEDIATION 26,901sq.m

Site gross area; impermeable, concrete surface

DAYLIGHTING 33%

<50% Cloud Cover



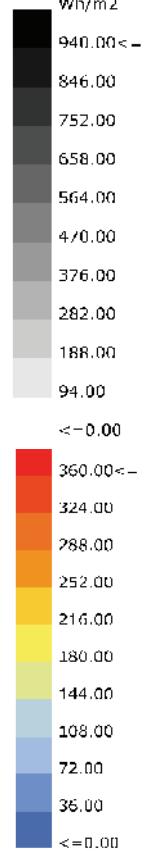
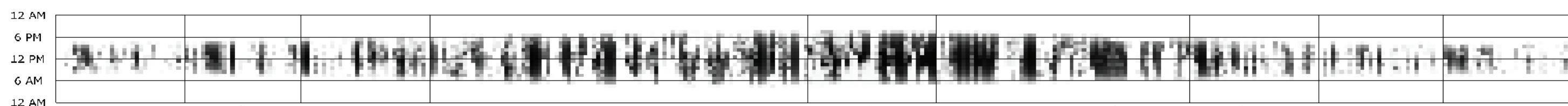
SOLAR RADIATION 571 wh/m²

Maximum diffuse solar radiation (daylighting)



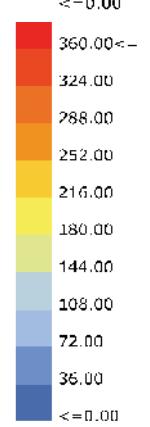
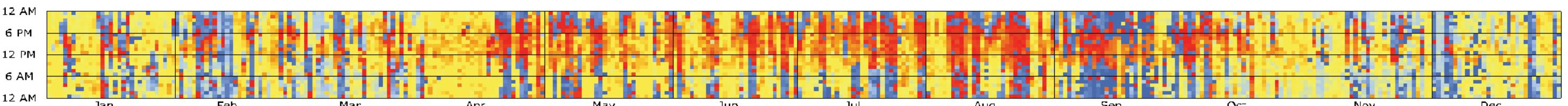
SOLAR RADIATION 940 wh/m²

Maximum direct solar radiation (winter-garden & PV)



COLD WIND DEFLECTION 50% SE 3.75 m/s

Average wind speed from SE >50% of the year

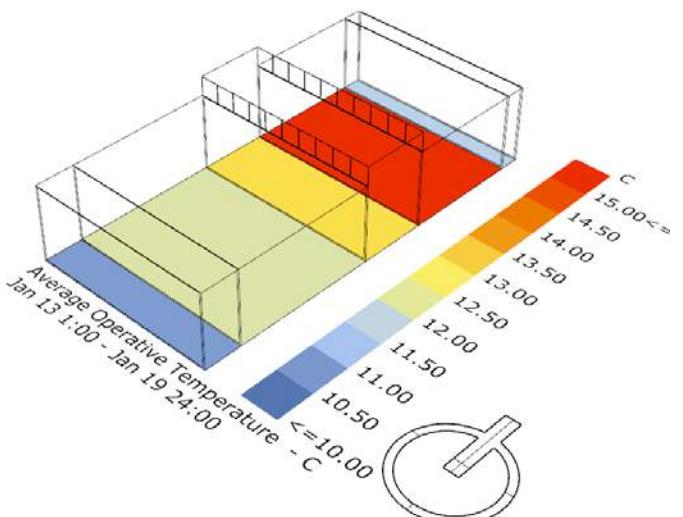
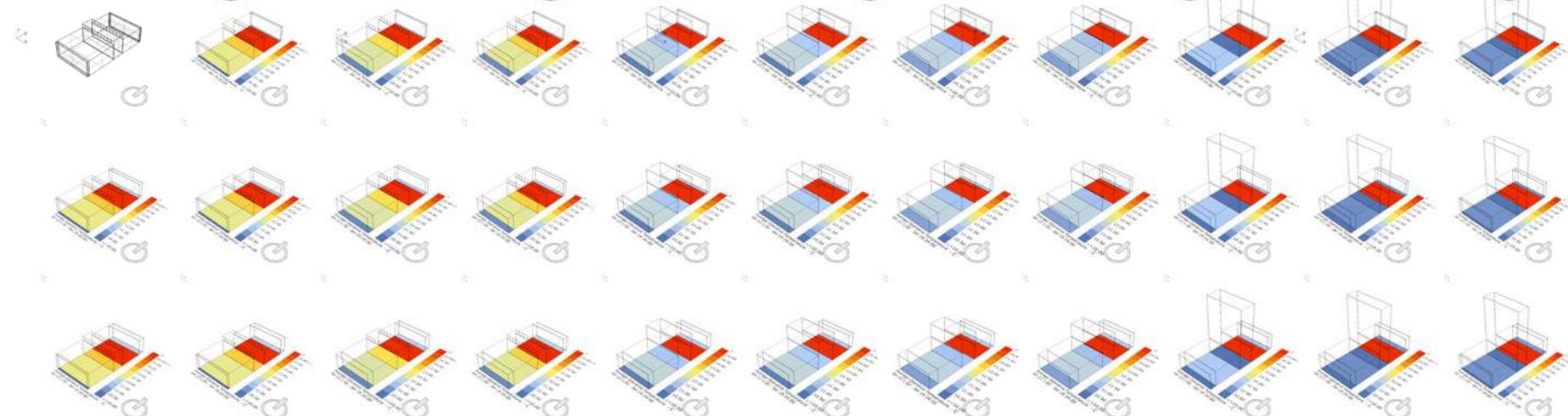
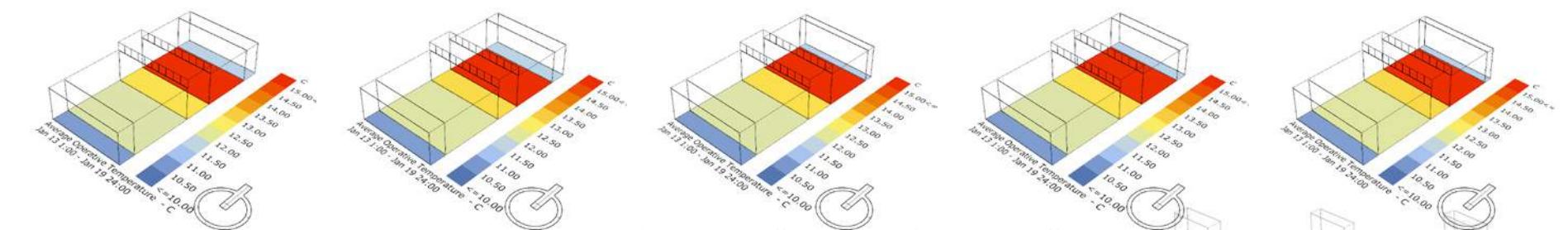
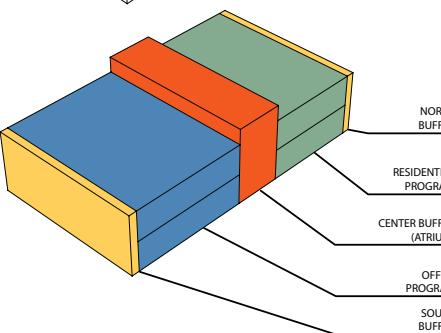
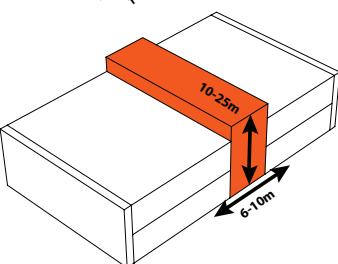
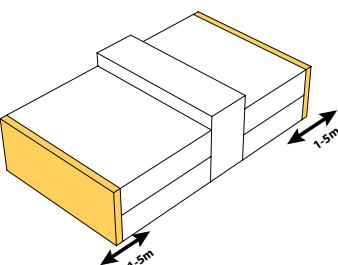
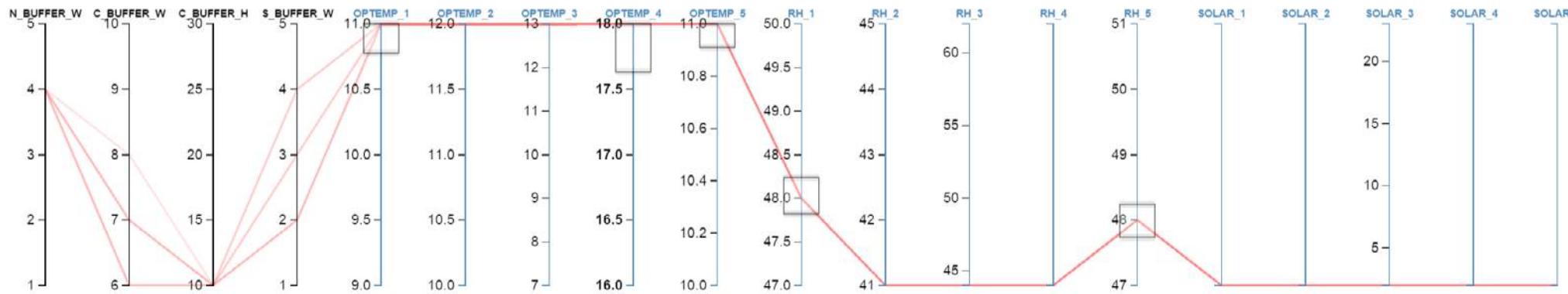
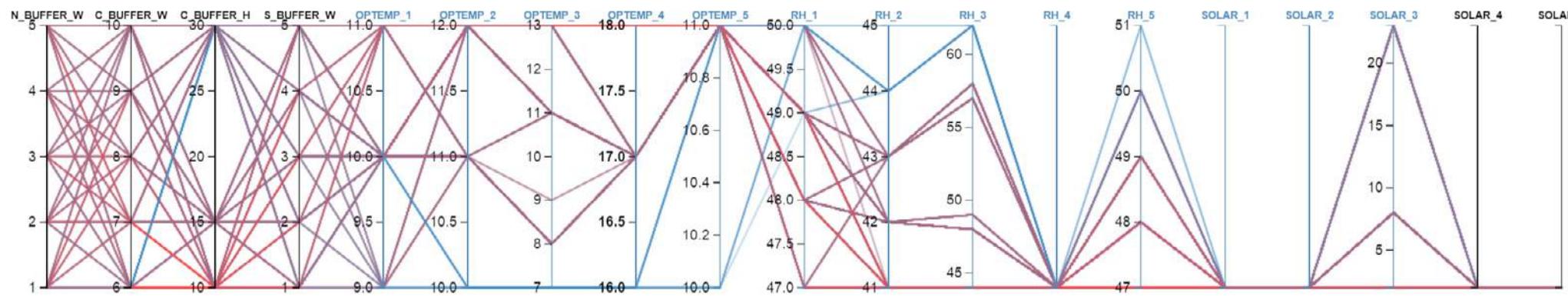


RAINWATER MANAGEMENT 50% 38.6 in

Annual mean precipitation; rain >50% of the year

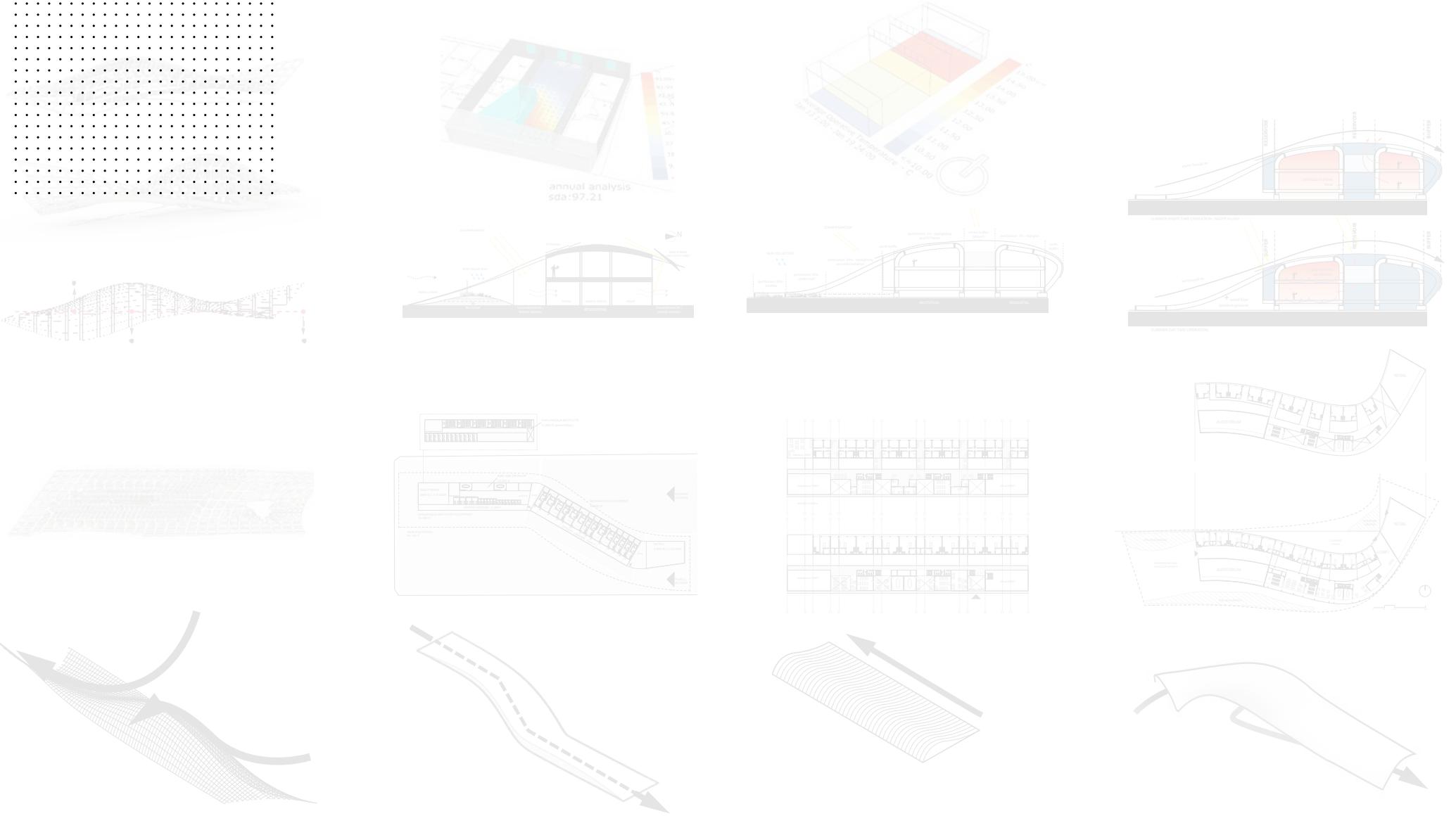
ABUNDANCY
100%

North/South Comfort Axis Analysis

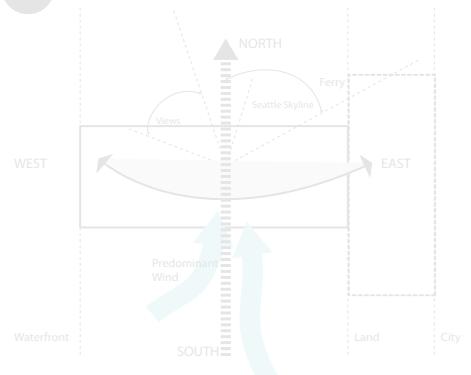


z
y
x

Design Narrative



FORCE FLOW



THE KINK



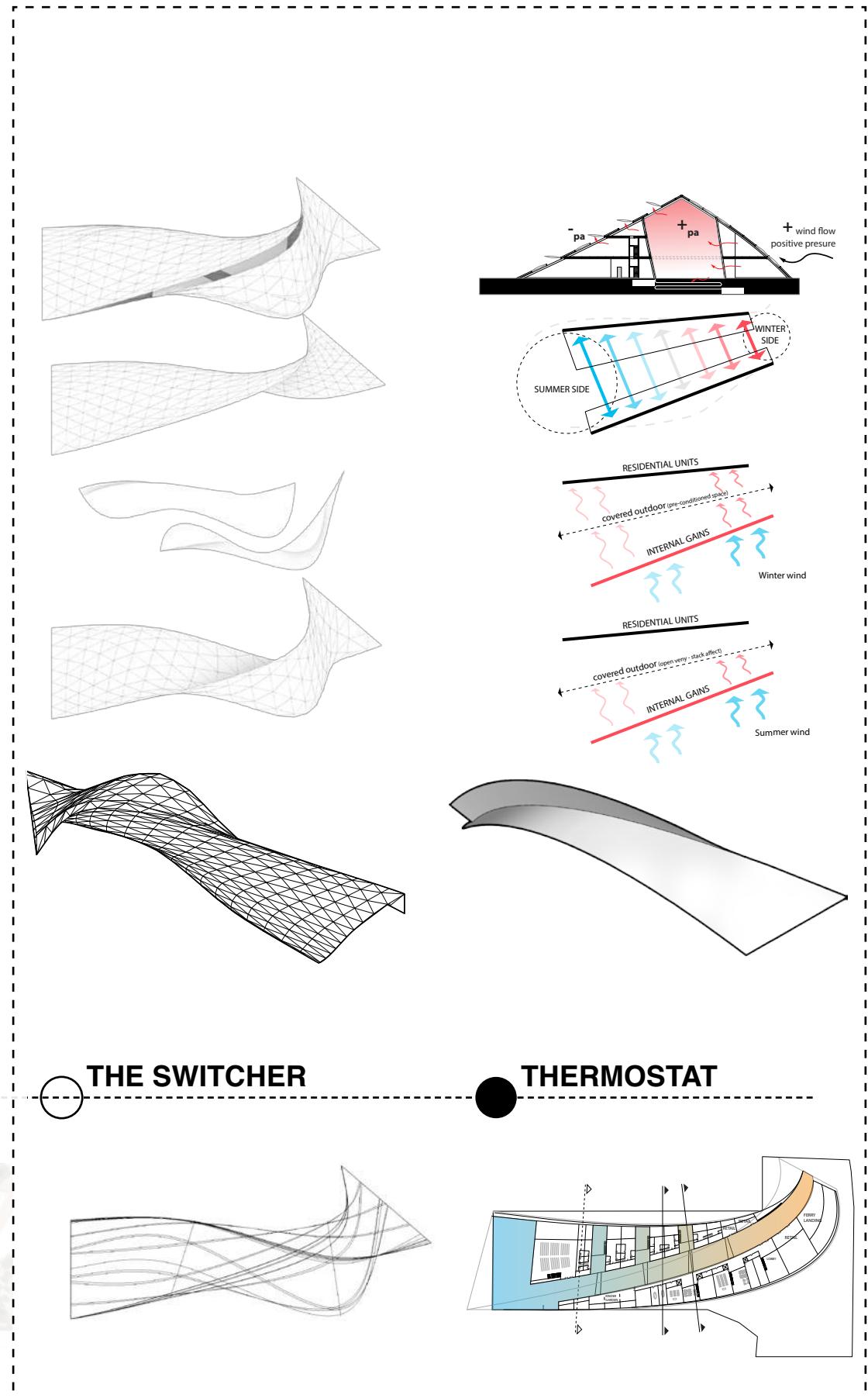
BREAD LOAF



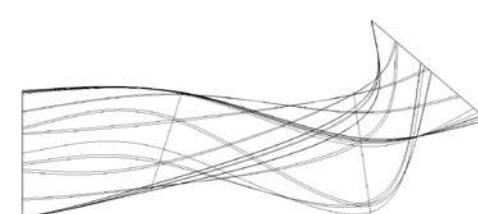
THE WING



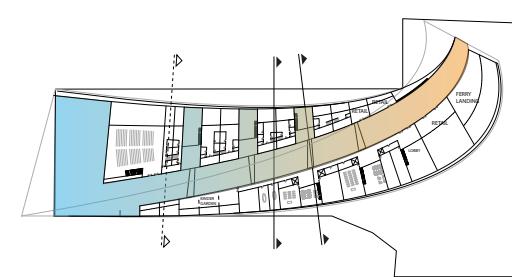
Architectural Refinement



THE SWITCHER

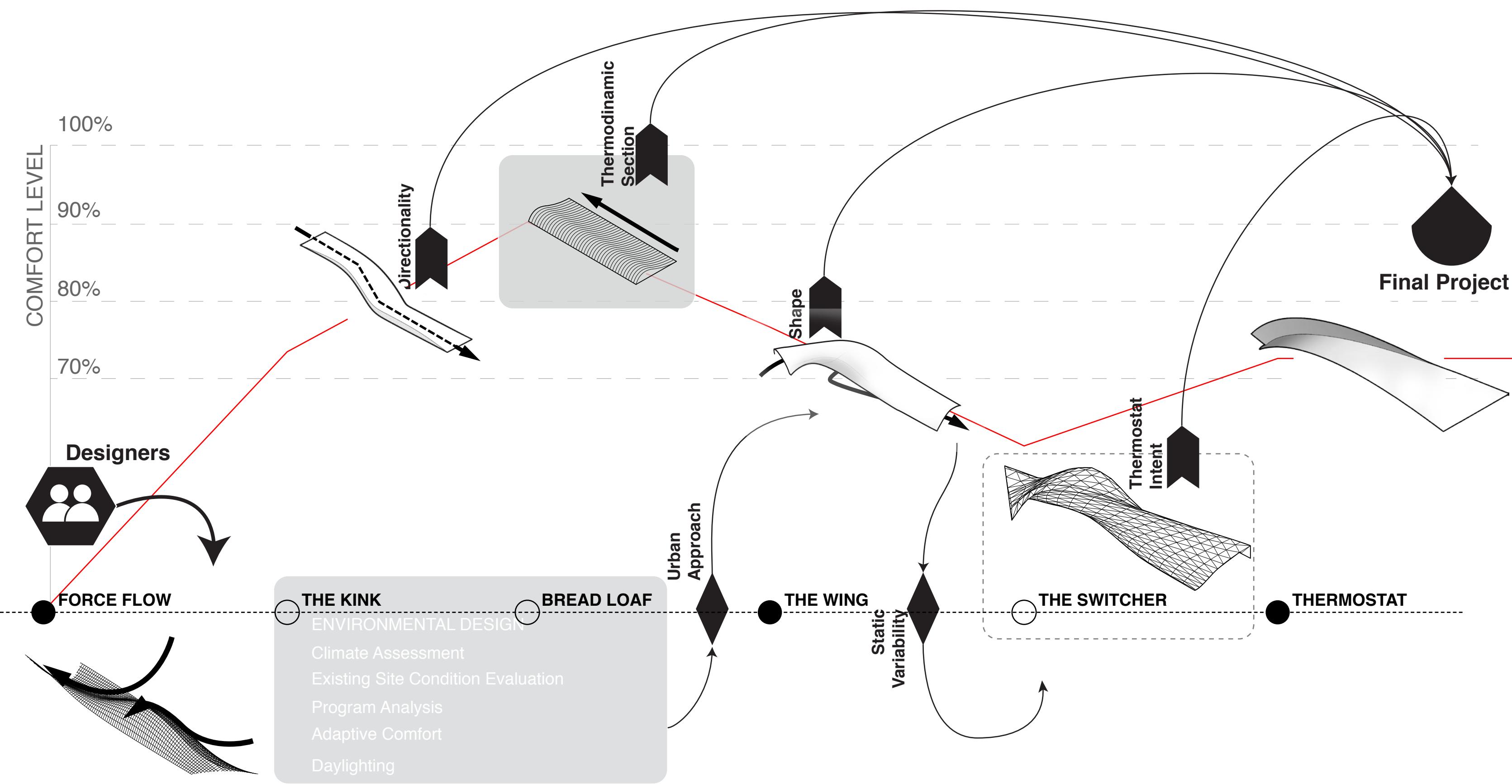


THERMOSTAT

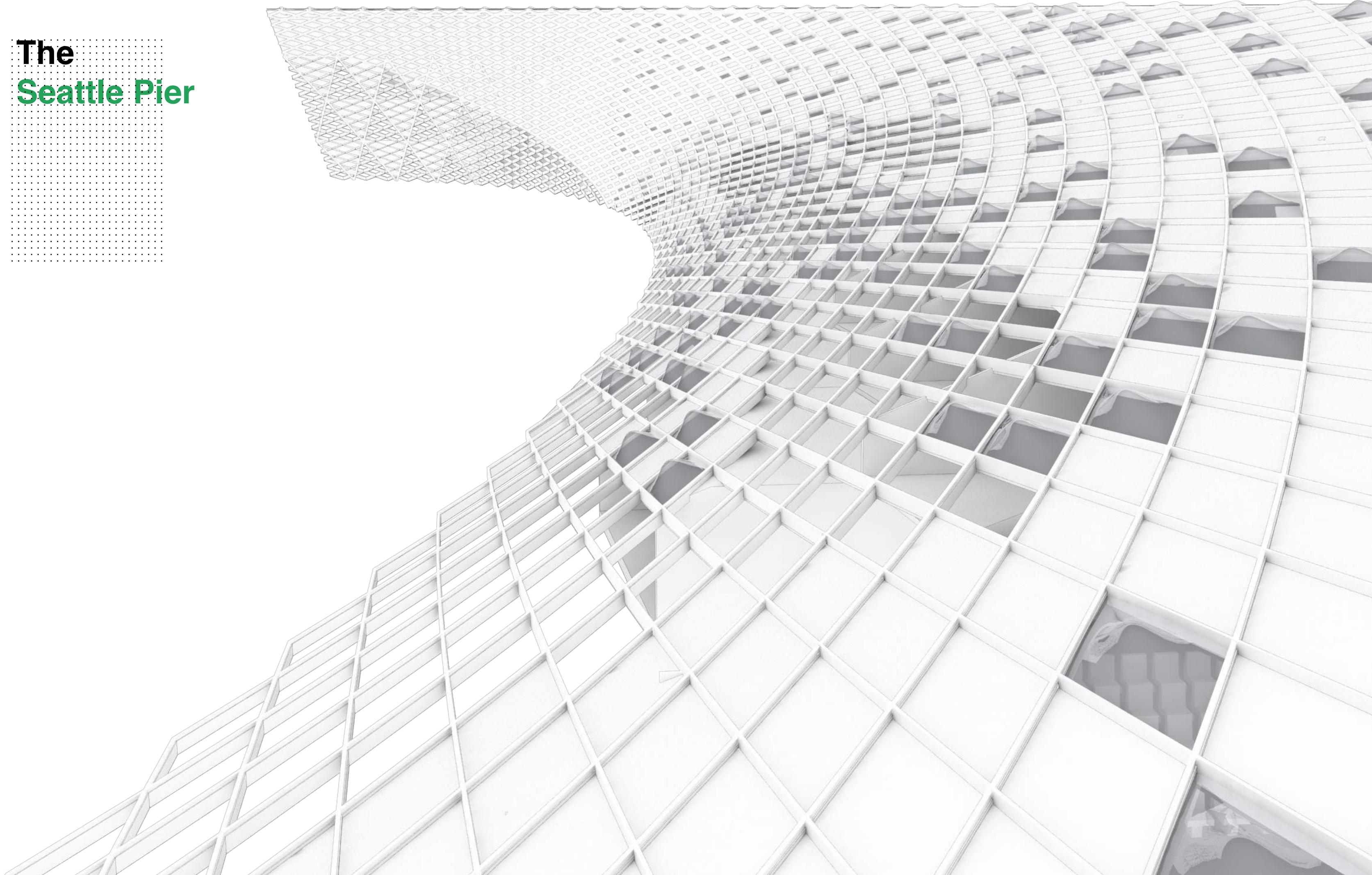


Design Narrative

Selective Improvements

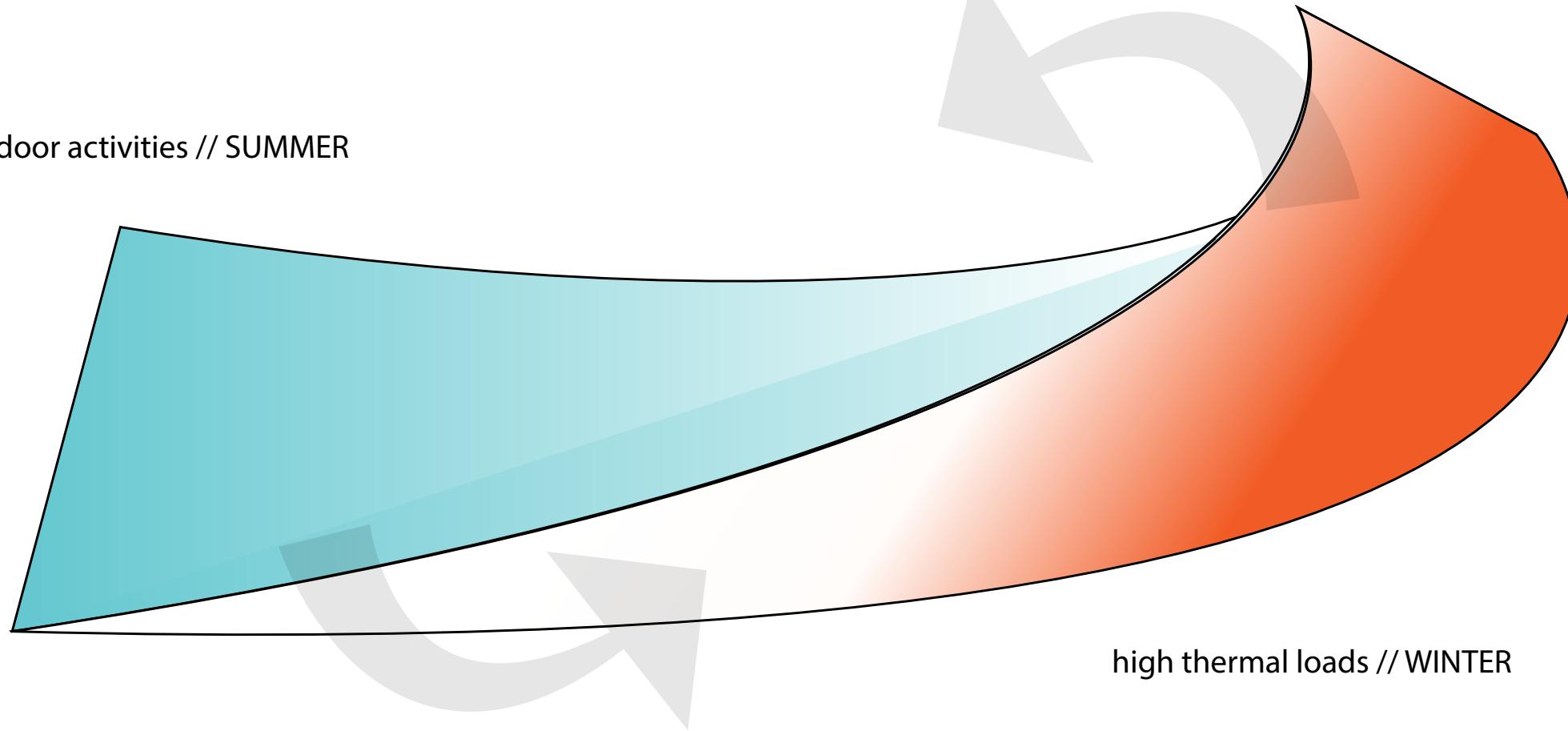


The Seattle Pier



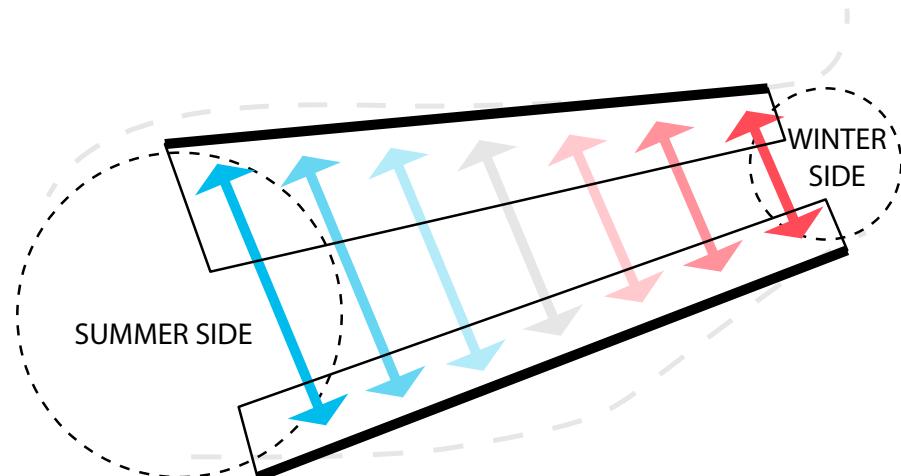
Design Intent

outdoor activities // SUMMER

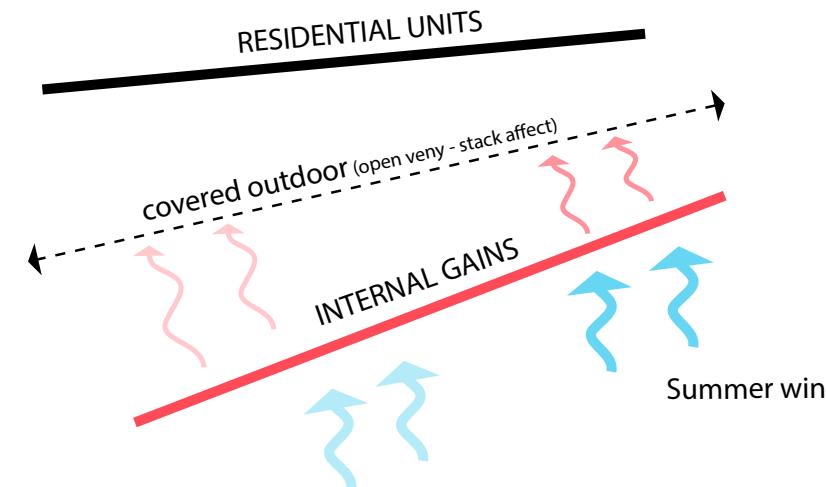


high thermal loads // WINTER

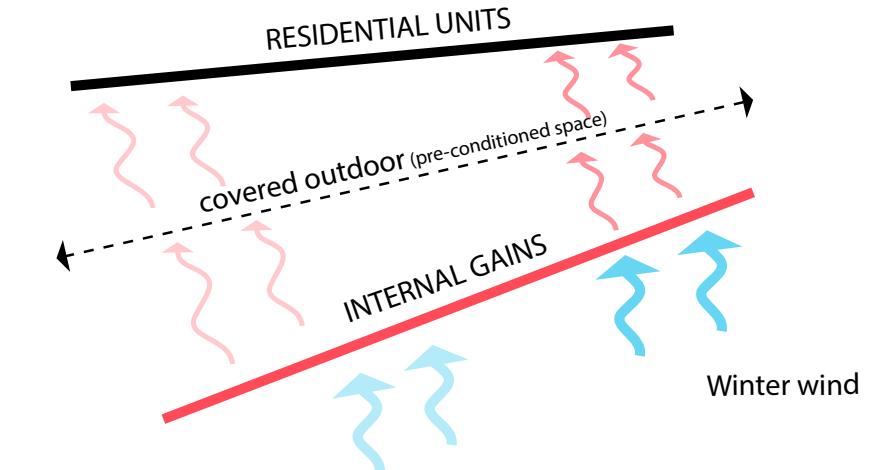
BUILDING THERMOSTAT - COMFORT VARIETY



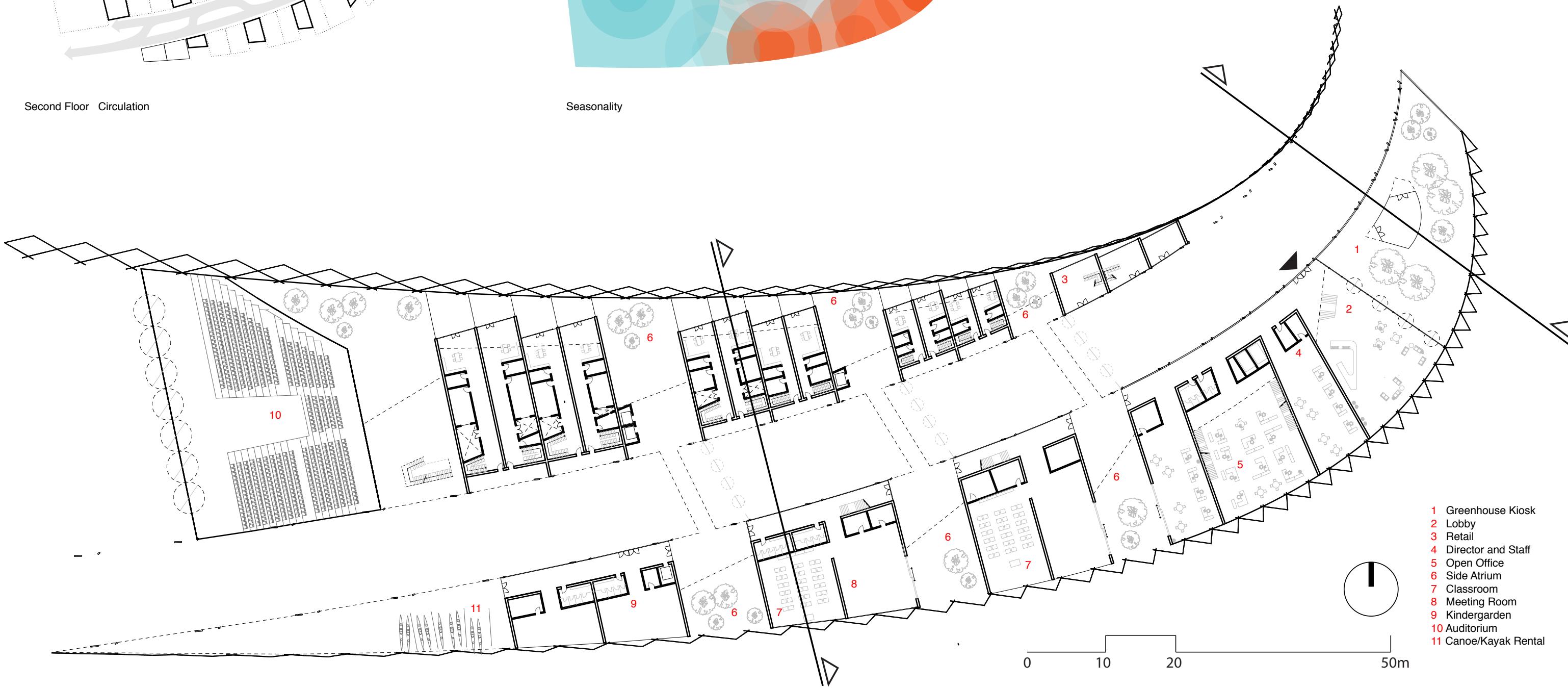
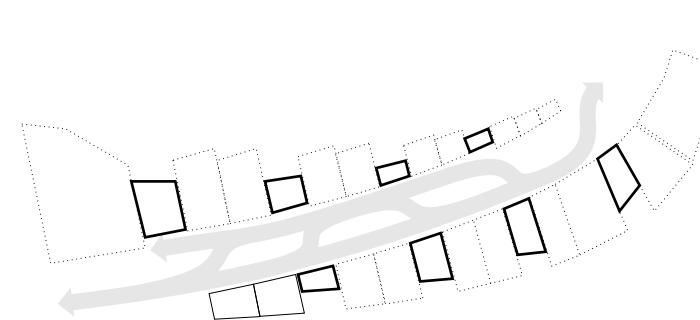
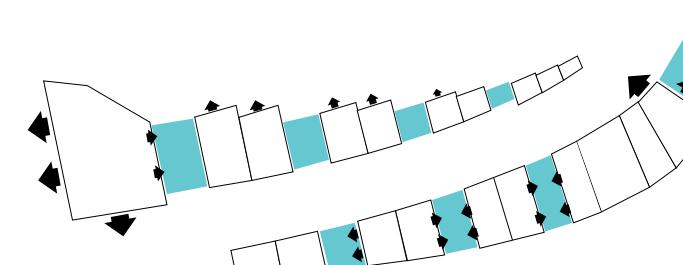
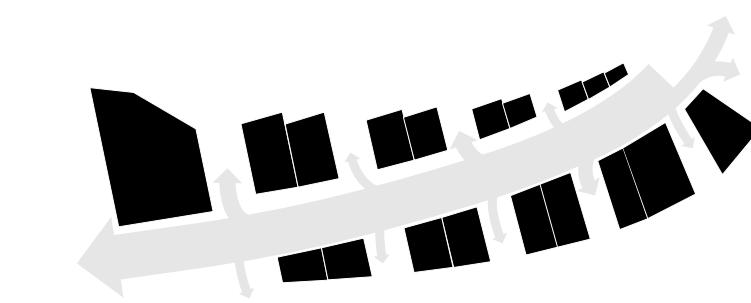
NATURAL AIR FLOW - summer



HEAT RECOVERY - winter

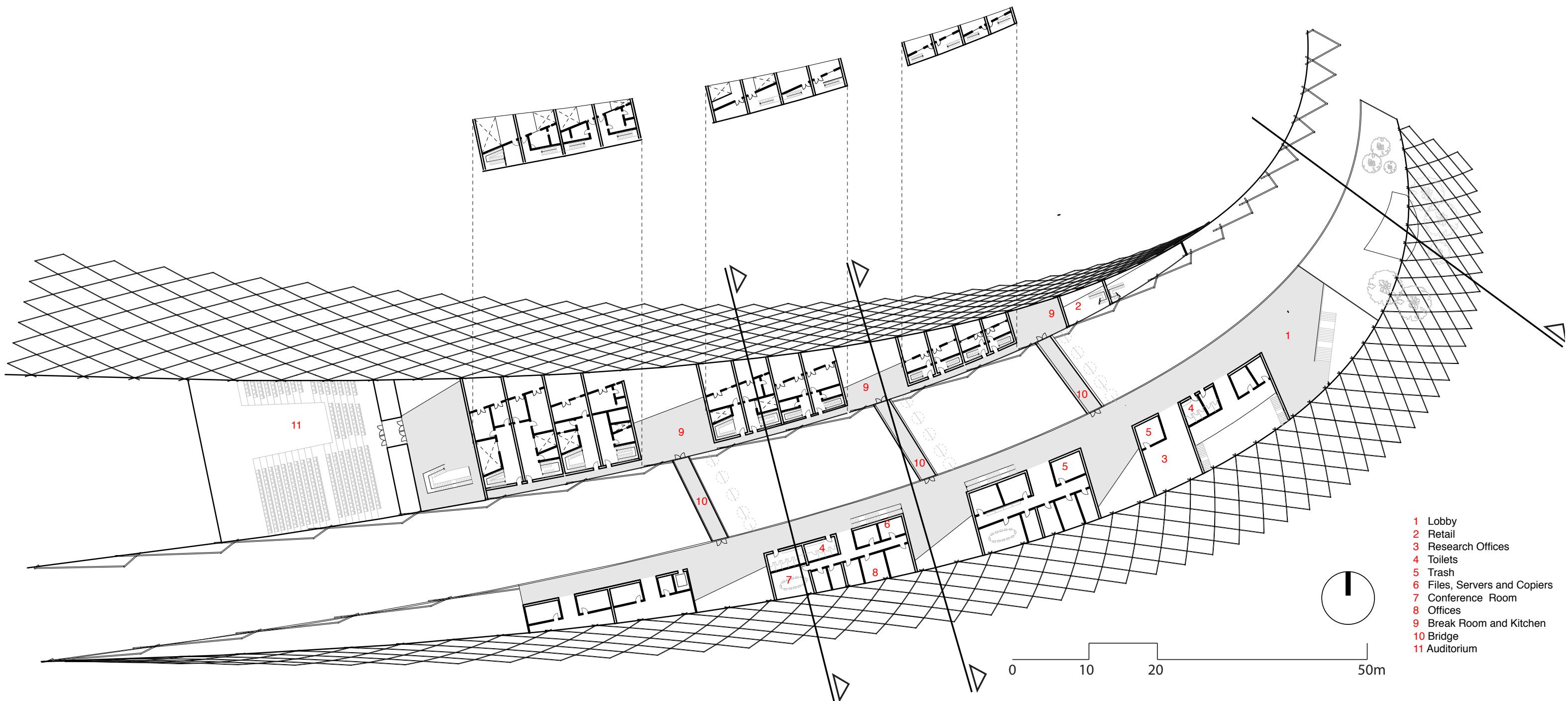


Design Ground Floor

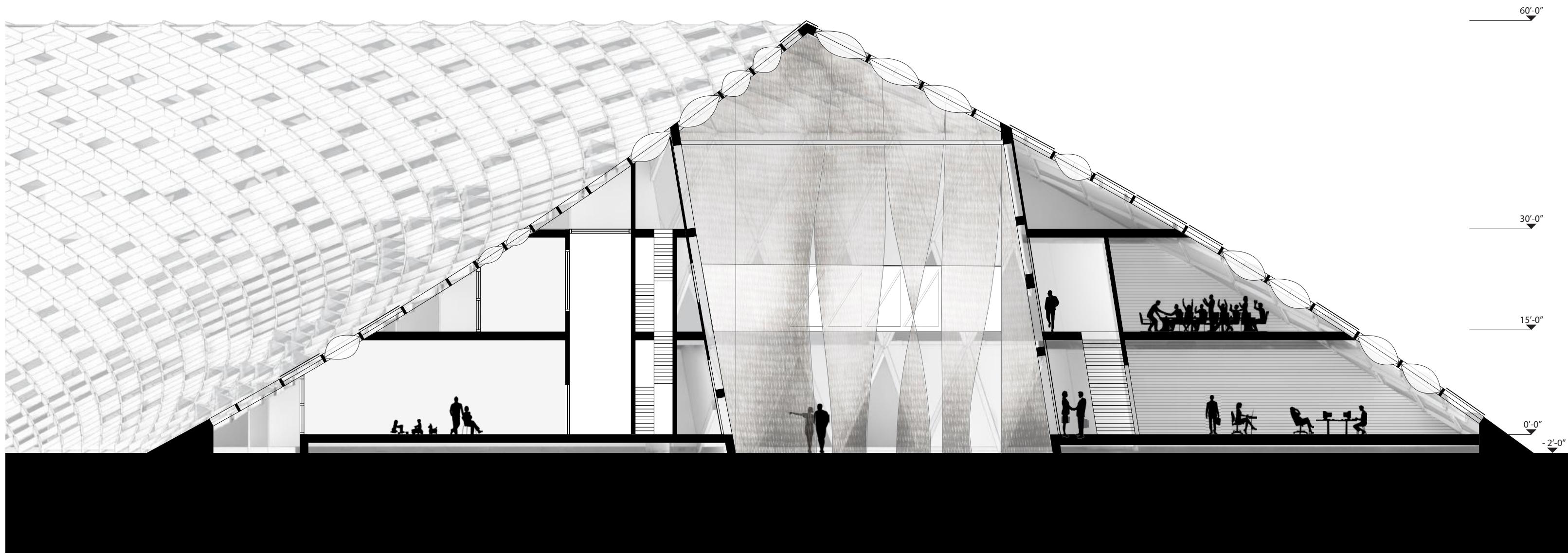
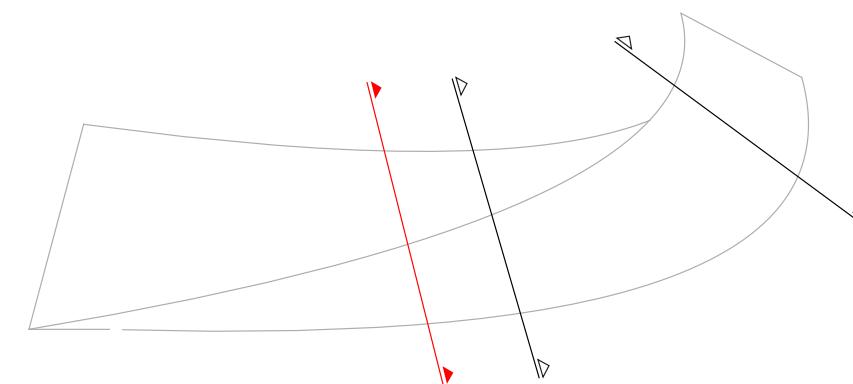
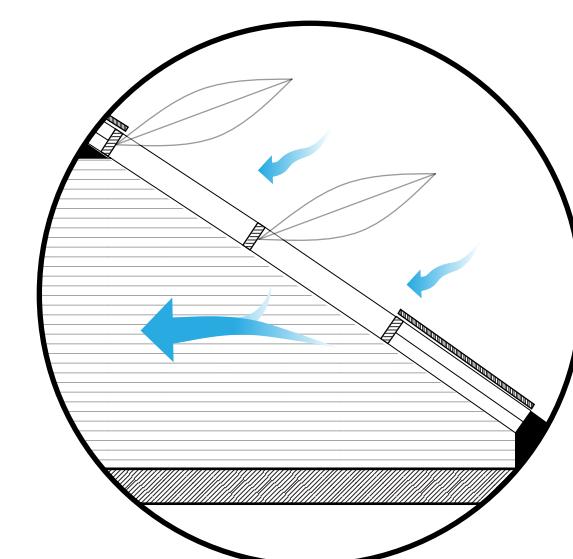
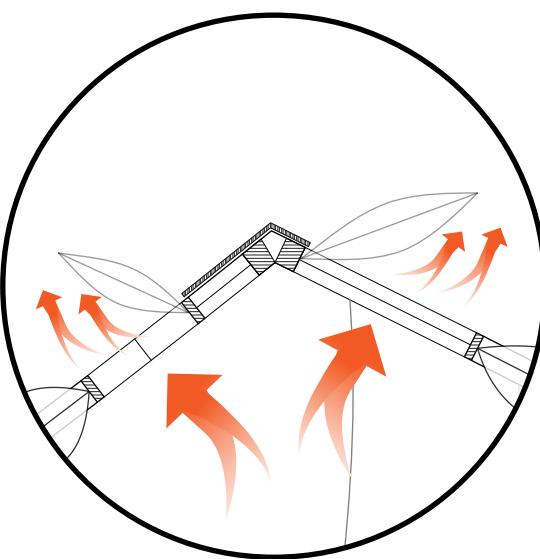
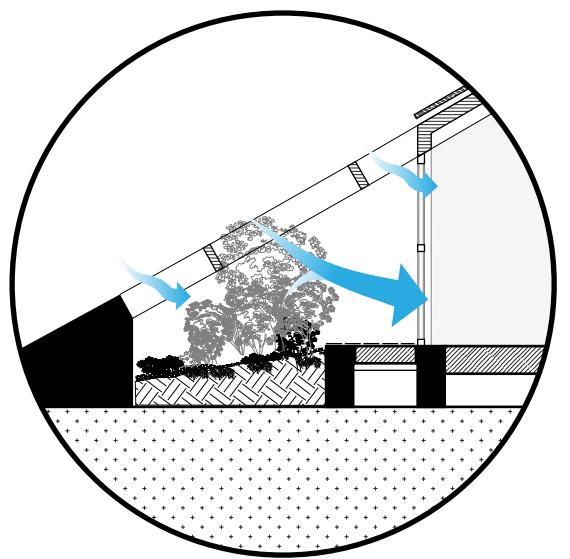


Design

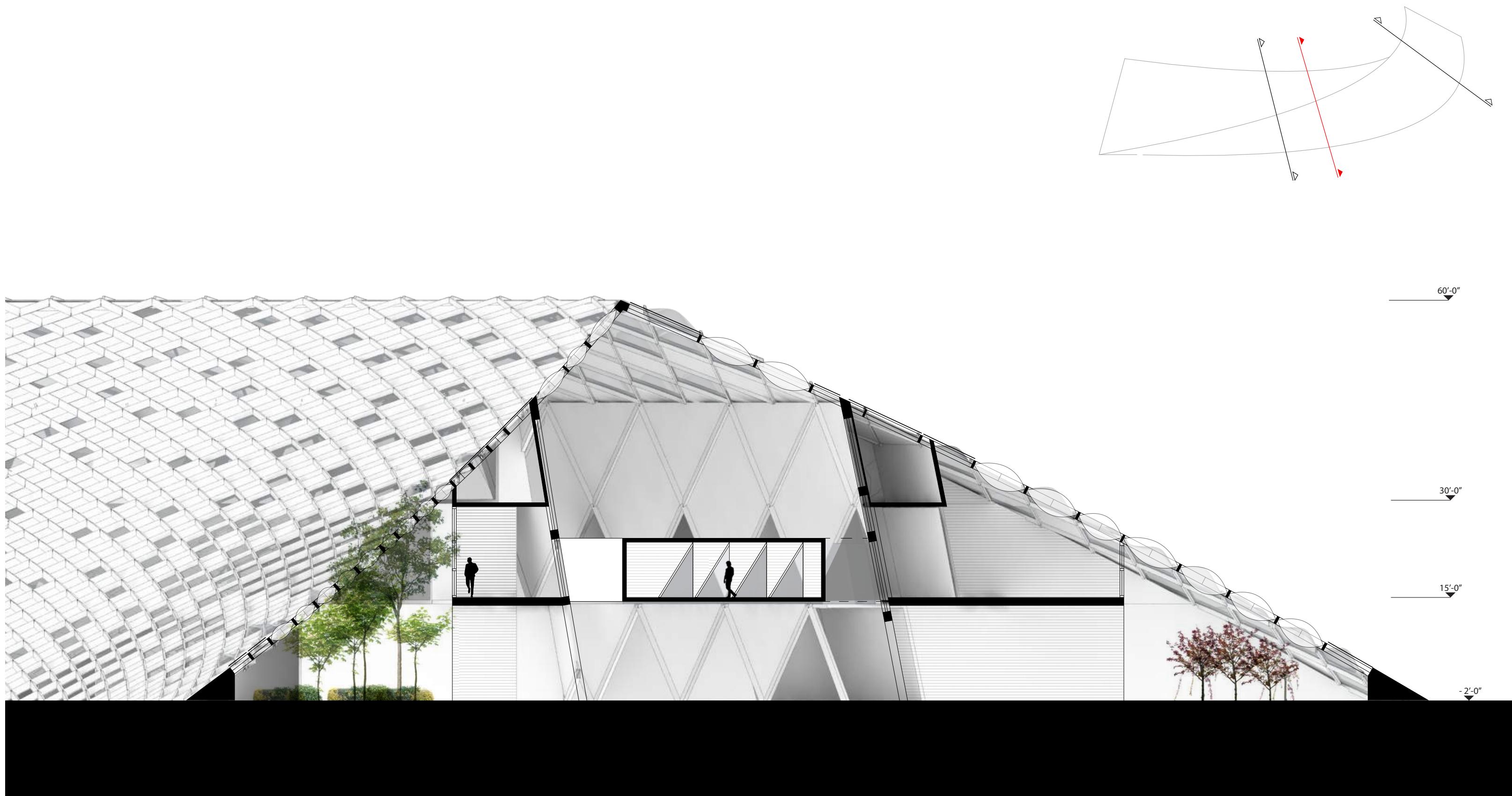
Second Floor



Design Section AA



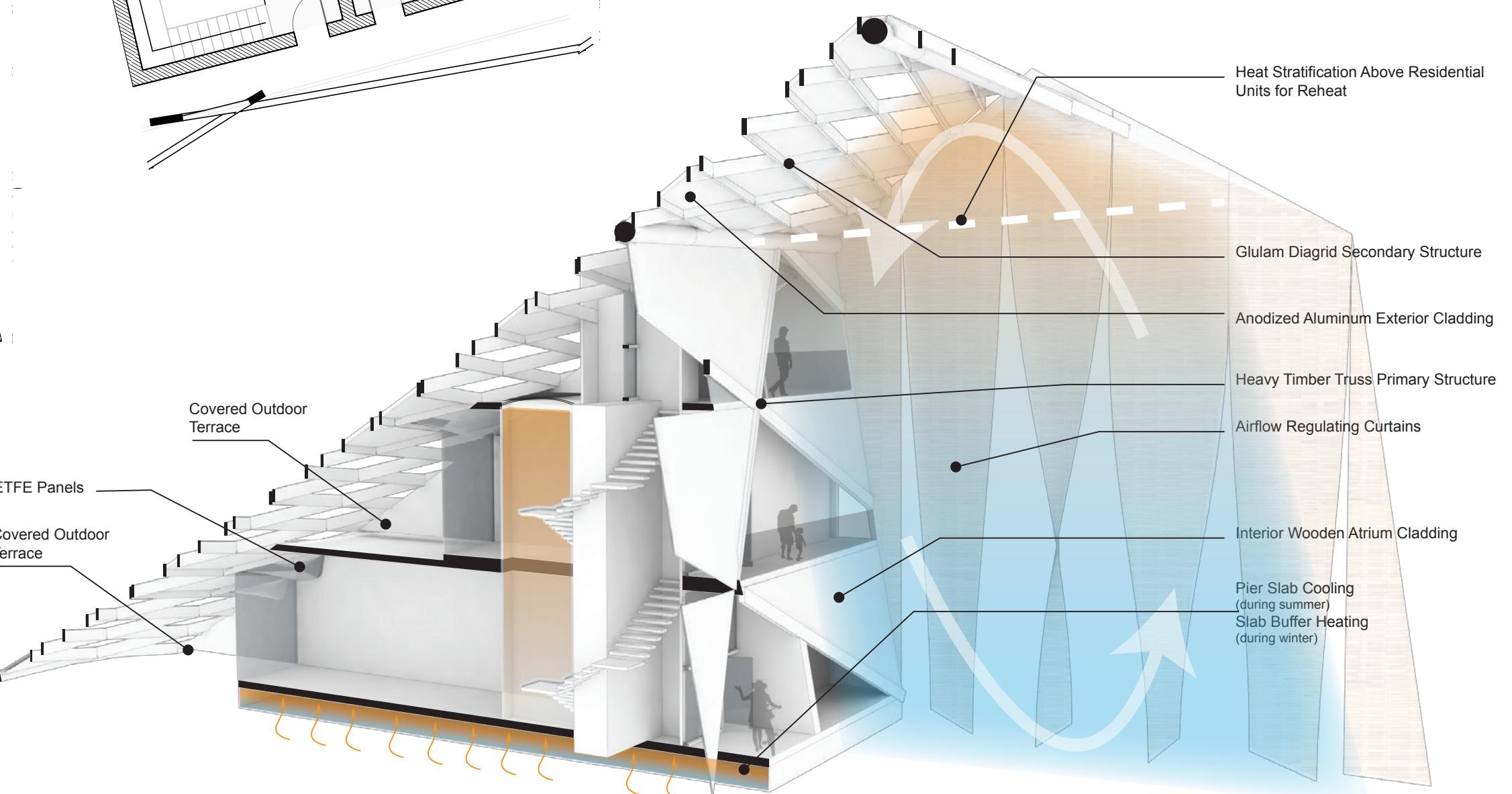
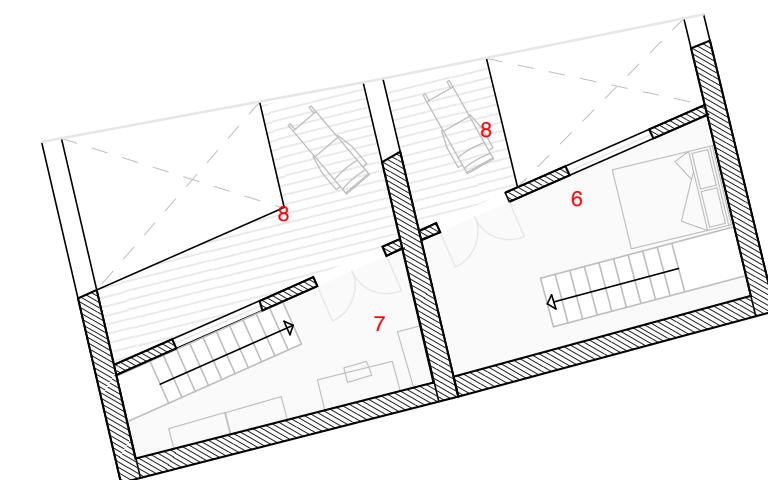
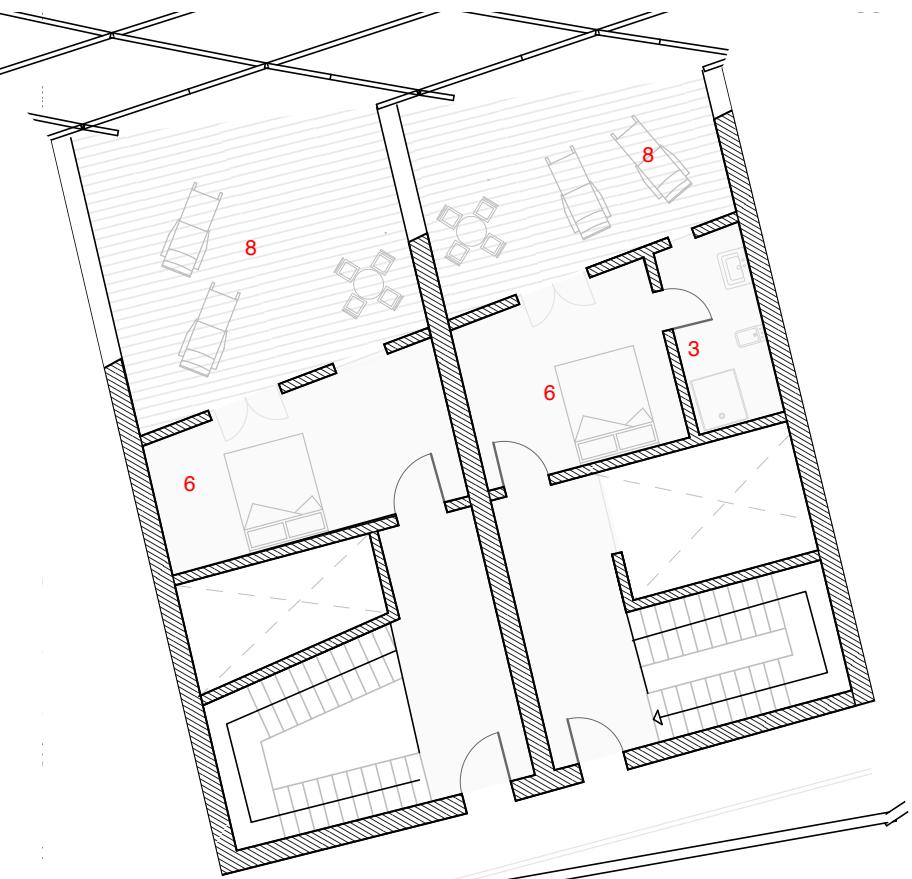
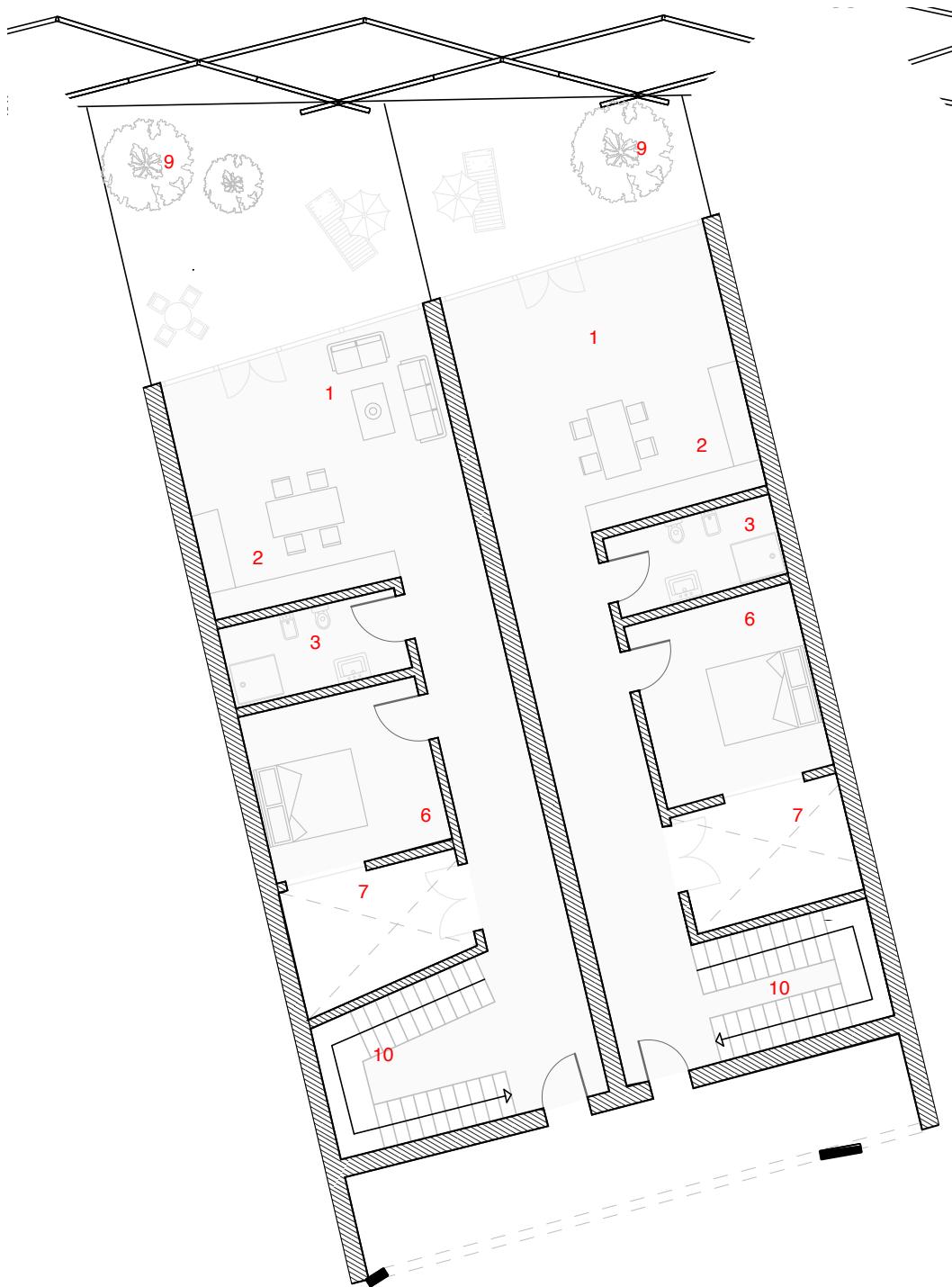
Design Section BB



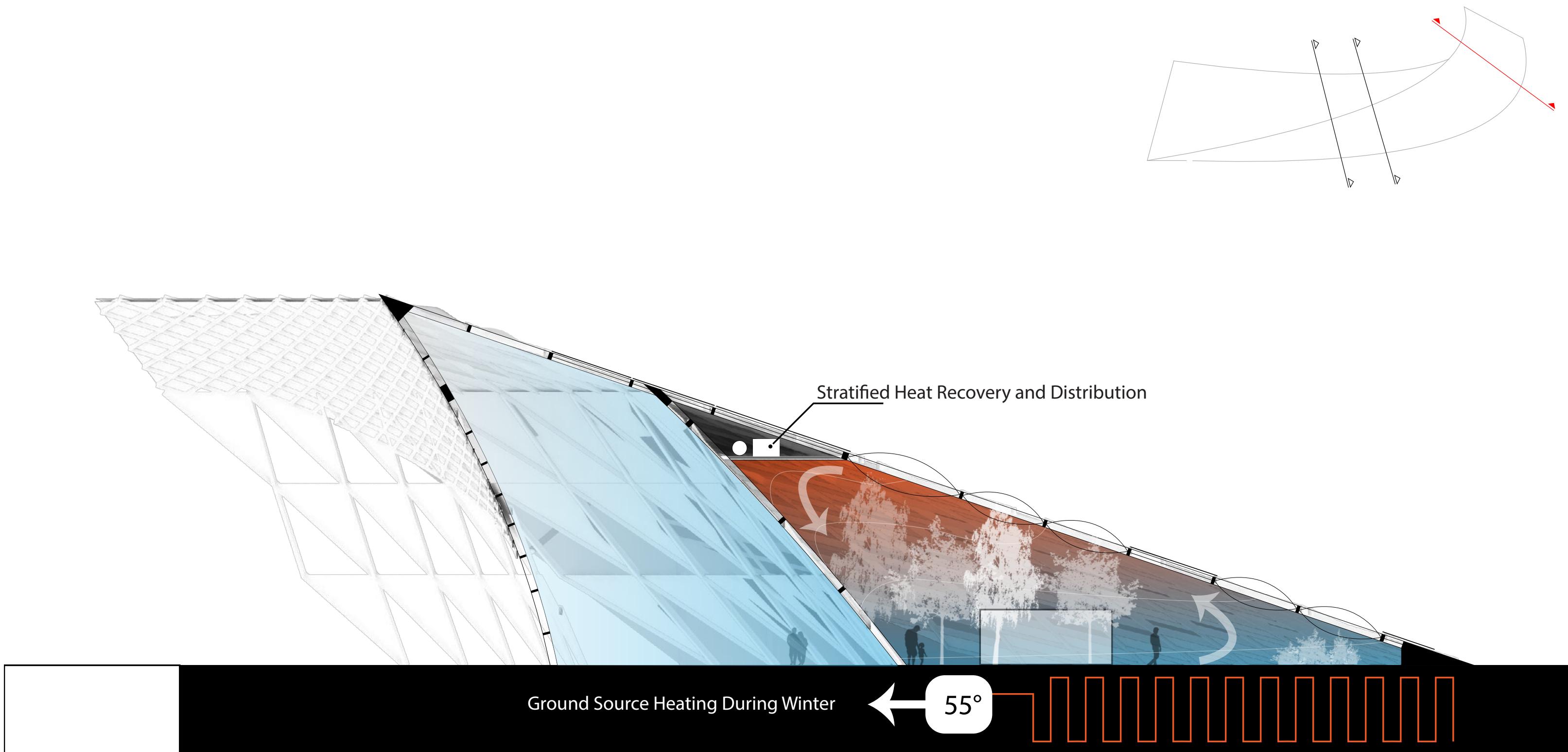
Design Site Plan

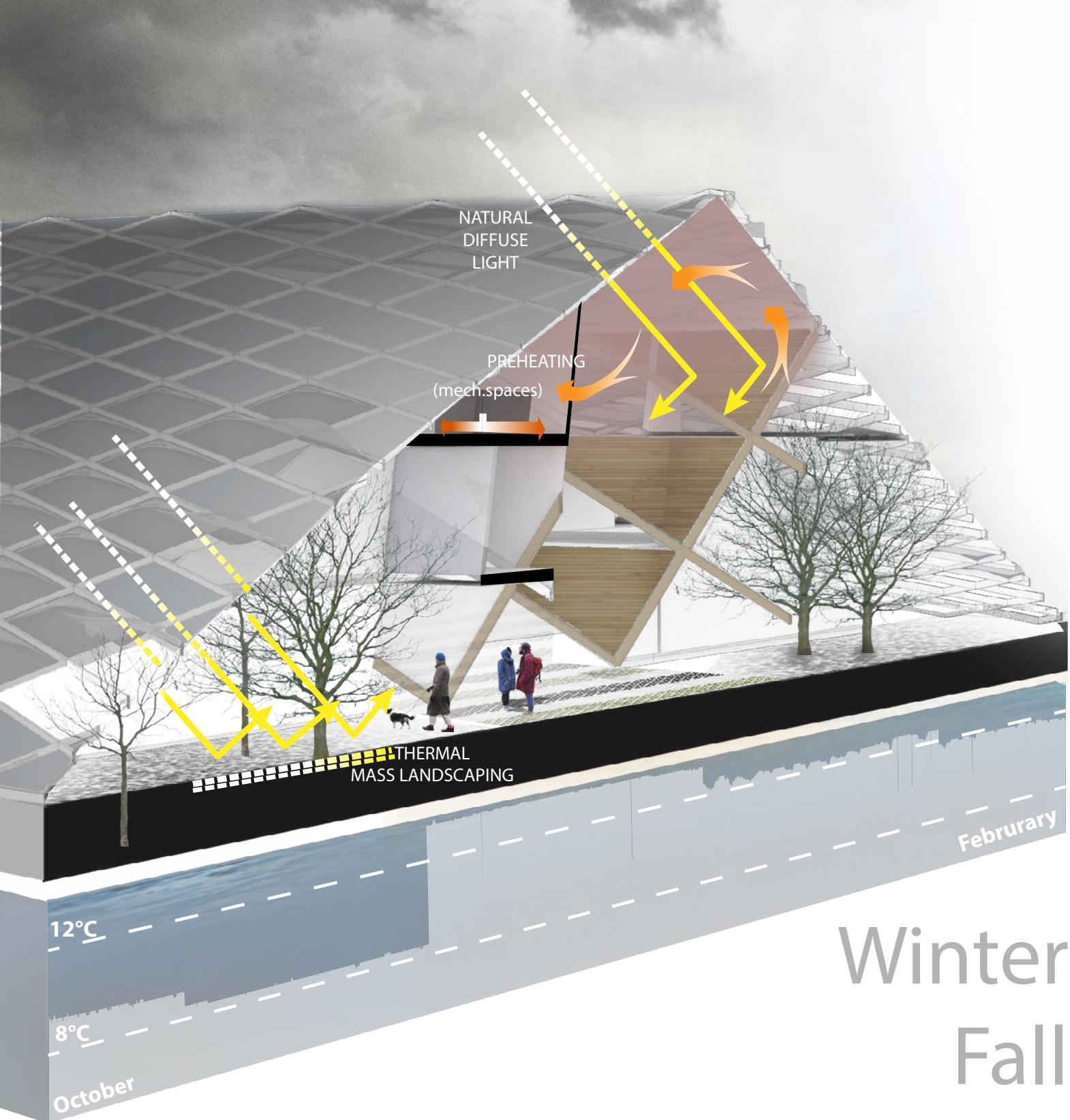


- 1 Living Room
- 2 Kitchen
- 3 Bathroom
- 4 Toilet
- 5 Light Well
- 6 Bedroom
- 7 Studio
- 8 Balcony
- 9 Courtyard
- 10 Stair



Design Section CC



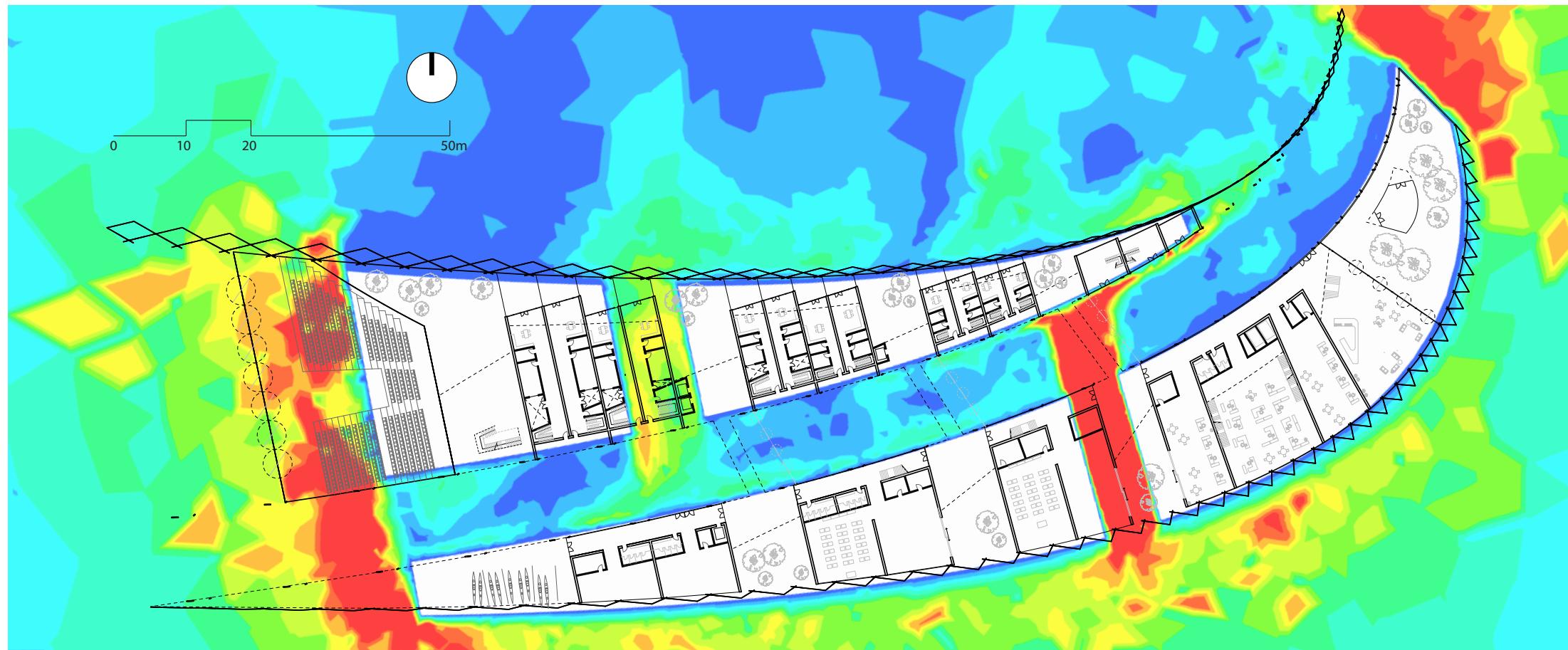


Winter
Fall



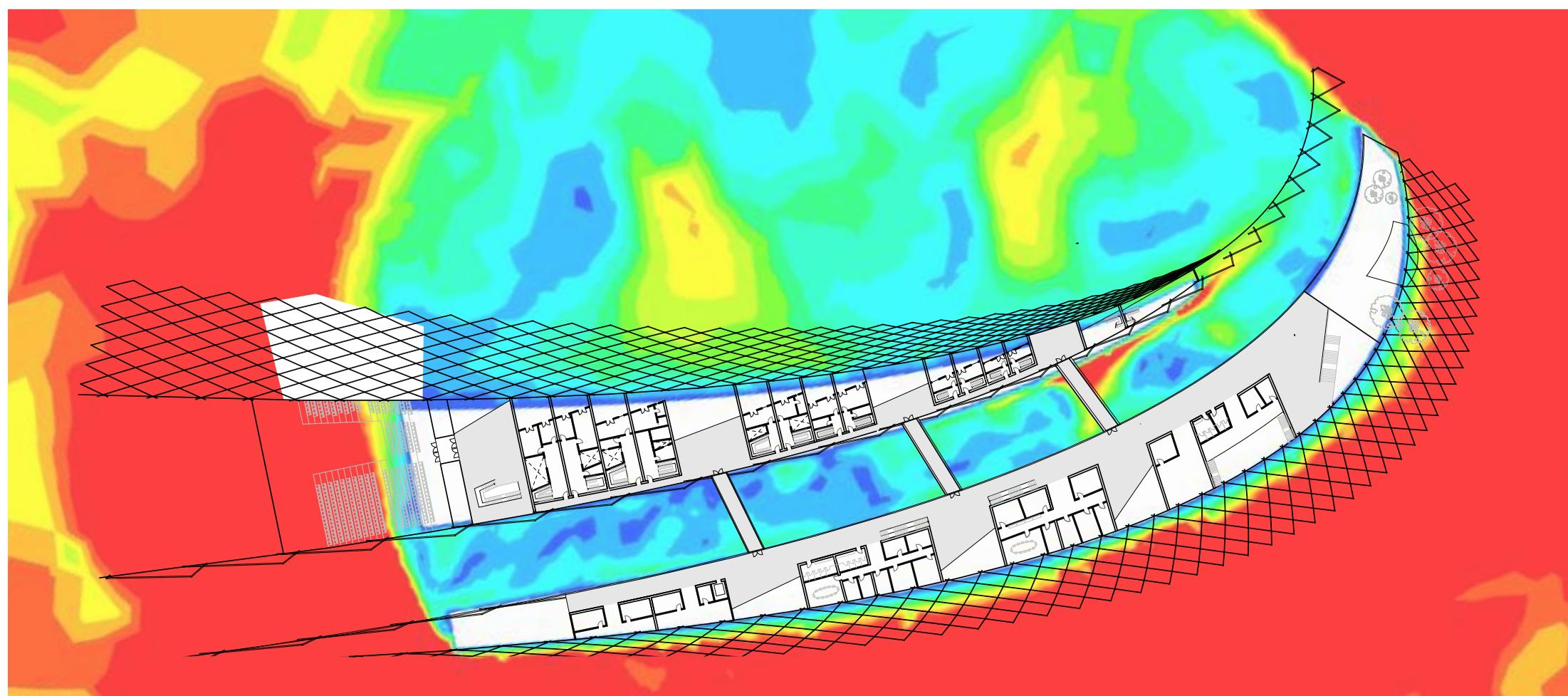
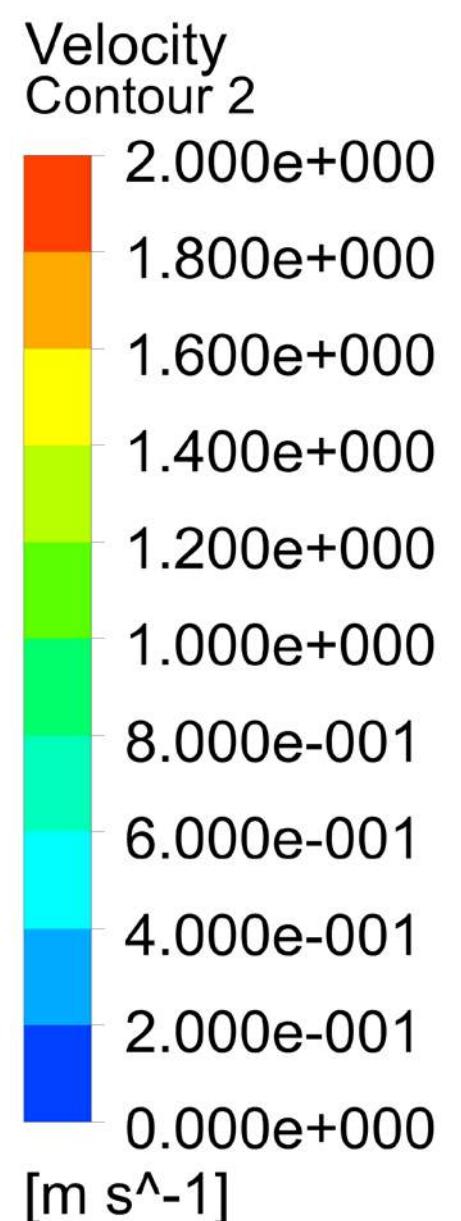
Summer
Spring

STATE 01

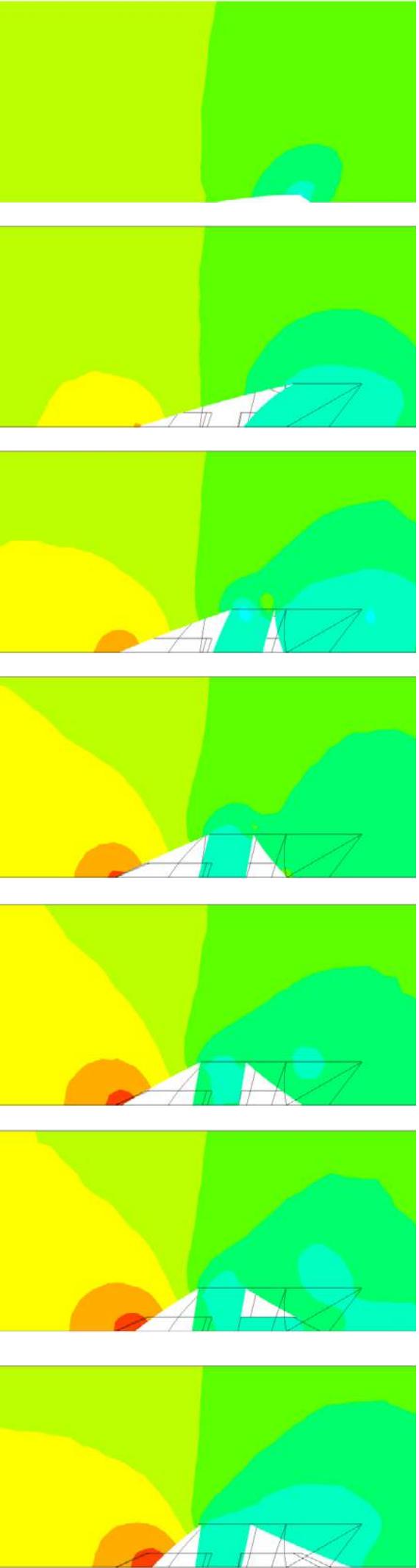


1-opening South
plan 2-meter height

Analysis
CFD

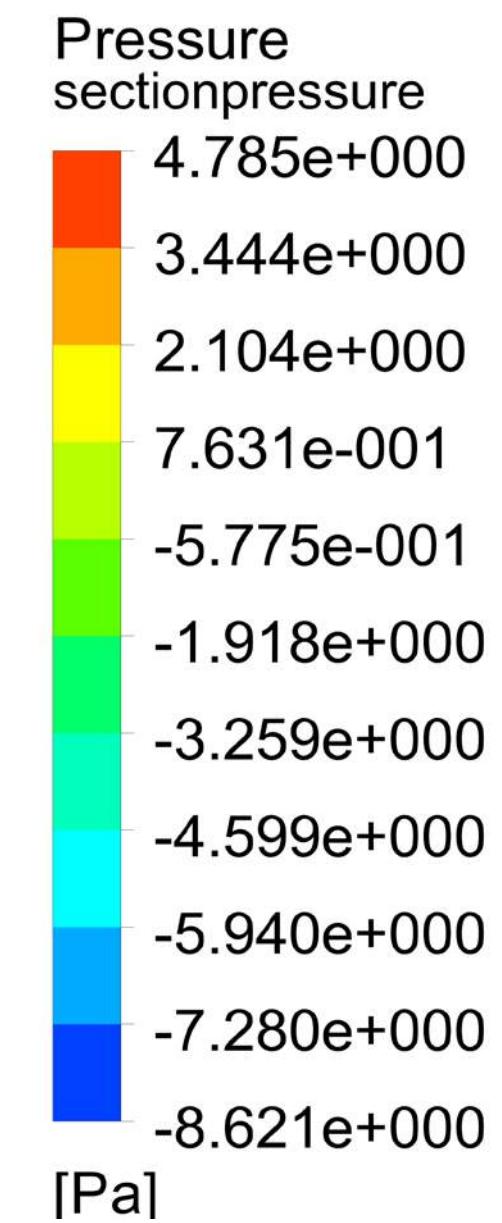
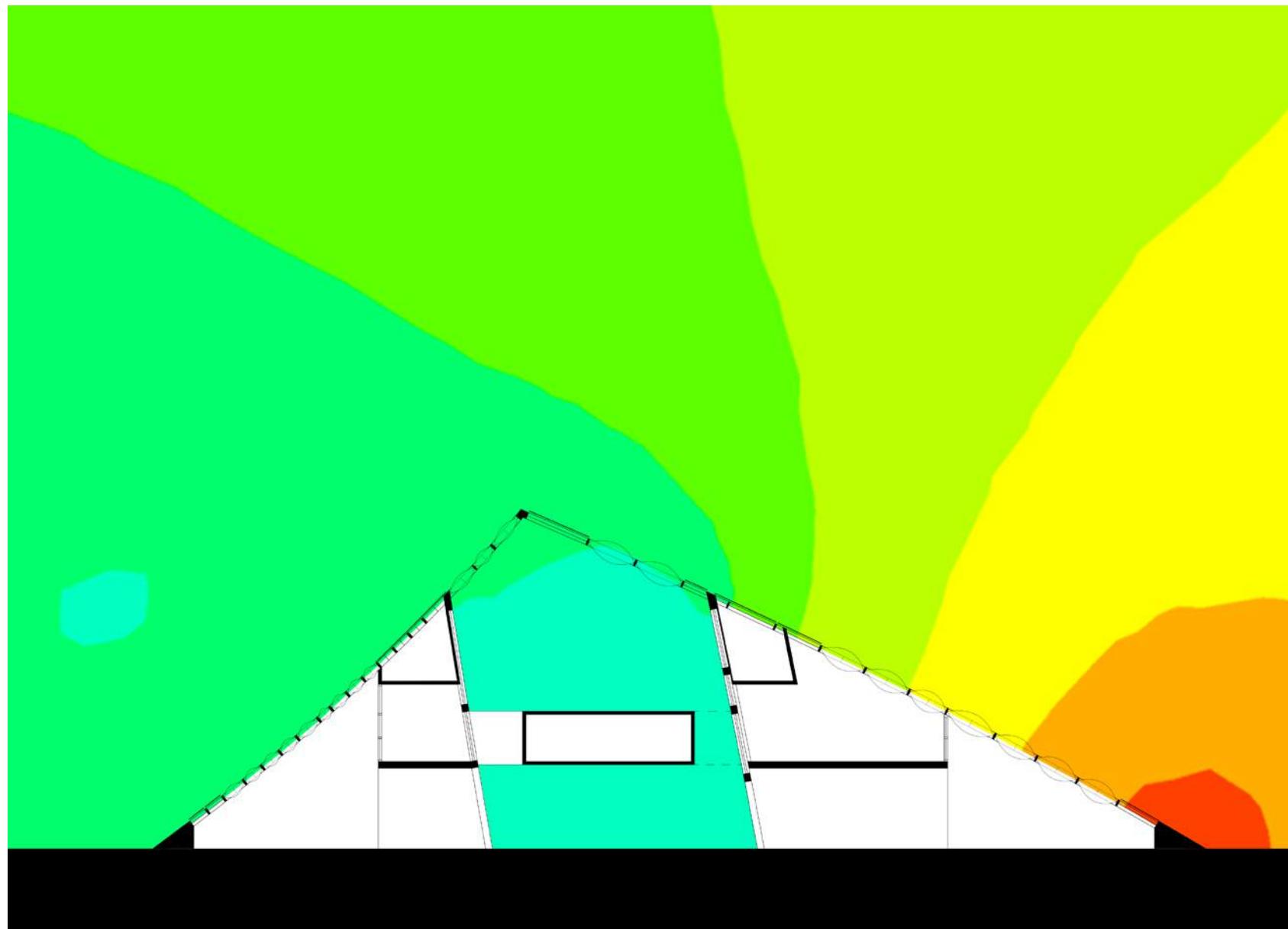


1-opening South
plan 6-meter height

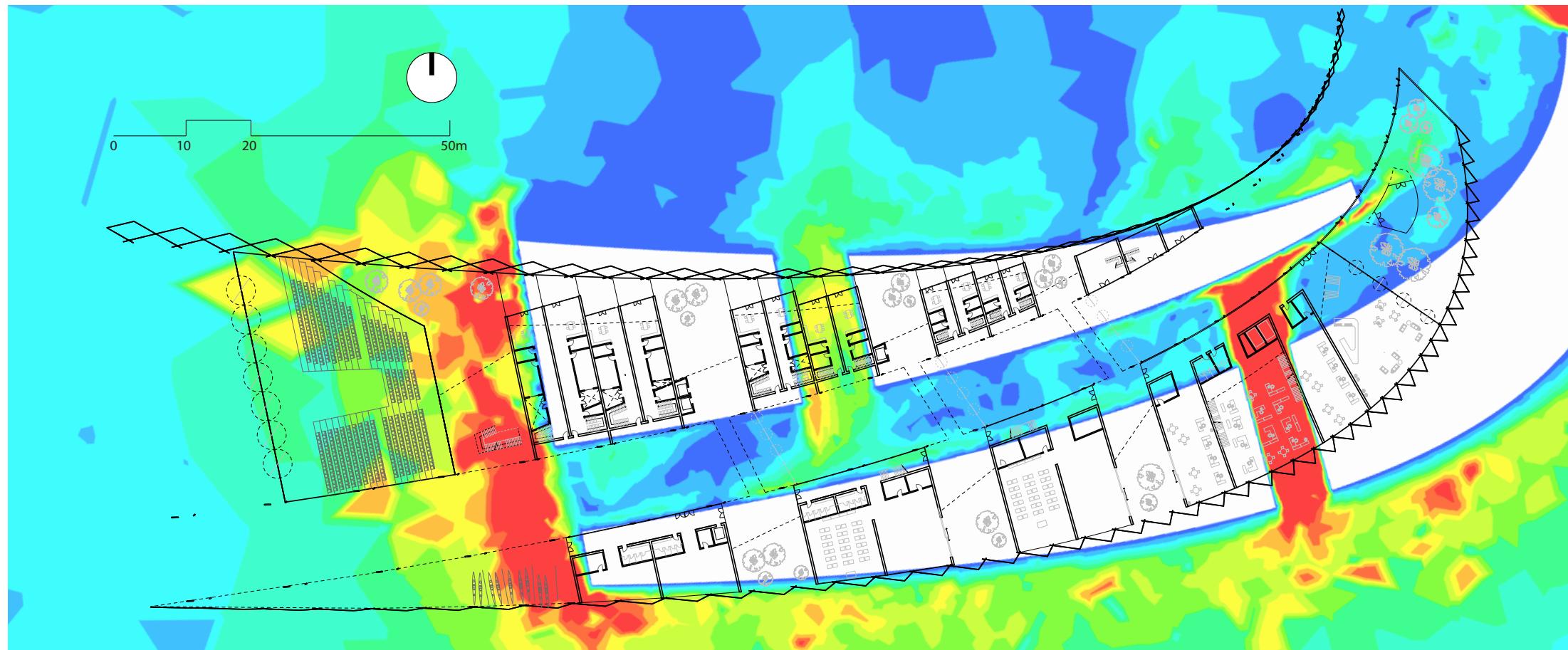


Pressure Differential
Transverse Section

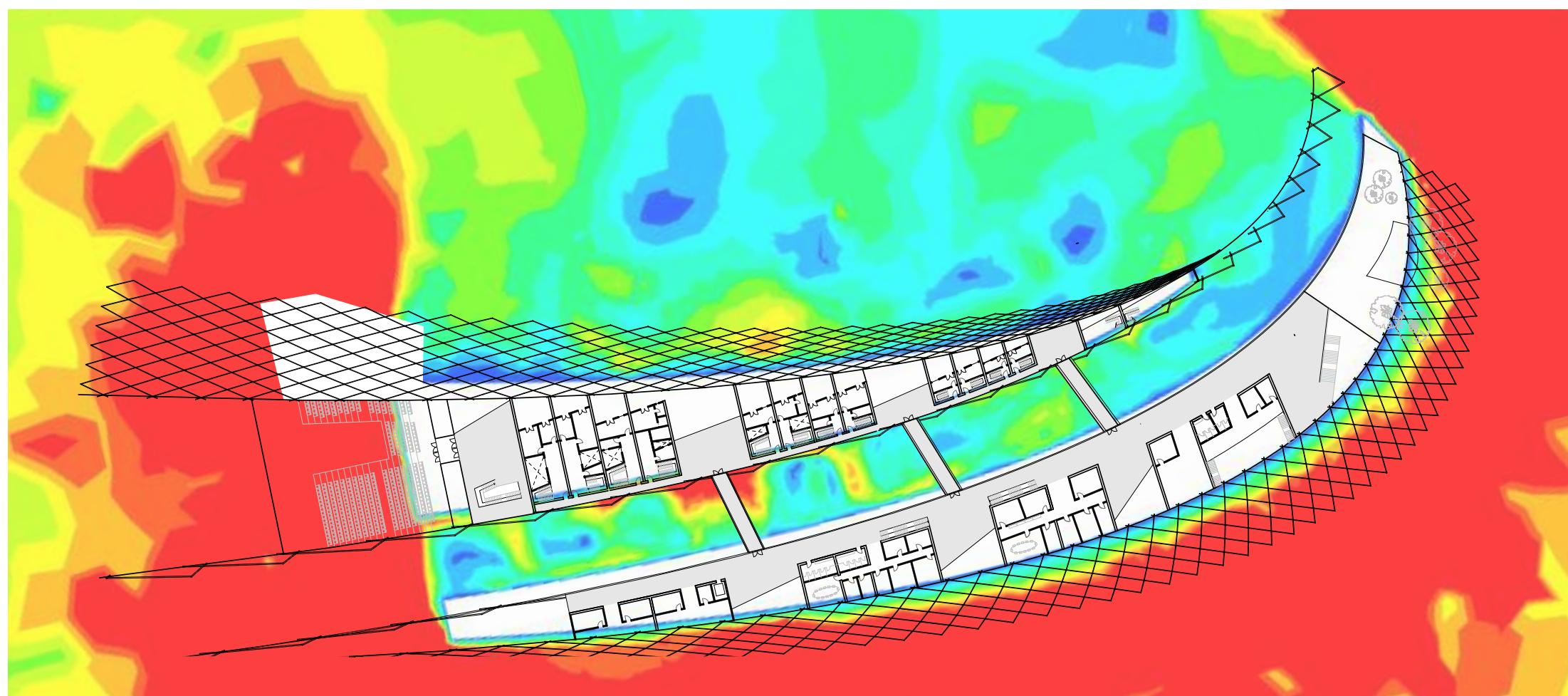
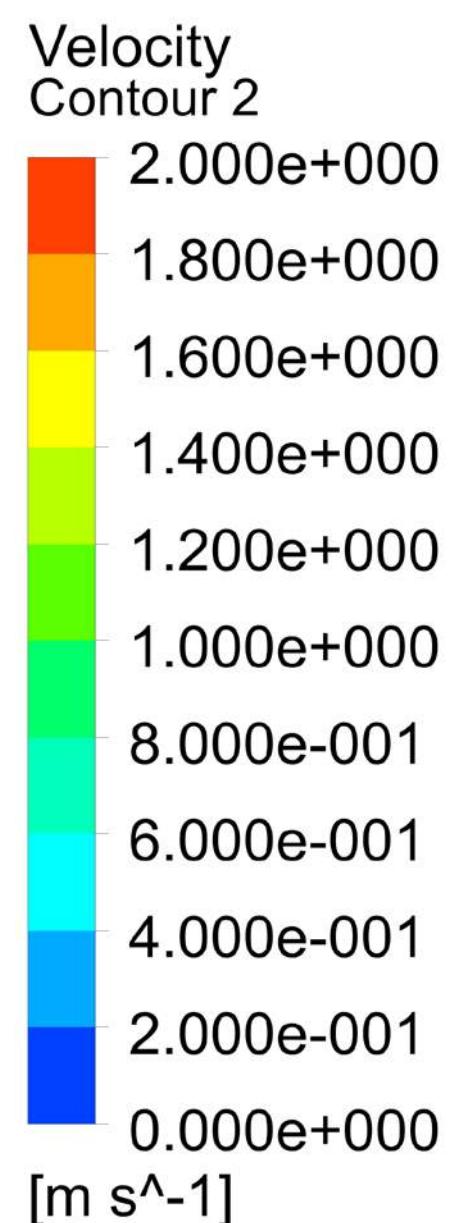
STATE 01



STATE 02

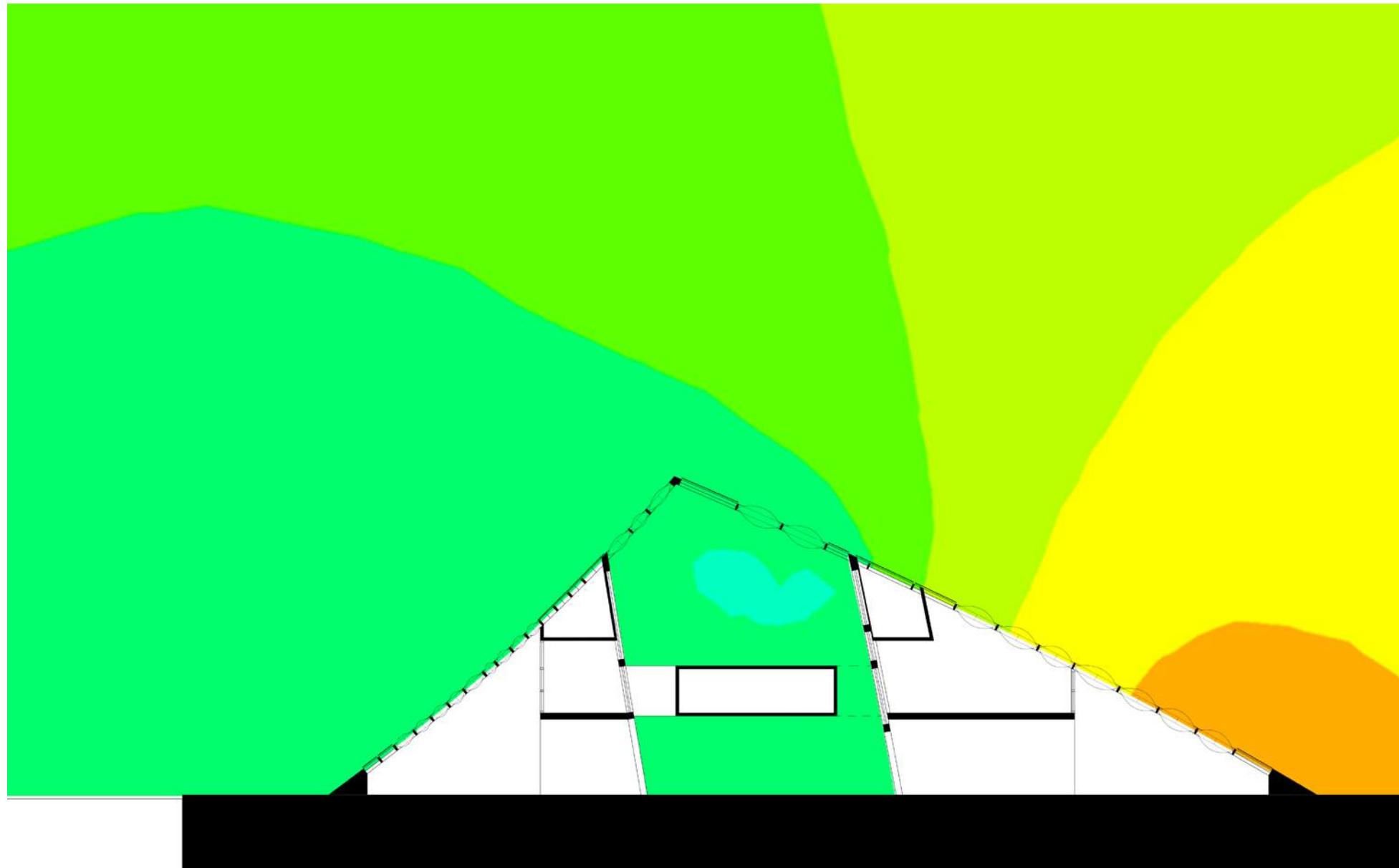
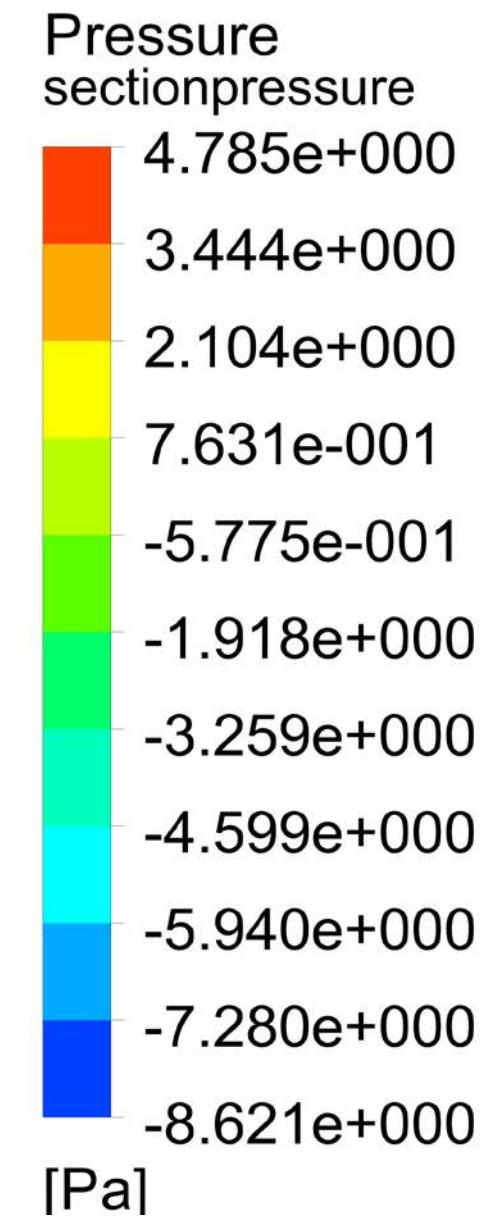


1-opening South
plan 2-meter height

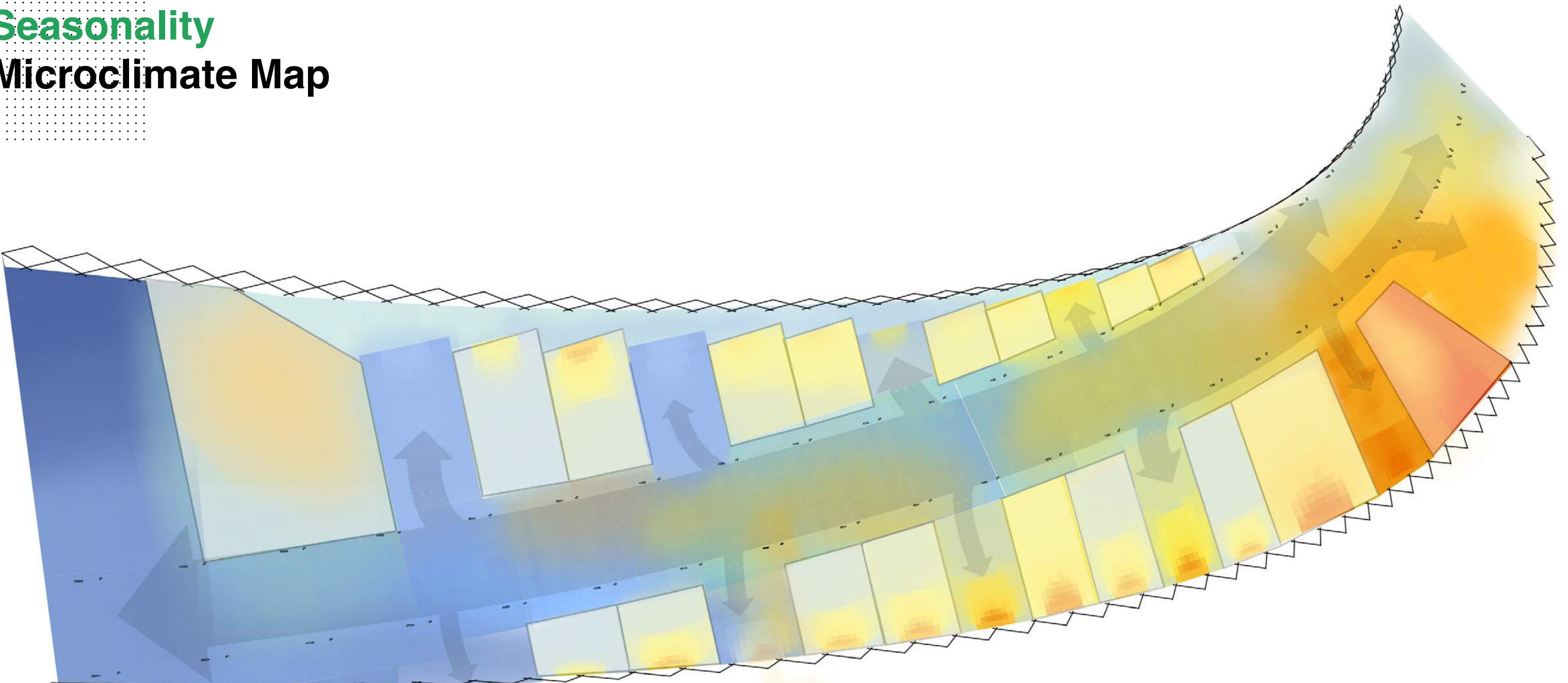


Fully Enclosed
plan 7-meter height

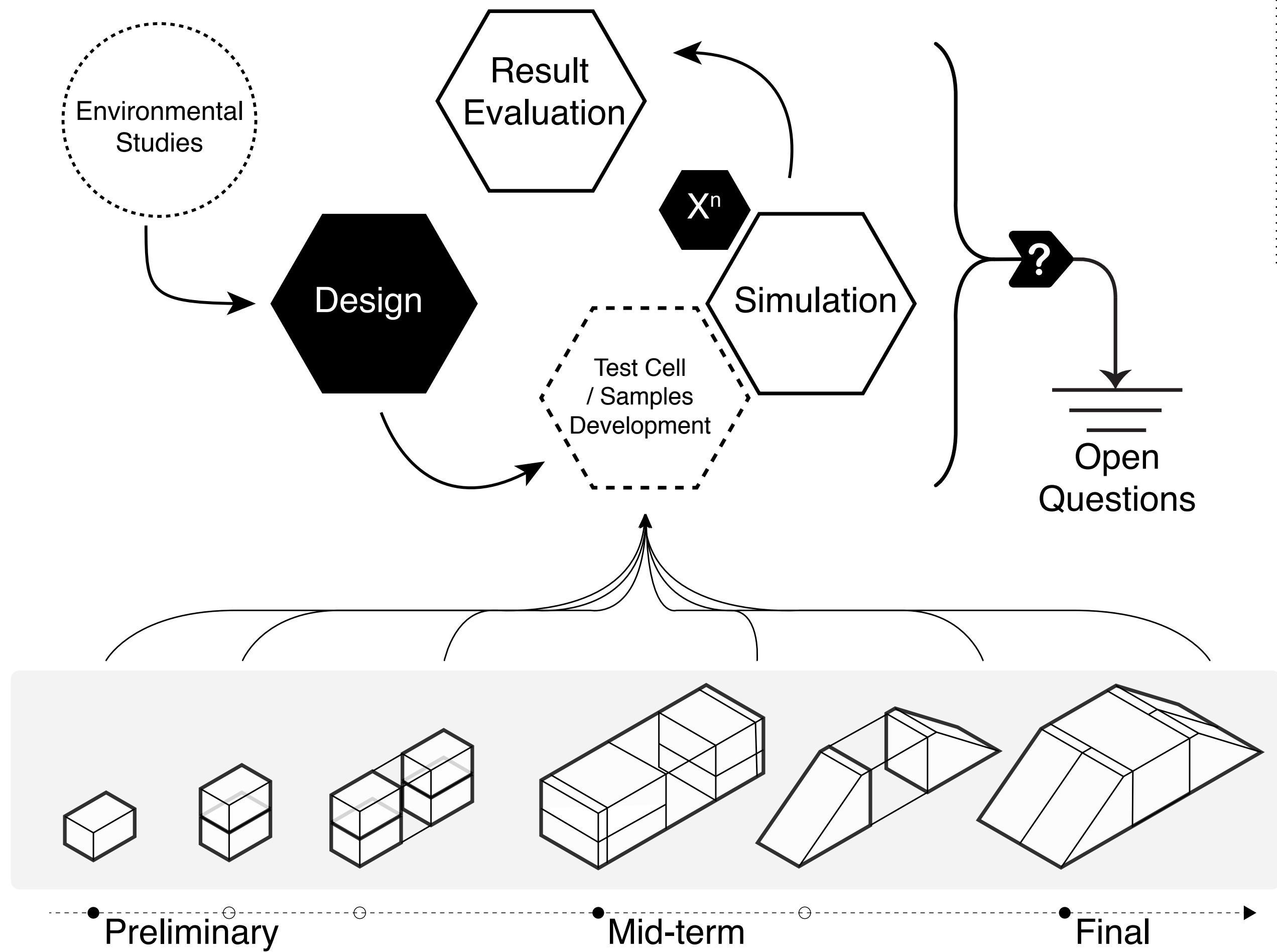
STATE ???
Section



Seasonality Microclimate Map

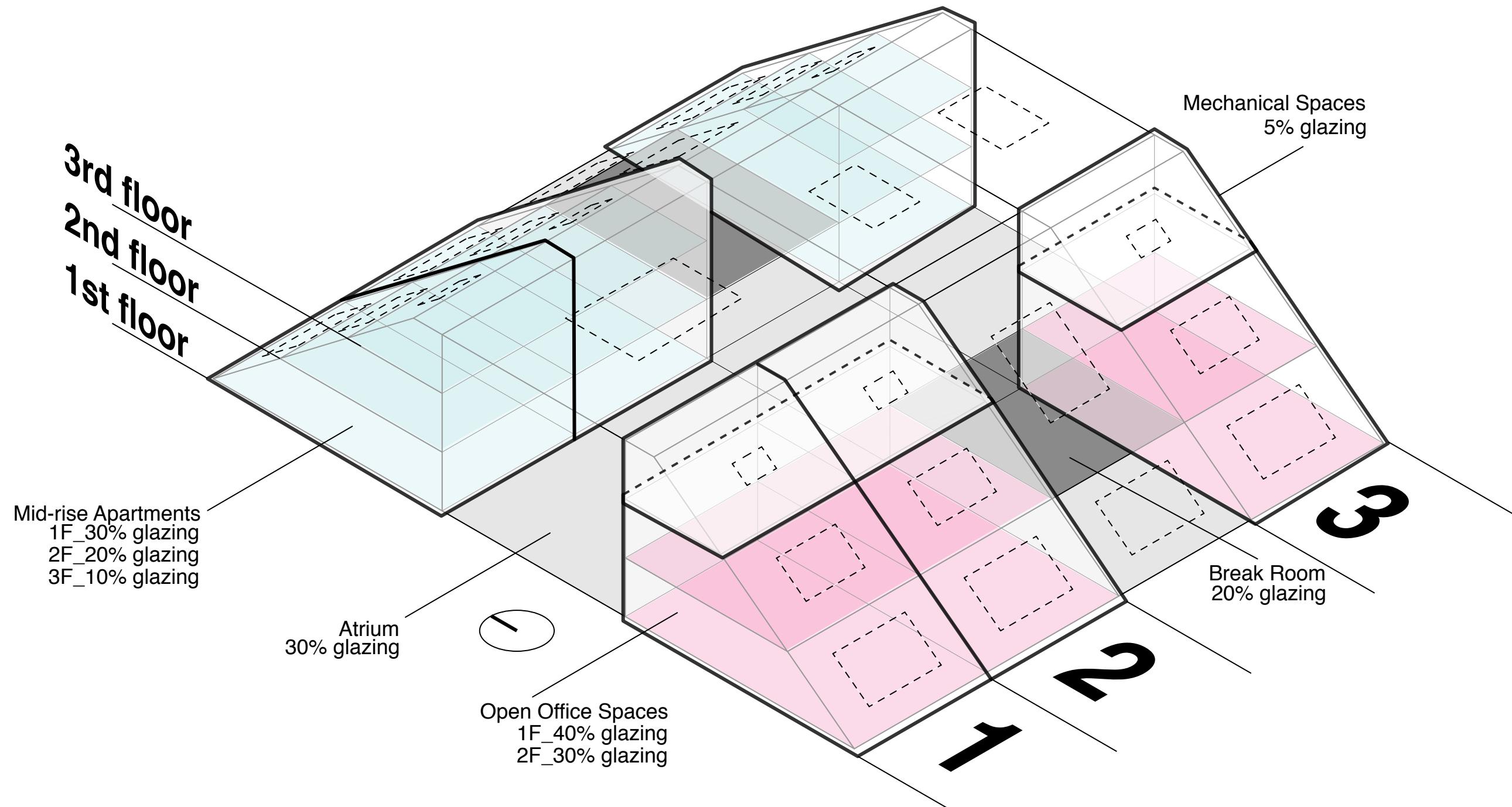


Design Process

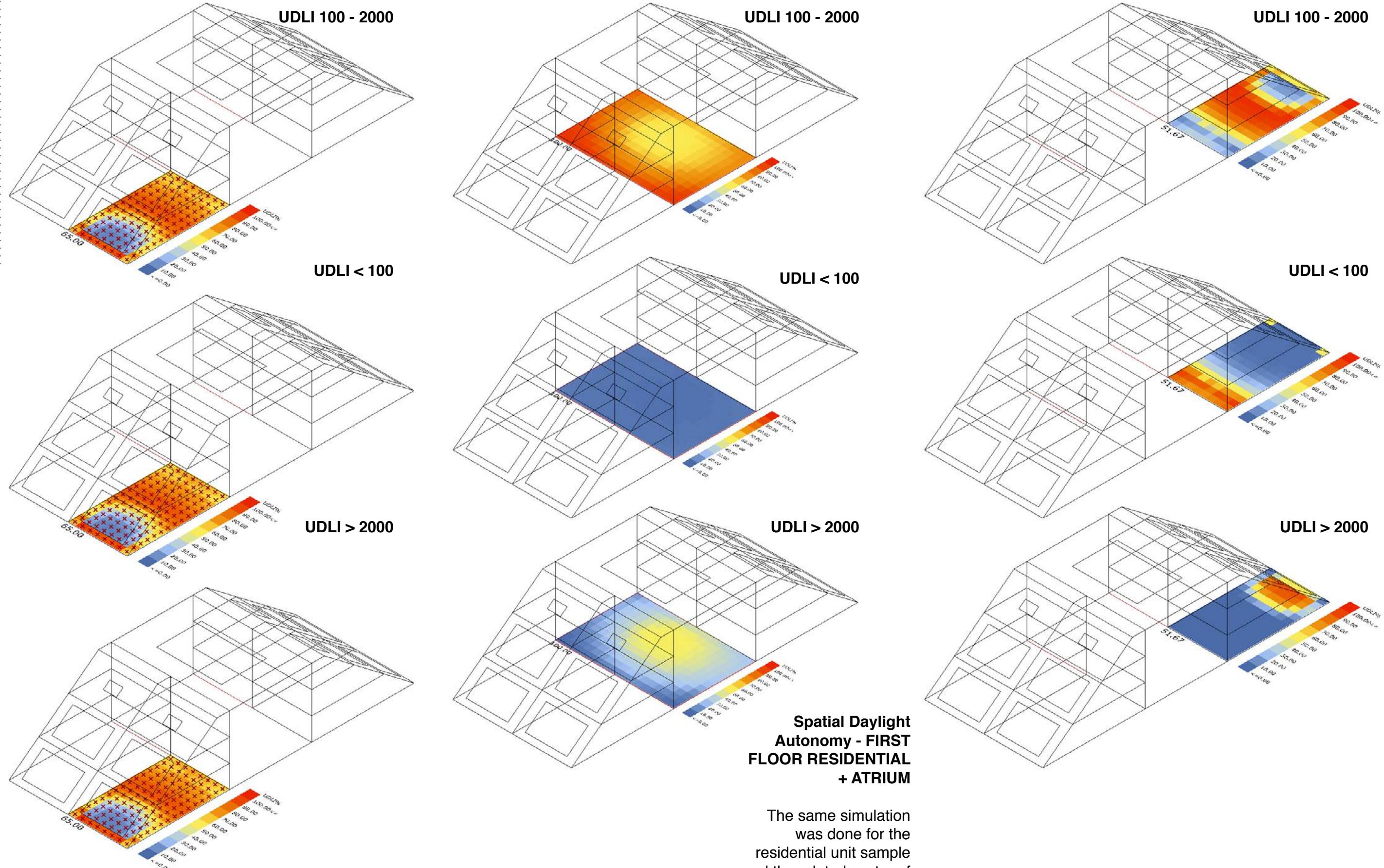


Final Studies

4



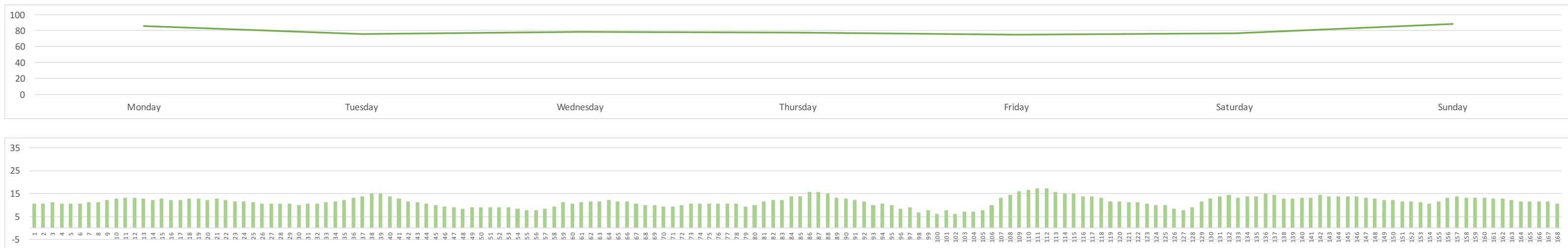
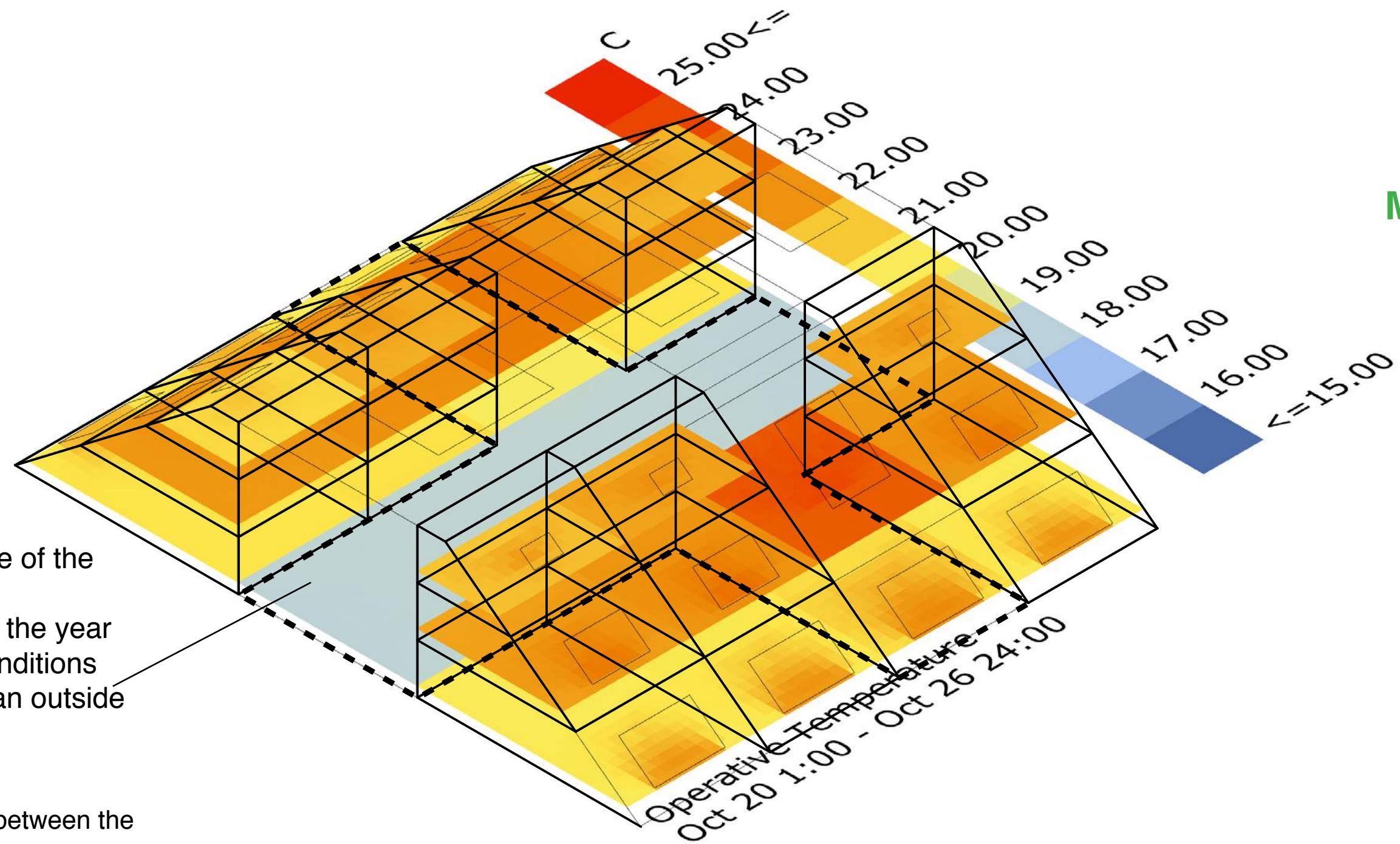
Daylight Analysis



Typical Weeks Analysis

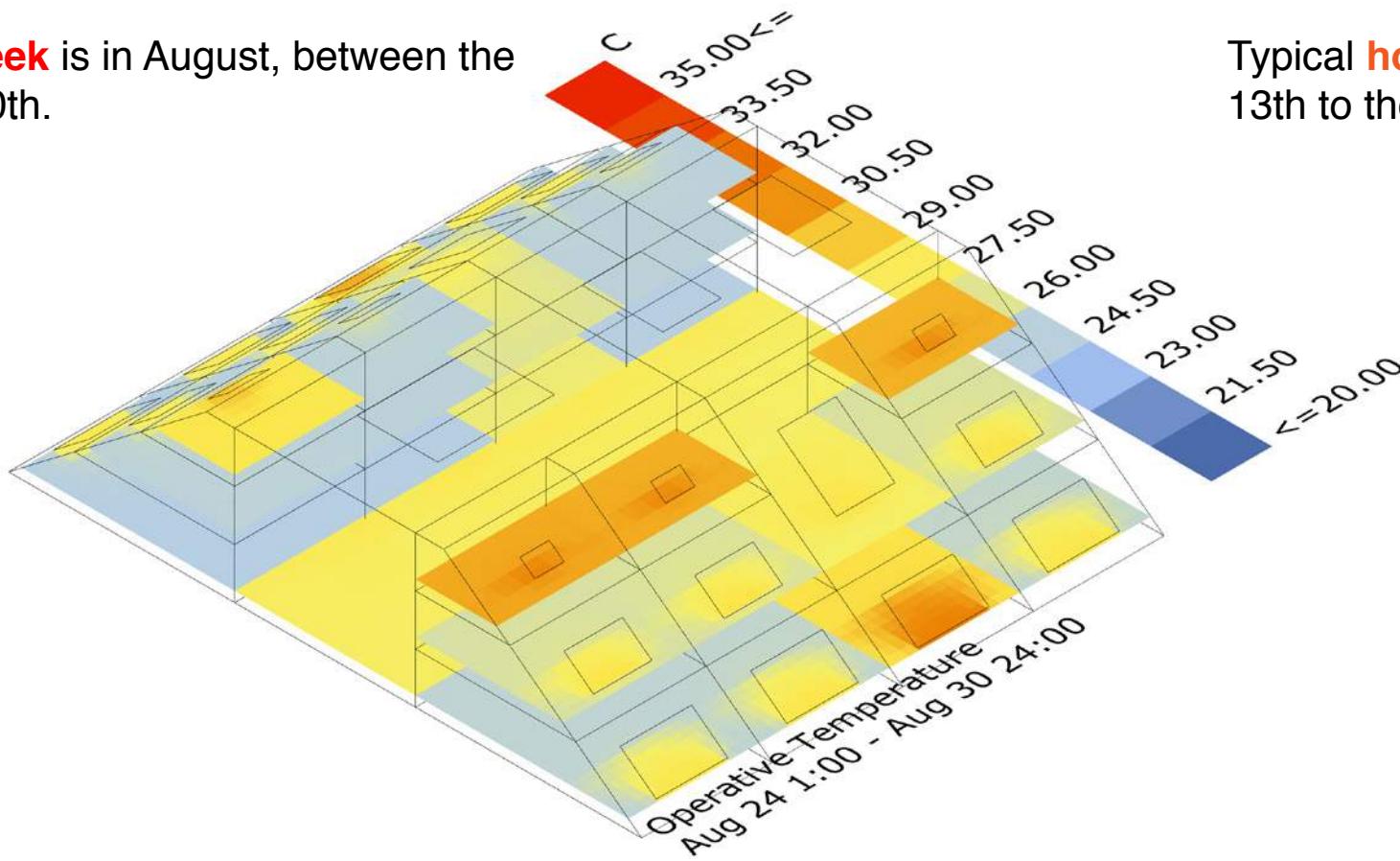
The operative temperature of the atrium during the typical week of the year provides good comfort conditions globally ($4-5^{\circ}\text{ C}$ higher than outside temperature).

Typical week is in October, between the 20th and the 26th.

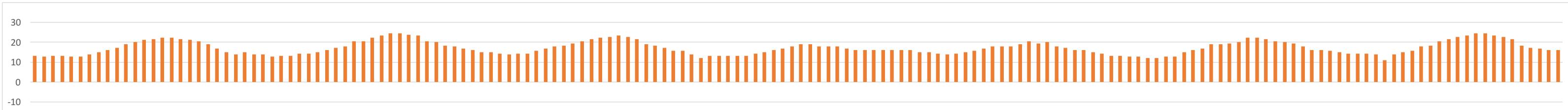
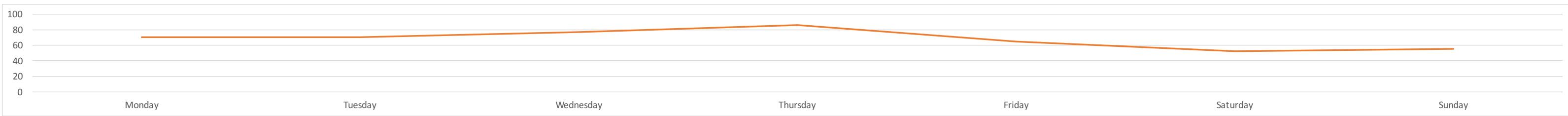
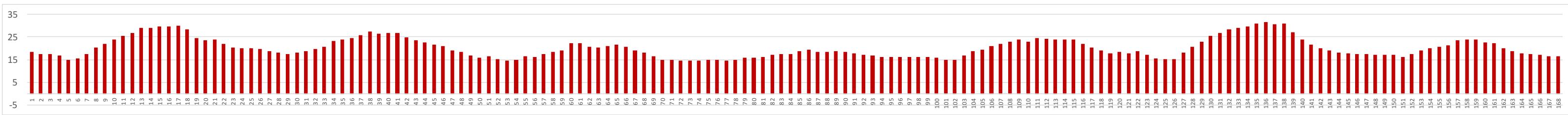
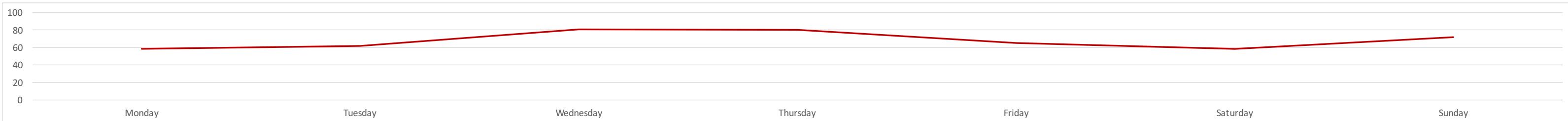
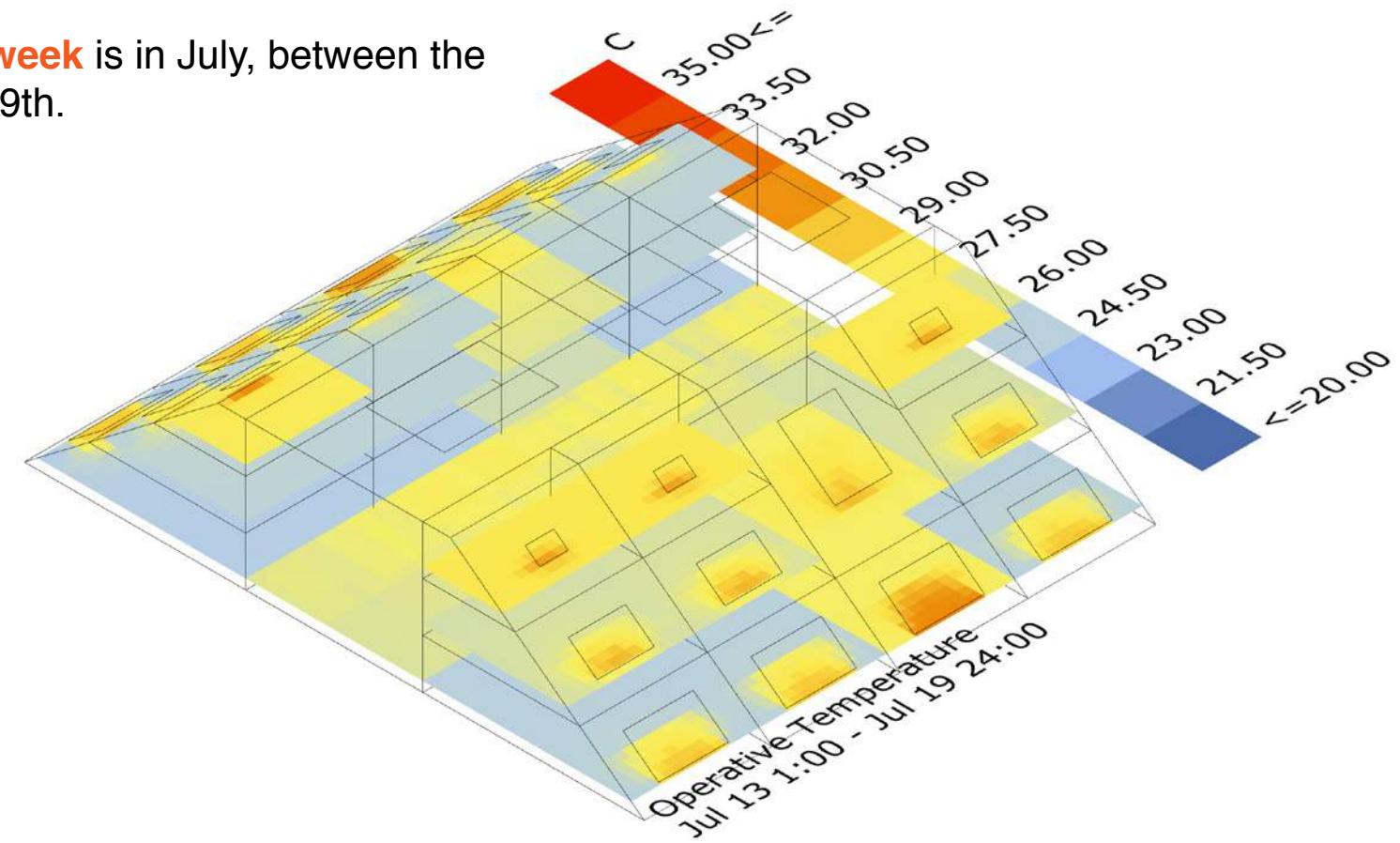


Indoor Microclimate

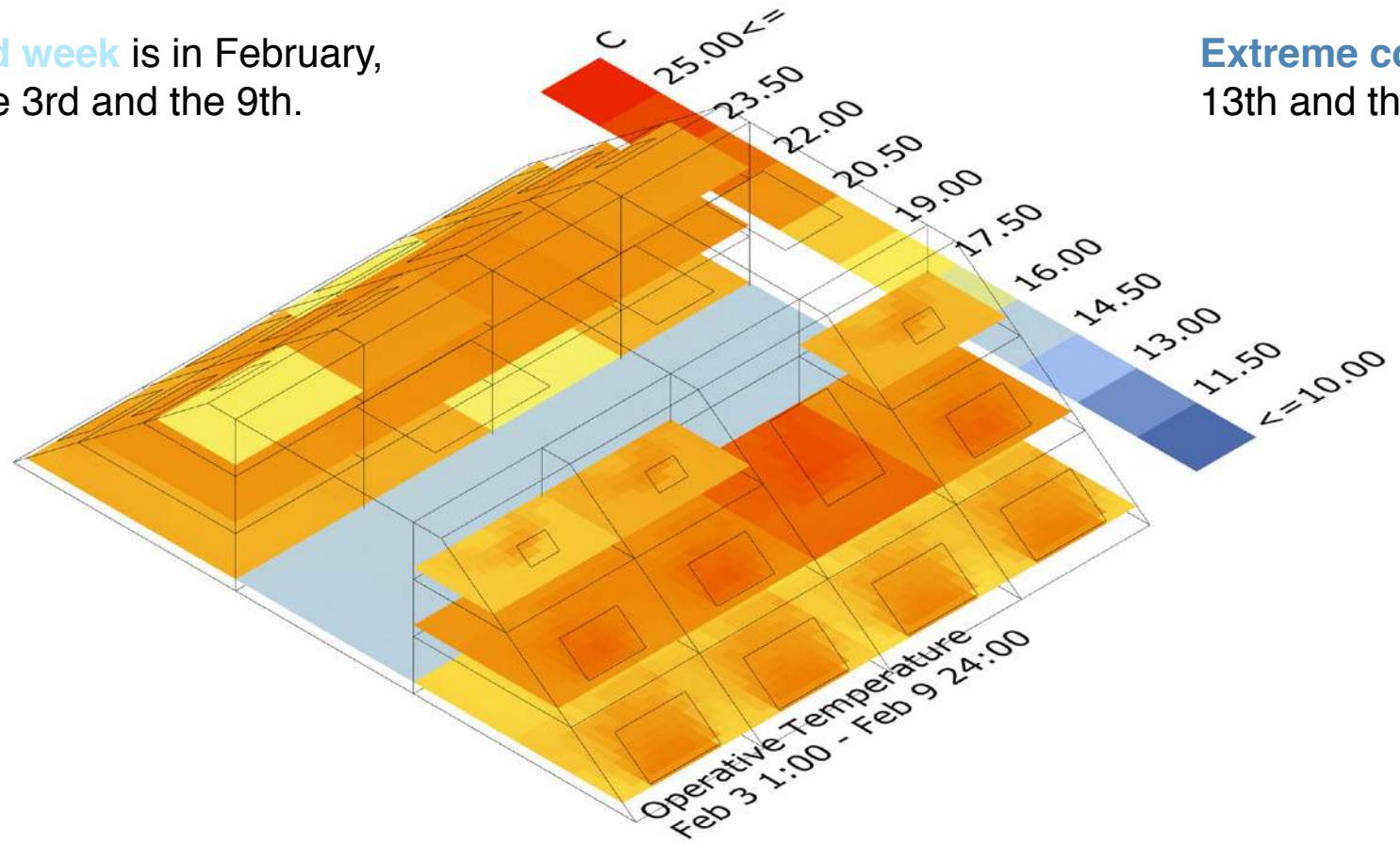
Hottest Week is in August, between the 24th and 30th.



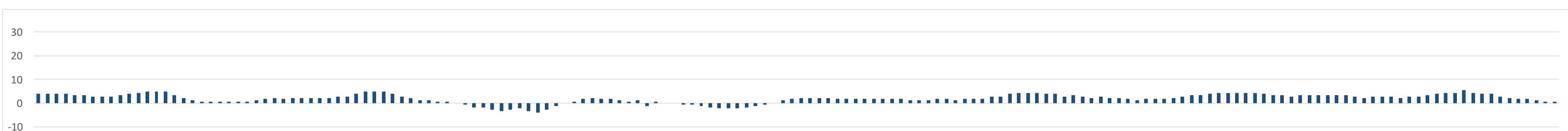
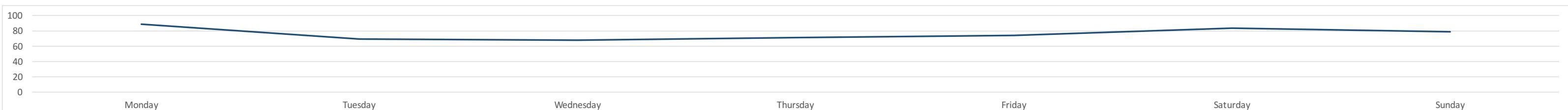
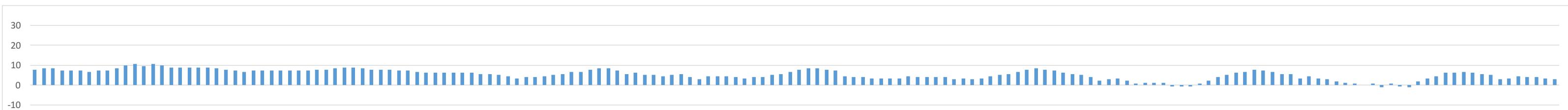
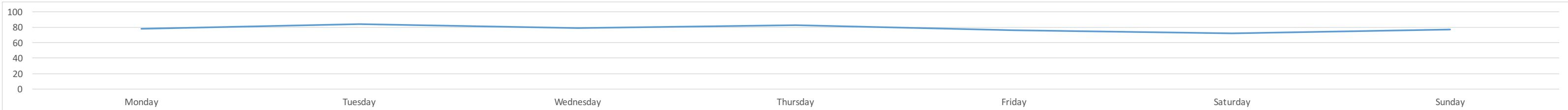
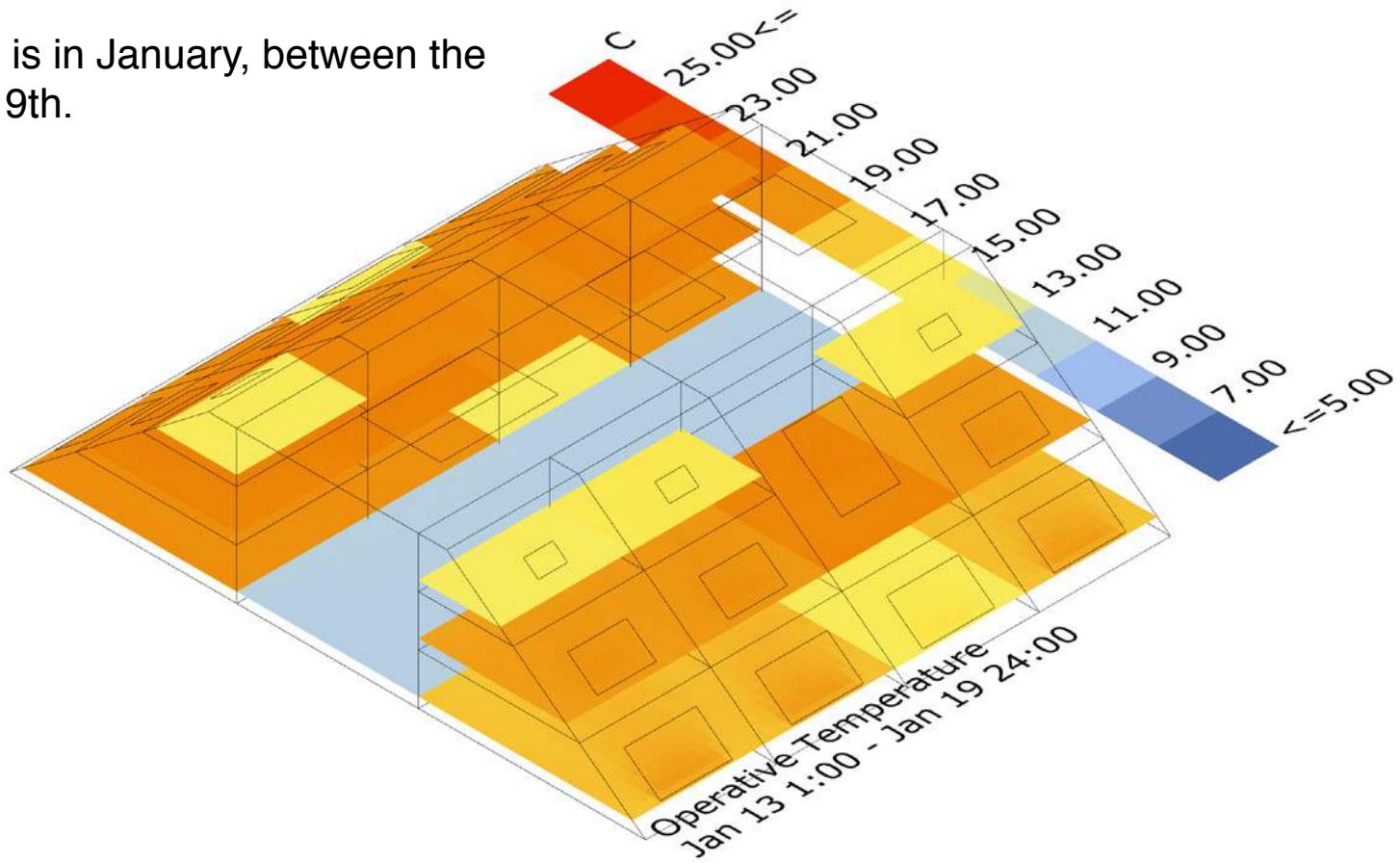
Typical **hot week** is in July, between the 13th to the 19th.



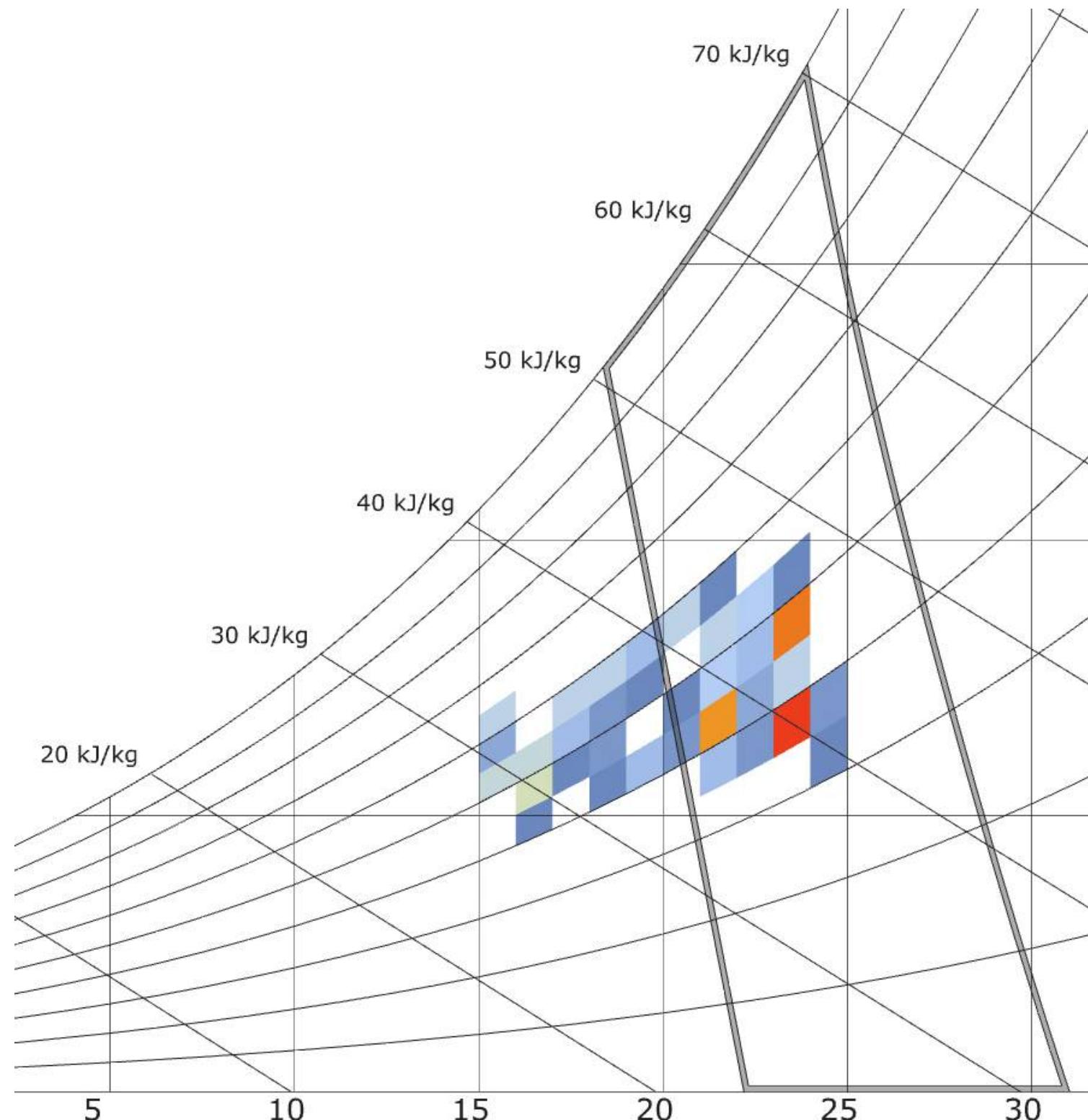
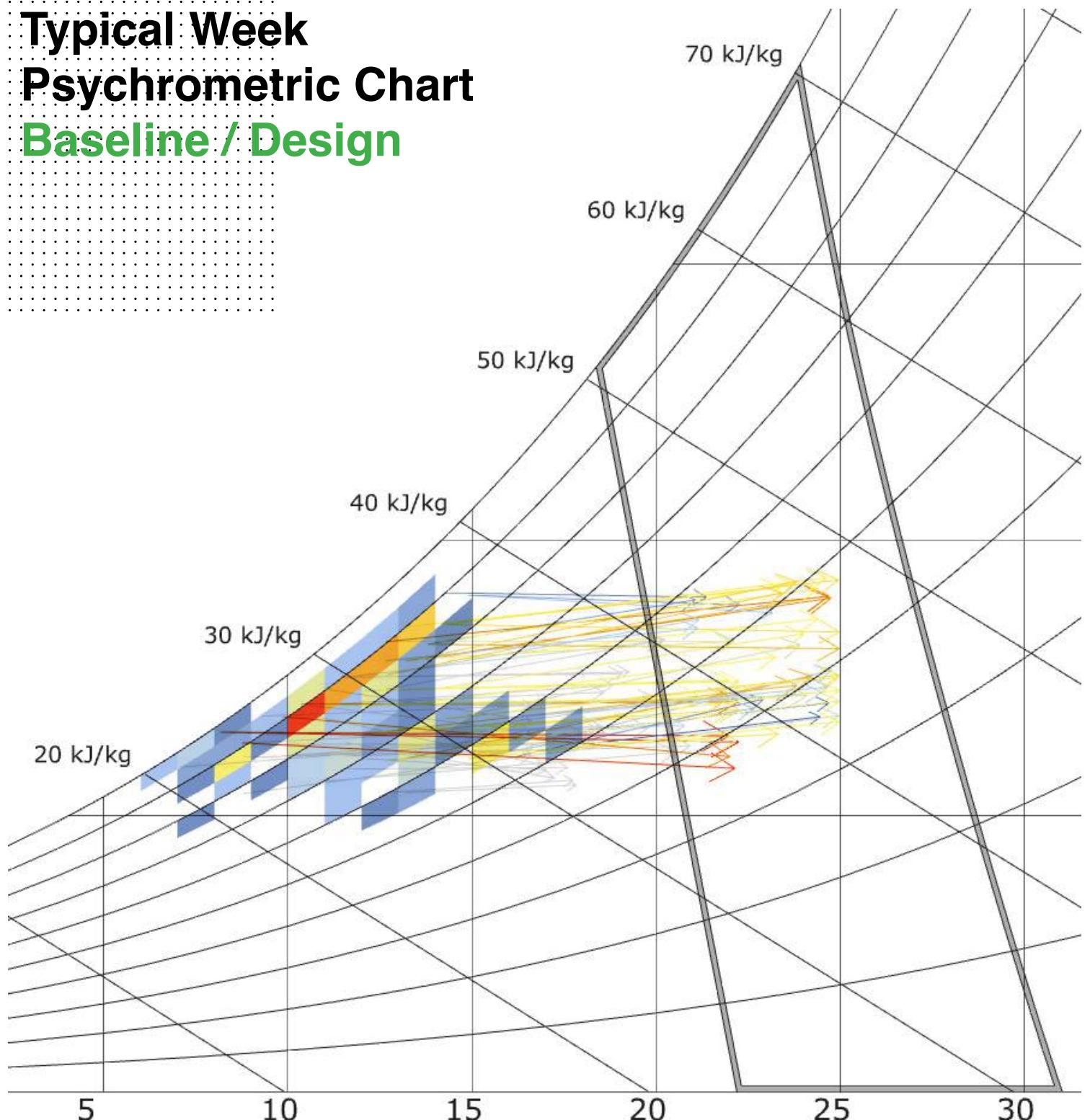
Typical **cold week** is in February,
between the 3rd and the 9th.



Extreme cold is in January, between the
13th and the 19th.

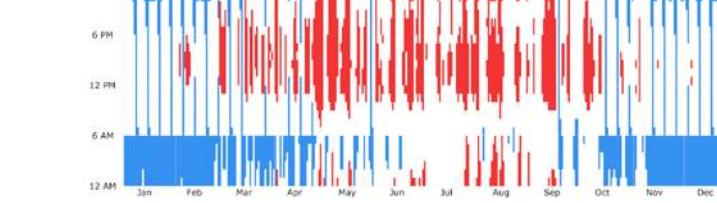
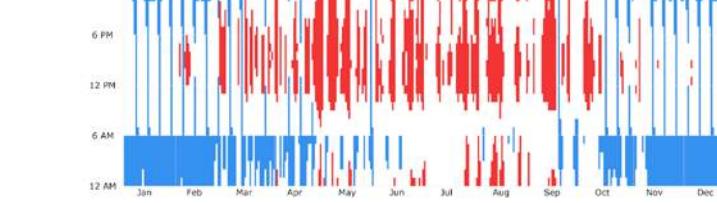
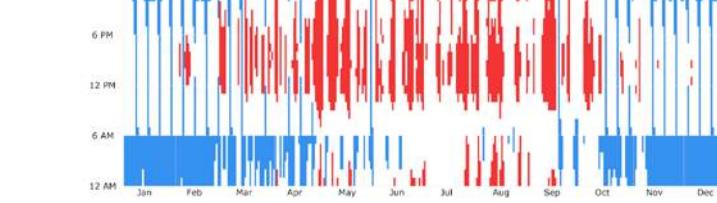
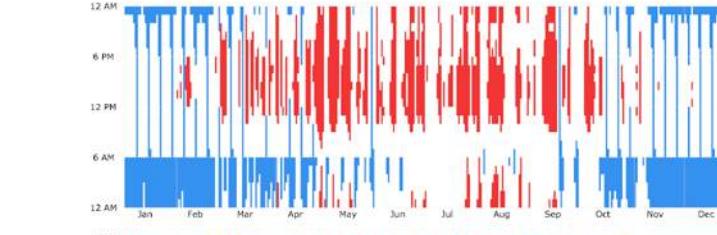
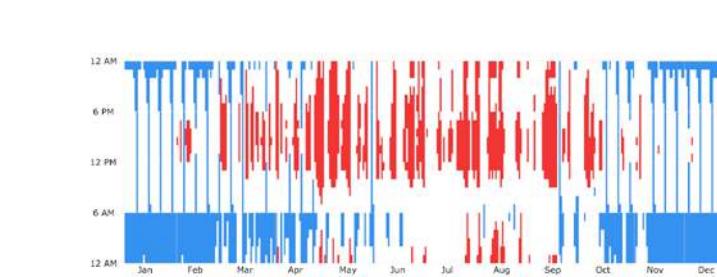
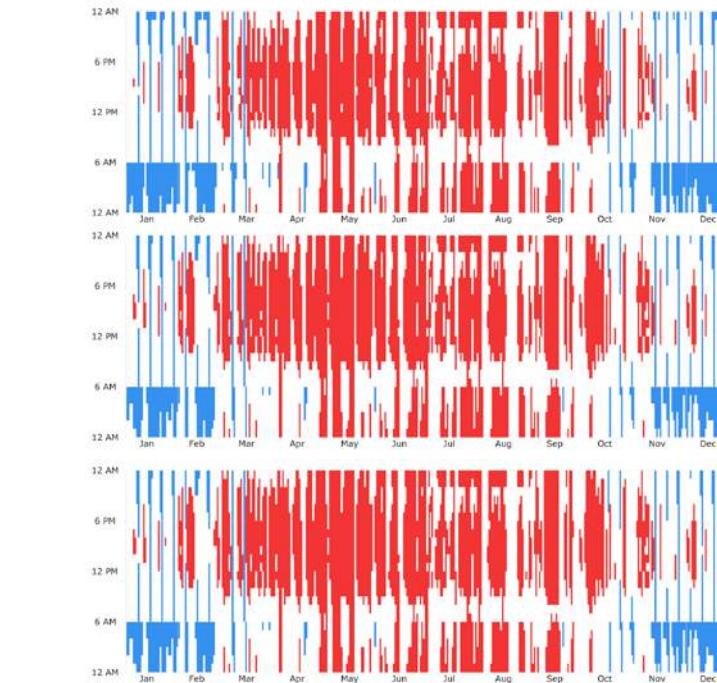
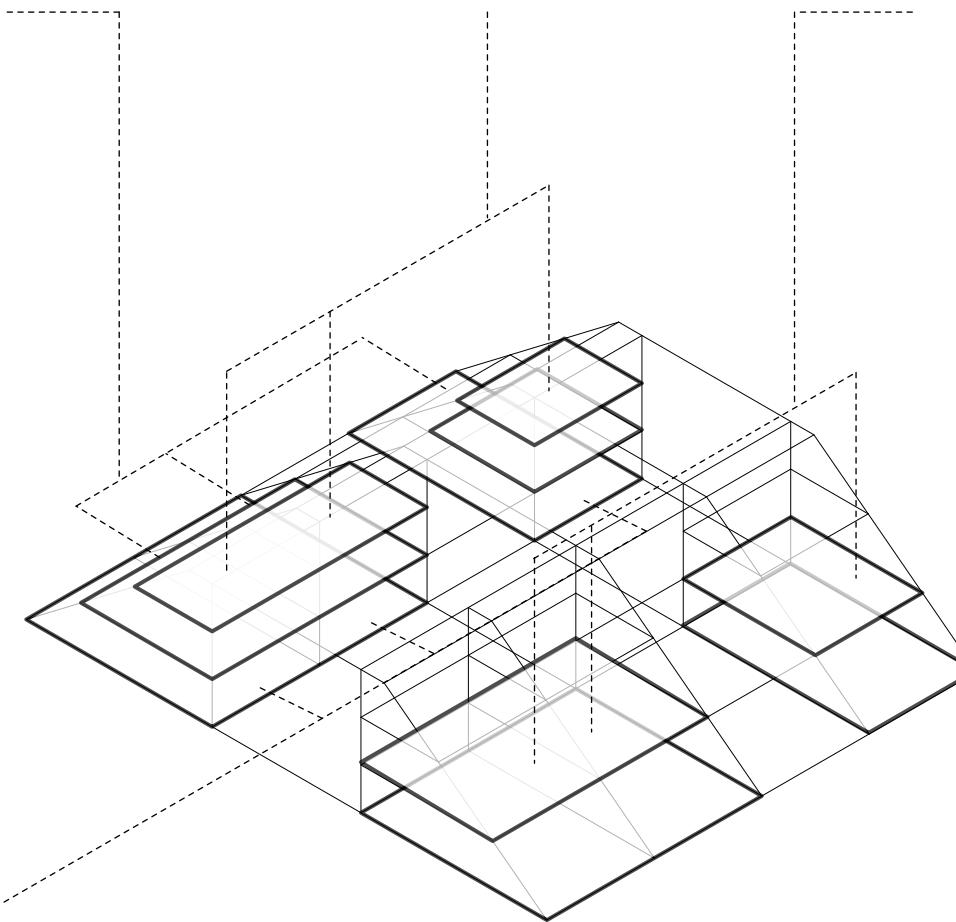
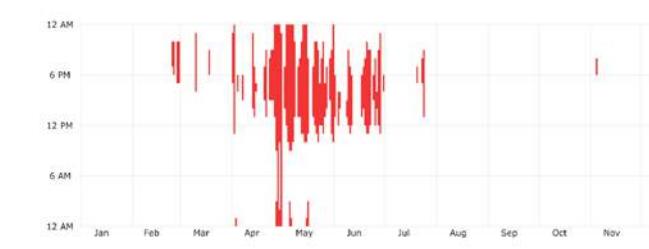
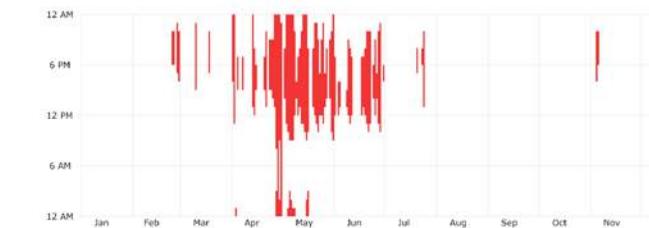
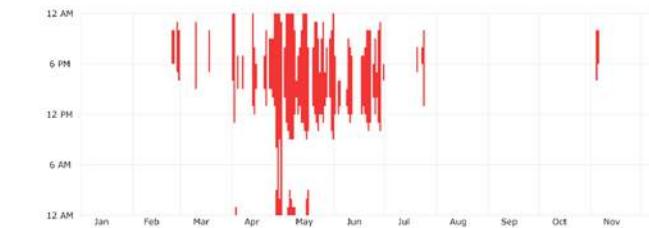
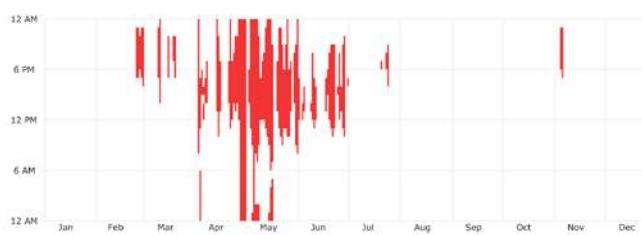
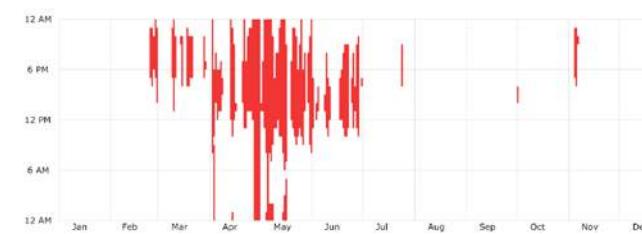
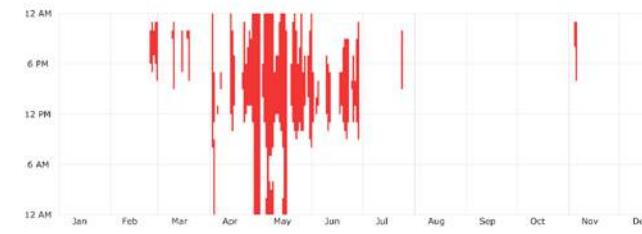
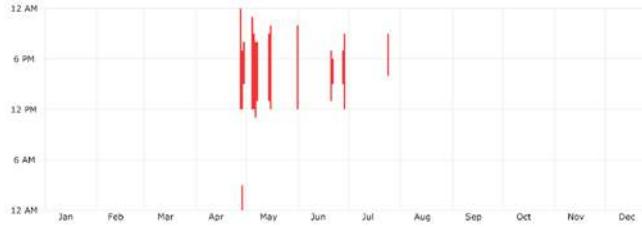
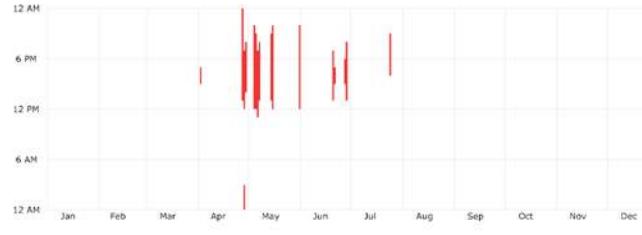
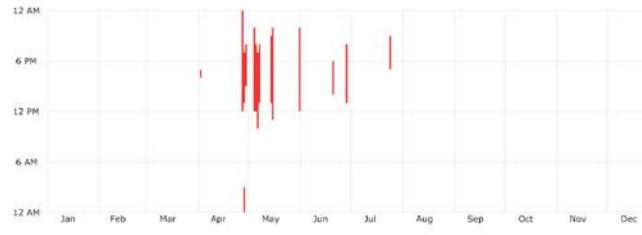


Typical Week Psychrometric Chart Baseline / Design



20 OCT 1:00 - 26 OCT 24:00

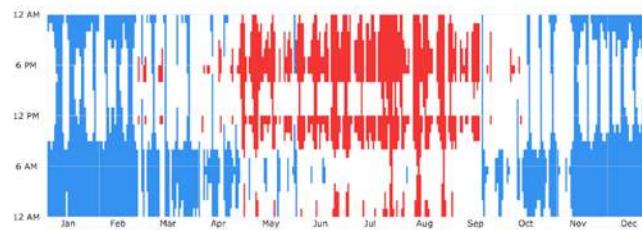
Residential Units and Offices



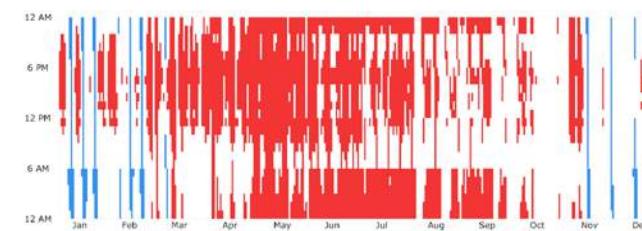
Adaptive
Comfort
Analysis

Atria and Break Rooms

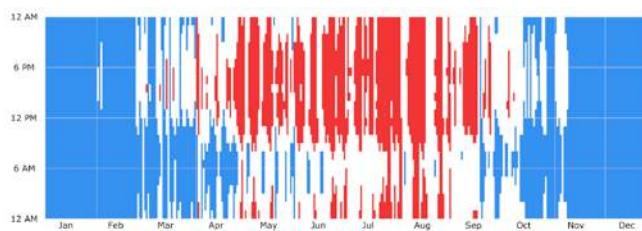
Adaptive
Comfort
Analysis



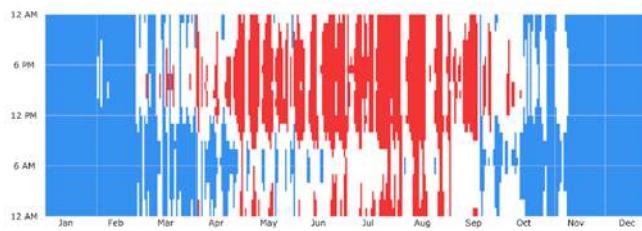
break_res_ground
55%



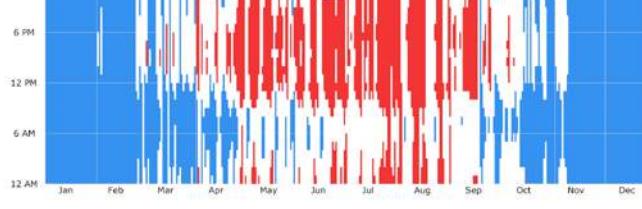
break_res_second
57%



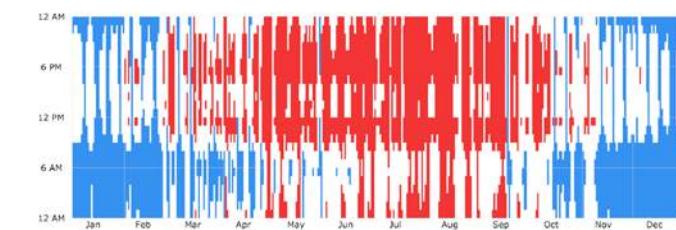
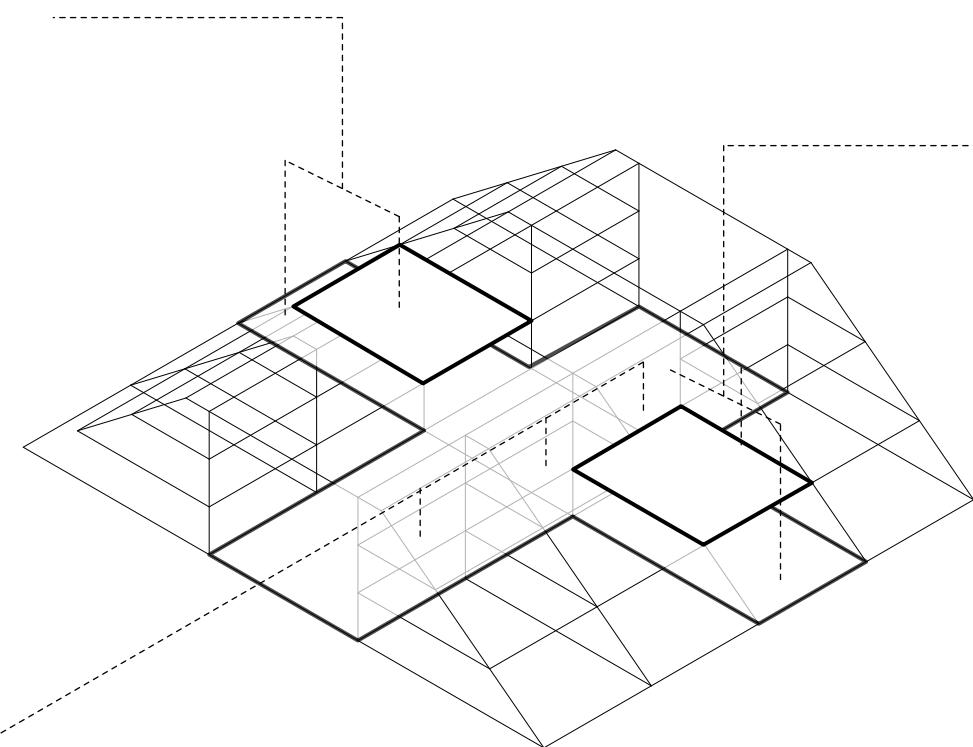
atrium
36%



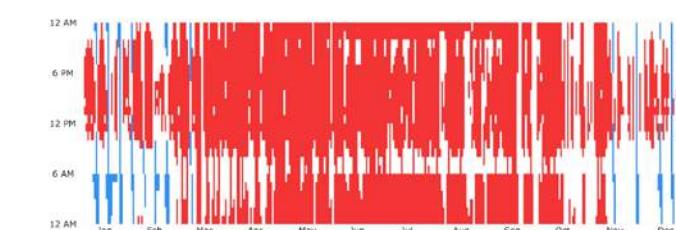
atrium_break
36%



atrium_3
37%



break_office_ground
44%

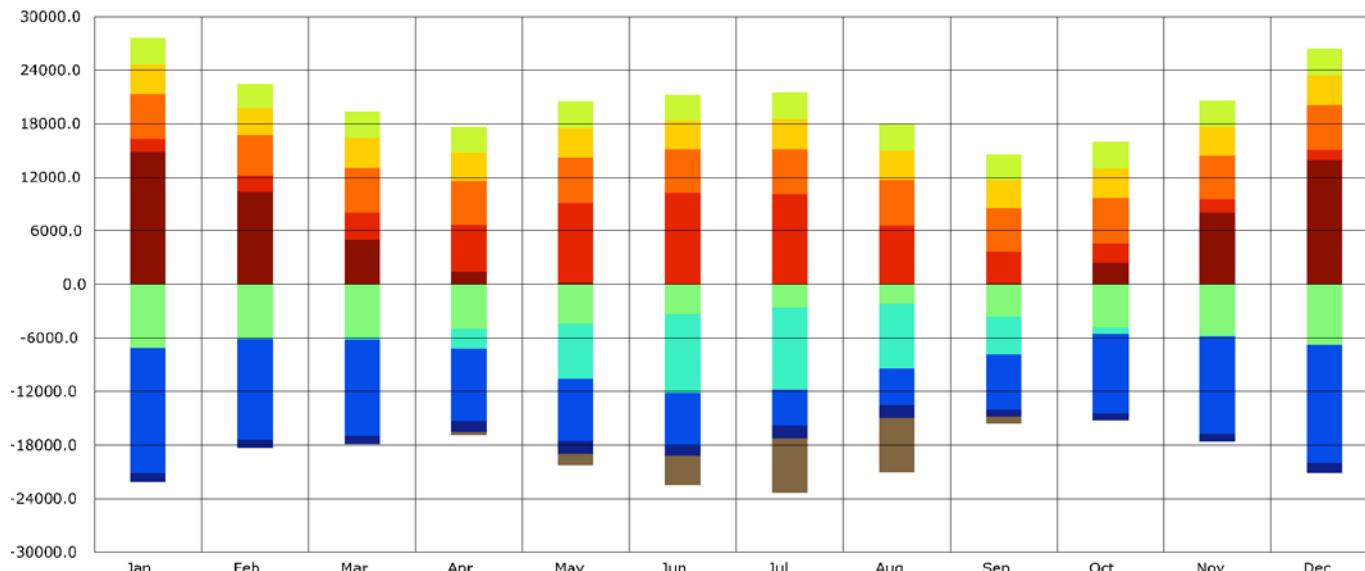
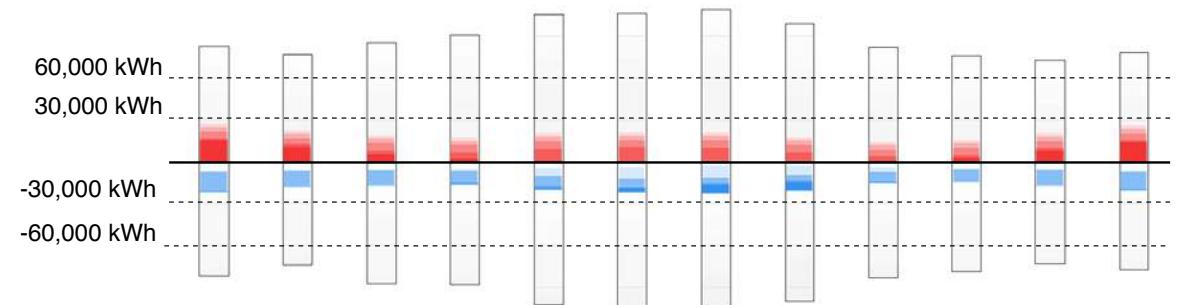


break_office_second
36%

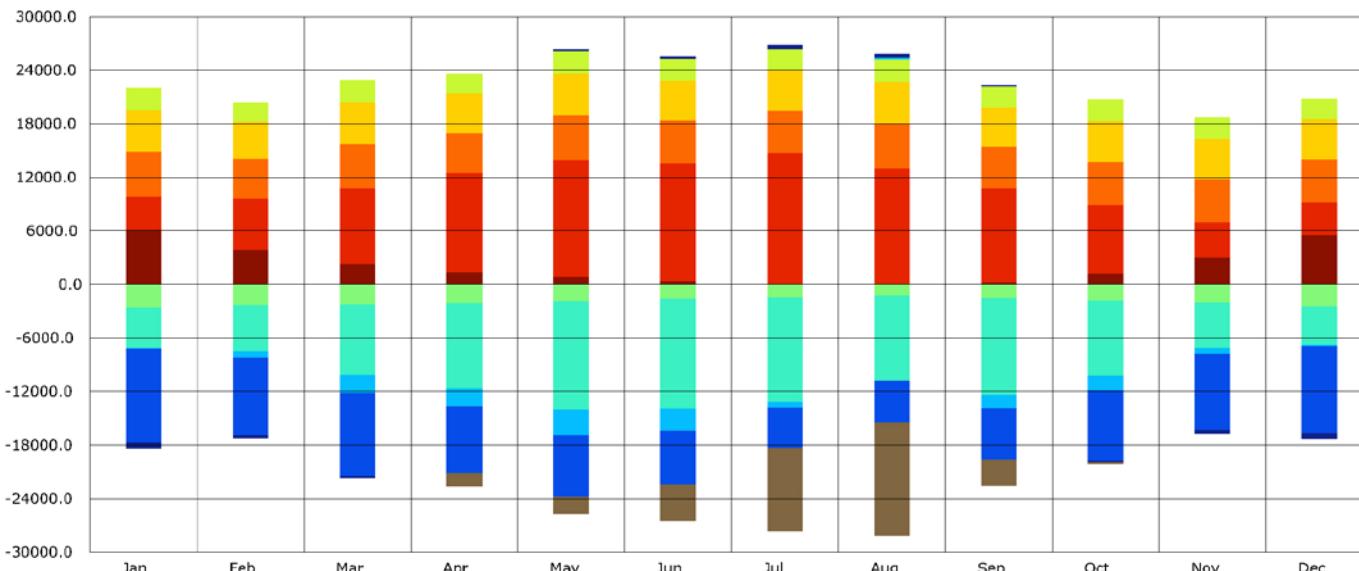
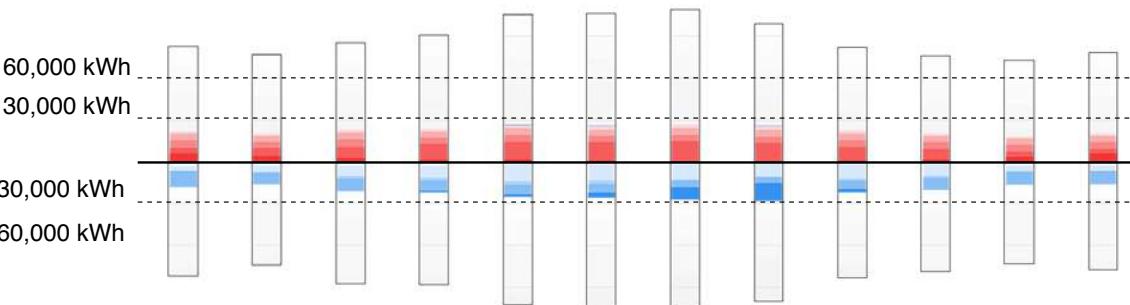
Energy Loads

Residential / Offices

Residential Units



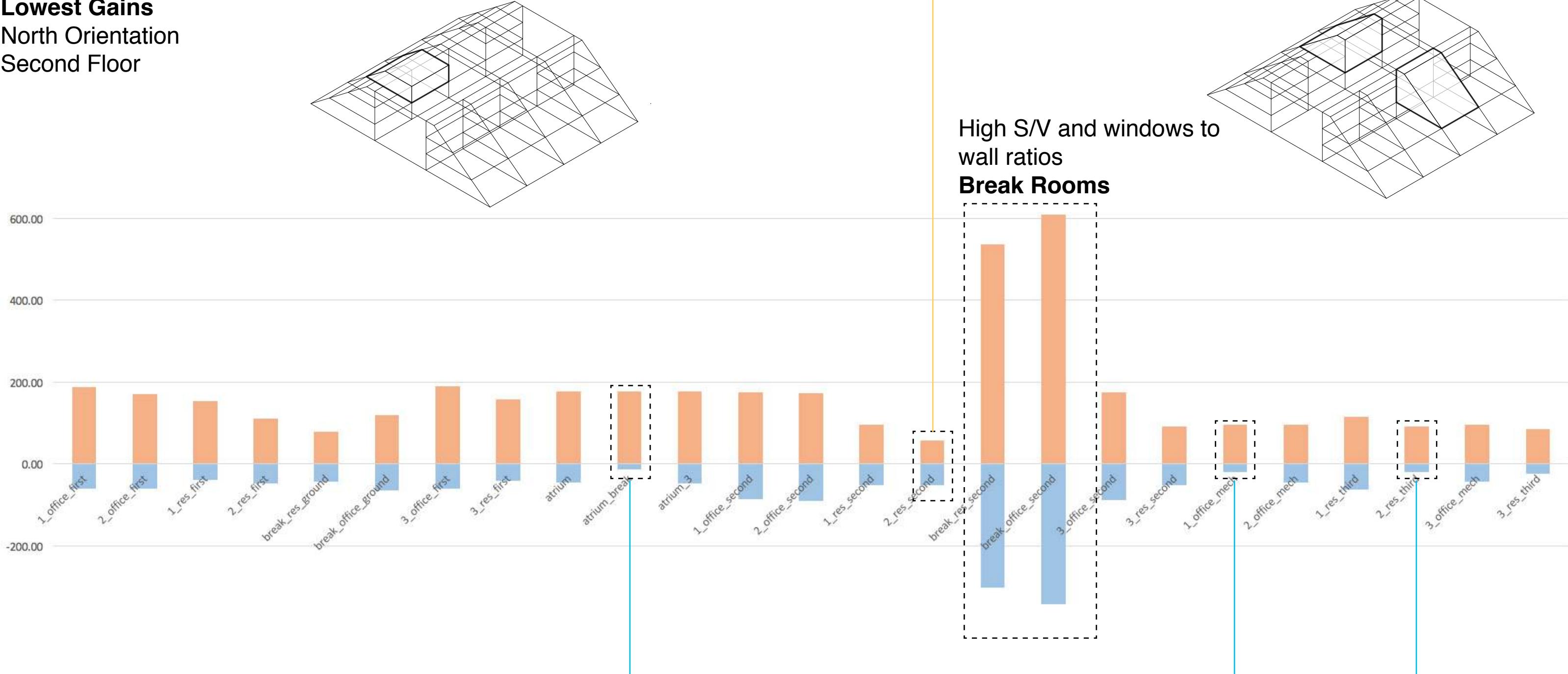
Offices



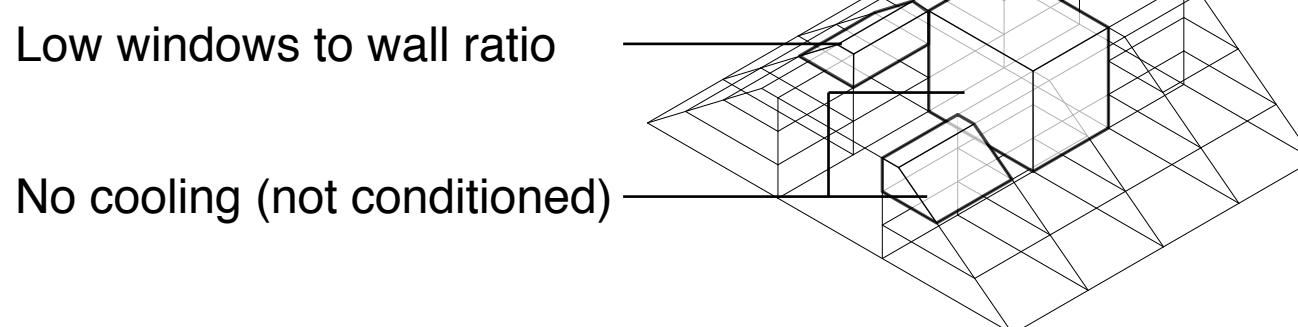
Cooling (Monthly)
Glazing Conduc (Monthly)
Opaque Conduc (Monthly)
Natural Ventilat (Monthly)
Outdoor Air (Monthly)
Infiltration (Monthly)
People (Monthly)
Equipment (Monthly)
Lighting (Monthly)
Solar (Monthly)
Heating (Monthly)

Lowest Gains

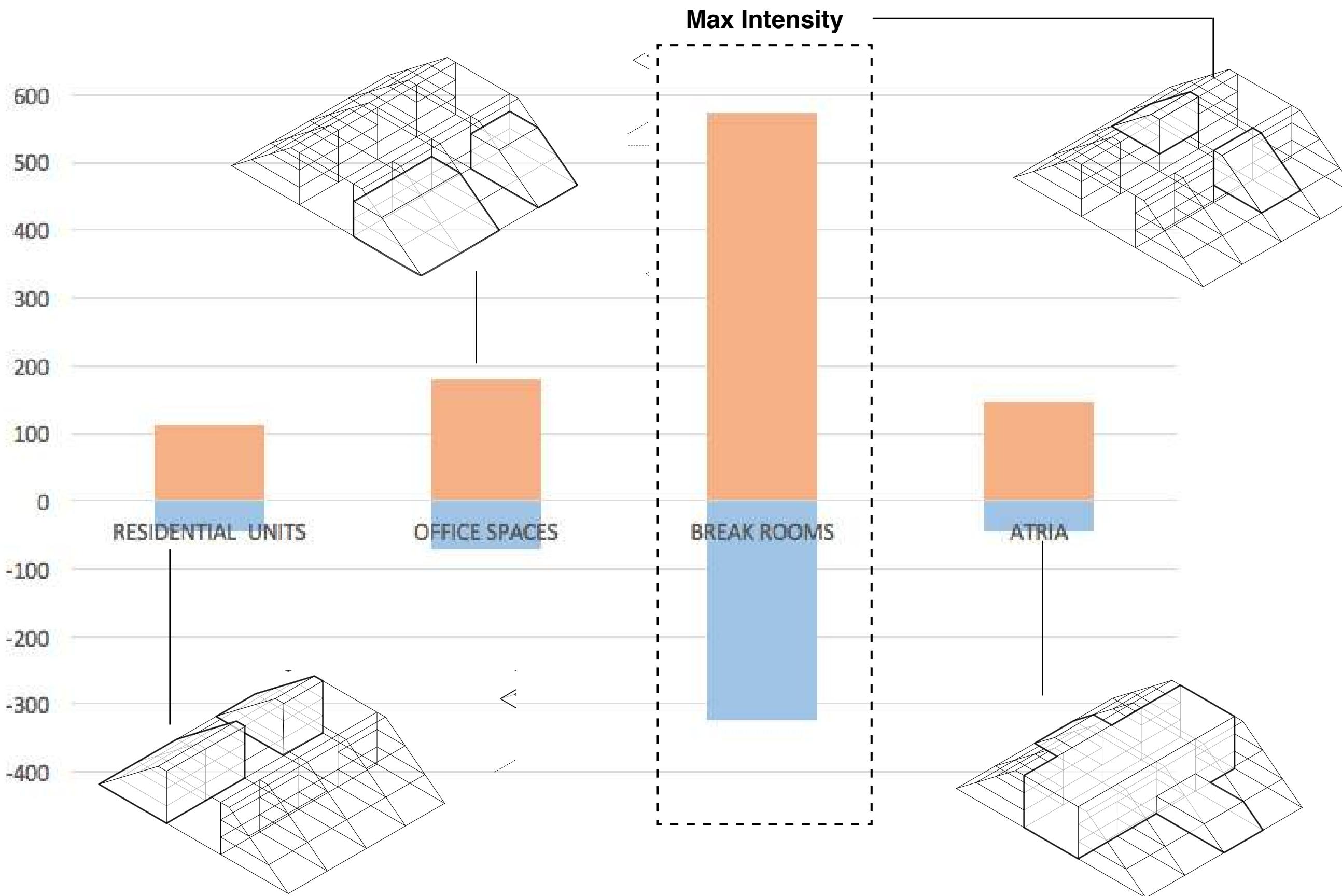
North Orientation
Second Floor



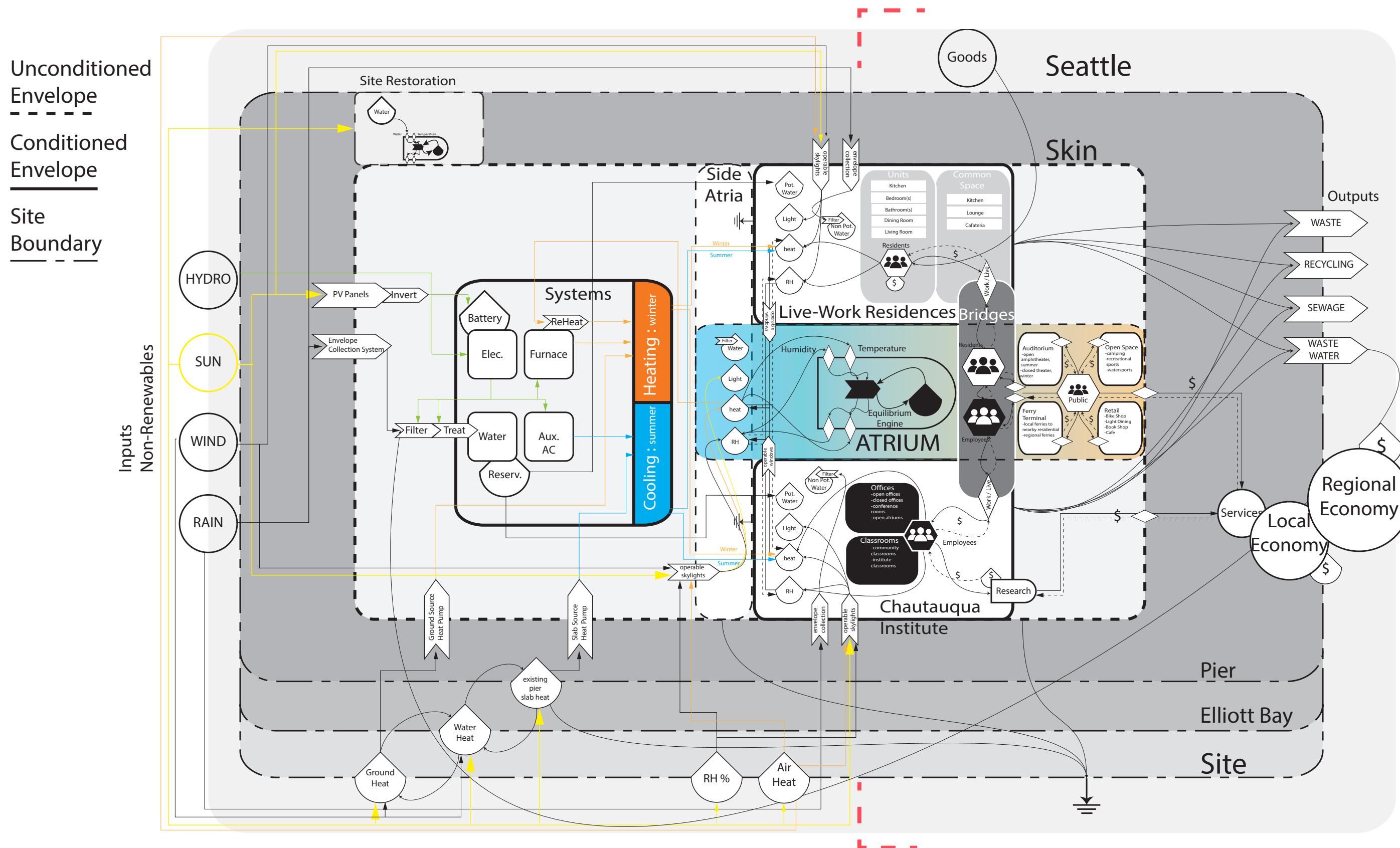
Lowest Losses



Energy Loads Calculated Intensities



Energy Analysis



Energy Section Analysis

