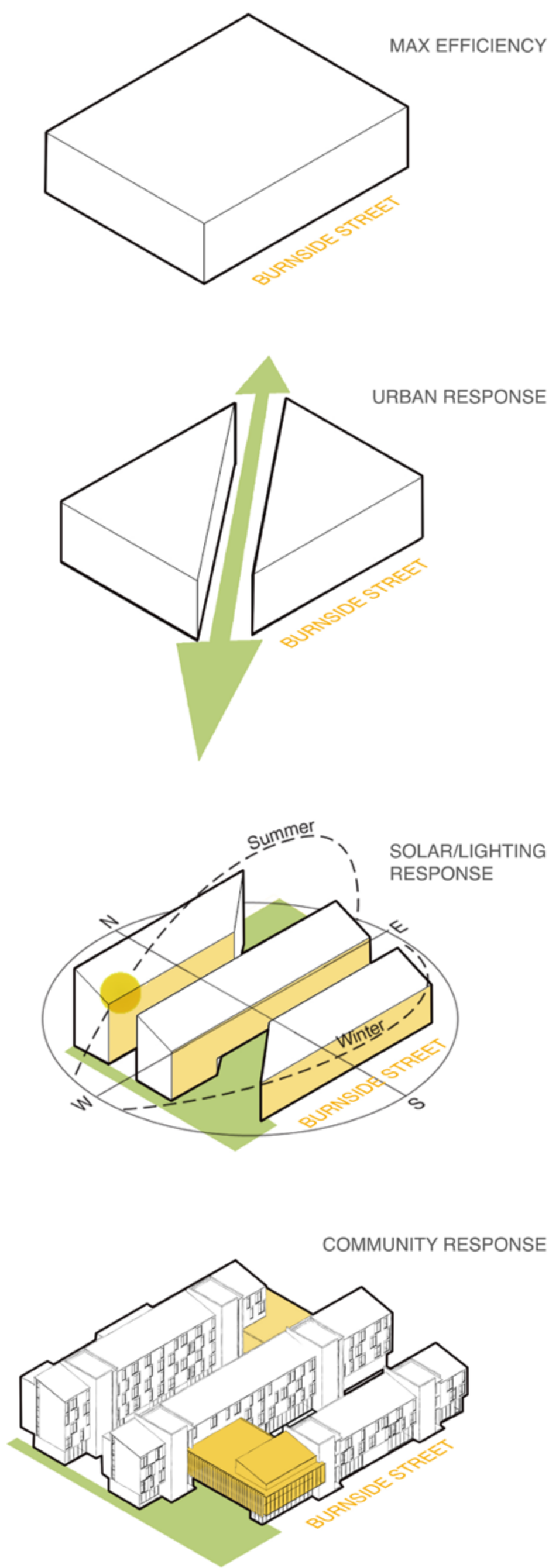


SITE PLAN

SITE STRATEGIES



THE 3 GREEN BARS BUILDING

The 3 green bars building derives from the intent to create a beautiful and highly energy efficient mixed-use complex. Portland is well known for its tradition in landscaping and urban design, which motivates the project to celebrate the public space. In our analysis, we found that Sandy Boulevard is a strong urban force that should be reflected in the project; hence the main public space is designed to engage this axis.

To maximize daylight in our living spaces, increase the passive heat gain for our climate, and account for a highly replicable module; the building was shaped as a thin bar oriented to the south and ruled by a 24x36 foot grid. The north side is primarily used as a circulation corridor, which also serves as a buffer zone that reduces the heat loss.

Shared Spaces. The three bars are stitched together by two common spaces, that bridge across on the second level. These offer kitchen, dining, and laundry to promote neighborliness and social interaction among the building residences. Having the shared appliances in substitute of individual ones also reduces the energy consumption in the project by 30%. Twenty-two studio units are encouraged to use the commons, while twenty-five two-bed units will still have their own stand alone kitchen and laundry. This builds on the Danish concept of cohousing, which has been a driving precedent.

Tight Building. The wall, roof, and floor are designed as highly insulated assemblies with controlled fenestration.

Solar Gain. The three bars are south facing, and step down in order to allow each building to receive the south sunlight. The roof angle responds to the latitude in order to maximize energy efficiency for the solar panels throughout the year.

Shading and Beauty. Sliding panels, which can be manually operated, serve as a protection for the unwanted summer heat gains. It gives the user a capability to alter the space, and as an aesthetic architectural result we have a building that changes and speaks across the seasons.

Embodied energy. The building is designed with cross-laminated timber (CLT) system construction. It has many great environmental benefits such as a positive CO2 balance, and it is a local source in Portland.



WINNING ENTRY
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University of Cincinnati

PERFORM
2015
BUILDING DESIGN
COMPETITION



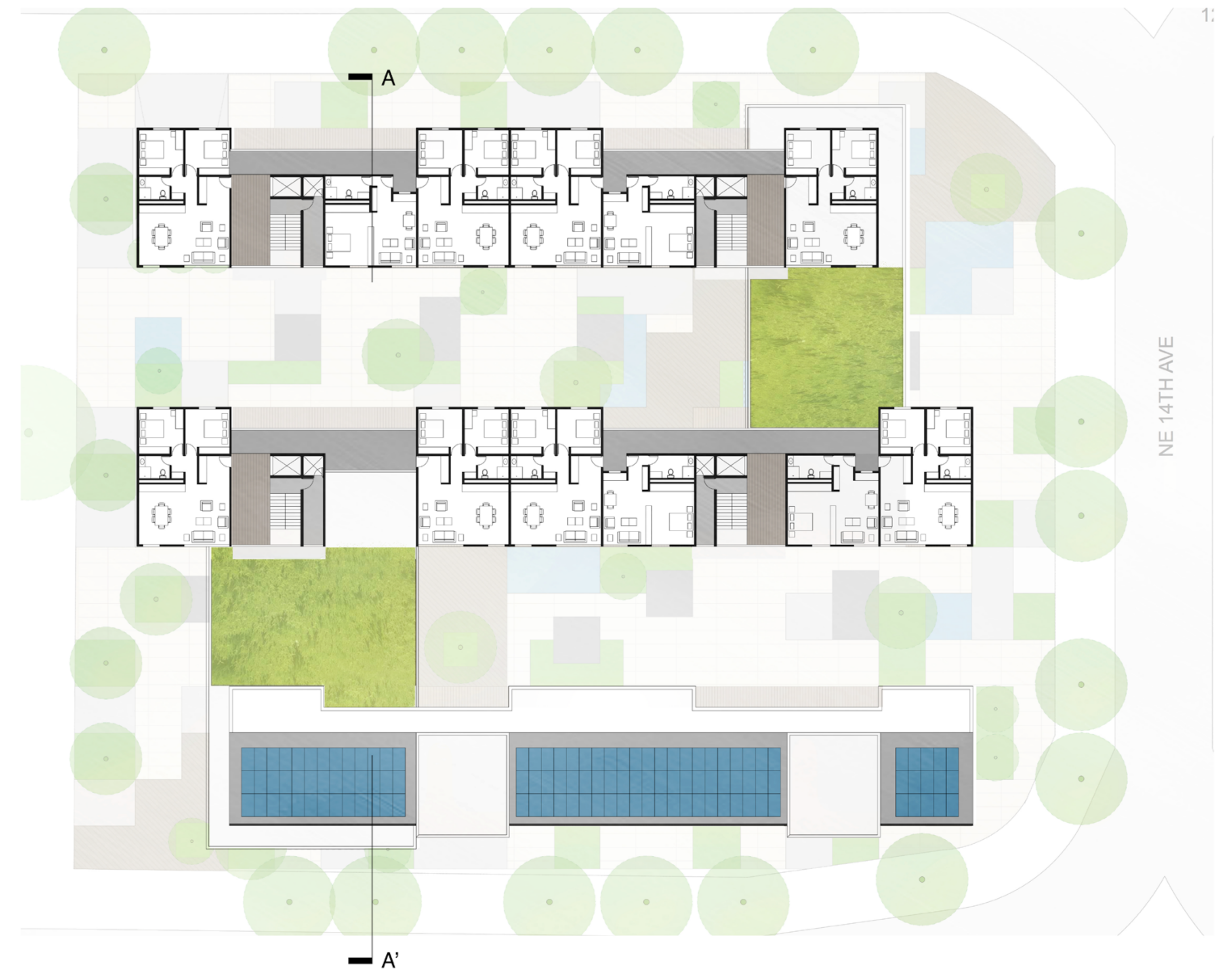


NE 14TH AVE

SECOND LVL

COMMONS:
KITCHEN
LAUNDRY
DINING
ENTERTAINMENT

HOUSING:
3 TWO-BED UNITS
11 STUDIO UNITS



NE 14TH AVE

FOURTH LVL

COMMONS:
ACCESSIBLE GREEN
ROOF

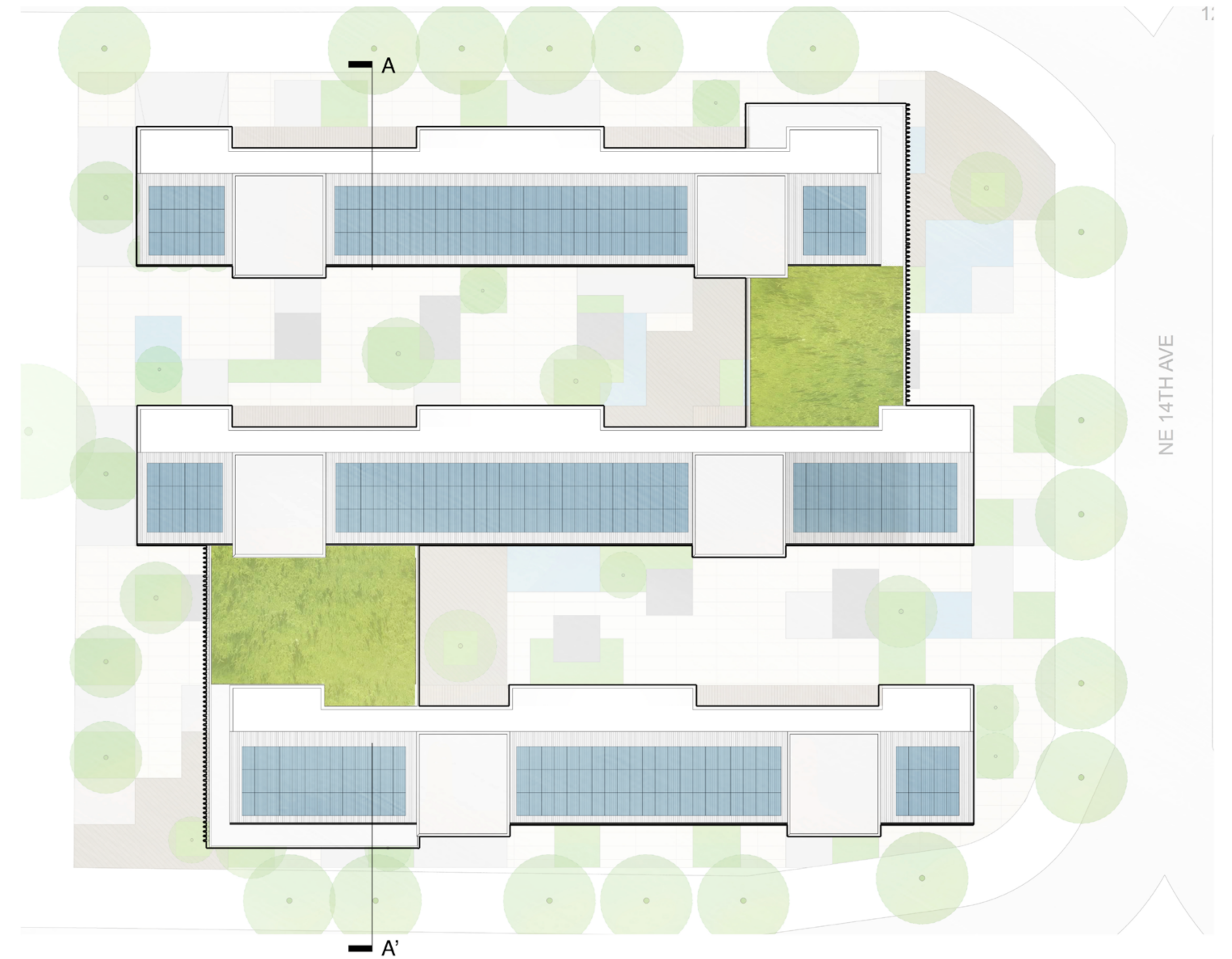
HOUSING:
8 TWO-BED UNITS
4 STUDIO UNITS



NE 14TH AVE

THIRD LVL

HOUSING:
10 TWO-BED UNITS
5 STUDIO UNITS



NE 14TH AVE

ROOF LVL

TILTED SOLAR ARRAYS TO
RECEIVE THE MAXIMUM
AMOUNT OF SUN.

50% PHOTOVOLTAIC
50% SOLAR THERMAL

WINNING ENTRY

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MODULE STRATEGIES DIAGRAM

SOLAR THERMAL

4,778 sf of solar thermal panels mounted on the roof are used as the main strategy to heat the water for domestic use as well as hydronic heating system.

PV PANELS

4,778 sf of PV panels mounted on the roof generates a total of 80,113 kWh of electricity per year.

SHADING PANEL

These sliding fabric panels are implemented as a passive strategy to block direct gain during summer. Panels are manually operable by each apartment.

CLT ASSEMBLIES

Cross Laminated Timber

Short set-up time	Comfortable and healthy indoor climate
Easy to assemble	Excellent fire safety characteristics
High level of prefabrication	Good insulating properties
Up to 10% more living space gained	Excellent structural properties
Eco-friendly and sustainable	Dry construction method
Positive CO2 balance	Earthquake-resistant
	Sustainable certified building material

THERMAL MASS

Thermal masses are used on the floor slabs for passive heat gain.

RAINWATER COLLECTING

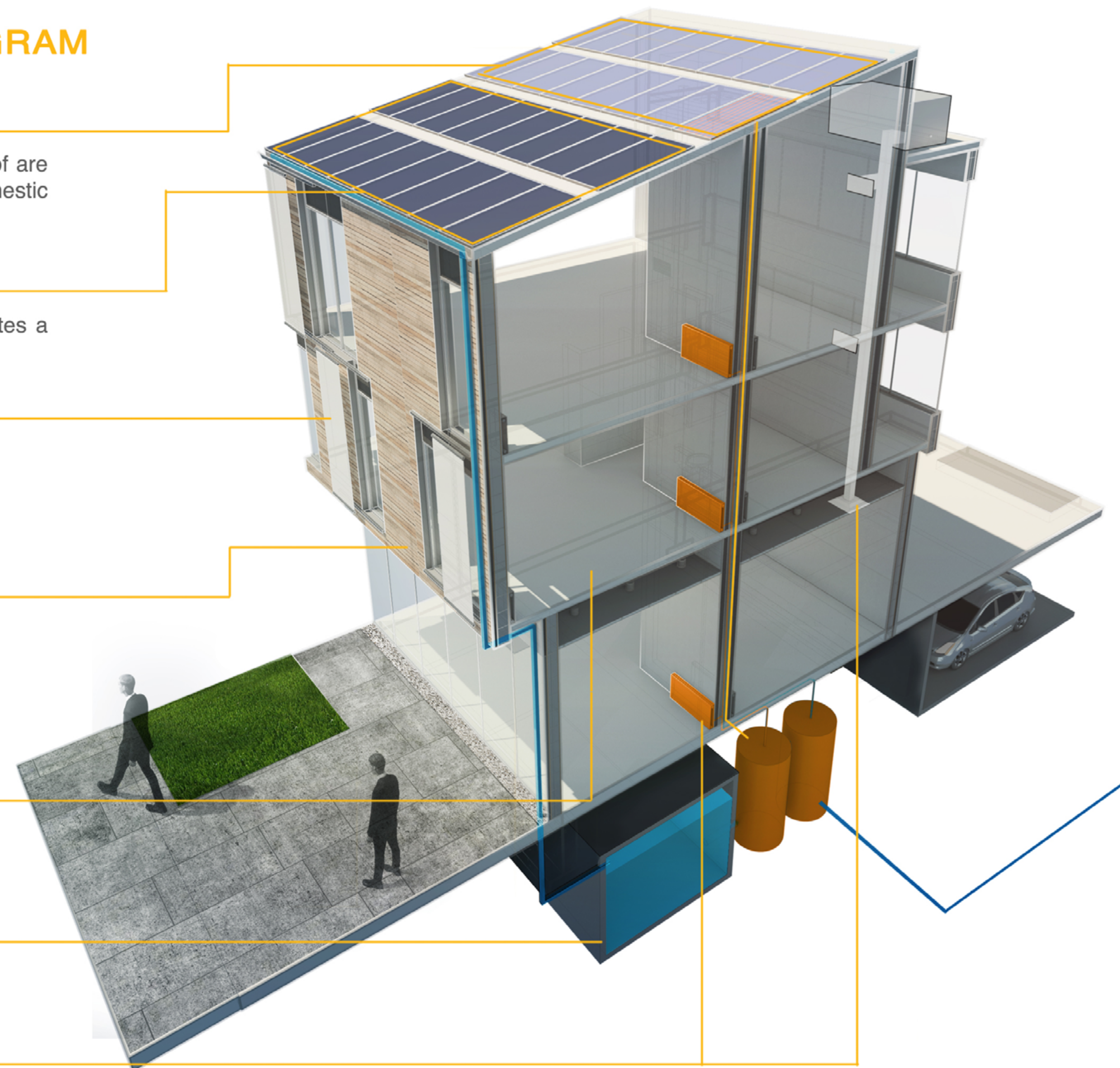
Rainwater is collected from the roof and stored in underground water tanks for laundry and toilet use.

ACTIVE SYSTEMS

Hydronic Heating System:

Is the main active heating system. Solar thermal panels are used to supply hot water into the system.

Air Exchanger: Small air exchanger units on the roof supply fresh air into building.



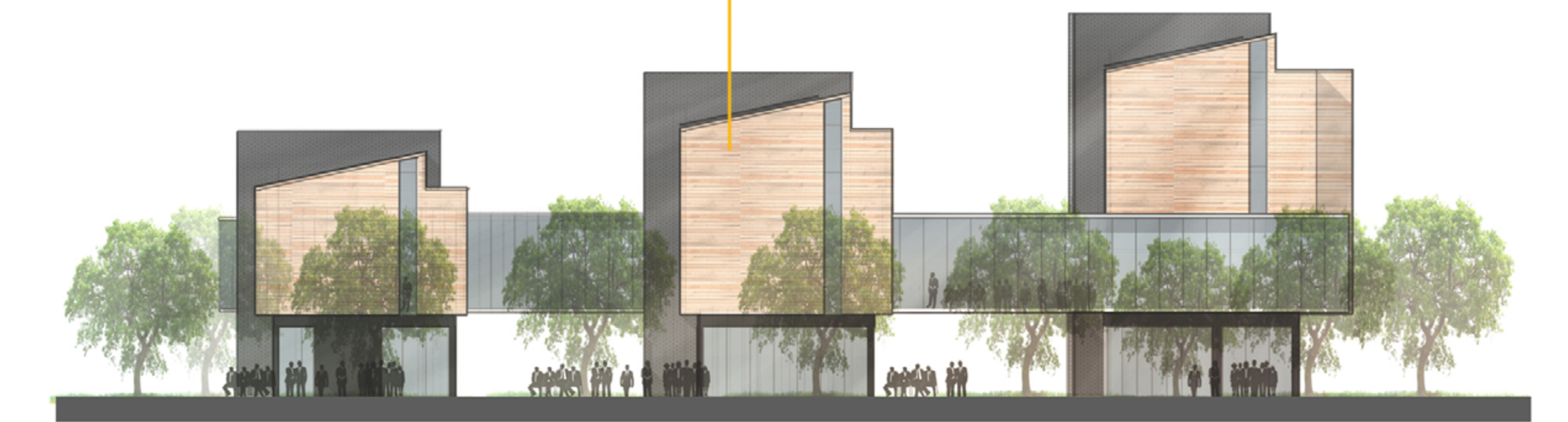
WEST ELEVATION



SOUTH ELEVATION

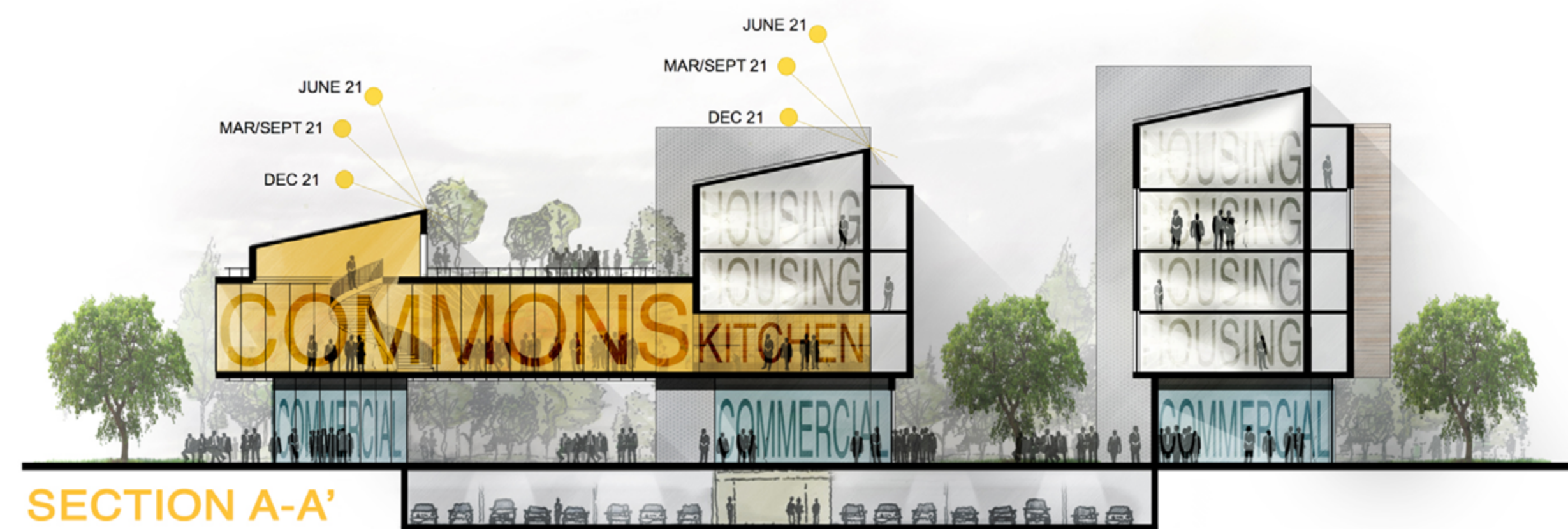


NORTH ELEVATION



EAST ELEVATION

NATURAL WOOD CLADDING SPEAKS TO THE TIMBER CONSTRUCTION AND DISPLAYS NATURAL BEAUTY IN THE PROJECT.



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