

ISOVER Multi-Comfort House Student Contest 2015

Middle East Technical University, Turkey
Mirbek Bekboliev, Kutay Can Biberoglu, Burak Ilhan

Focus on Student Affordable Housing



CITY CENTER

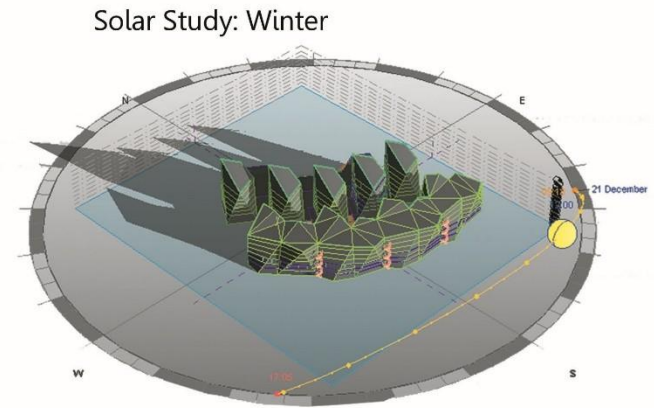
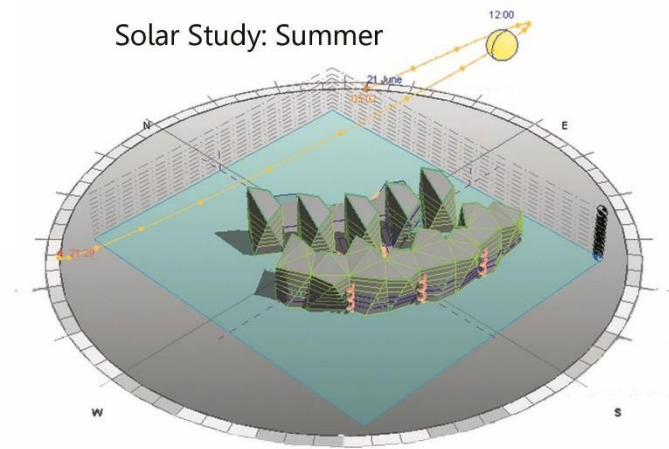
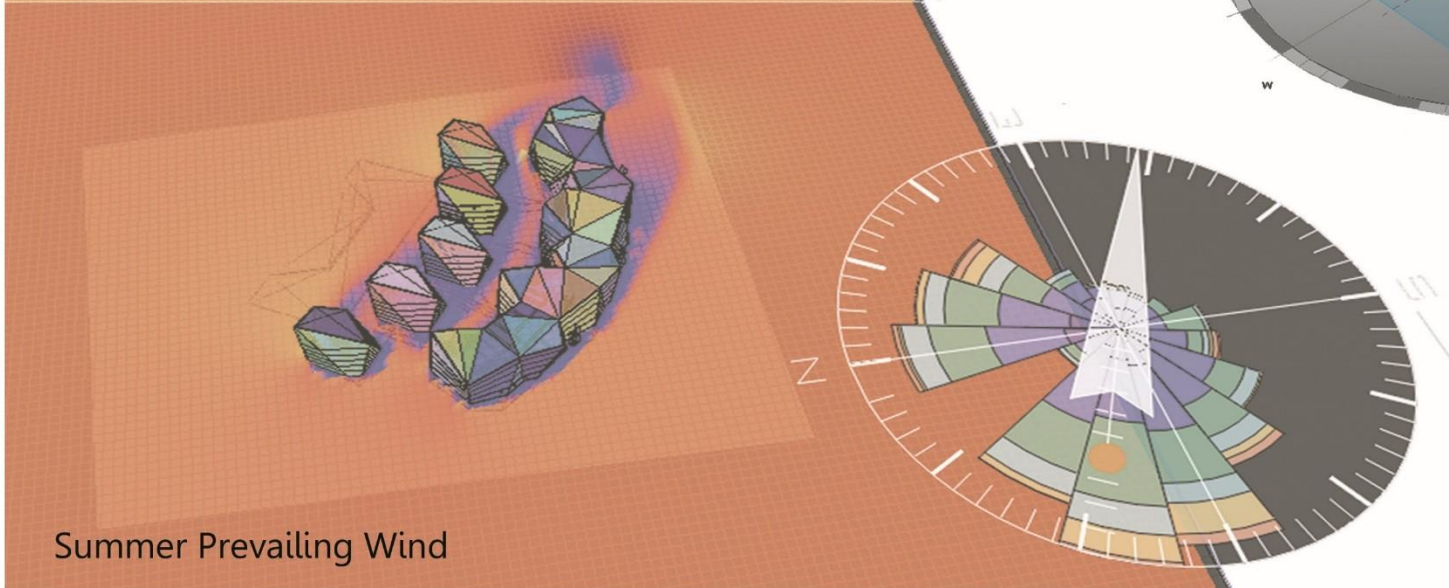
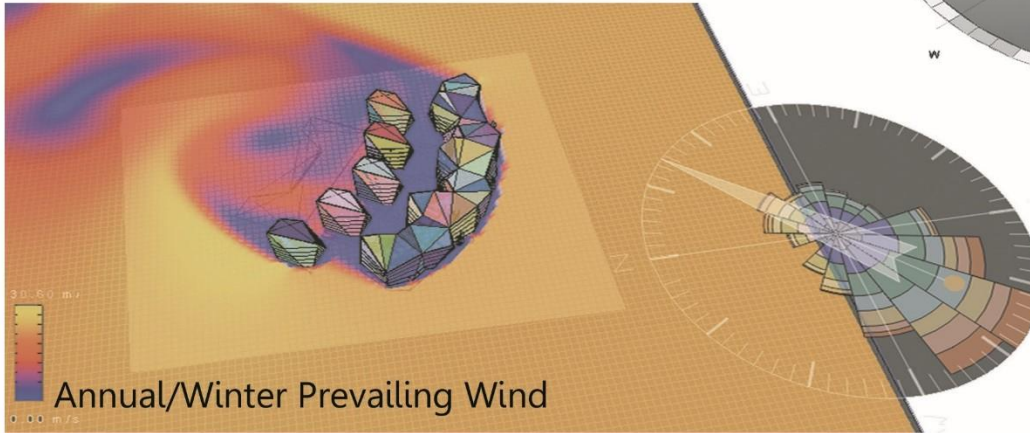
NAZARBAYEV
UNIVERSITY

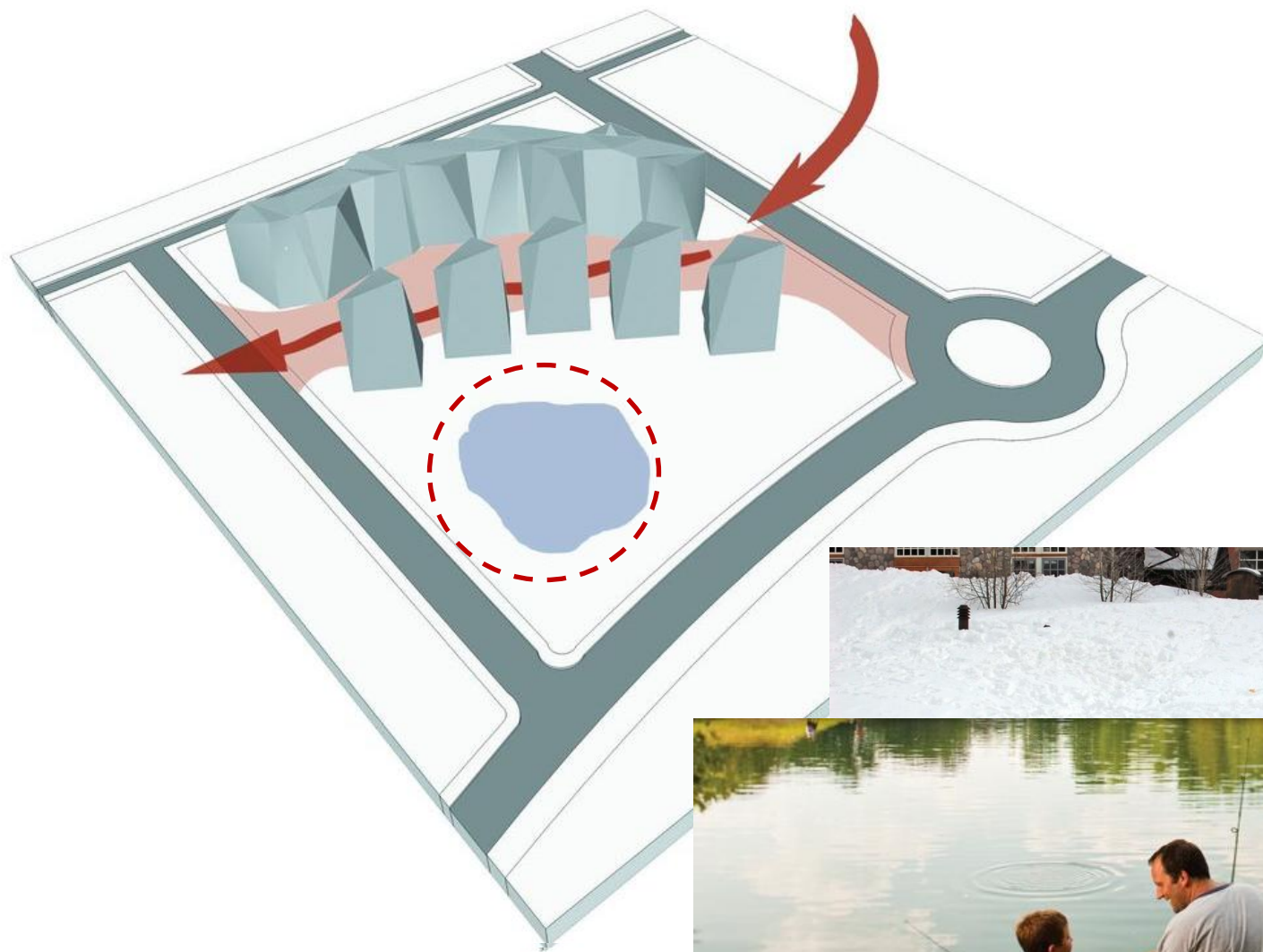
500 mt.

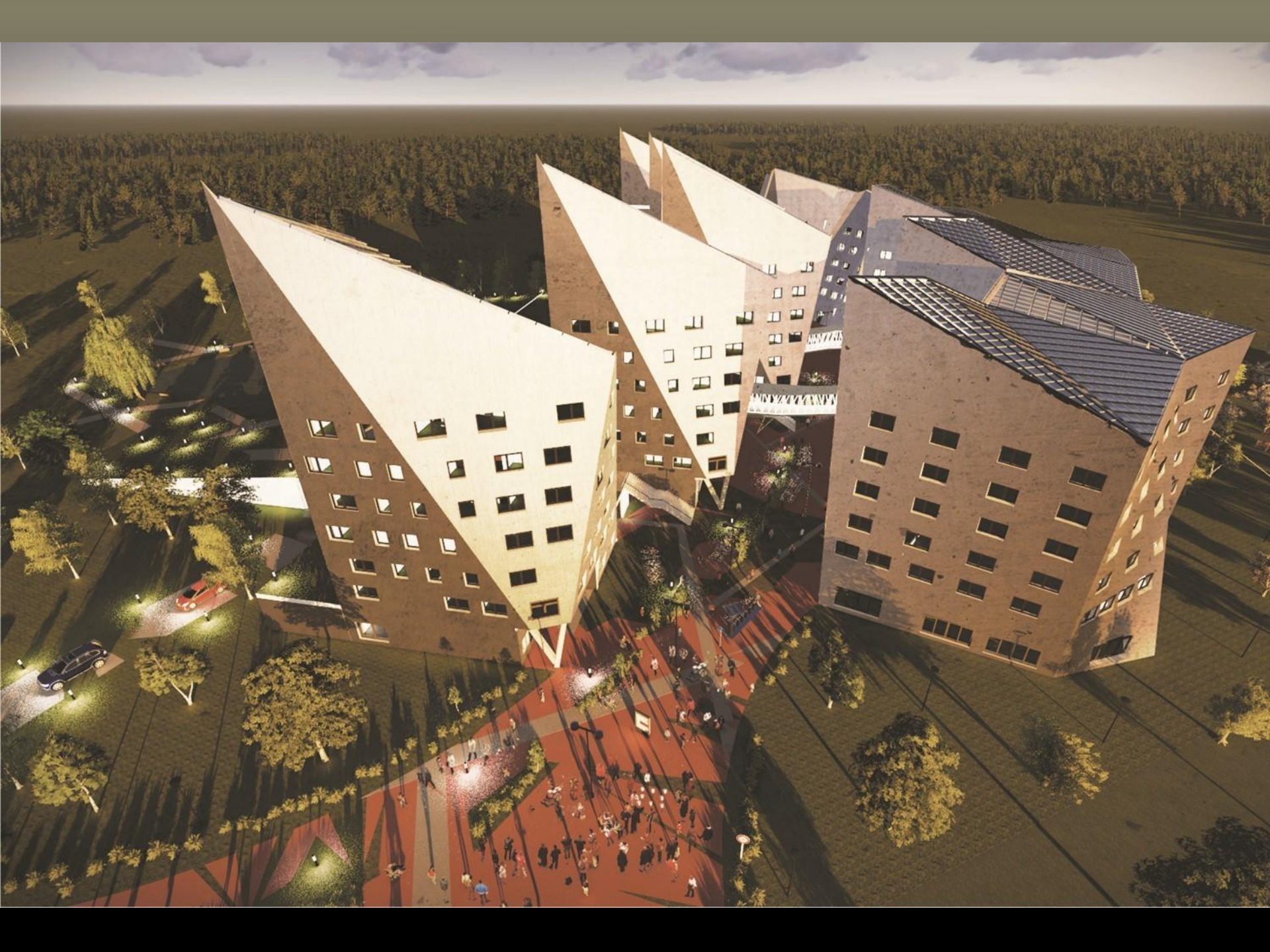
EXPO Complex

Site bioclimatic analysis

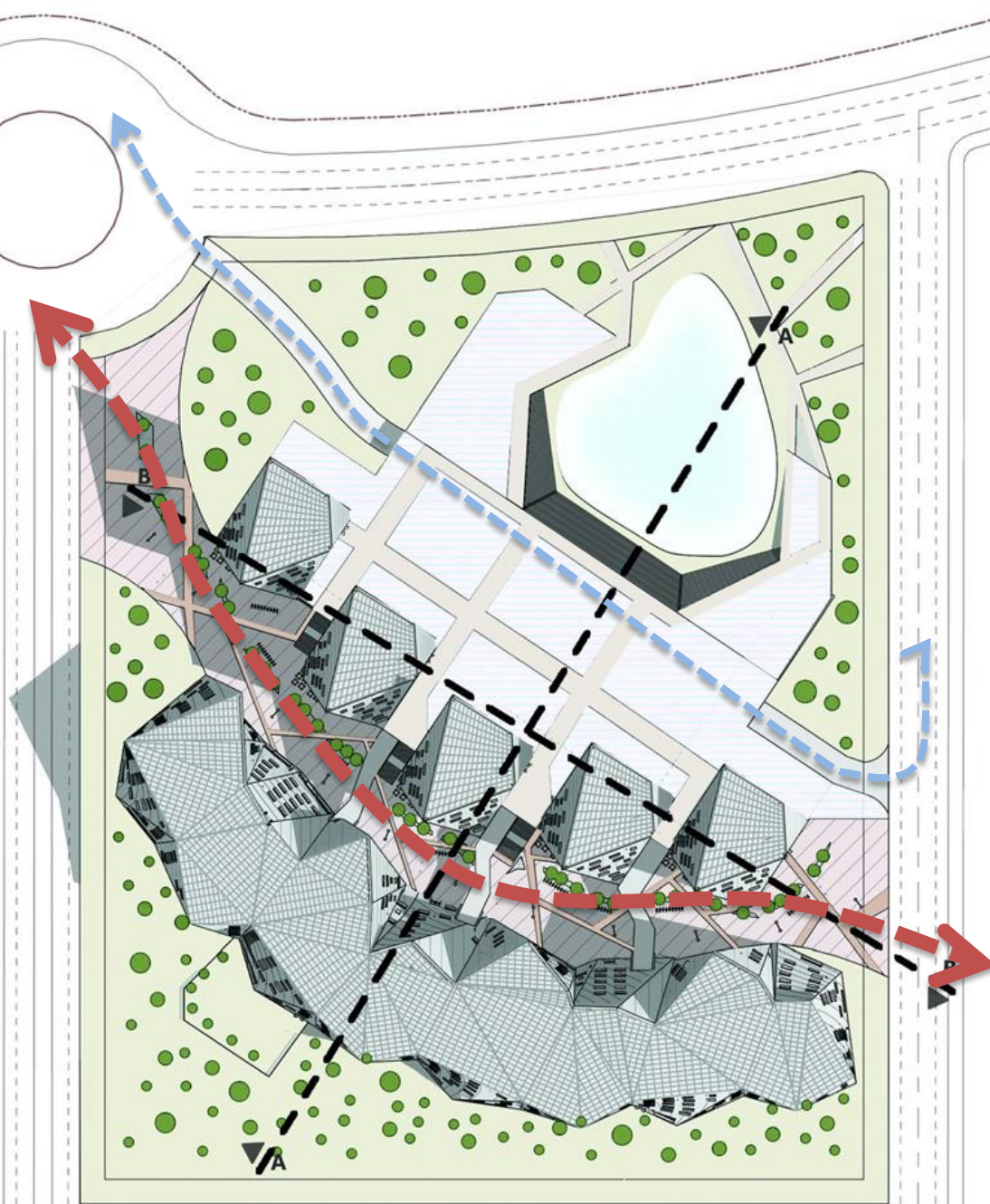
51°5'13" North, 71°24'31" West
Astana/ Kazakhstan Dynamic Wind Analysis







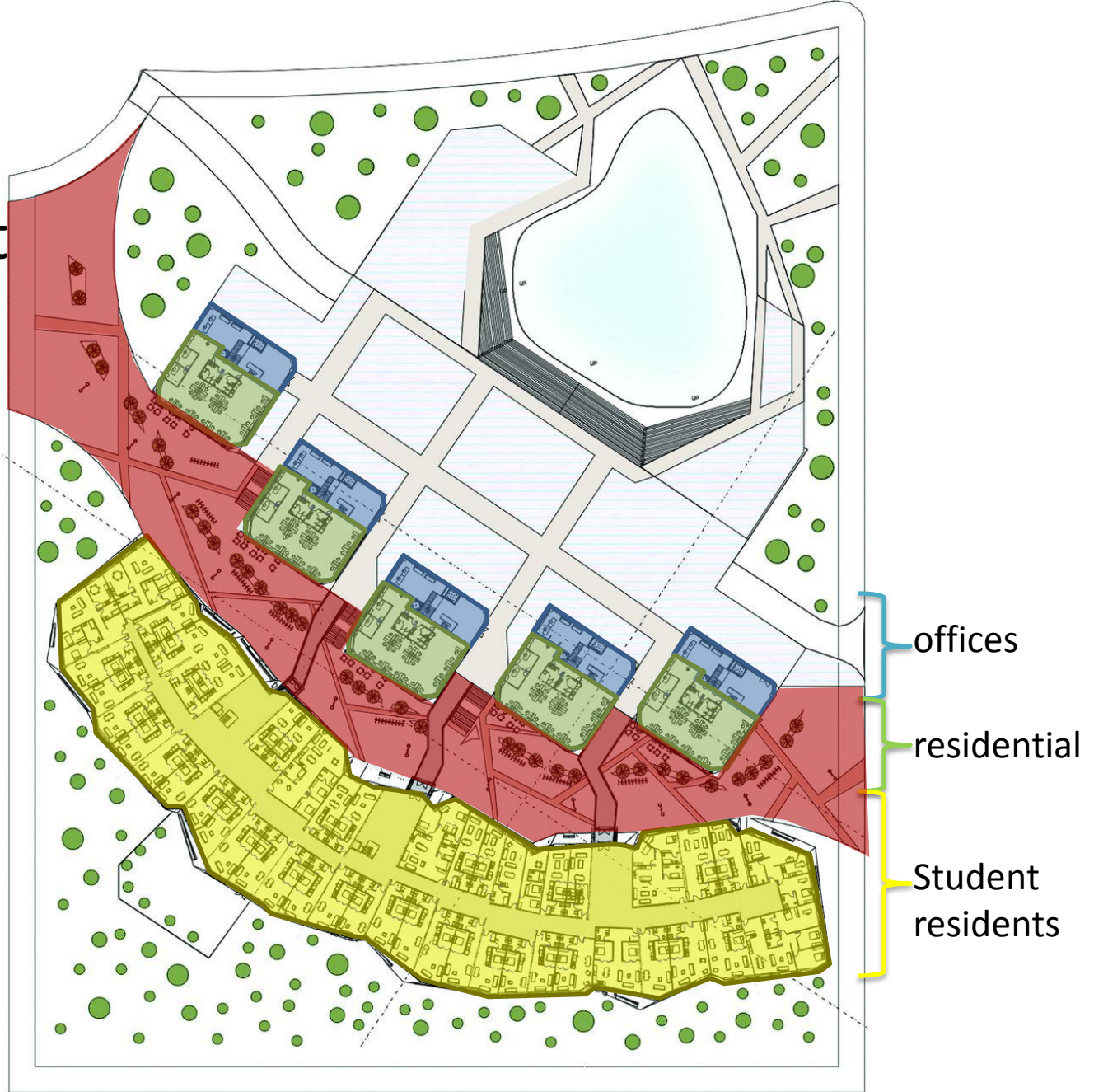
Nazarbayev
University



Site Plan 1/1000

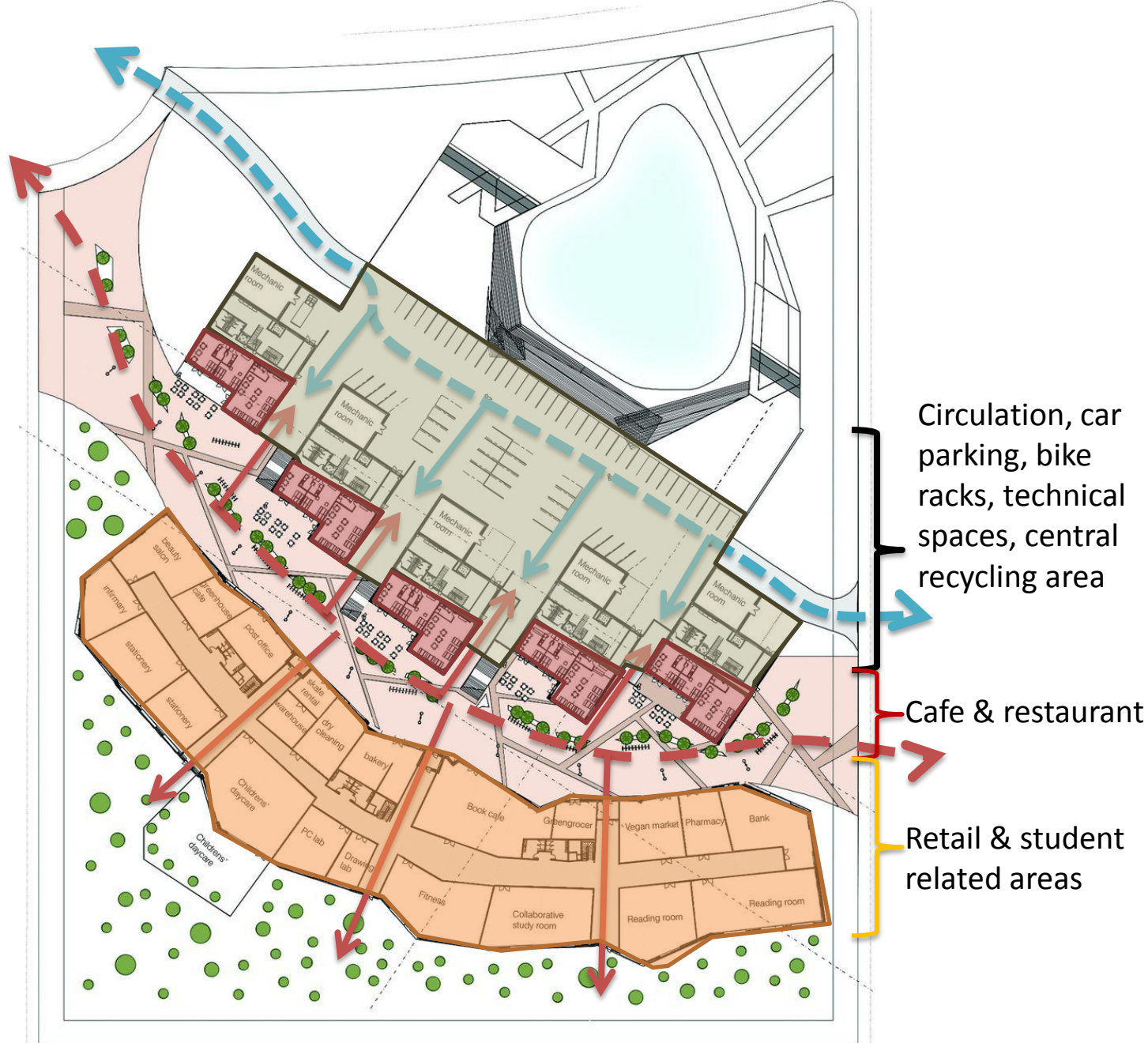


Social street



+4.50 Office and Residential Floor Plan
1/1000



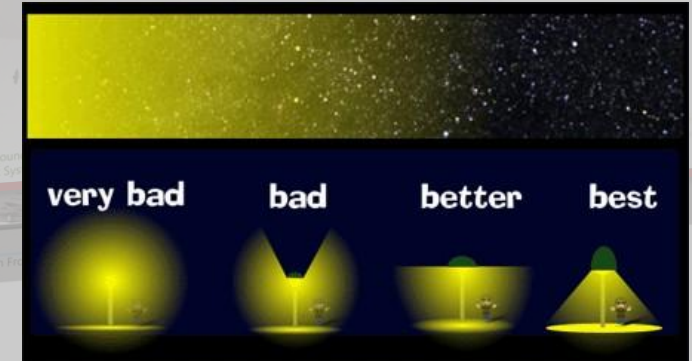
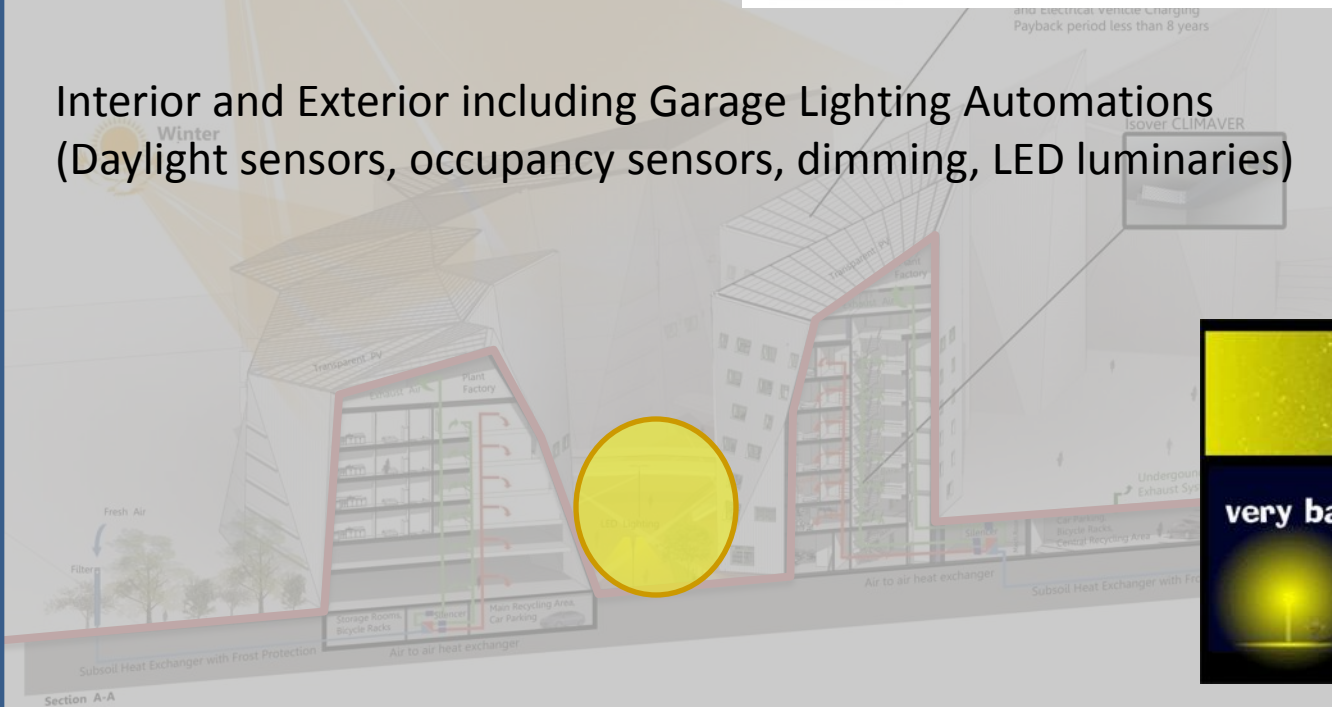


±0.00 Ground Floor Plan - Commercial
1/1000

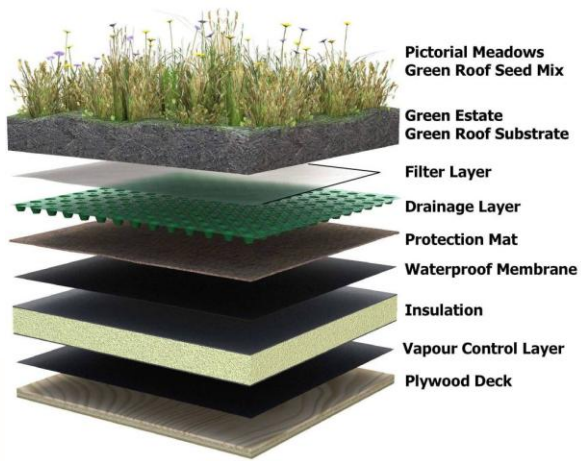




Interior and Exterior including Garage Lighting Automations
(Daylight sensors, occupancy sensors, dimming, LED luminaries)



Light Pollution Reduction Strategies



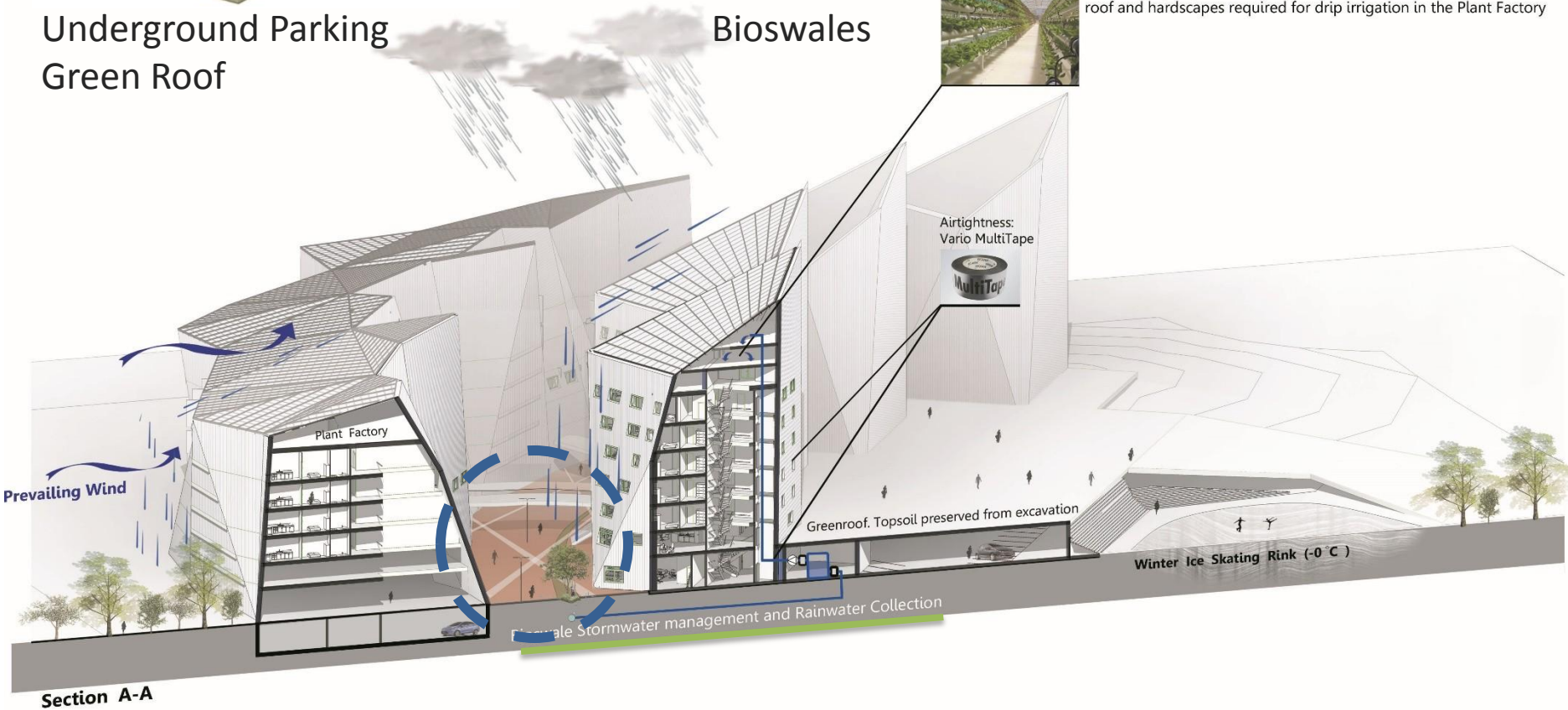
Underground Parking Green Roof



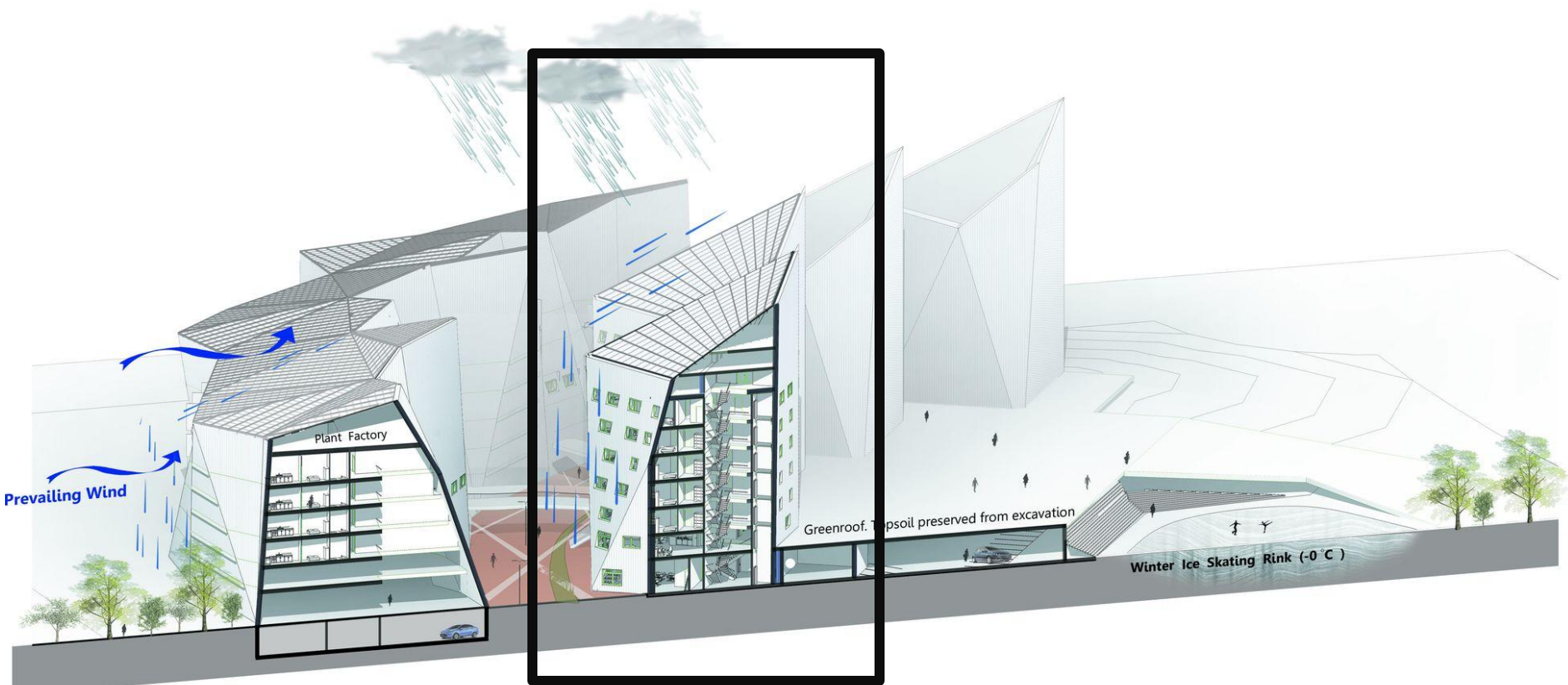
Bioswales

Water Efficient Landscaping—No Potable Water Use and Xeriscaping

Estimated 1,729,920 liters per annum of rainwater harvested from roof and hardscapes required for drip irrigation in the Plant Factory

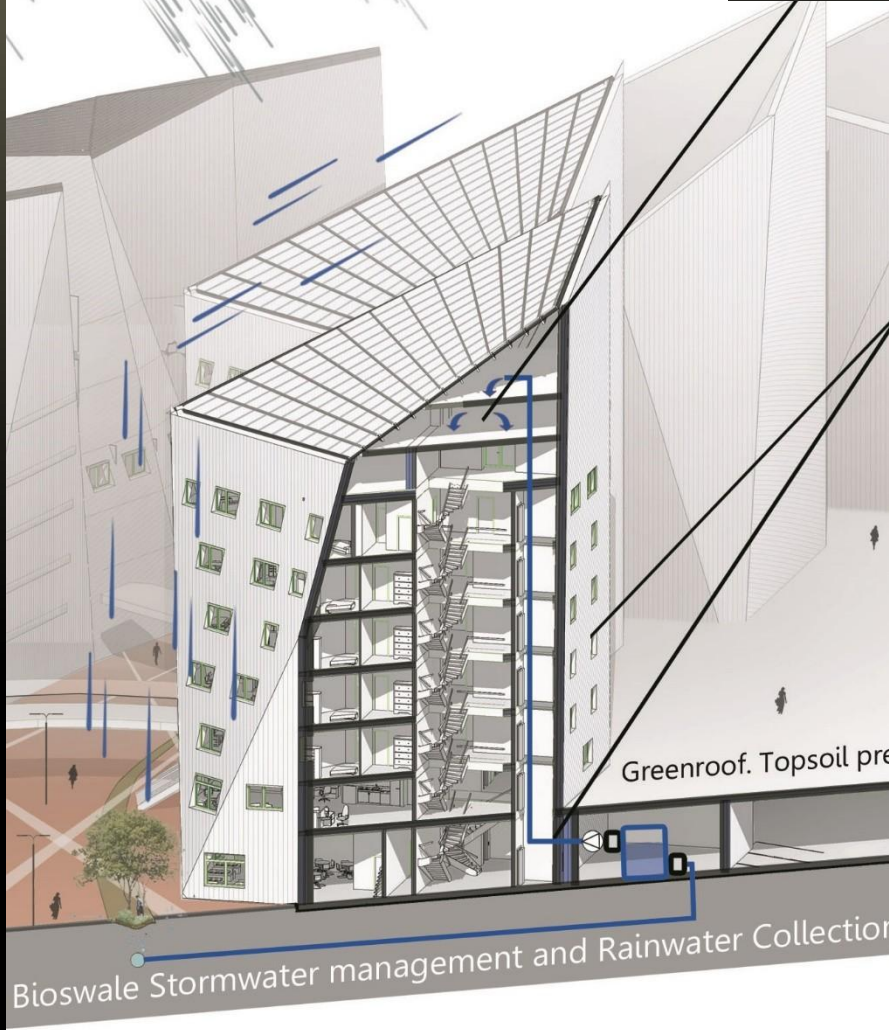






Section A-A

Rainwater and grey water harvest



Waterless Urinals



Double Flush Units

Drip Irrigation



Storm water Management

Global risk:
Global Warming and
Sea/river Level Rise



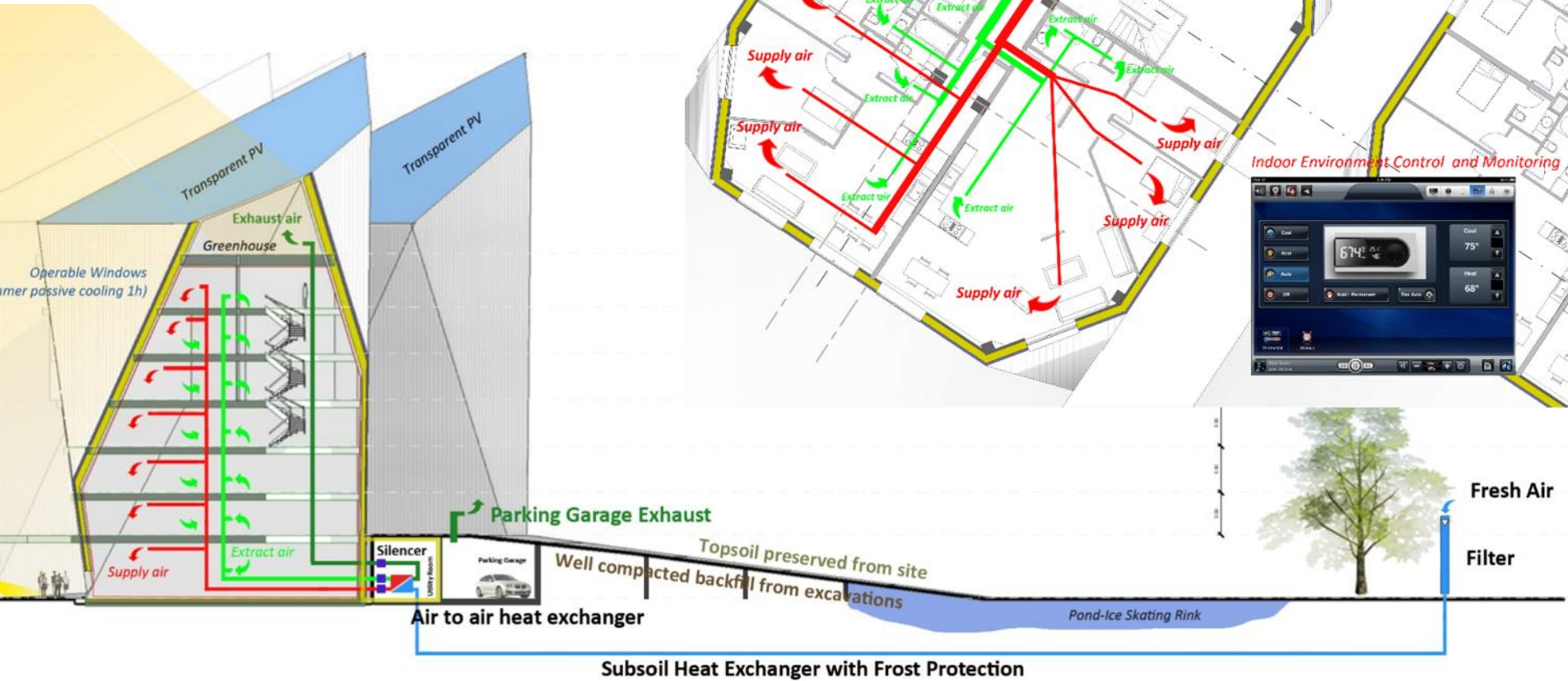
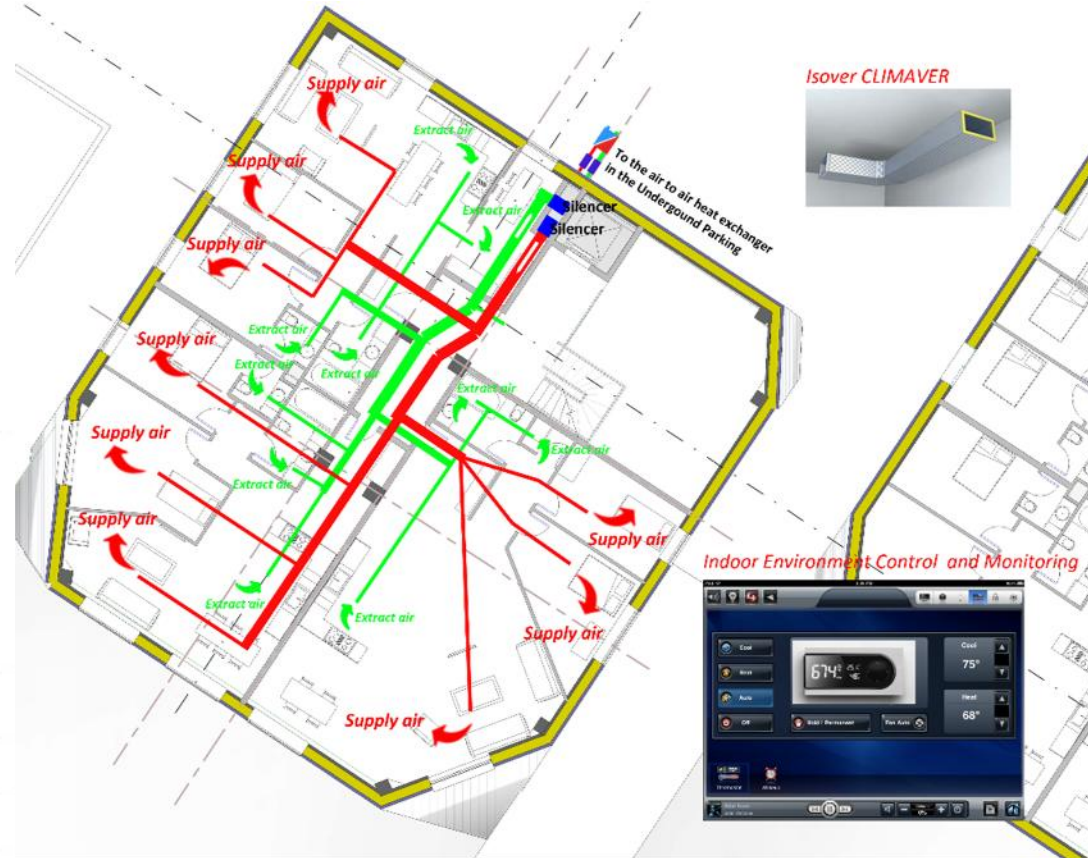
Water Use Reduction

Regional risk:
Central Asia is
the risk zone for
drought



Heat Recovery Ventilation

IEQ Control and Monitoring



GREENHOUSE DESIGN

Factors and issues
to be taken into account during
greenhouse design



High Concentration of CO₂
required for plants

Humidity



Greenhouse has been separated
from building envelope over the
roof, which creates secondary
thermal boundary.
High concentration of CO₂ and
humidity obtained from heat
recovery are supplied into the
plant factory.

Recycling Program

- Biodegradable waste goes as a compost into the greenhouse's soil
- Plastic, Glass & Metal goes to recycling center
- Hazardous waste stored safely and collected



COMPOST



all food



paper wrappers



All cups
Coke lids &
straws



plates &
napkins
please recycle
utensils



coffee & tea
items
please recycle
coffee lids



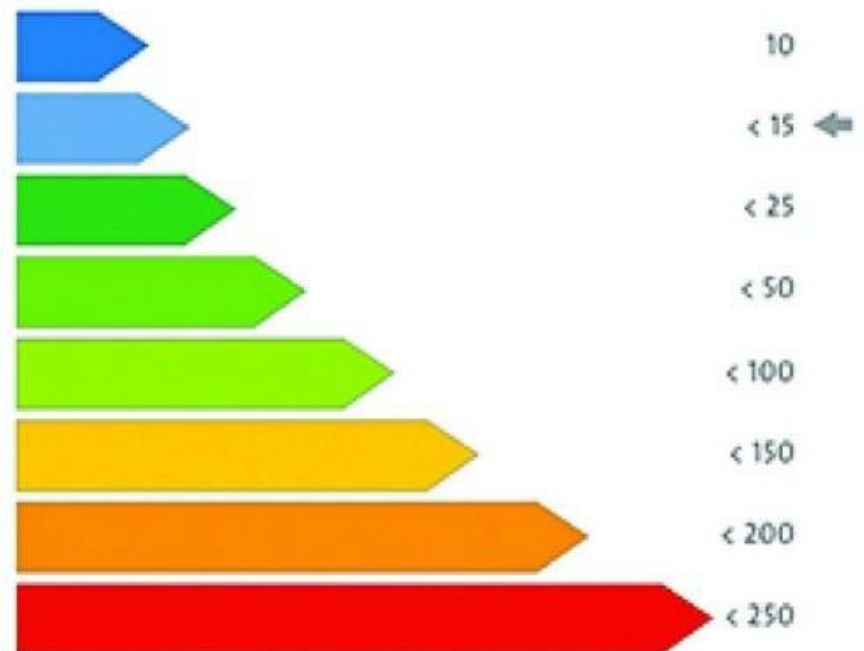
pizza boxes




Heat Demand Calculations

Transmission Heat Losses:	75374.59	kWh/a
Ventilation Heat Losses:	18222.70	kWh/a
Total Heat Losses:	93597.30	kWh/a
Internal Heat Gains:	27558.52	kWh/a
Available Solar Heat Gains:	43259.15	kWh/a
Total Heat Gains:	65556.83	kWh/a
Annual Heat Demand:	28040.47	kWh/a
Specific Annual Heat Demand:	11.44	kWh/(m ² a)

Energy Efficiency Classes



An aerial photograph of a modern building with a large, sloped glass roof. The sun is setting behind the building, creating a warm, orange glow across the sky and reflecting off the glass panels. The building's facade features a grid-like pattern of windows. The surrounding area is dark, suggesting a wooded or undeveloped landscape.

Thank You!
Рахмет!