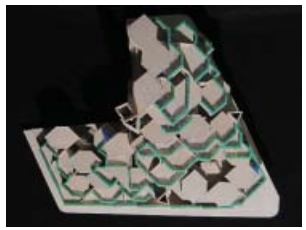
AARON MICK

ERIC HAAS

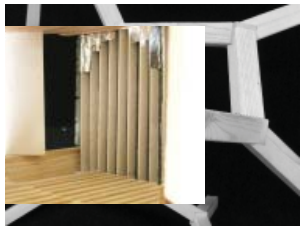
302A - FALL 2011

ARCH 302A









FALL 2011

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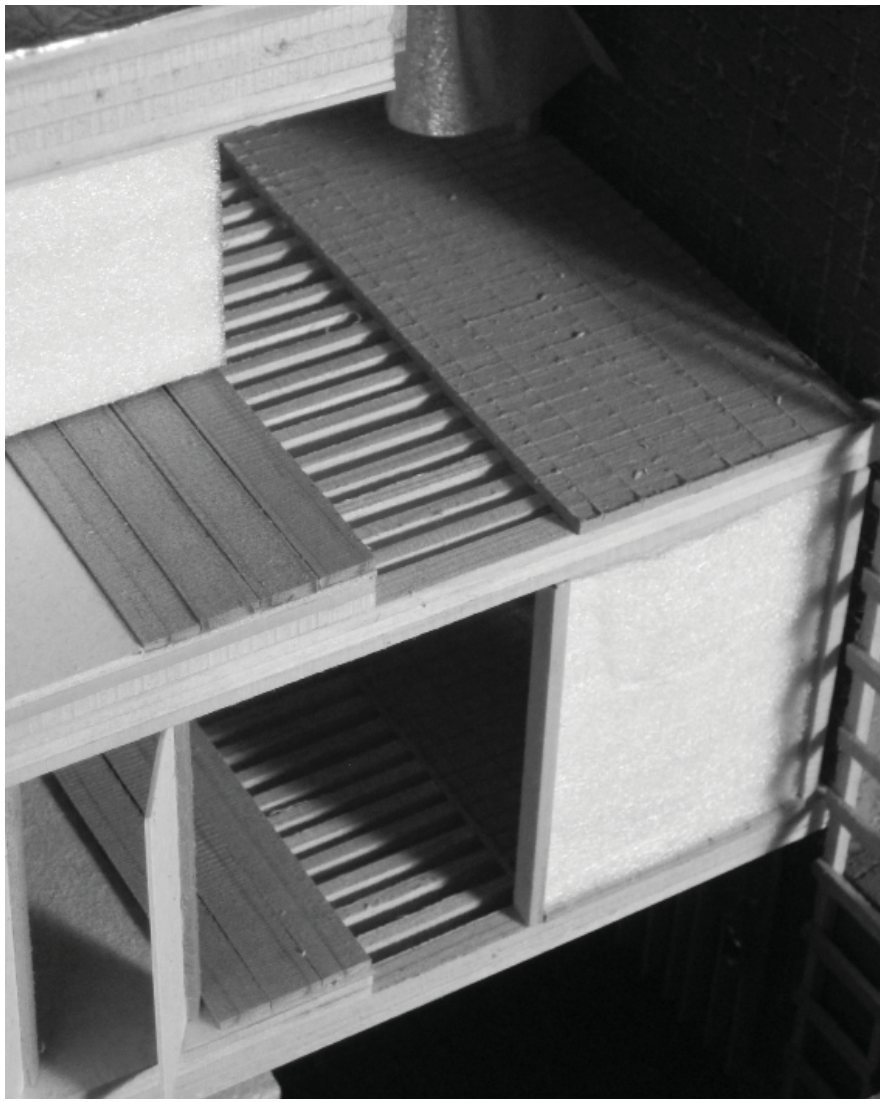
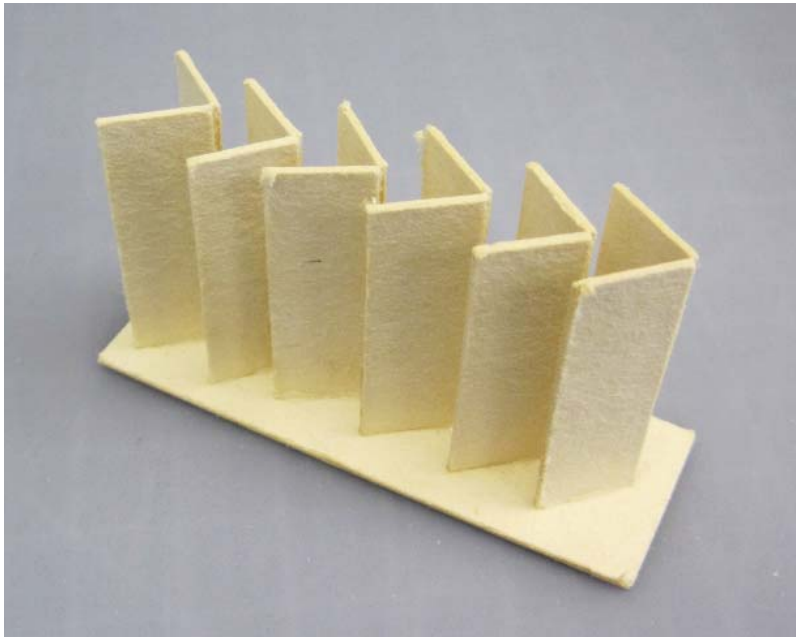
CONTENTS

01: TUNISIAN DESERT



SINGLE-FAMILY DWELLING



Project 1 focused on the development of a single family residence with special regard to environmental conditions of the Tunisian desert. The project was designed to incorportate passive sustainable features into the structure and program of the habitat, making use of stack and cross ventillation, as well as taking advantage of natural air currents and using humidification methods to achieve cooling in the hot, arid climate.

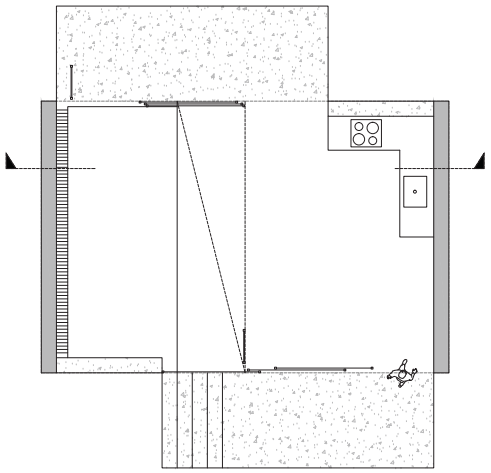
Program organization places main areas of “daytime” activity low, and places nightime areas of “rest” high above to make full use of thermodynamic stack air currents.

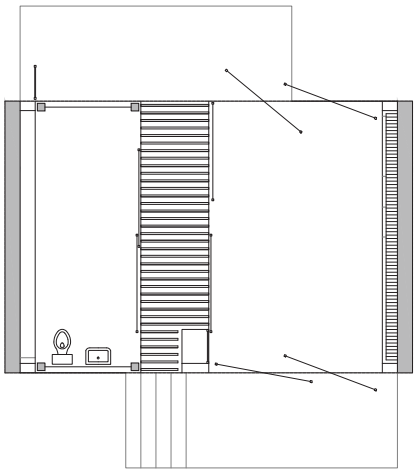
A perforated main vertical core and two concrete block walls take advantage of downdrafts to create natural cooling air currents, and allow collection of rainwater for humidification.

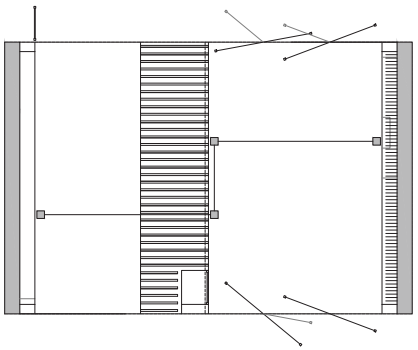
Left page: Preliminary study models showing humidifying wick, hydraulic radiator, privacy vent, and stack ventilation concepts.

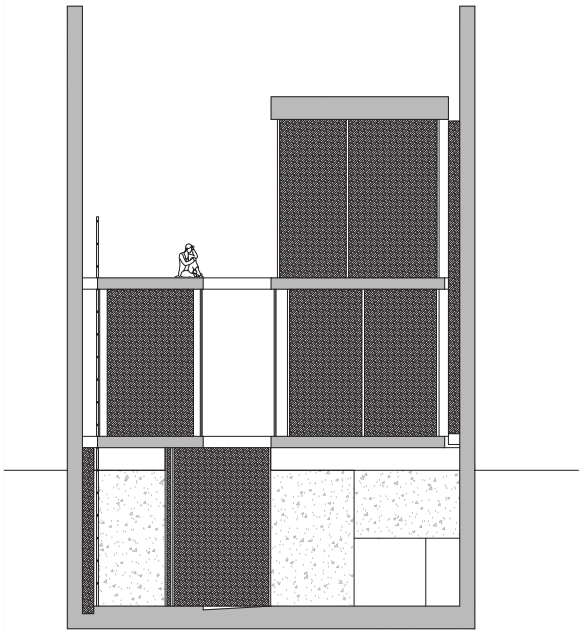
Above: Preliminary schemes.

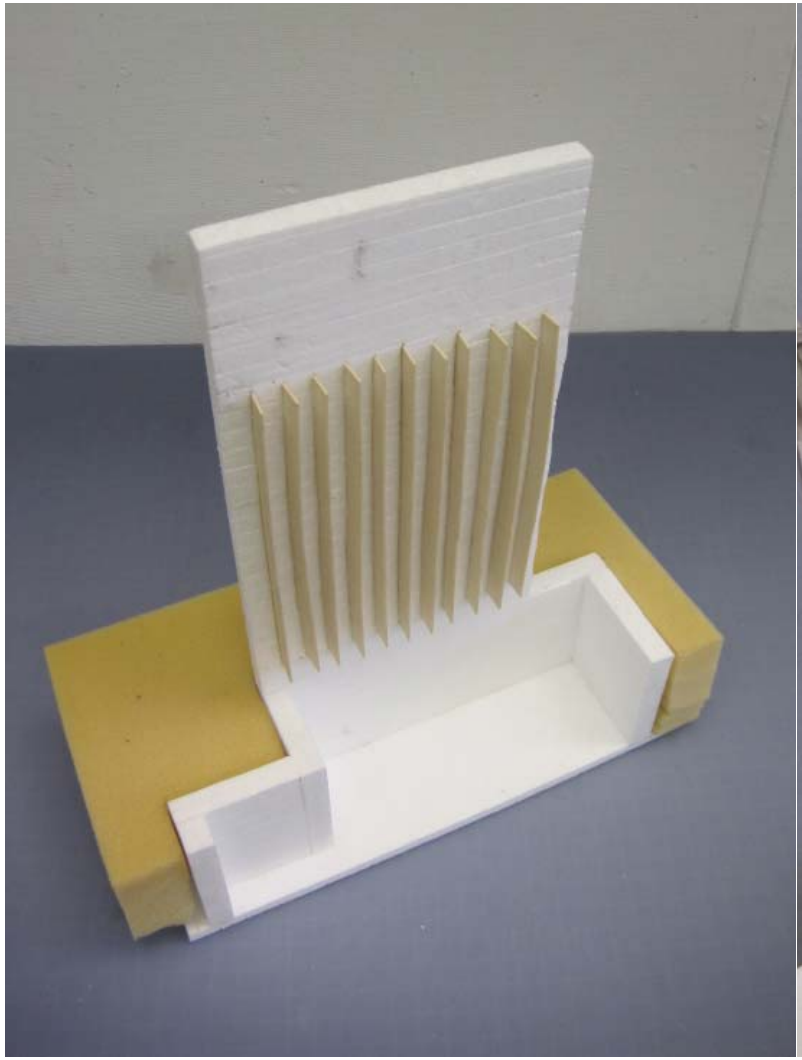
Right page: Selected preliminary scheme.





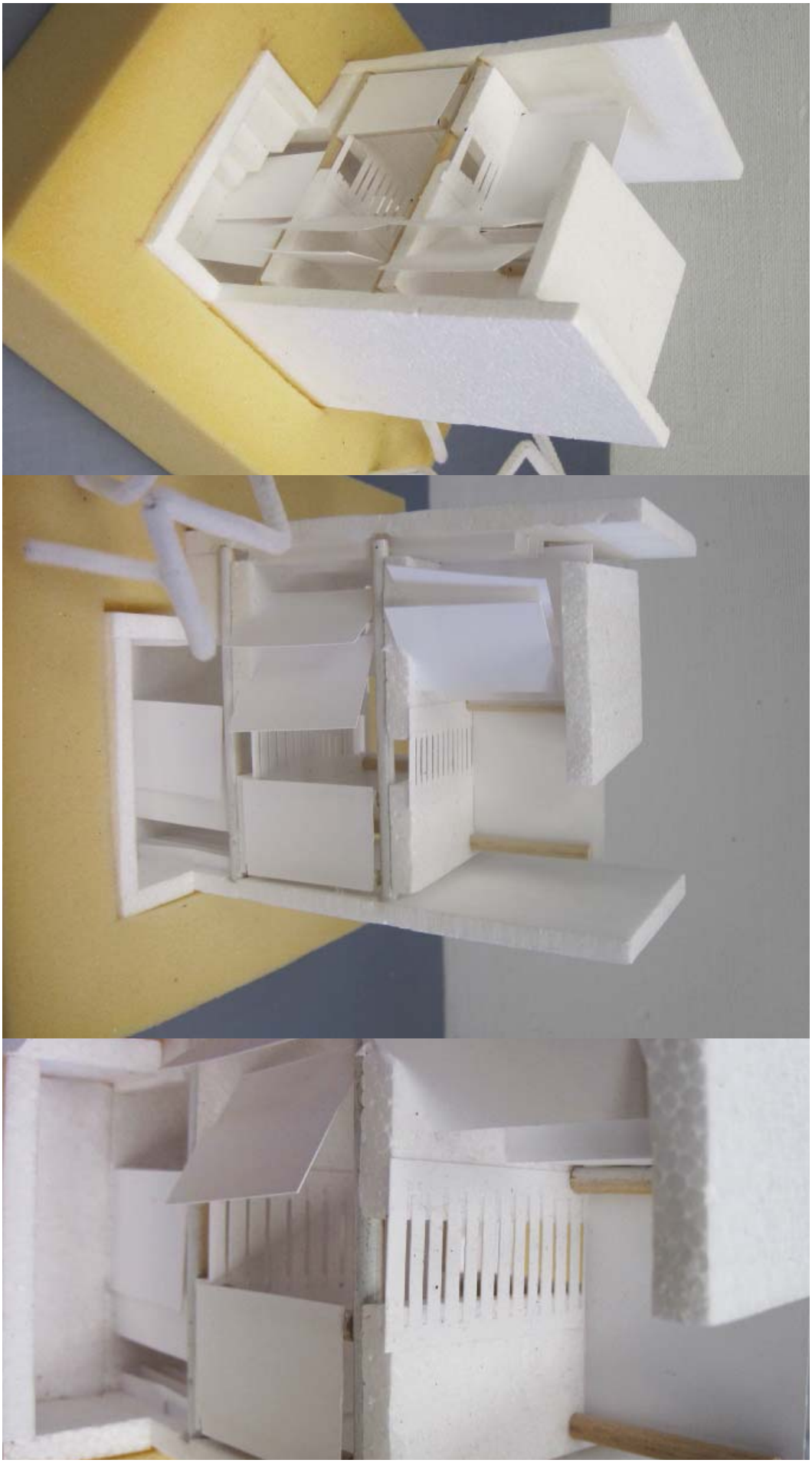


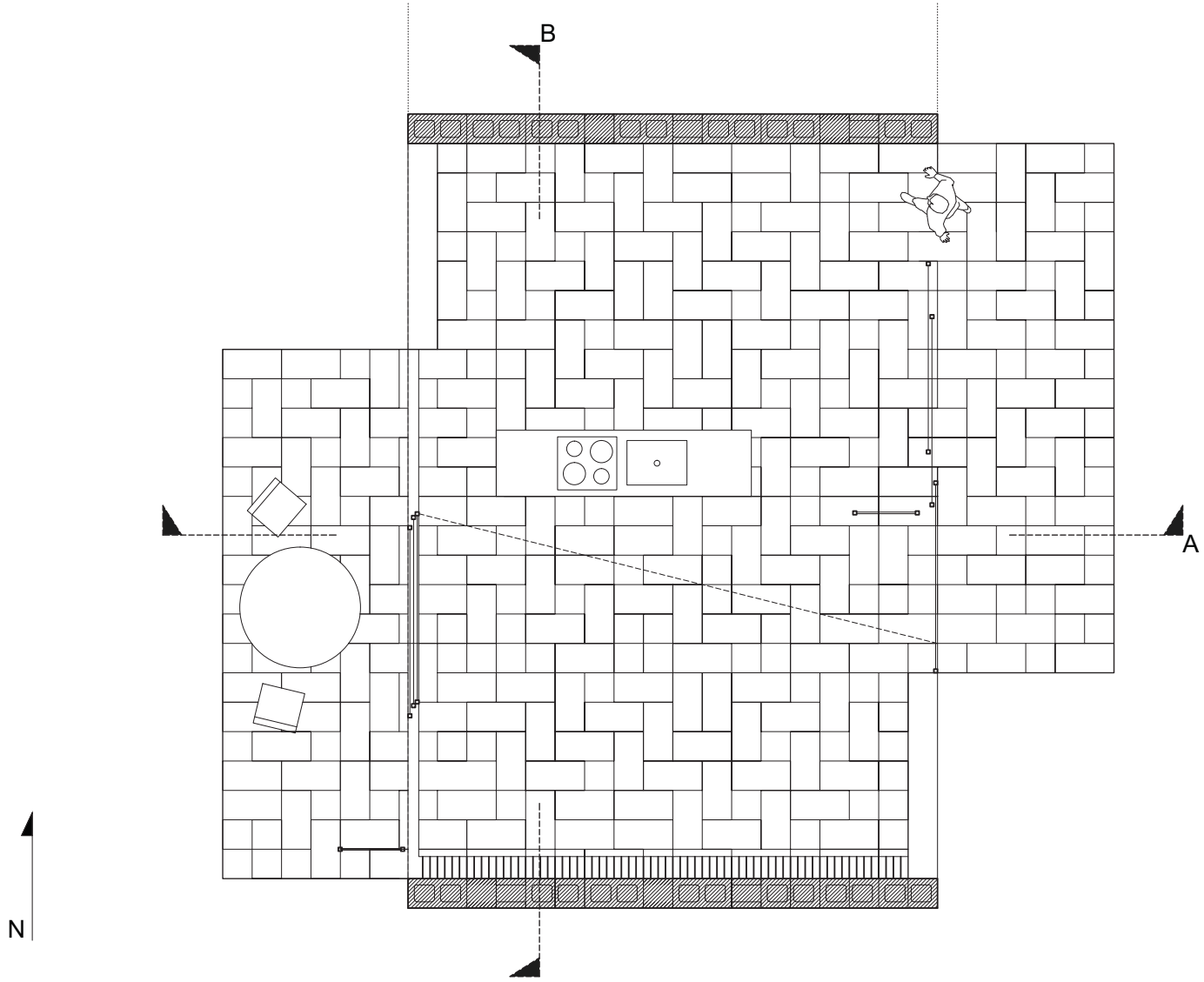




Above: Models describing wall humididor and vertical core perforation.

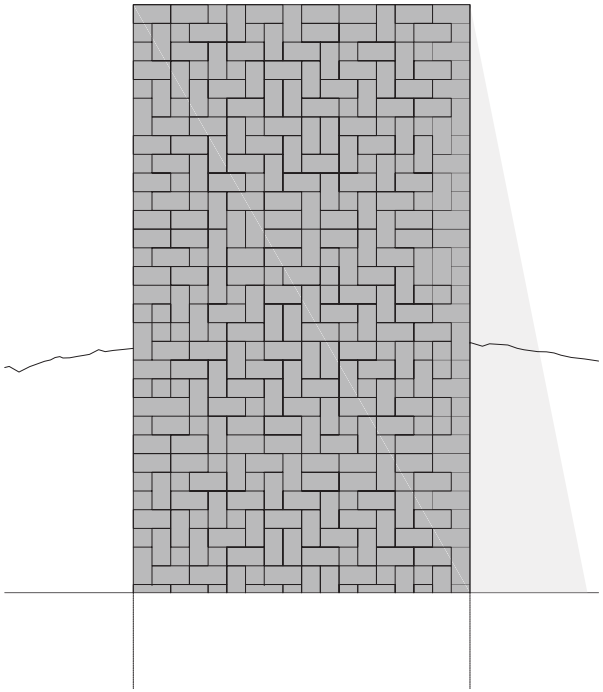
Right page: Complete study model of building.

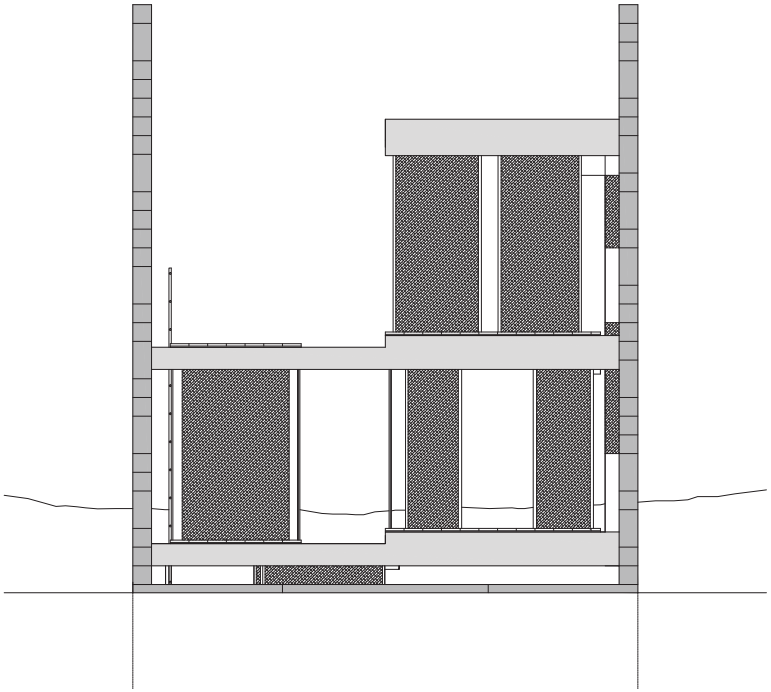


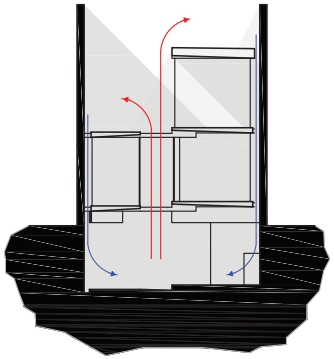


Above: Final ground plan.

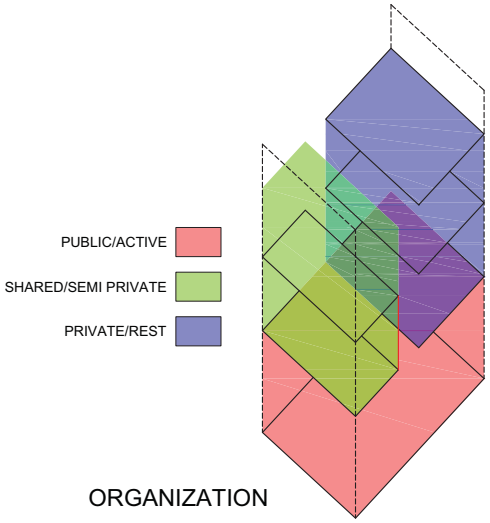
Right page: Final elevations.



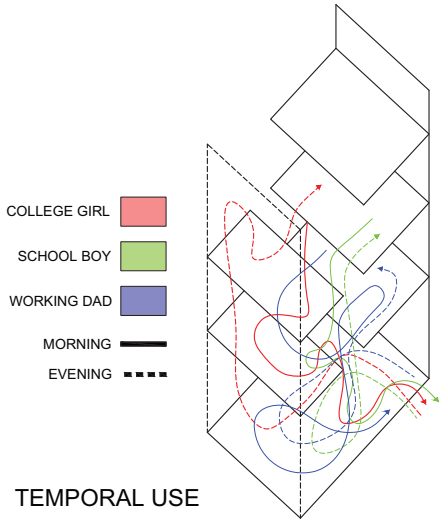




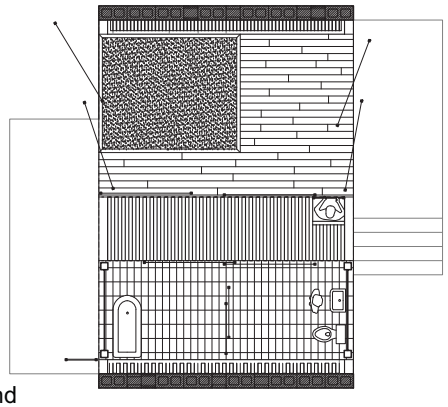
ENVIRONMENT



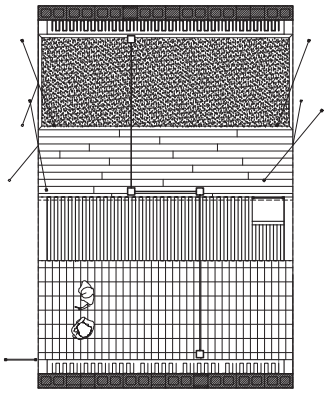
ORGANIZATION



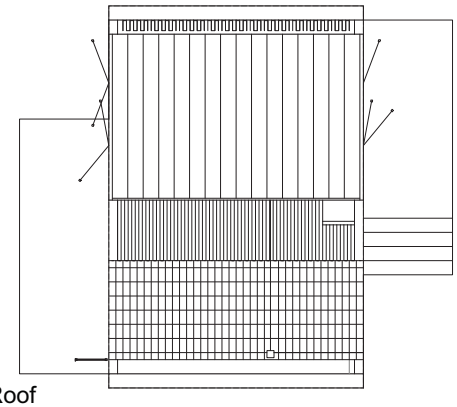
TEMPORAL USE



2nd



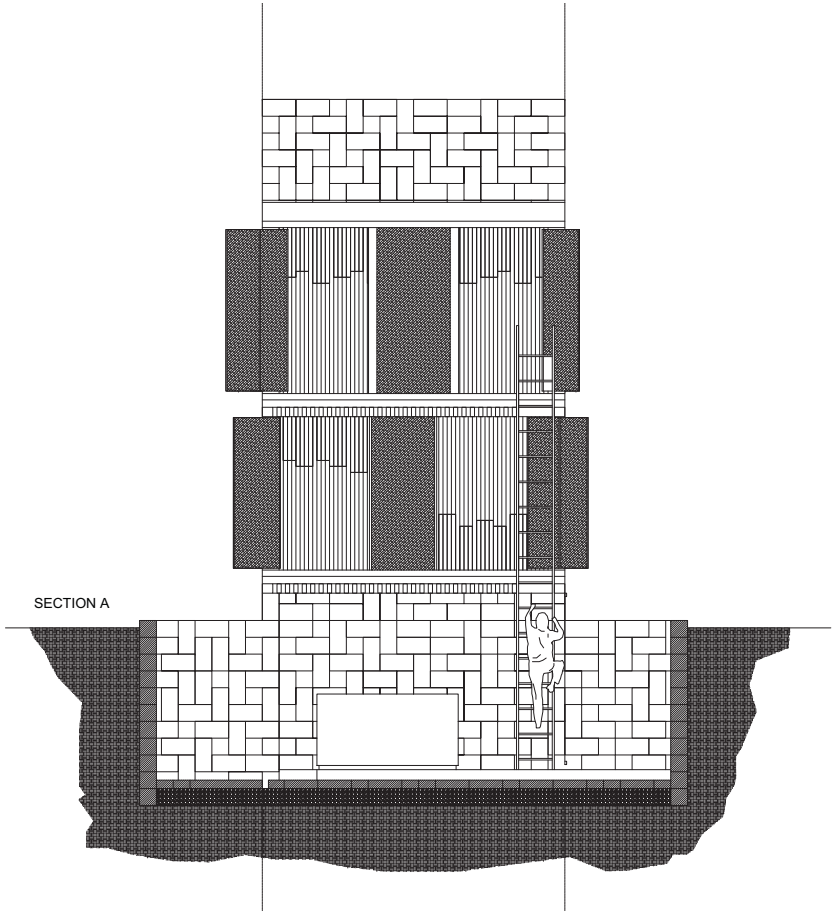
3rd



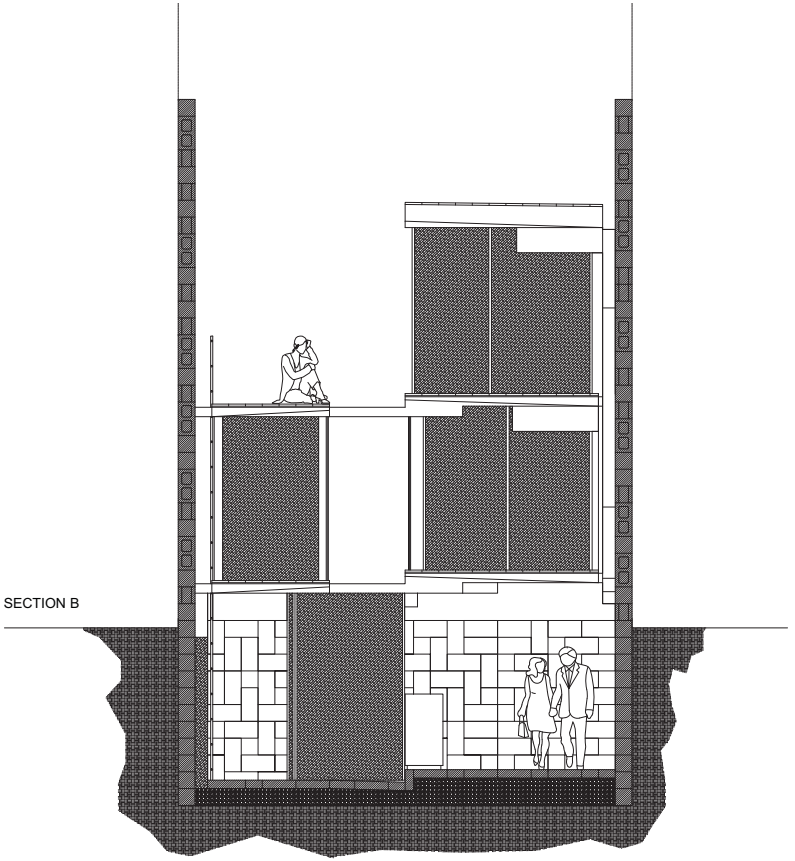
Roof

Above: Diagrams and upper floor plans.

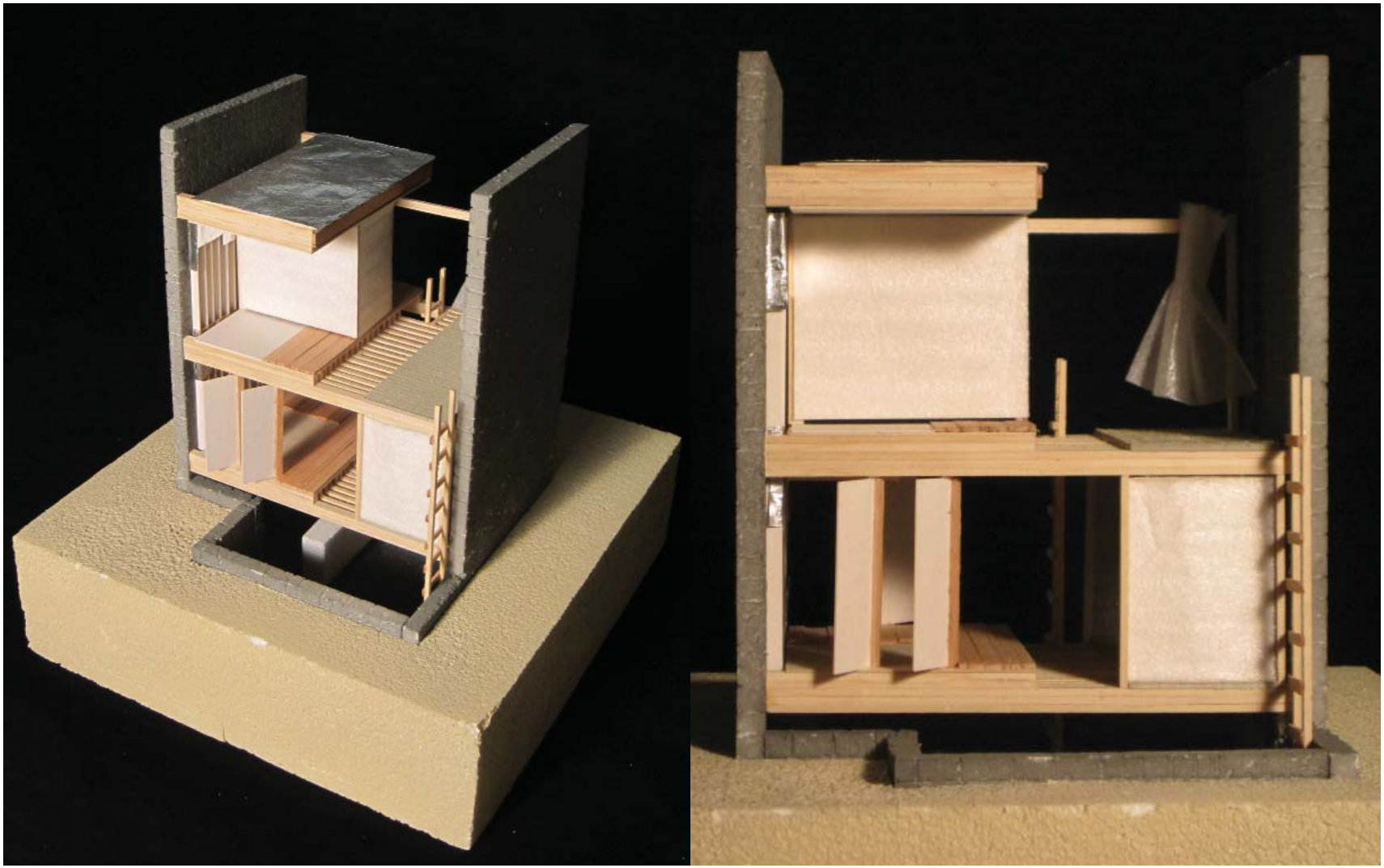
Right page: Final sections.



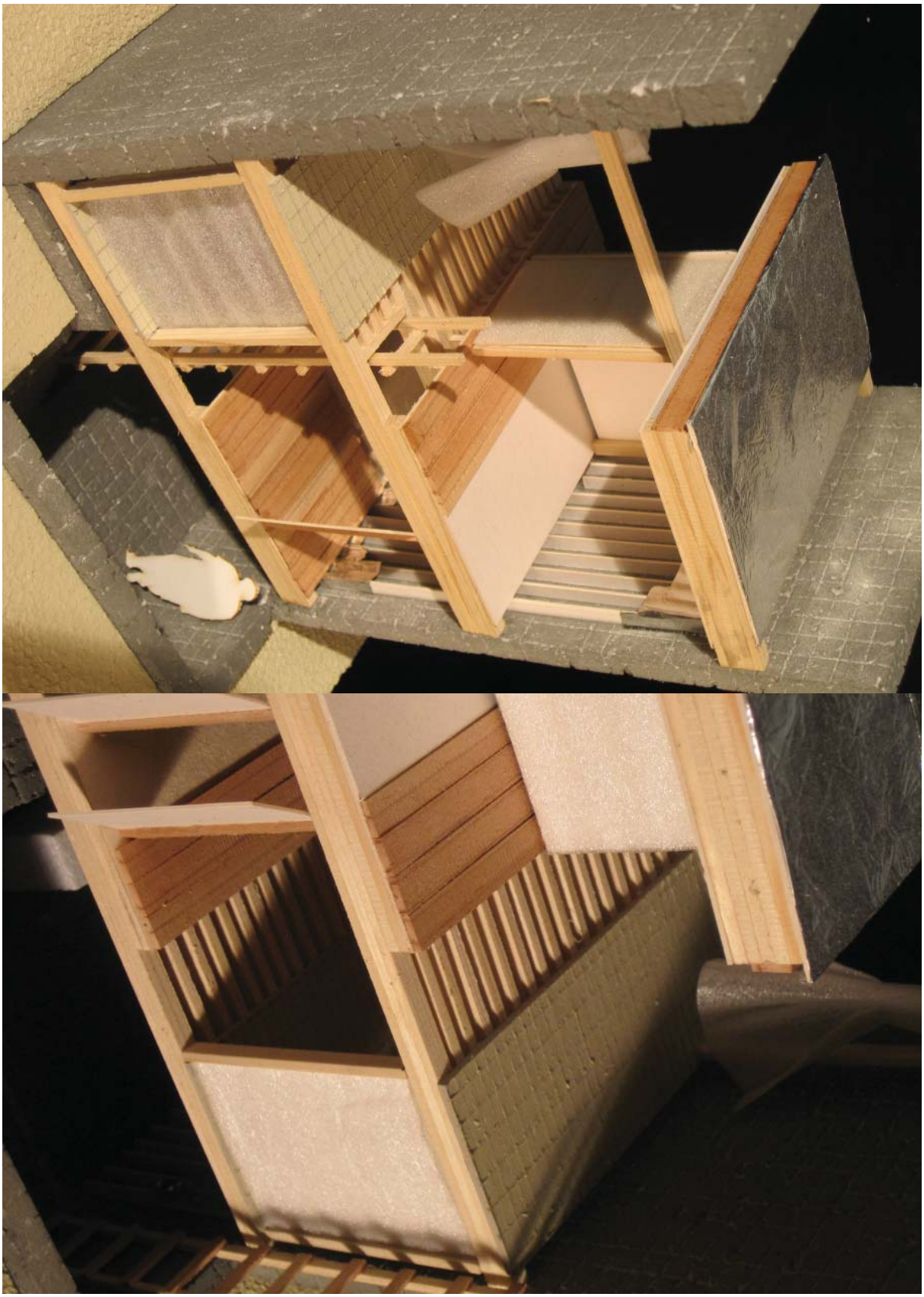
SECTION A



SECTION B



Final model.



02: NEMAUSUS

PRECEDENT STUDY

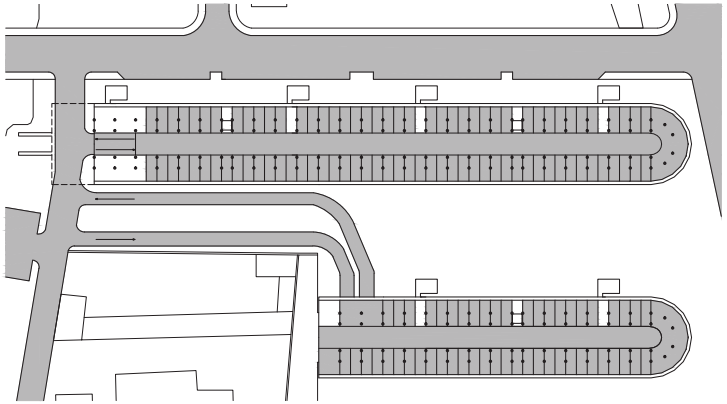
Project 2 began with the investigation of Nemausus social housing development in Nimes, France. This project is especially notable for its simple, rugged construction and use of passive sustainable strategies in its siting, materiality, and plan and sectional design.

Making use of industrial materials and prefabricated elements, the entire wall of a unit on its balcony end can be folded to the side, opening the living areas to maximum outdoor exposure in combination with operable clerestory windows lining every other level that let light and/or air in without sacrificing privacy.

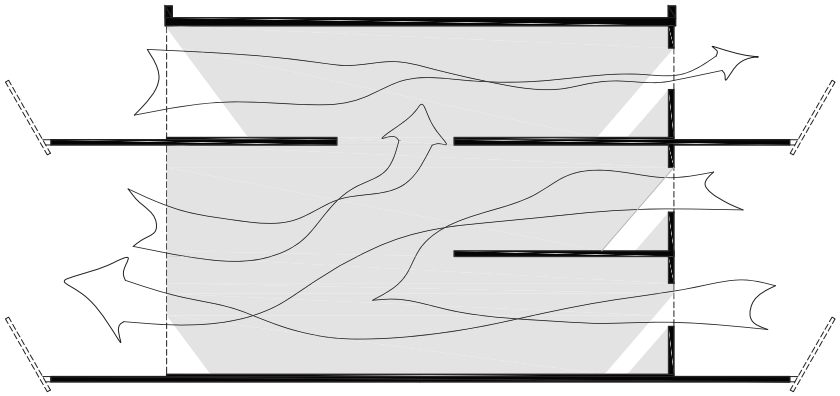
Nouvel cleverly chose to use a single-loaded entry/exit system, with the corridor and stairwell access on the Northwest side of each building in order to minimize sun exposure from the South during the day.

It is sustainable thanks to its modularity, cost-effectiveness, and ability to function like a machine. Finished in 1987, Nemausus still stands today as contemporary and sustainable as it did when originally conceived. It may not possess more advanced sustainable technologies that other newer buildings do today, but it maintains an extremely effective sustainability in its inherent spatial considerations, material strategies, and rugged simplicity.

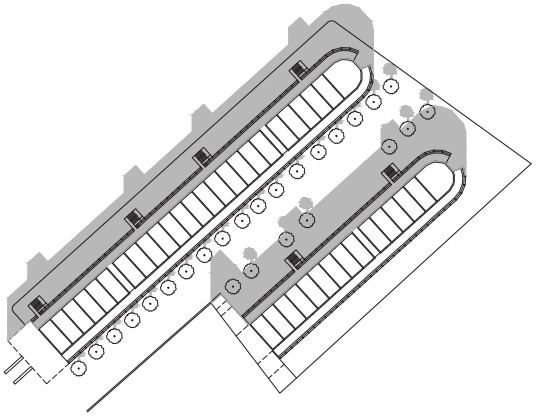
Left page: Photo documentation of building.



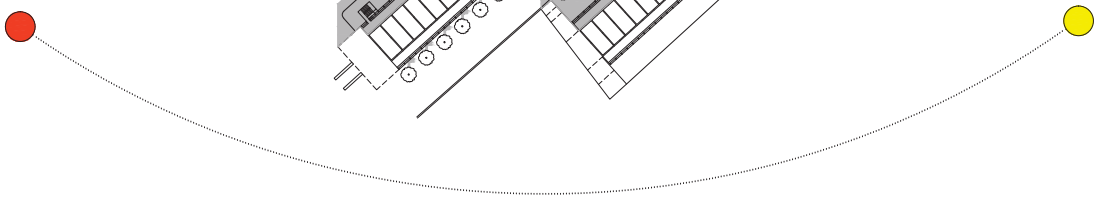
PARKING STRATEGY



AIRFLOW & LIGHT

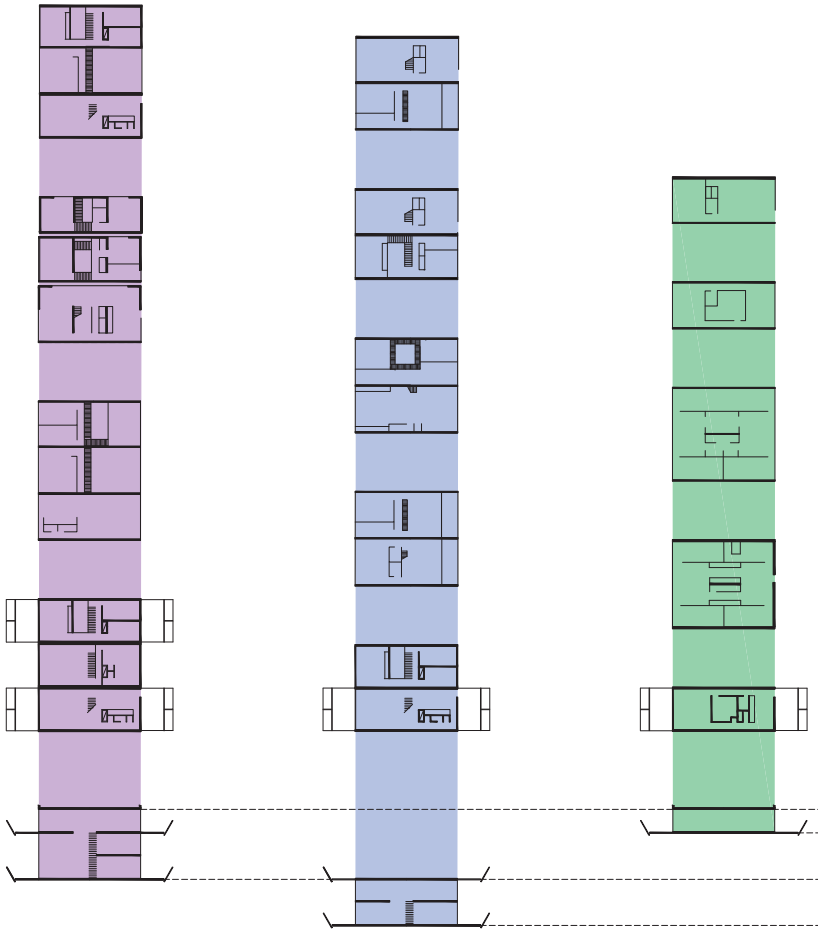


SITE ORIENTATION

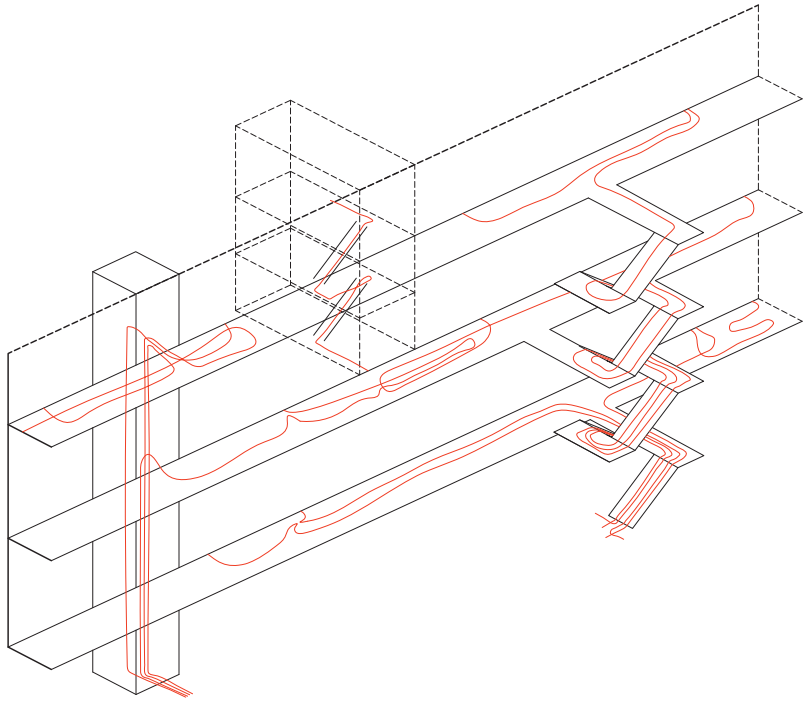


Above: Diagrams describing sustainable design and parking strategy.

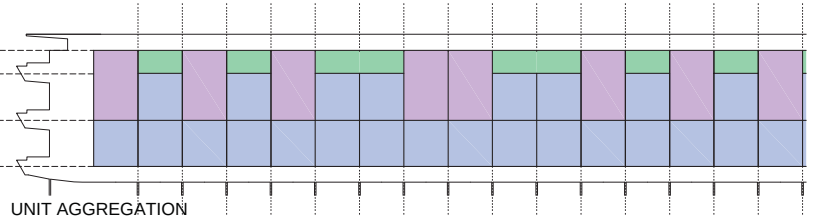
Right page: Diagrams detailing unit organization and entry system.



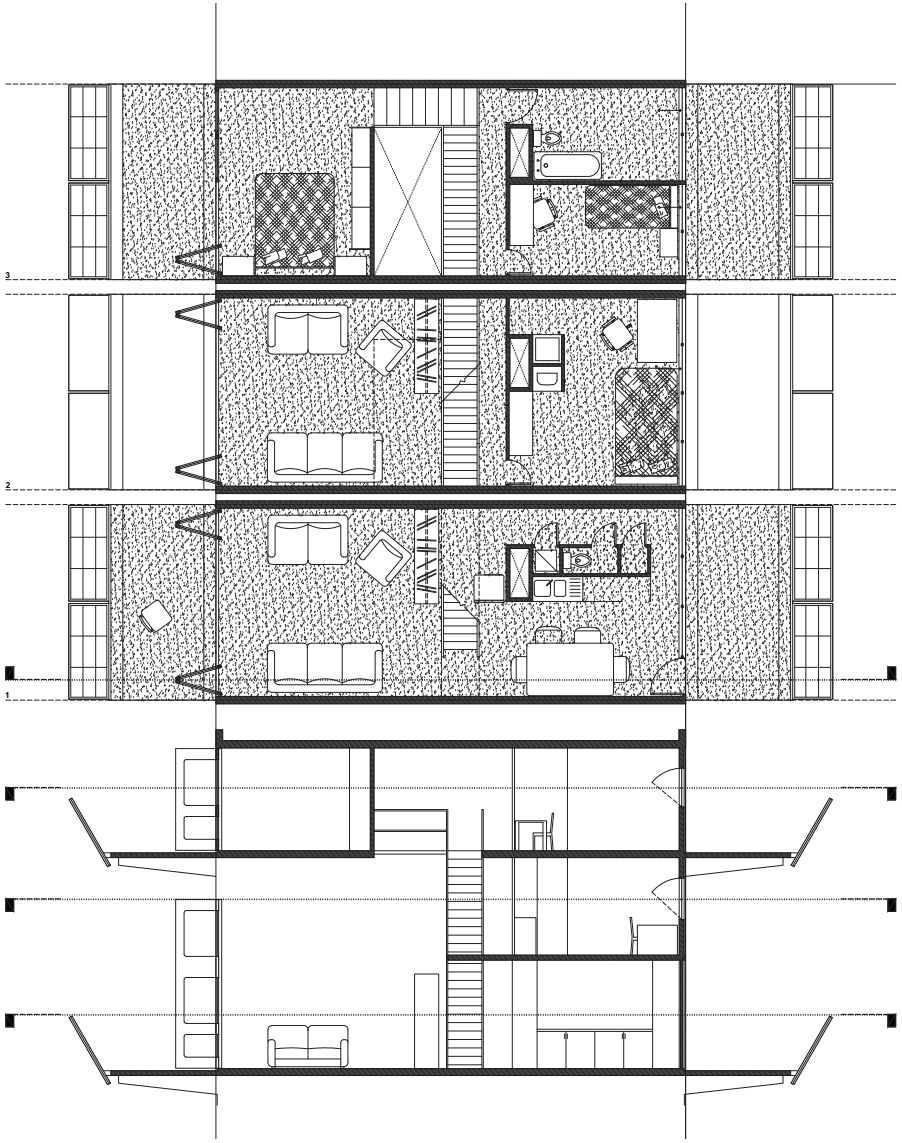
UNIT TYPES

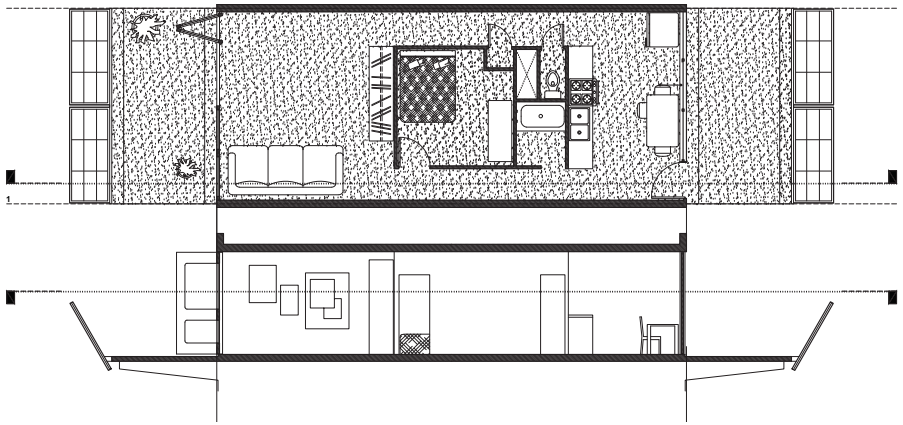


INHABITANT PATHS



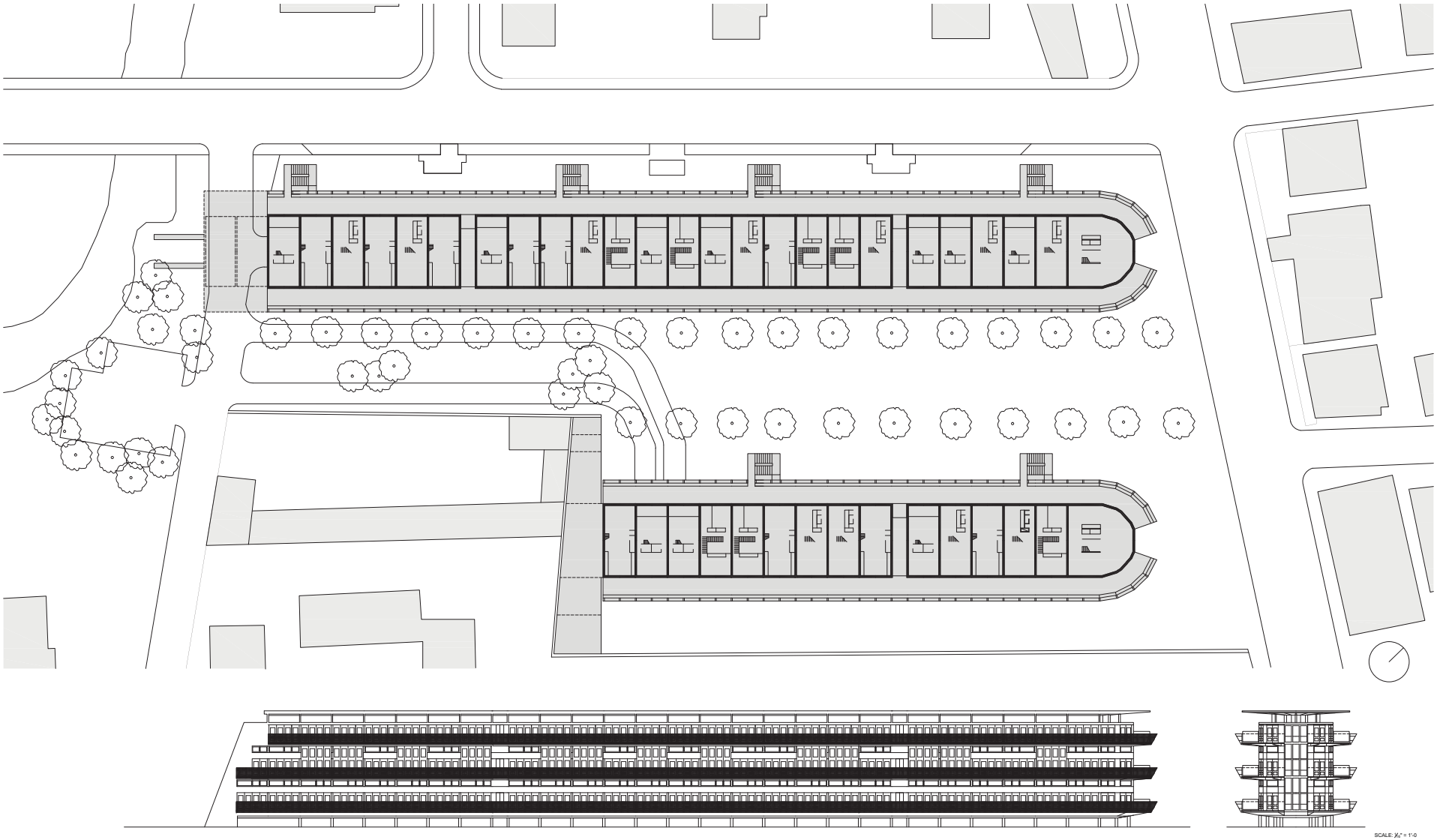
UNIT AGGREGATION





Above: Simplex and triplex plan and section.

Right page: Site plan and full elevation.



SCALE: 1/64" = 1'-0

SOLAR MANAGEMENT

NEMAUSUS 1
43.8° N
4.35° E

Nemausus is a social housing project located in Nimes, France. The single-loaded entry is placed on the Northwest side of the building, so that exterior circulation is shielded from the sun. Stacked balconies and perforated aluminum panels provide shade from direct light during when the sun is high.

DUAL FUNCTION

MOUNTAIN DWELLING
55.7° N
12.4° E

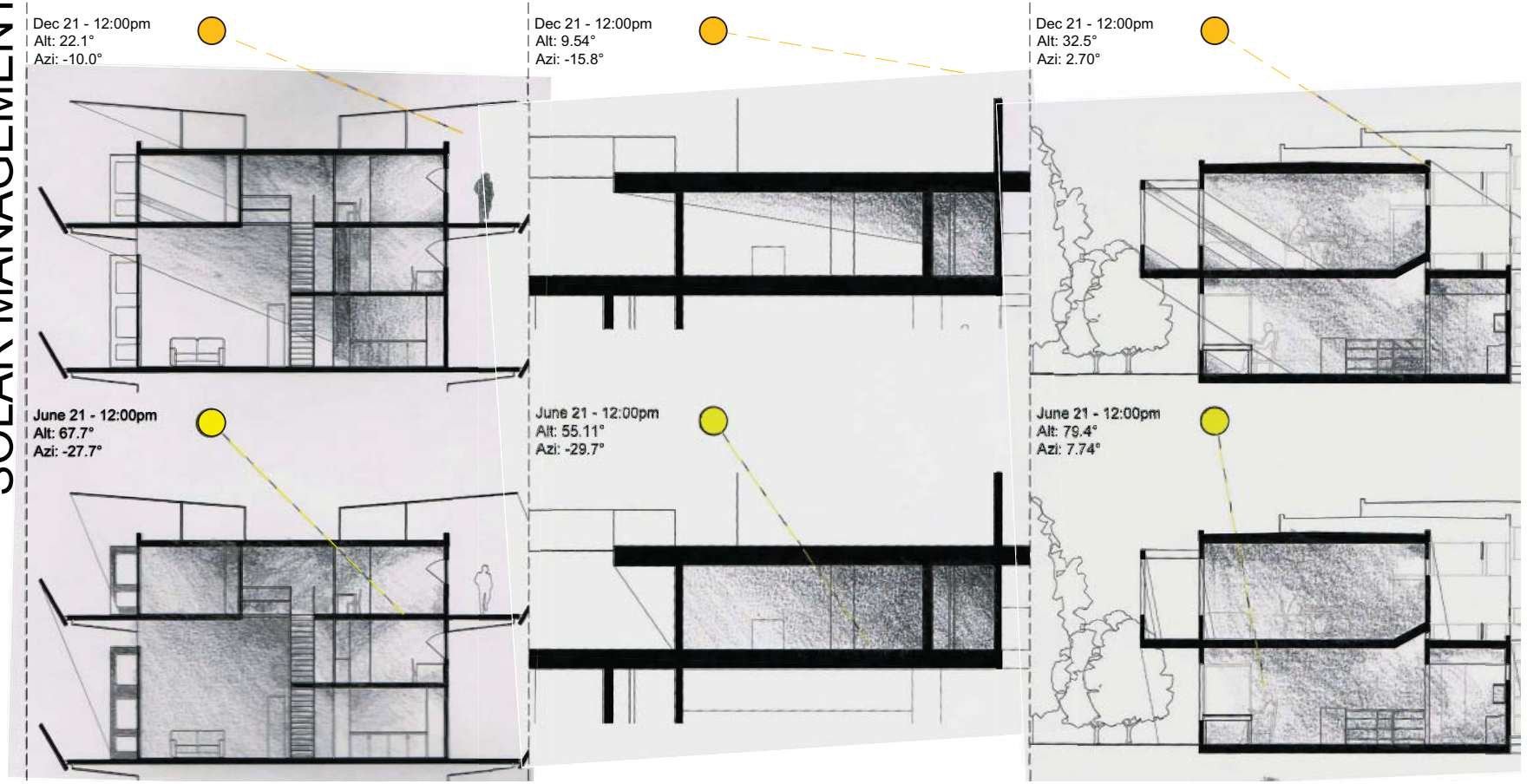
Mountain Dwelling is located in Copenhagen, where sunlight is scarce, and exposure to it is desired. A large garden patio and glass wall on the south side of each unit lets it in most directly during the AM, and allows it to enter the living room during afternoon hours.

MAXIMUM EXPOSURE

DUNSMUIR FLATS
34.0° N
118° W

Dunsmir Flats utilizes larger windows on the south side to let in light during afternoon hours. An overhanging balcony blocks direct light during the middle of the day and during summer months. As the sun lowers in the evening and the winter months, more is let into the space.

DYNAMIC SHADING

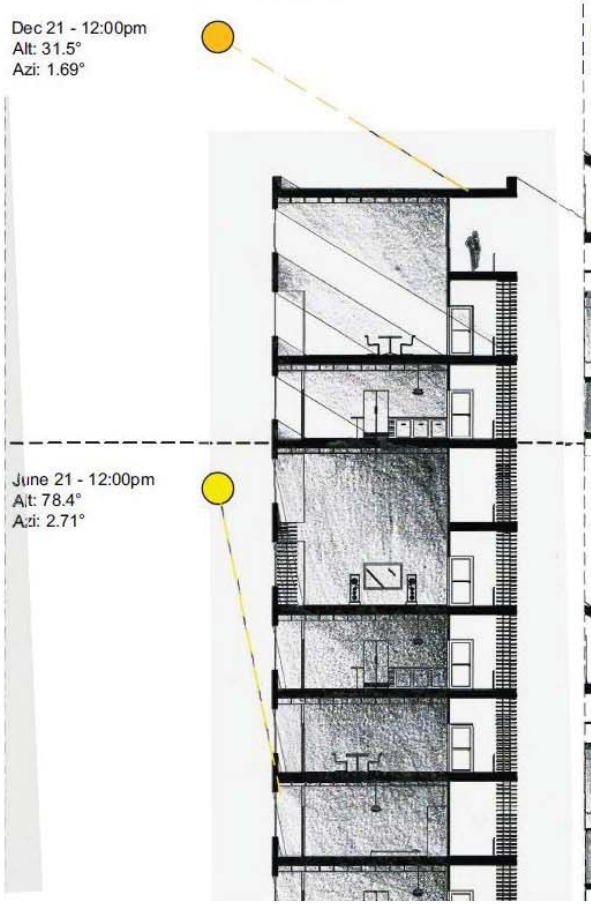


Part B: Analysis of solar shading methods and effect in various precedents

GIFU KITAGAWA 35.0° N 136° E

This compartmentalized, modular apartment building utilizes single load access on the shaded North side of the building, and lets light filter into each modular unit from the South side, where a common circulation corridor is placed in every unit.

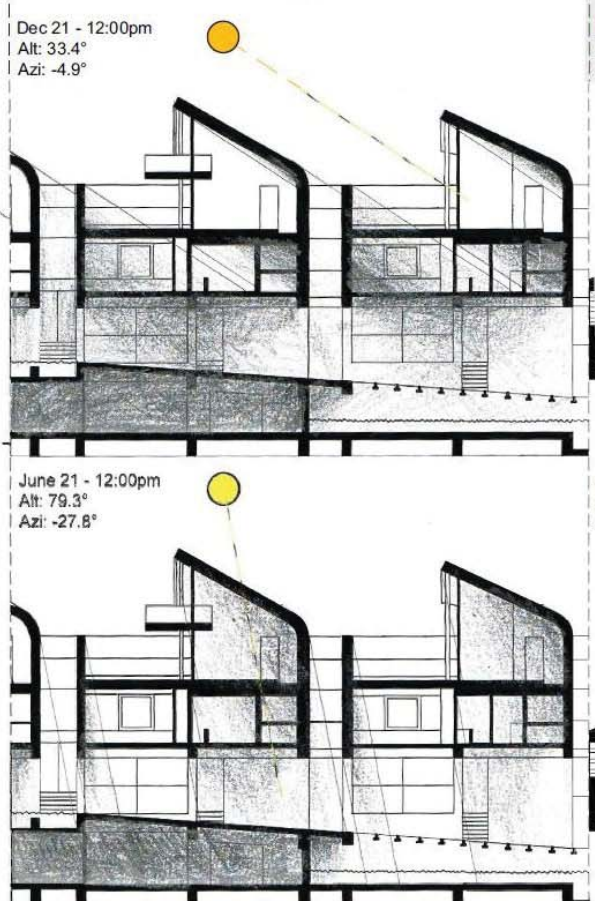
ONE-WAY



NEXUS WORLD HOUSING 33.0° N 130° E

Located in Japan, this South oriented building uses concave shell-like forms and vertical shafts to soften and diffuse the Southern light, and gently filter it down into the living spaces. A large central void in each unit and large balcony openings allows the light to enter each room.

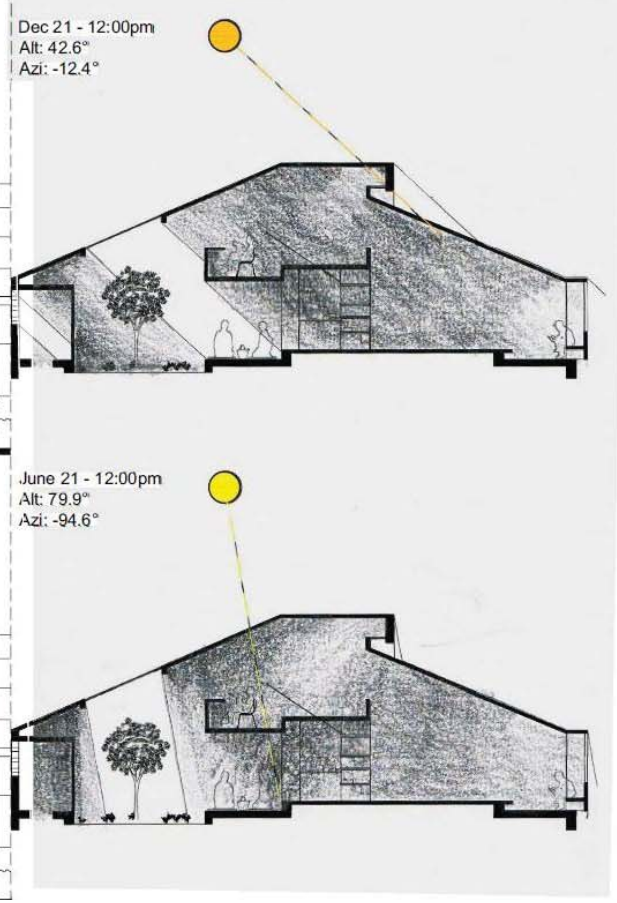
DIFFUSED



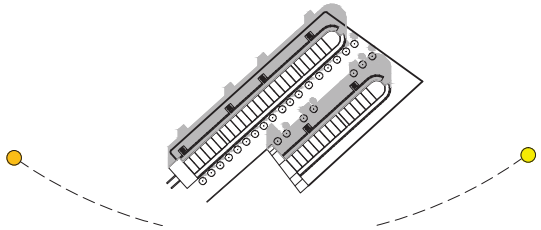
TUBE HOUSE 23.0° N 72.0° E

The tube house features a large skylight providing direct sunlight for an indoor garden, and blocks the rest of the unit from any direct sunlight. Windows on the ends let in some light, but mostly air, and some heavily diffused, soft light filter in through the air vent in the ceiling.

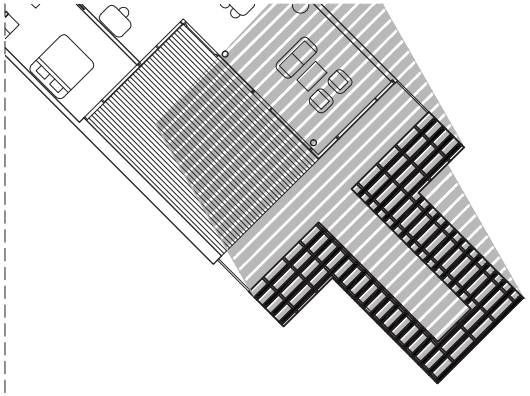
MINIMAL EXPOSURE



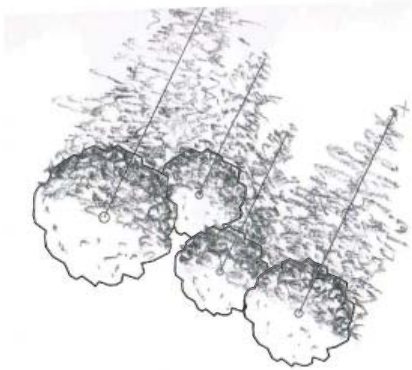
ACTIVITY vs. REST



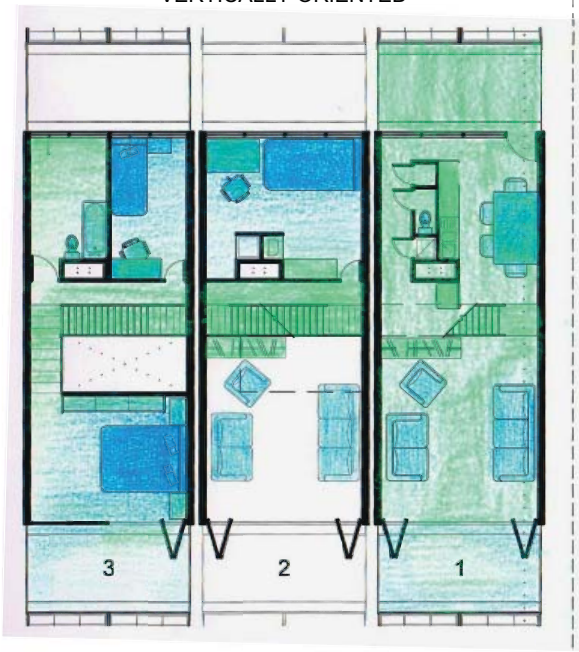
VERTICALLY ORIENTED

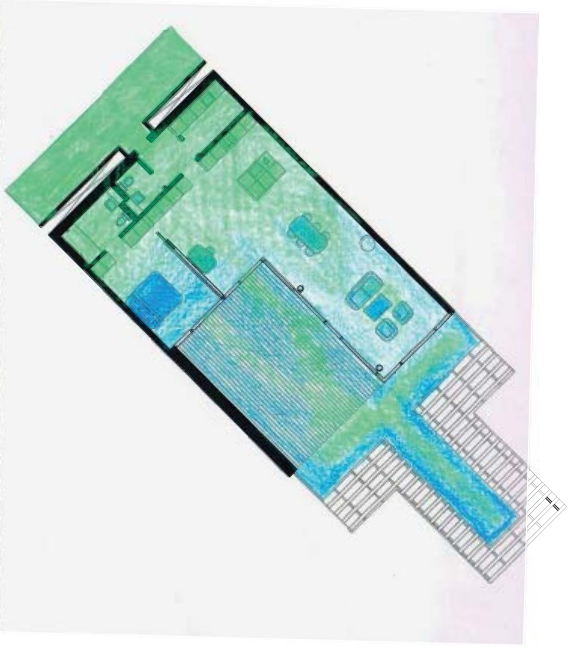


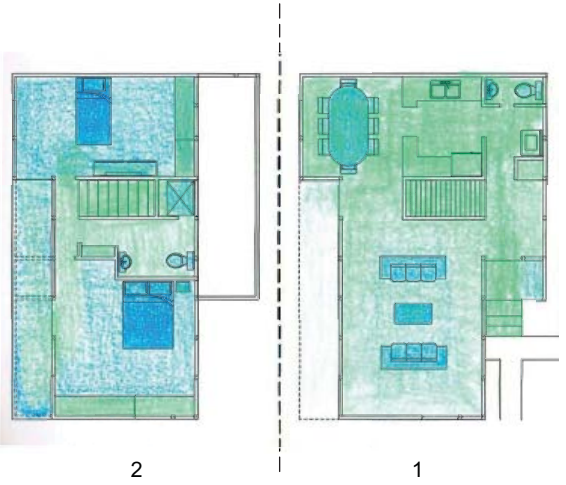
GRADIENT



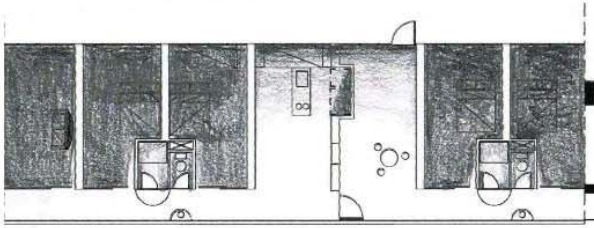
SPLIT



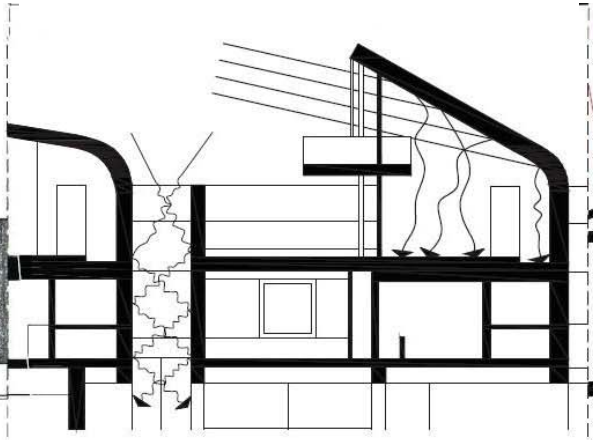




Part B: Solar analysis in plan and gradient representation of temporal activity vs. rest.



COMPARTMENTALIZED



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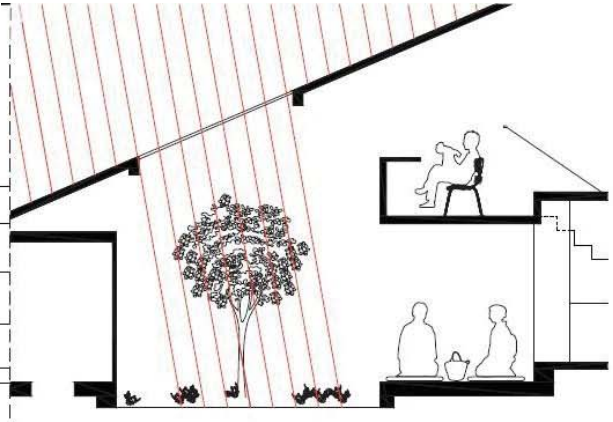
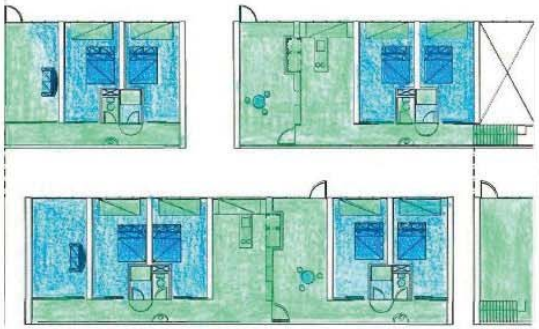
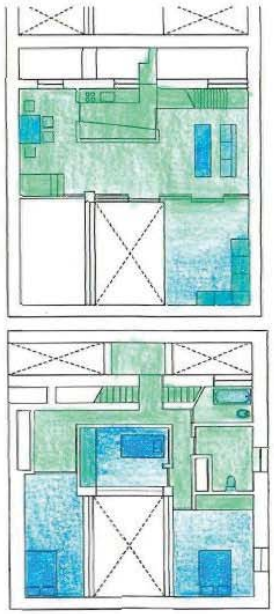


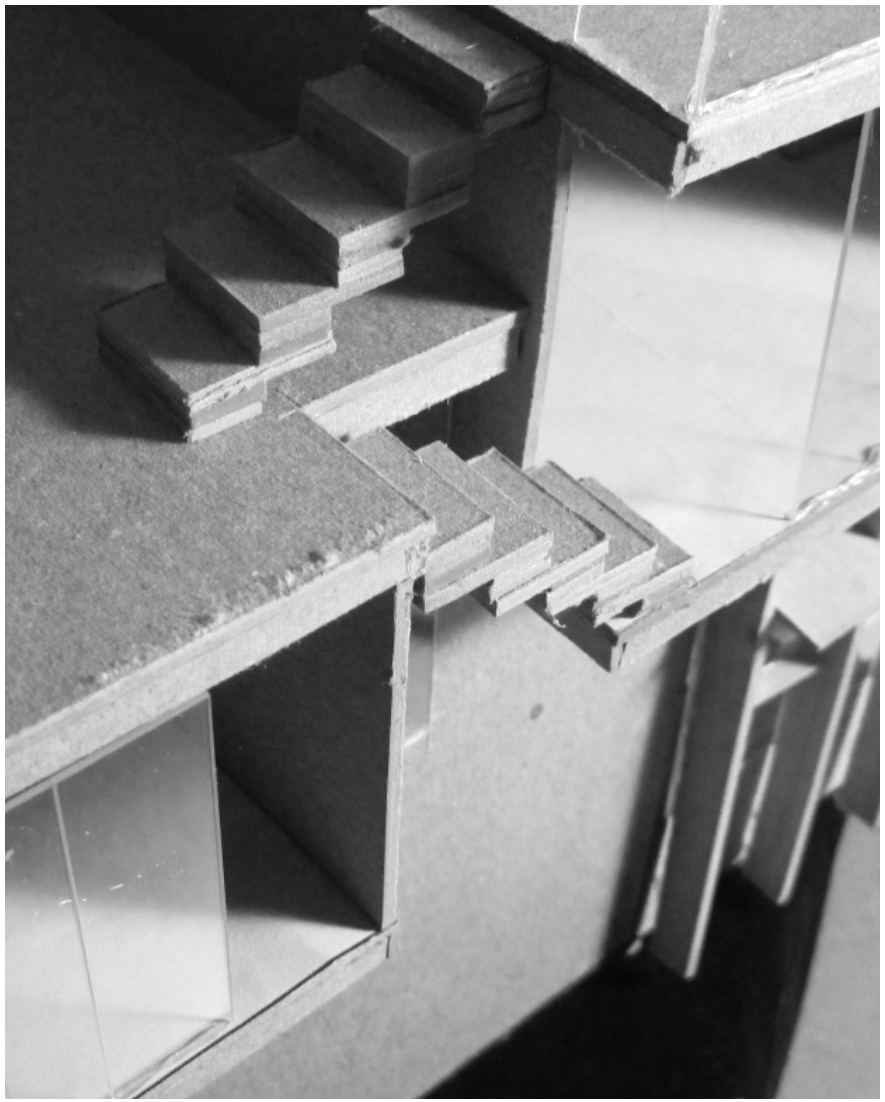
MIXED



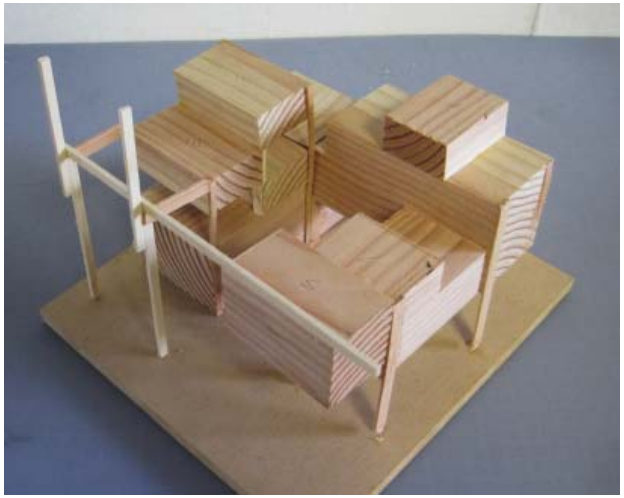


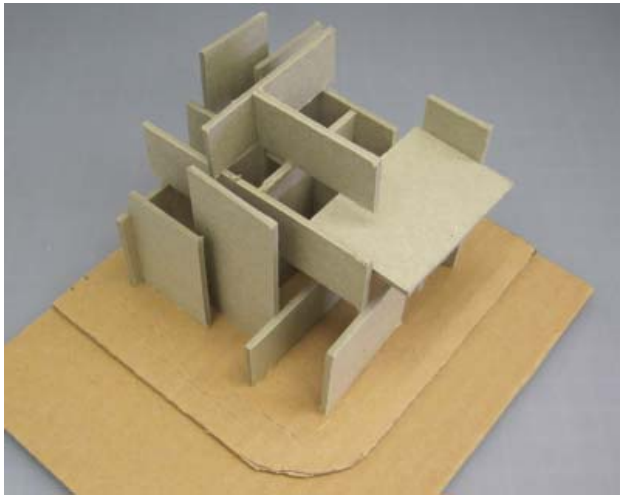
aaron mick - chelsey koenig

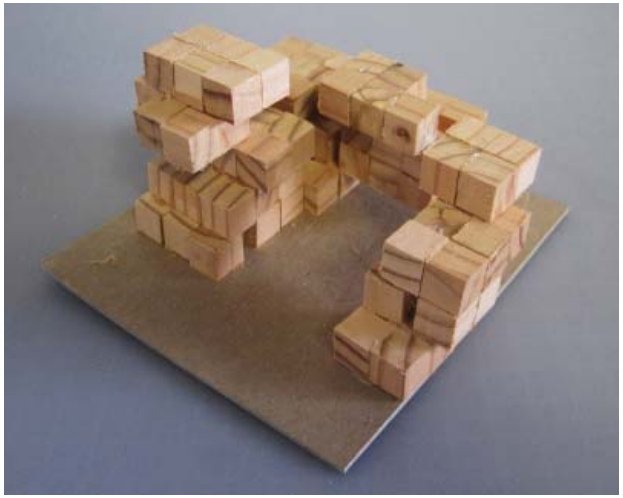
03: HOPE CORNER



SOUTH PASADENA DEVELOPMENT



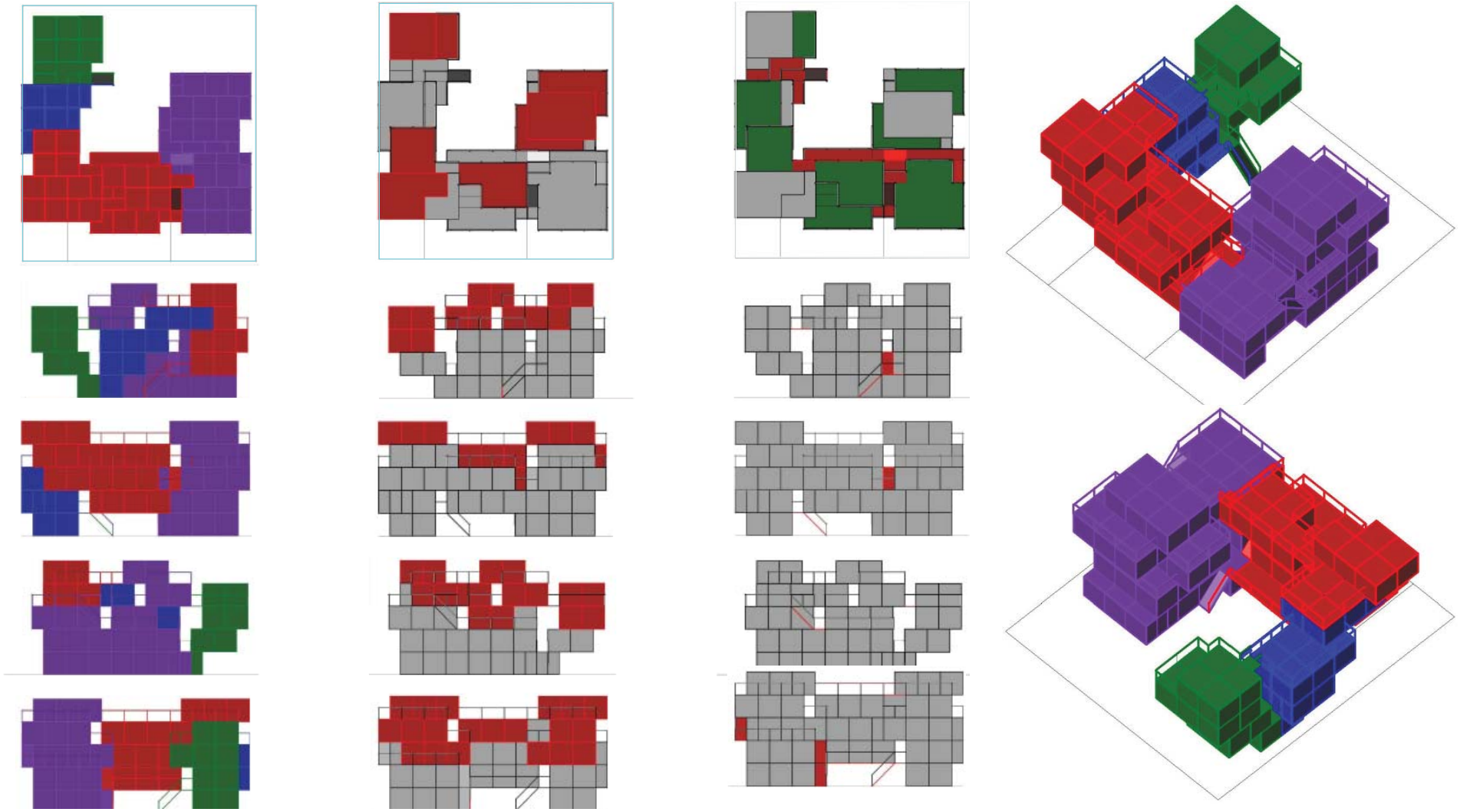




Project 3 aims to create a innward focused gathering space, a courtyard, around which a variety of unique unit types are constructed. Each unit varys in number of occupants, as well as orientation. However, all units open onto a common space, and possess passive sustainable design feautres (such as cross and stack ventilation, and variable width horizontal and vertical shading devices on windows).

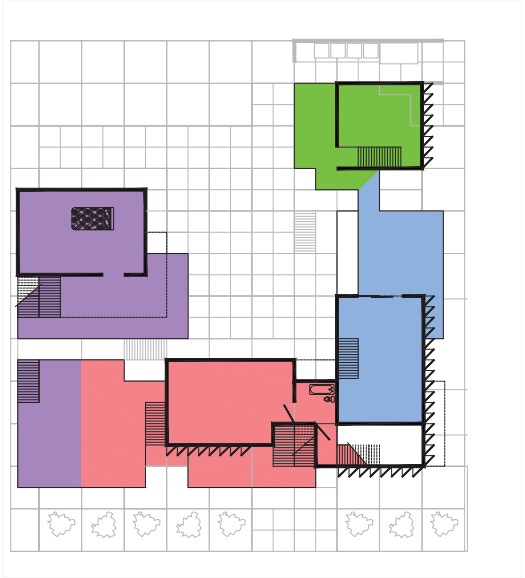
An intuitive split-level sectional devlopment employs the use of a spiral-like interior pathway of circulation, allowing users to transition naturally and smoothly between levels and spaces without the need for ambulating toward a central stair set or core. This allows more free-flowing circulation between spaces, and creates a narrative-like dialouge between spaces and reinforces thier connections to each other while still maintaining effecient mobility for occupants.

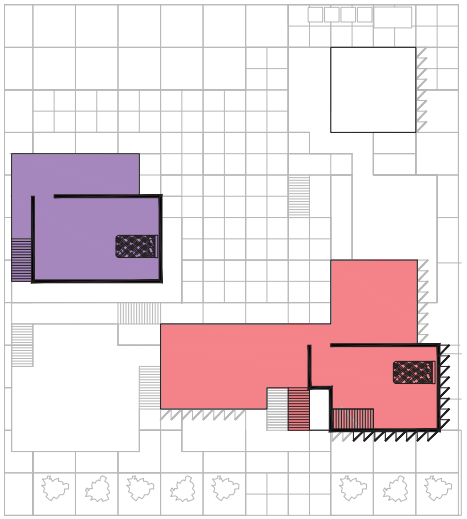
Left page: Preliminary parti massing development

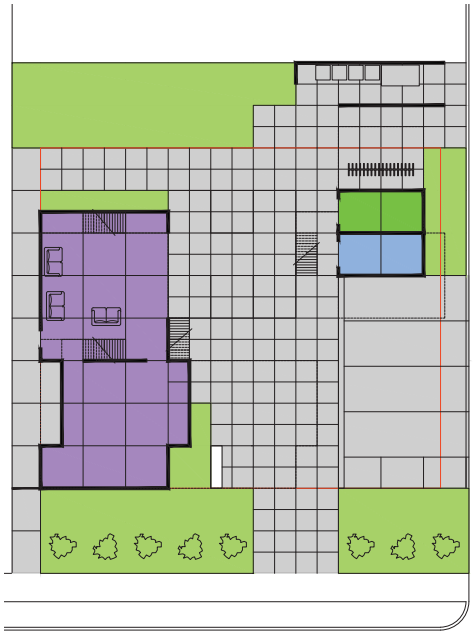


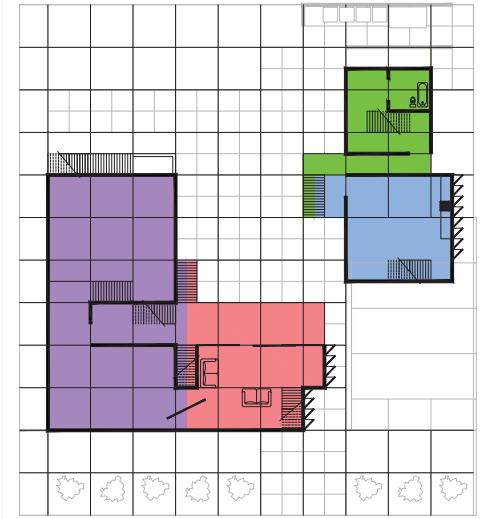
Above: 1st parti model in Rhino and plans.

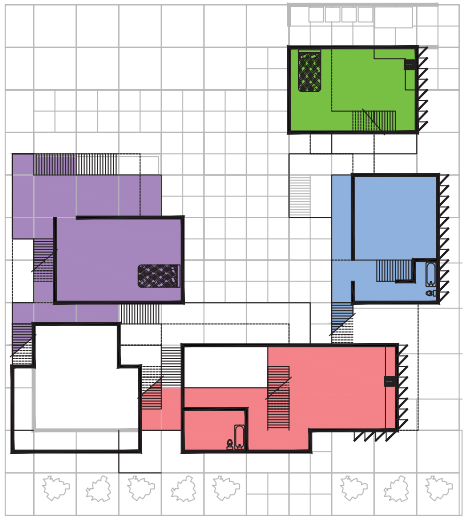
Right page: 2nd parti plans..

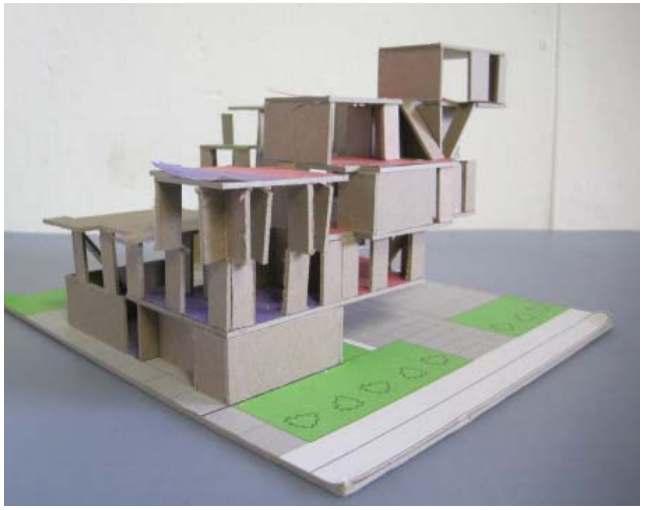


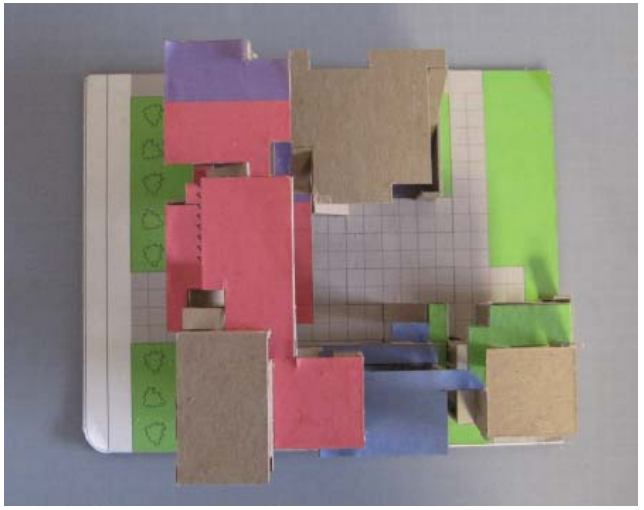






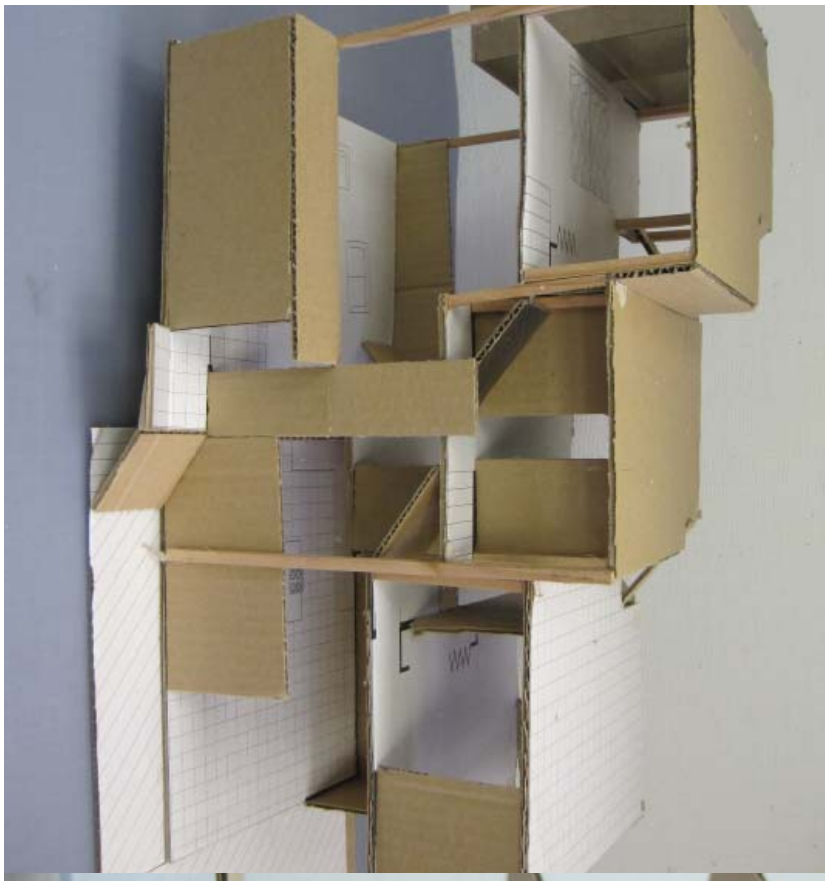


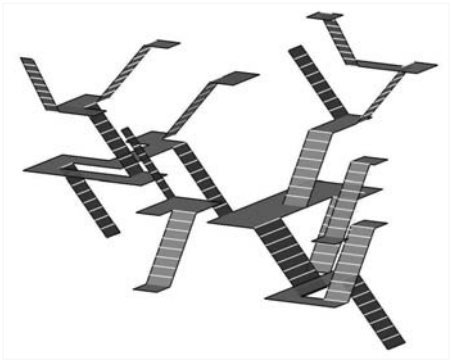


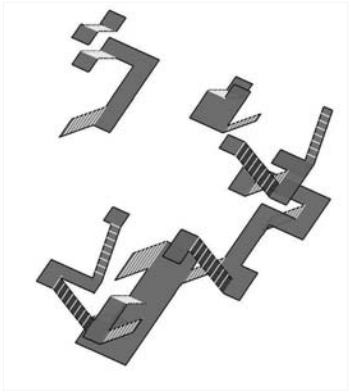


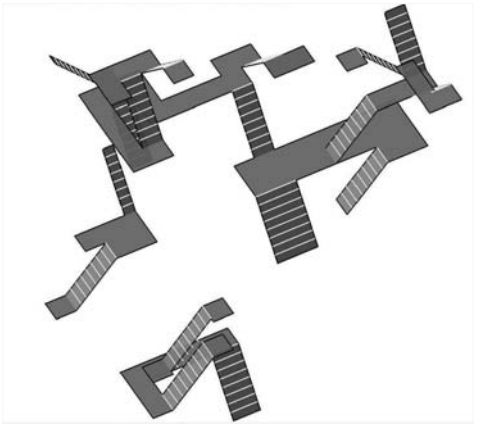
Above: 2nd parti model with massing and apertures.

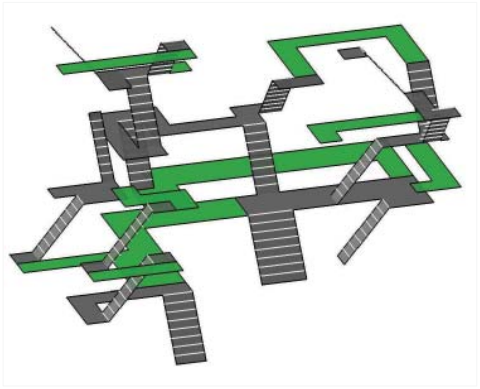
Right page: Parti model for 3 bedroom unit.

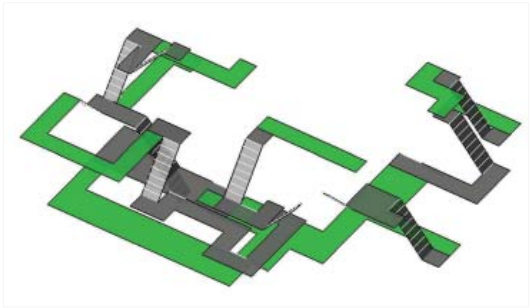


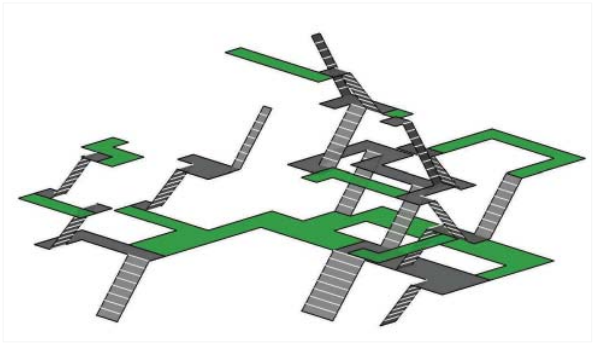








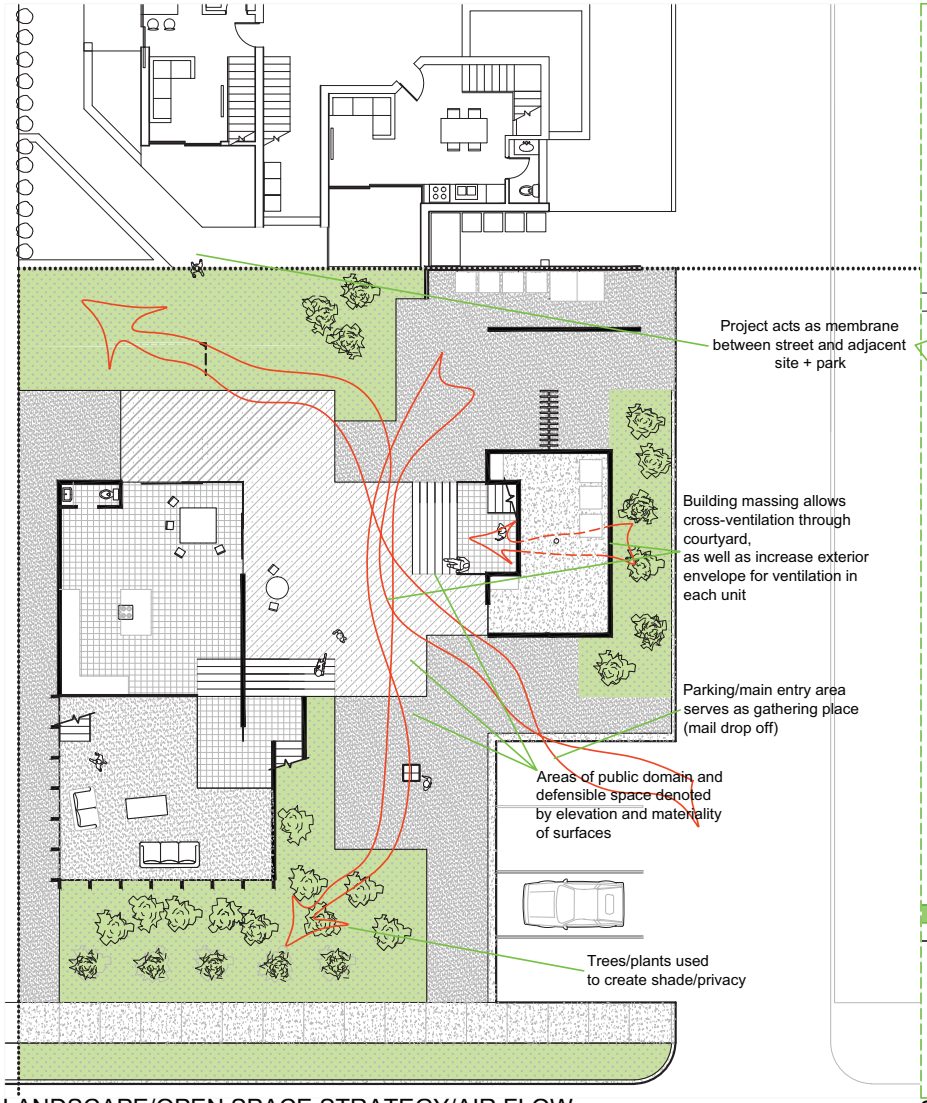




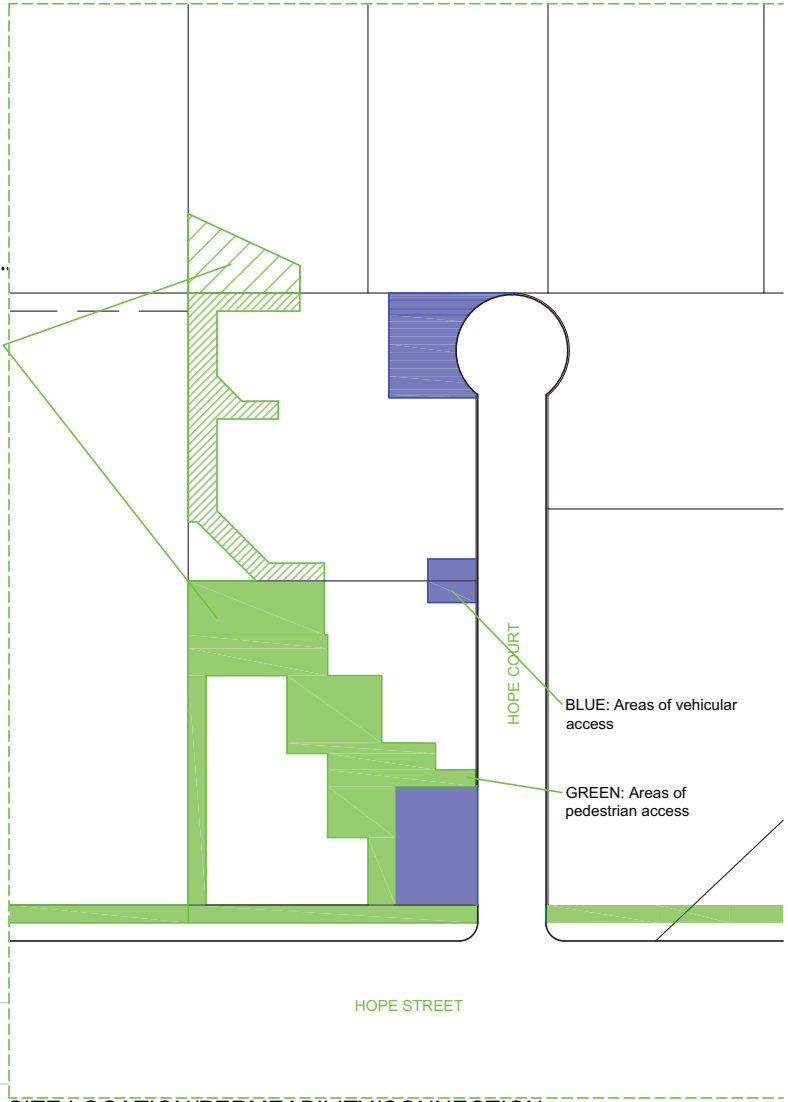
Above: Isometric diagrams outlining revised circulation system.

Right page: Updated Rhino model showing solar shading system.

Project 3 in South Pasadena utilizes strategies involving building massing, stack ventilation, natural lighting, and programmatic organization in order to achieve passive cooling and ventilation, as well as connect the project to the surrounding neighborhood and engage the adjacent sites. Variation in shading device type, placement of apertures and openings in the building envelope, and programming of space within each unit are designed to keep occupants cool during the day, warm during the night, and still allow desirable views and natural lighting to occur.



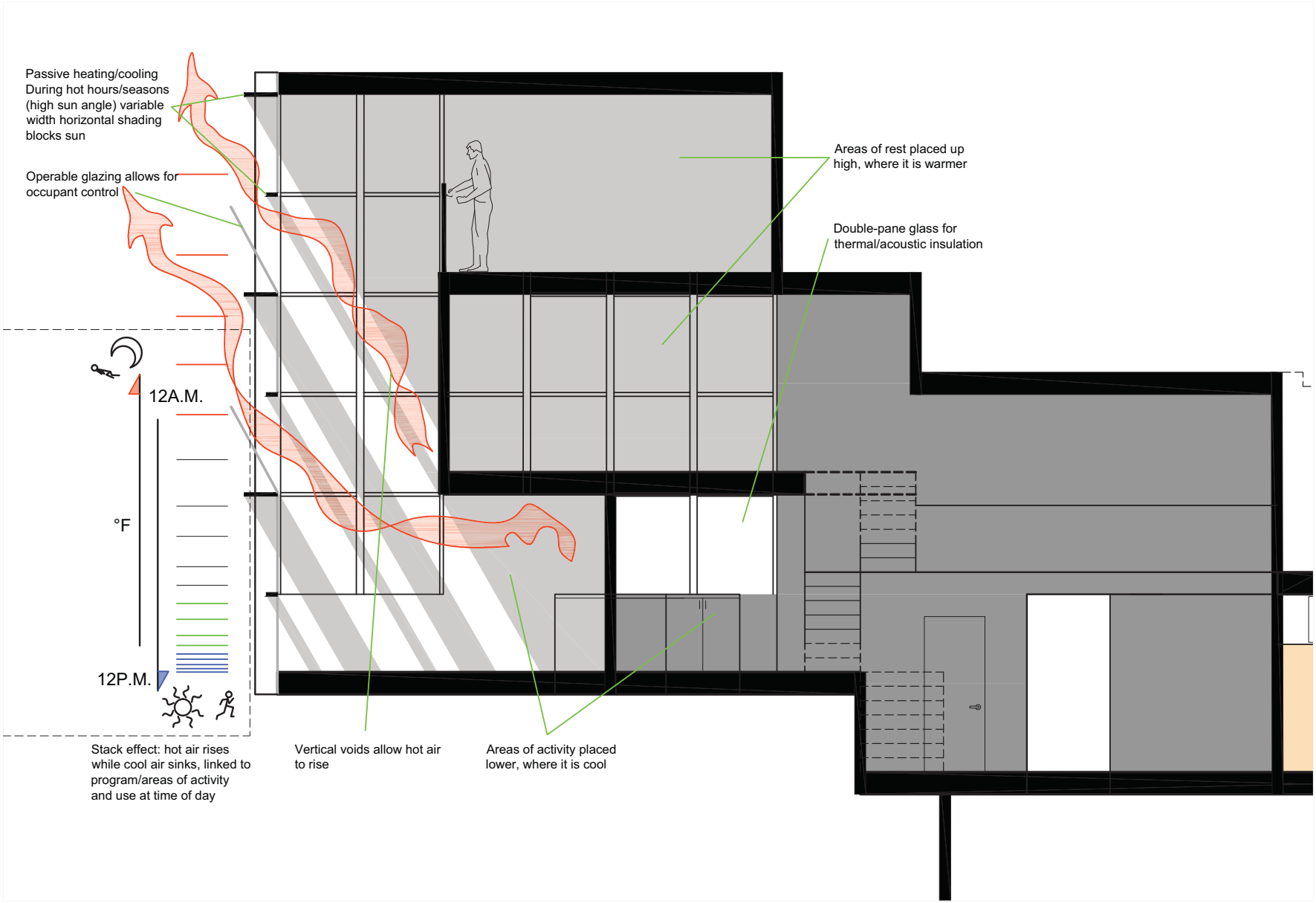
LANDSCAPE/OPEN SPACE STRATEGY/AIR FLOW

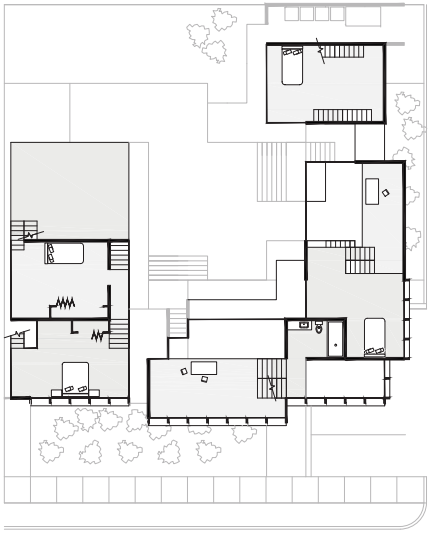


SITE LOCATION/PERMEABILITY/CONNECTION

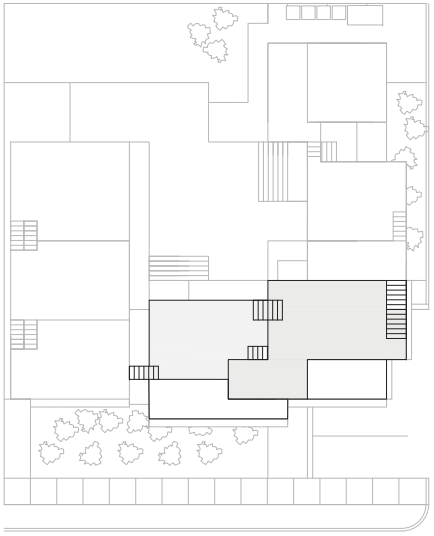
Above: Ground level (floors 1-2) in plan and sustainabile strategies in plan.

Right page: Sustainable strategies in section.

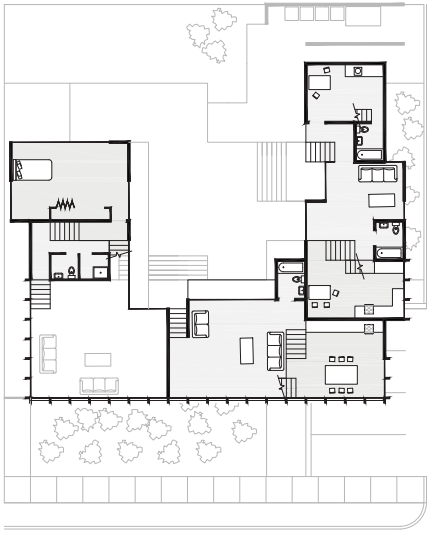

Passive heating/cooling
During hot hours/seasons
(high sun angle) variable
width horizontal shading
blocks sun
Operable glazing allows for
occupant control
Areas of rest placed up
high, where it is warmer
Double-pane glass for
thermal/acoustic insulation
12A.M.
°F
12P.M.
Stack effect: hot air rises
while cool air sinks, linked to
program/areas of activity
and use at time of day
Vertical voids allow hot air
to rise
Areas of activity placed
lower, where it is cool



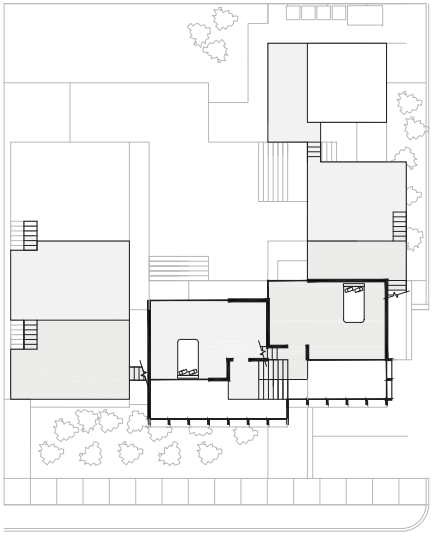
LEVELS 5-6



LEVELS 9-10



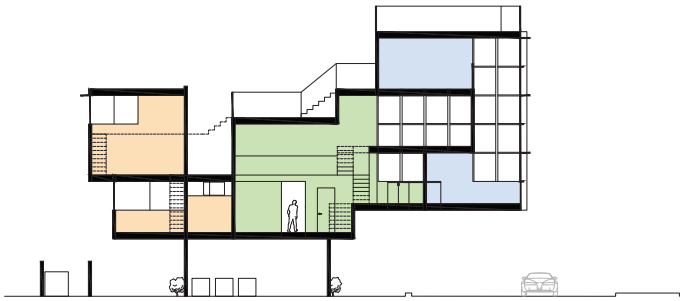
LEVELS 3-4



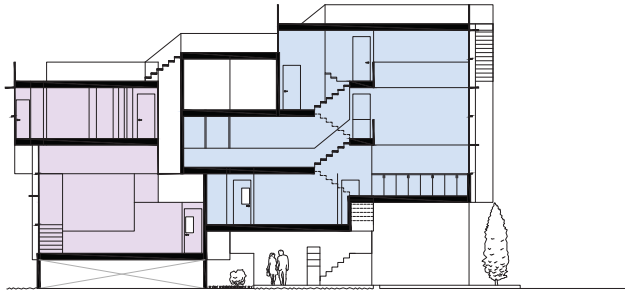
LEVELS 7-8

Above: Final plans, levels 3-10.

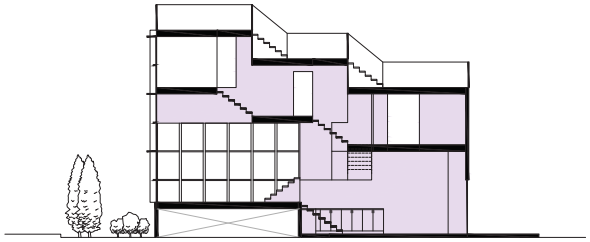
Right page: Final building sections and elevations.



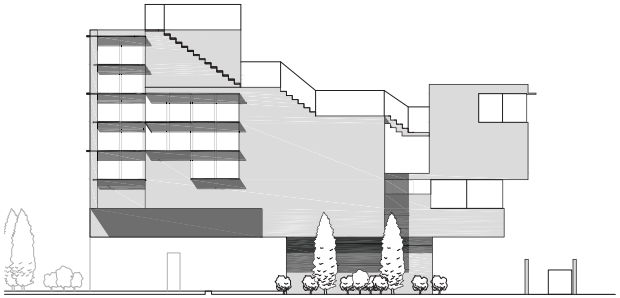
SECTION A ⅛"=1'-0



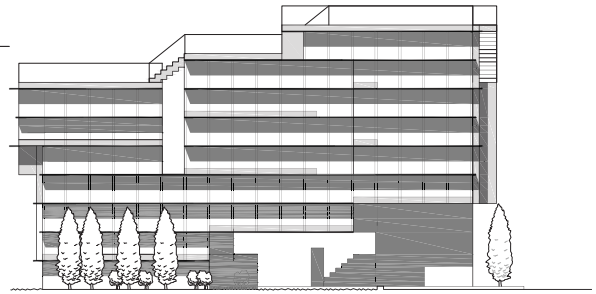
SECTION B



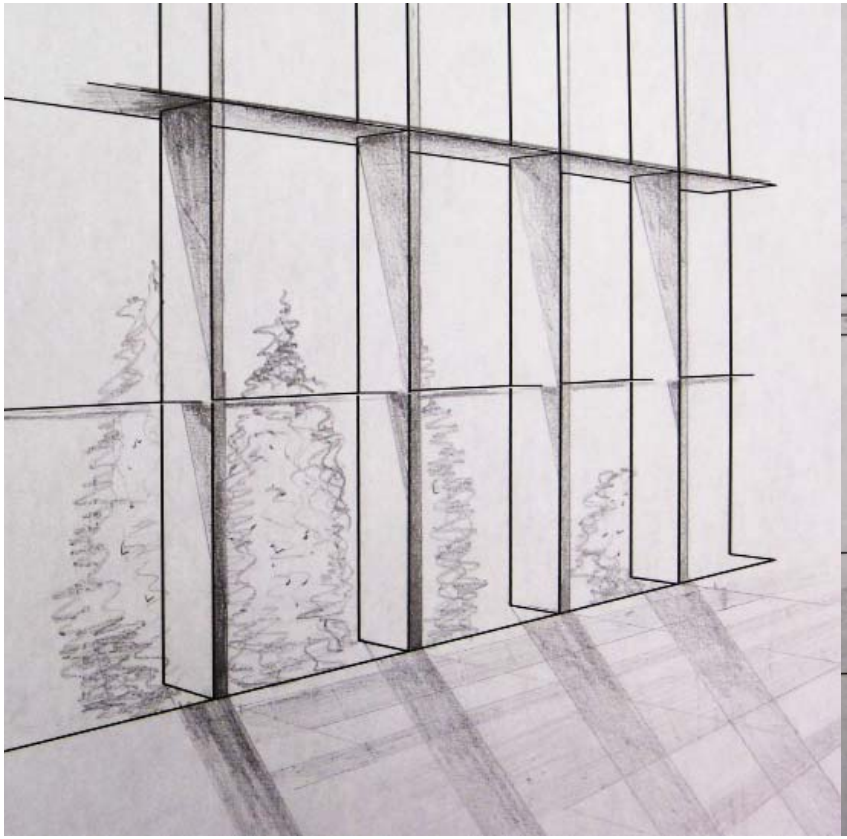
SECTION C

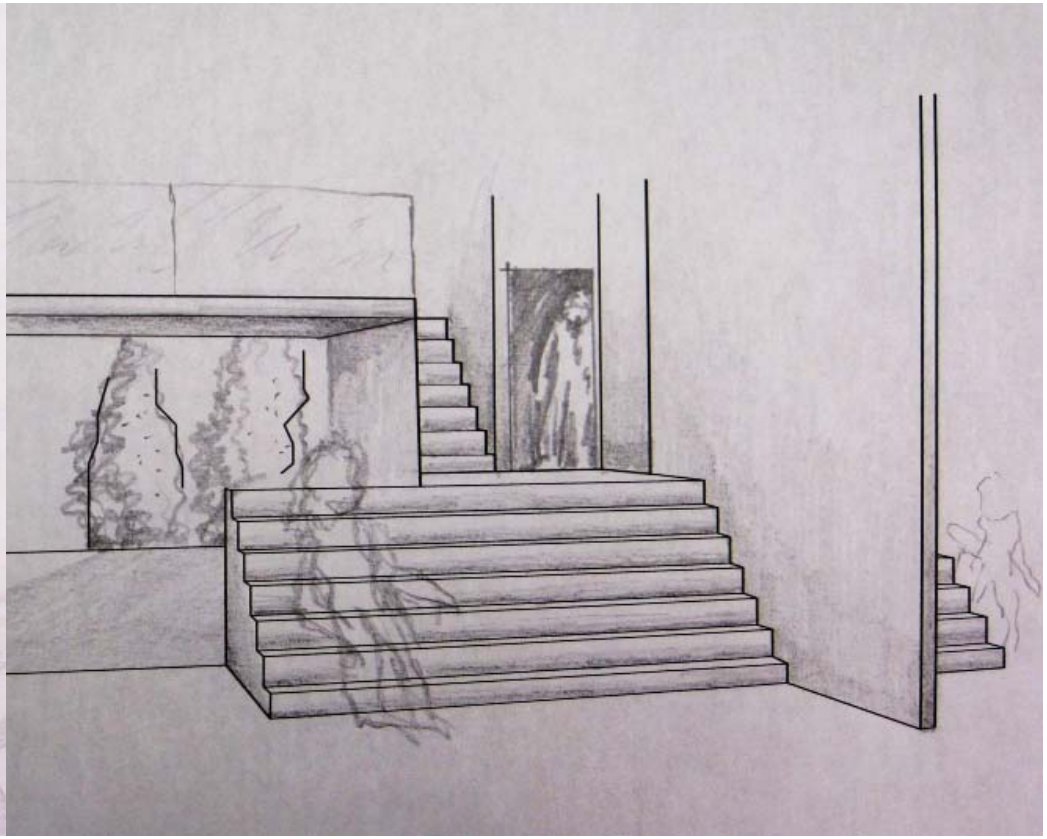


EAST ELEVATION



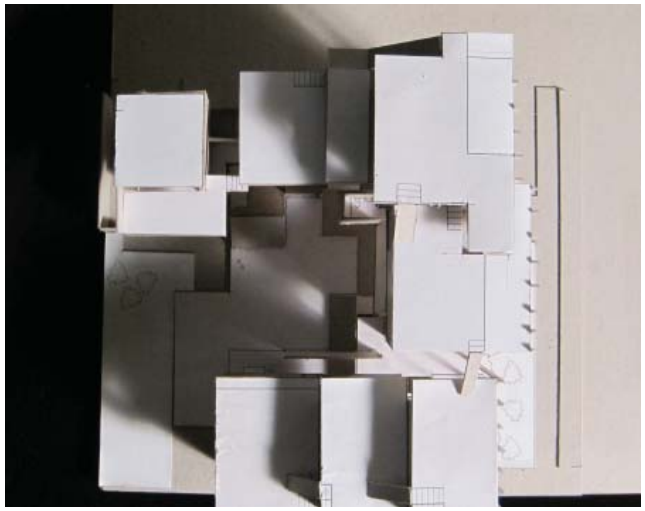
SOUTH ELEVATION

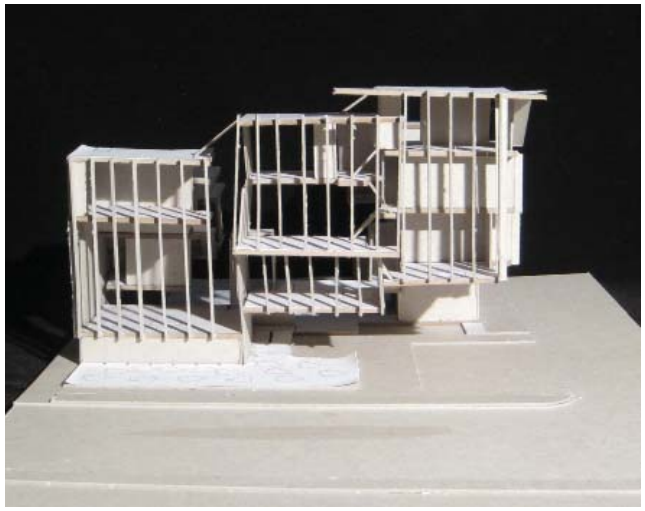




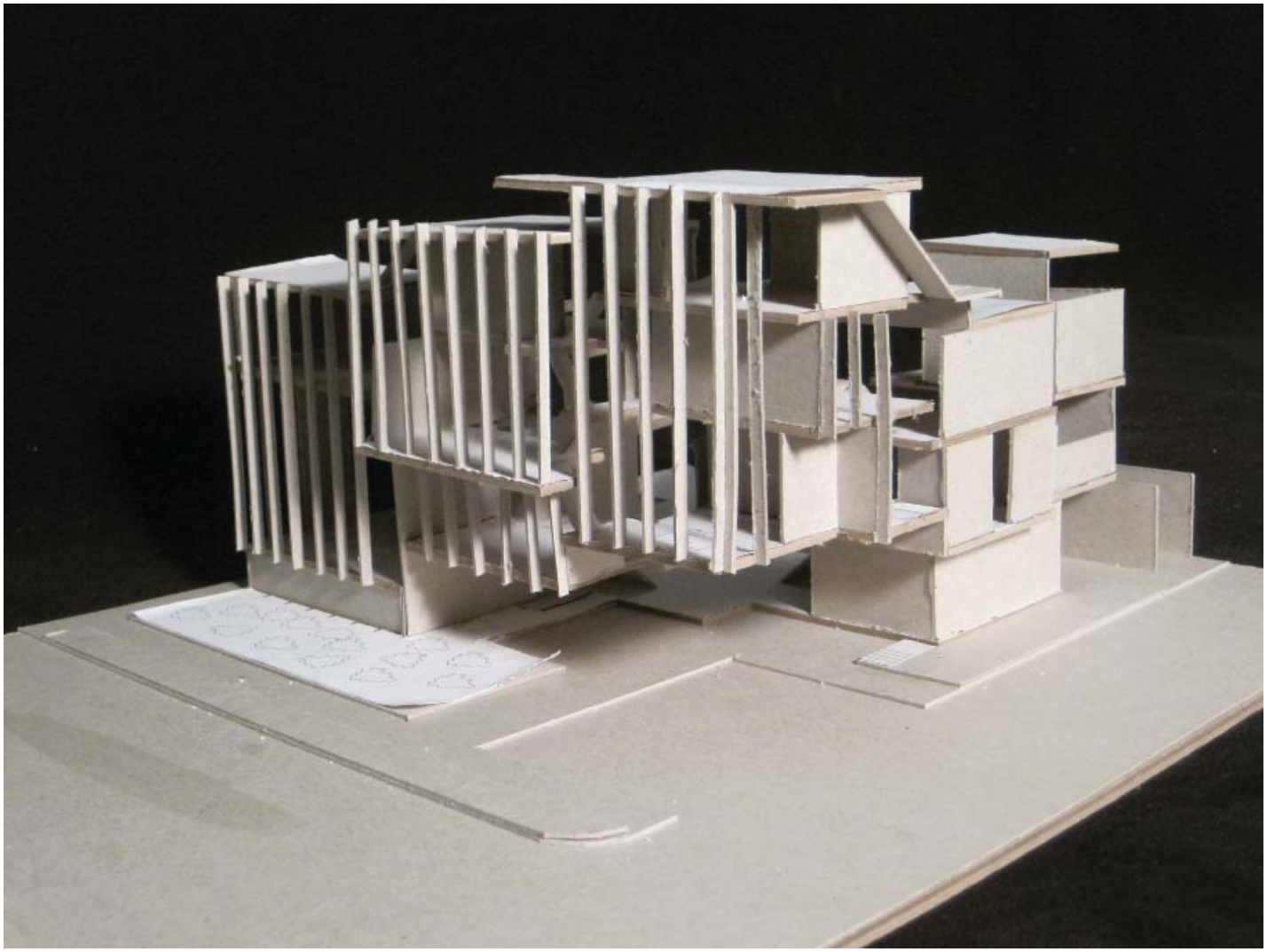
Above: Final hand renderings.

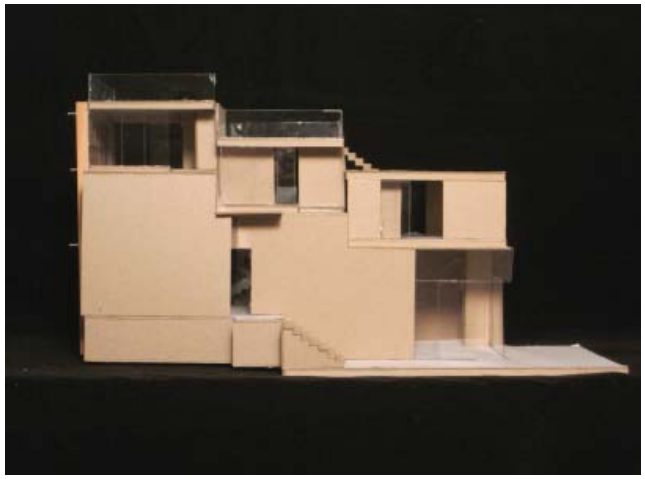
Right page: Final building model in context.

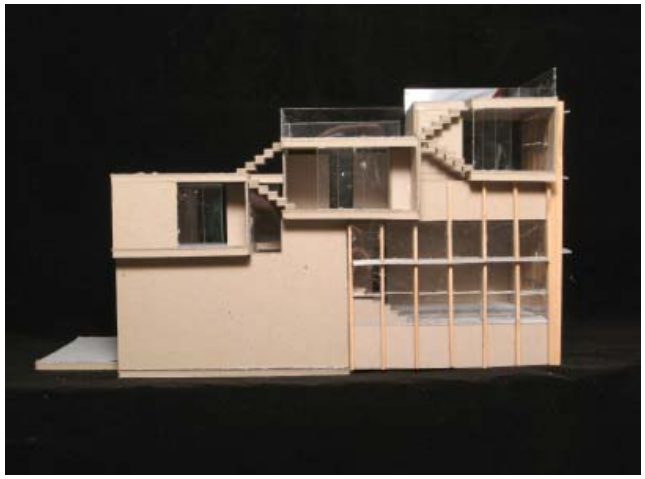




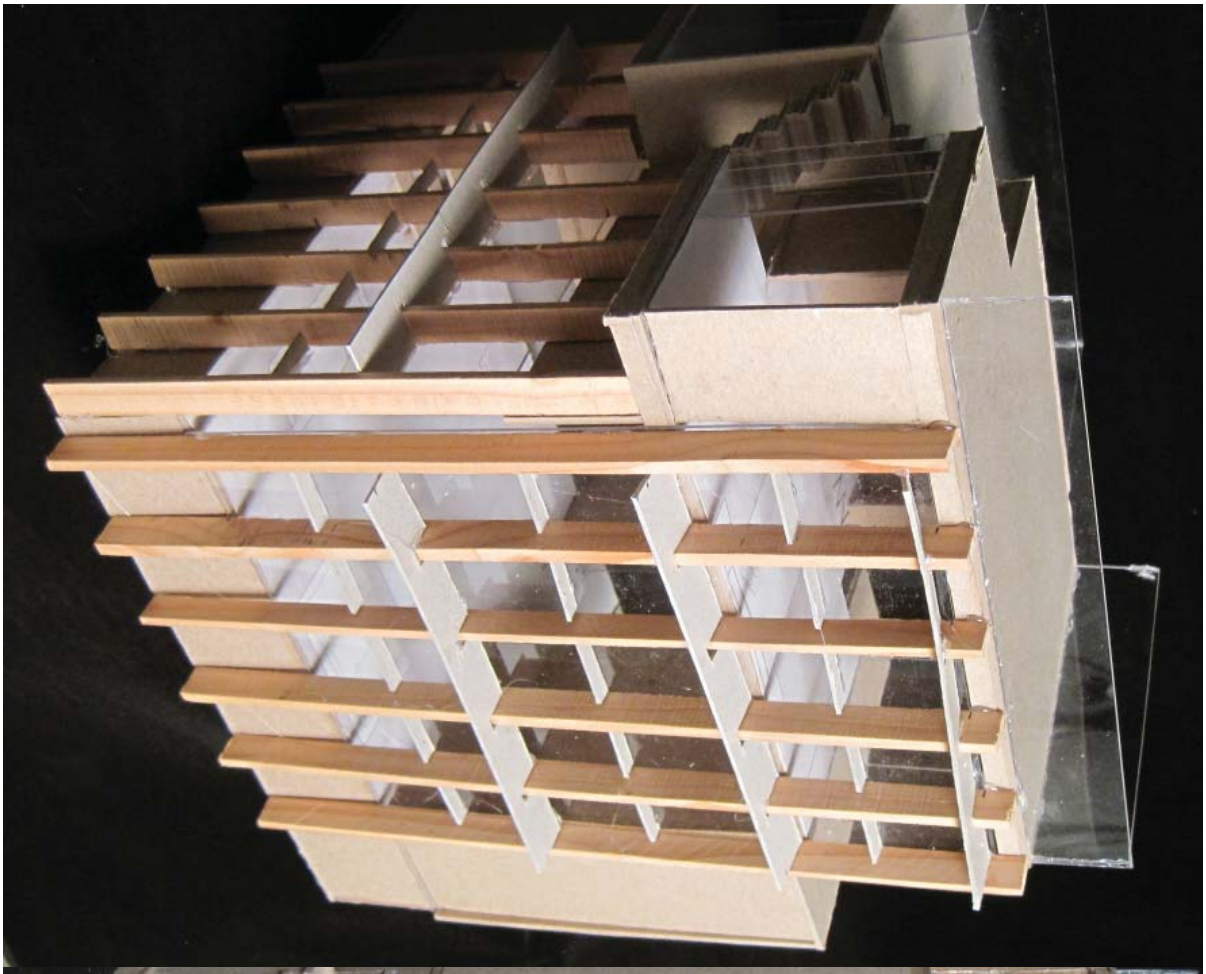
Final massing model.

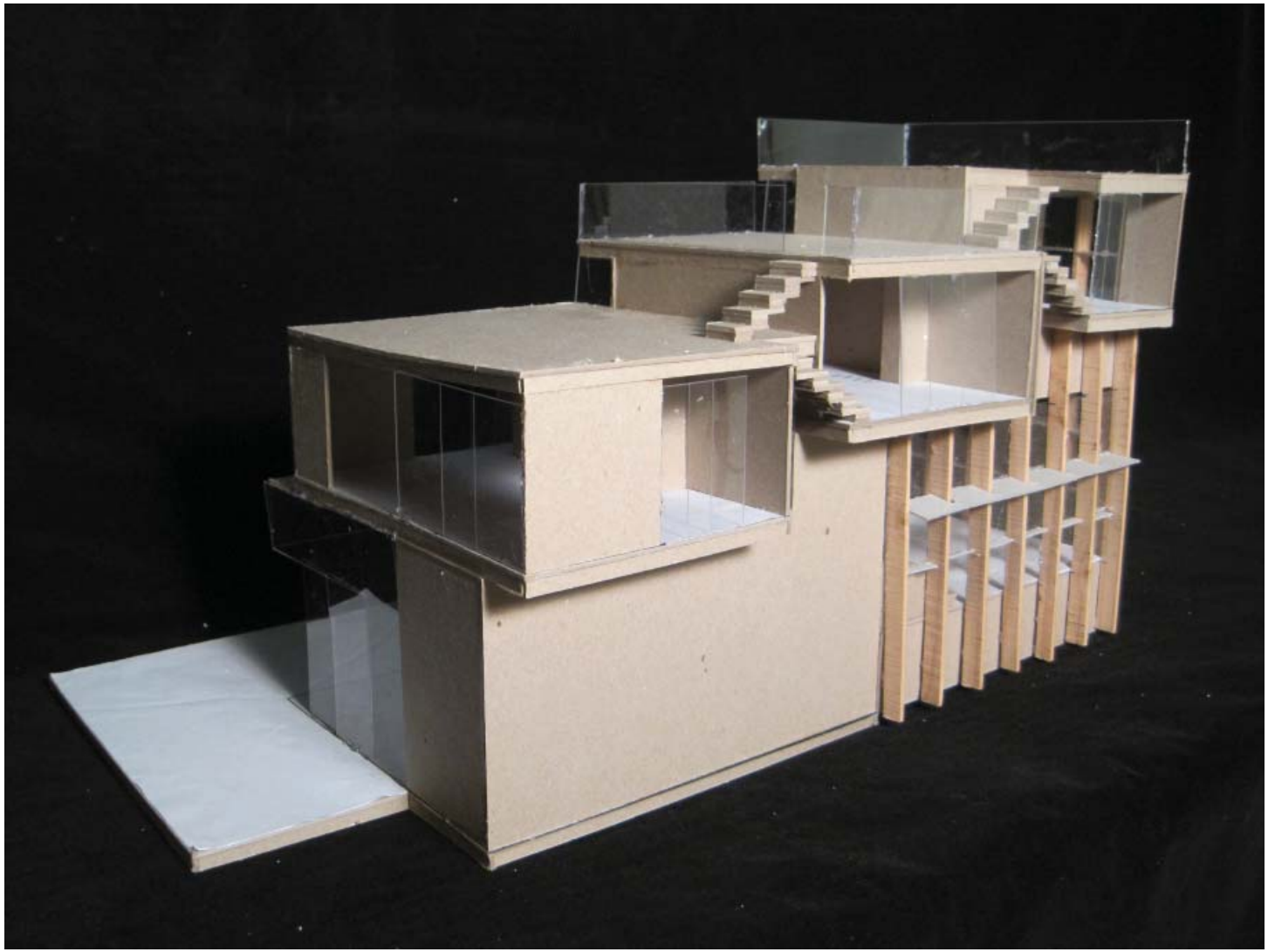




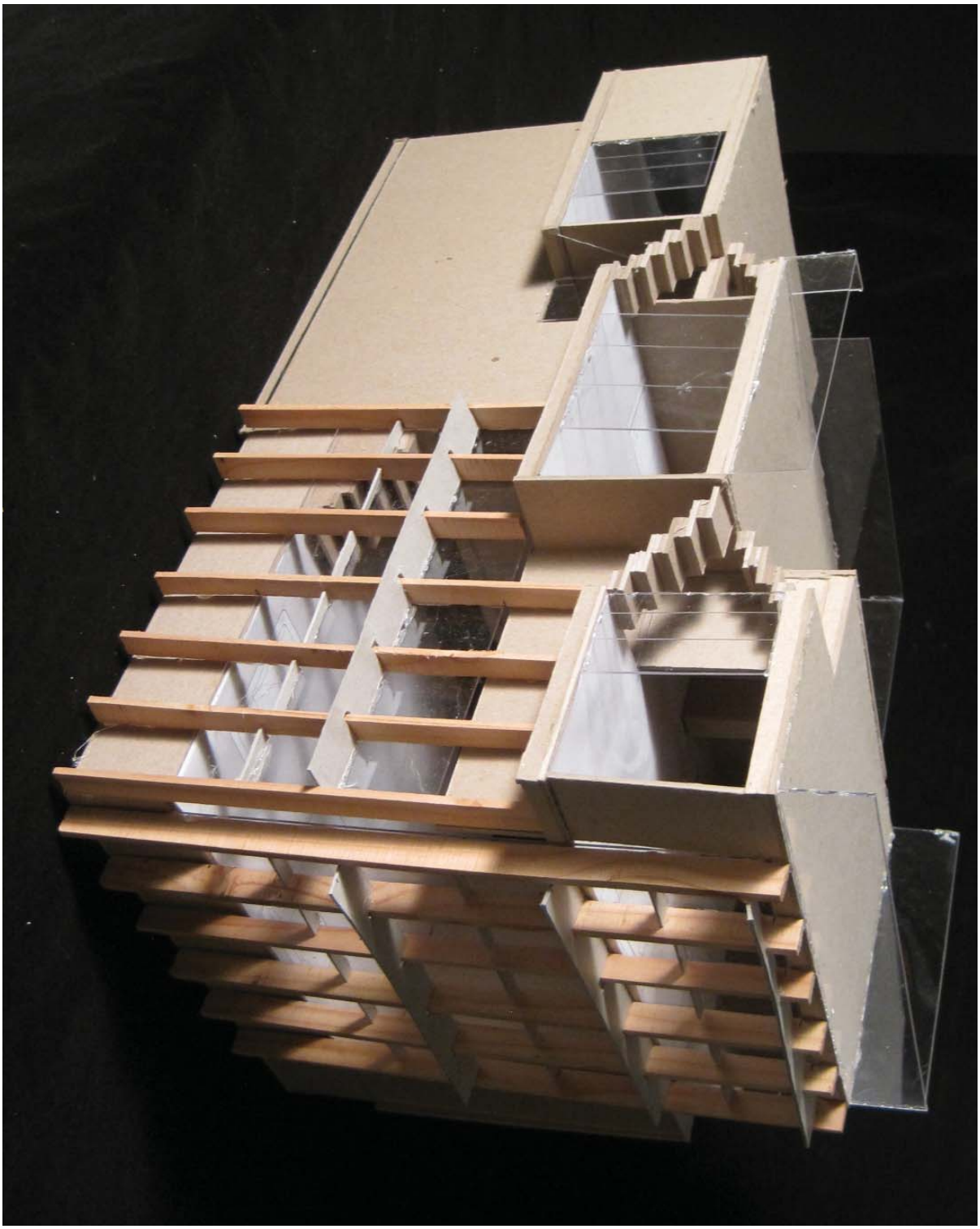


Final unit model.

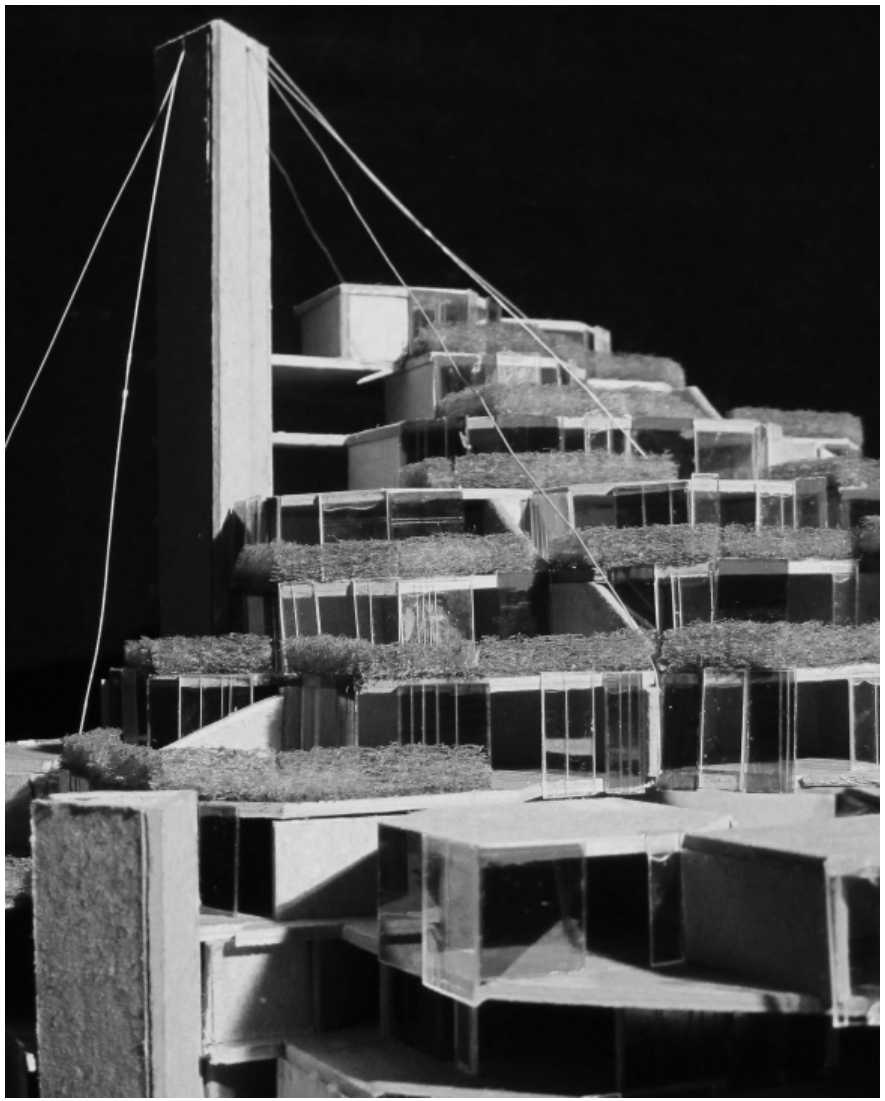




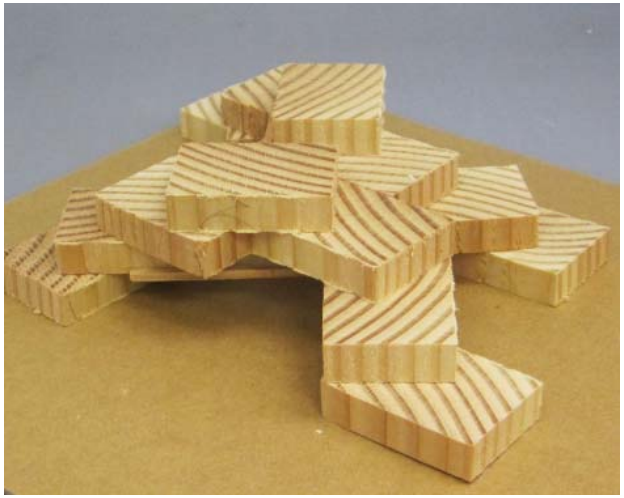
Final unit model.

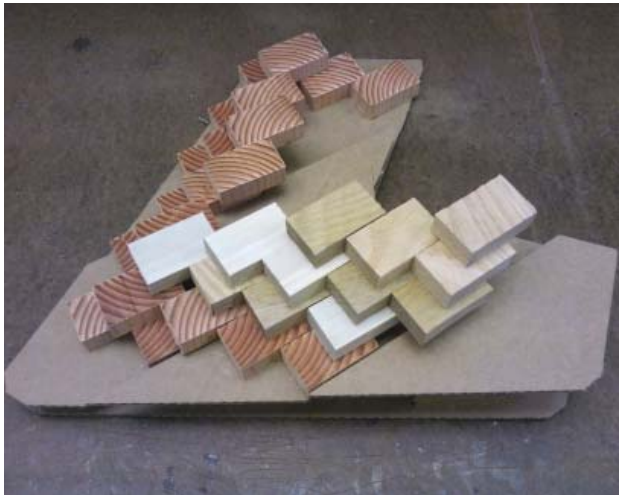


04: SUNSET JUNCTION



SILVERLAKE HOUSING



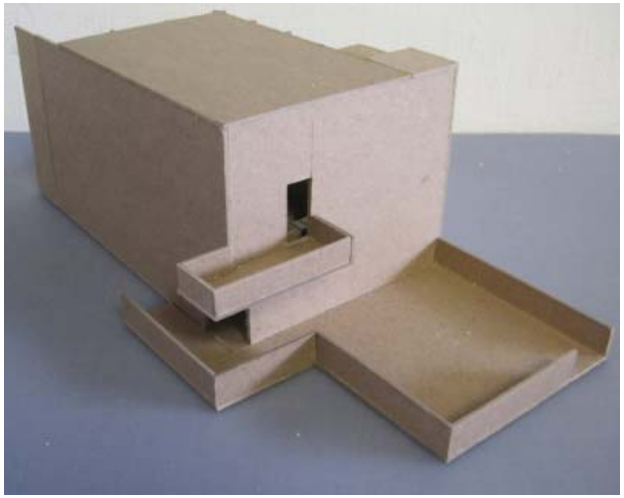


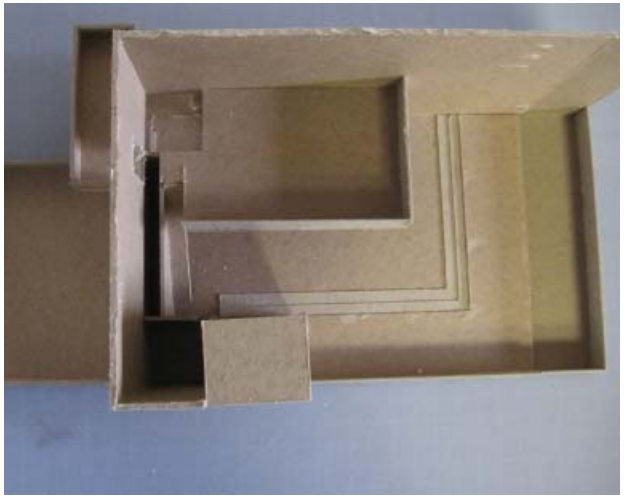
Sunset Junction is a fifty unit social housing project intended to provide a pleasant, dynamic living environment for starving artists, musicians, and actors. In addition to providing outdoor style terraced living for each of its occupants, the project aims to engage the surrounding Sunset Blvd. area in Silverlake, and serve as a place of gathering and artistic creation by providing studio, practice, and performance + exhibition spaces.

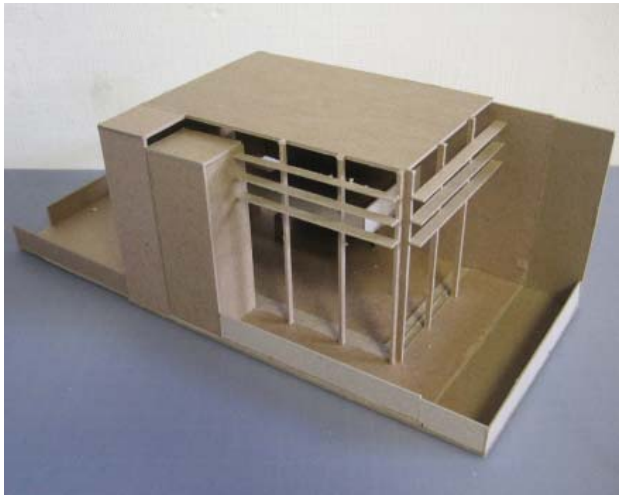
Sustainable features of the building are provided by its inherent design and use of various technologies. By following the natural topography of the site, each unit possesses natural light and ventilation. The slope of the aggregation allows for unobstructed views from each unit, afternoon light into each unit for as long as possible into the afternoon hours. Operable apertures and horizontal and vertical shading devices that allow for occupant control over natural ventilation and passive cooling (and heating in winter) work in combination with the placement of a water-circulated system that provides “dynamic thermal mass” and stores solar energy.

Access to each unit is single loaded, provided by three stairwells, and a central circulation core including elevators on the underside of the terrace shell. Perforations in the aggregation provide moments of light and ventilation to penetrate to the underside of the terrace, and encourage the use of defensible spaces along the (wide) circulation pathway.

Left page: Preliminary parti aggregation-driven massing models.

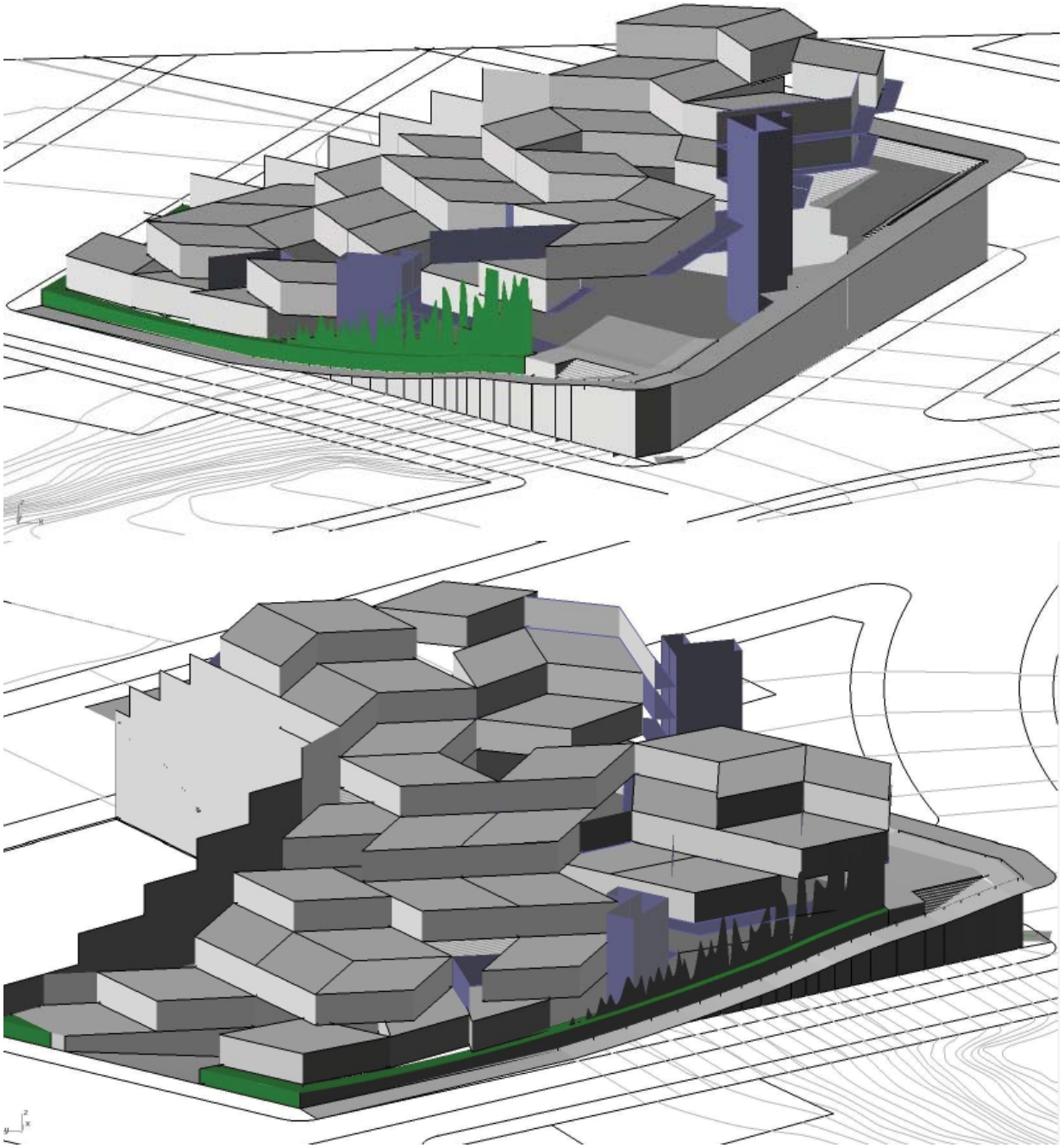


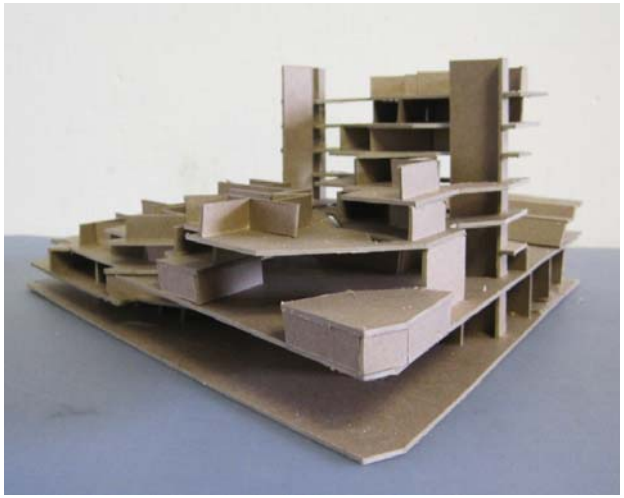


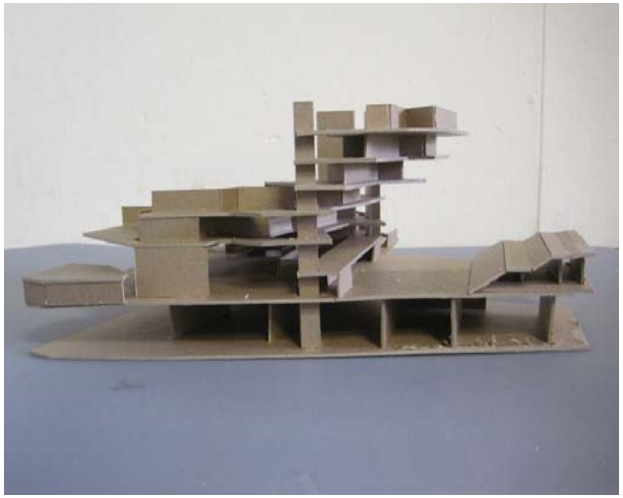


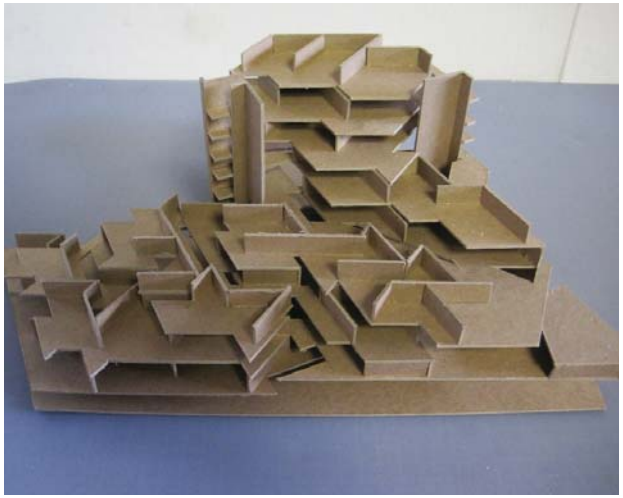
Right: 1st parti unit model.

Right page: 2nd parti massing model in Rhino.



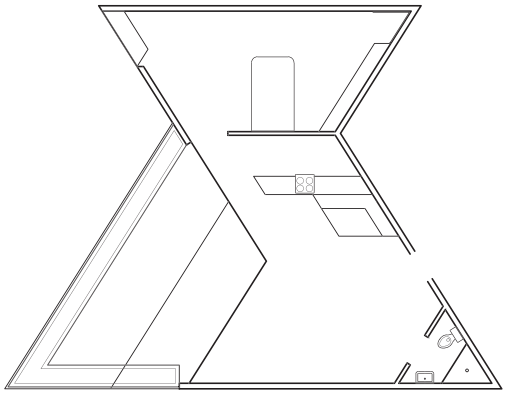


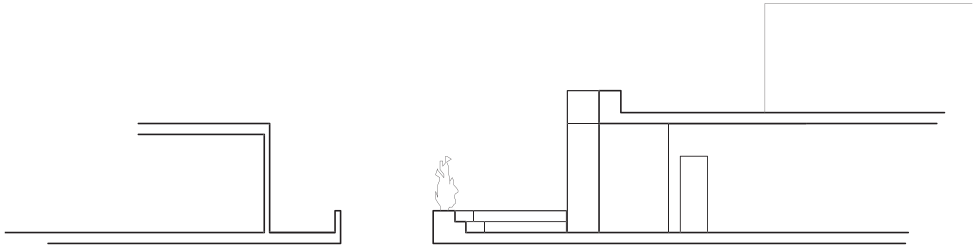


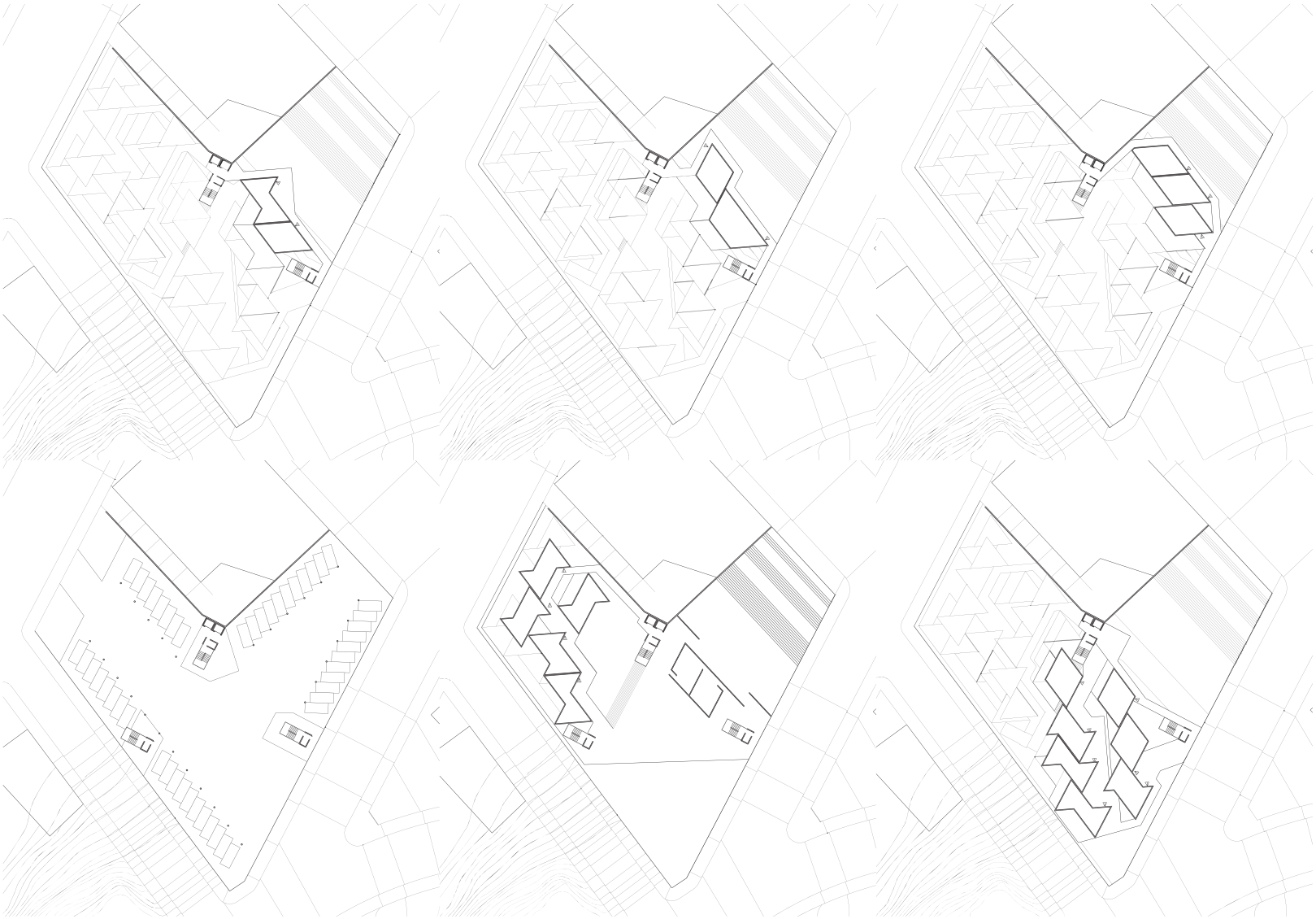


Right: 3rd parti massing model.

Right page: 3nd parti unit plan and model.

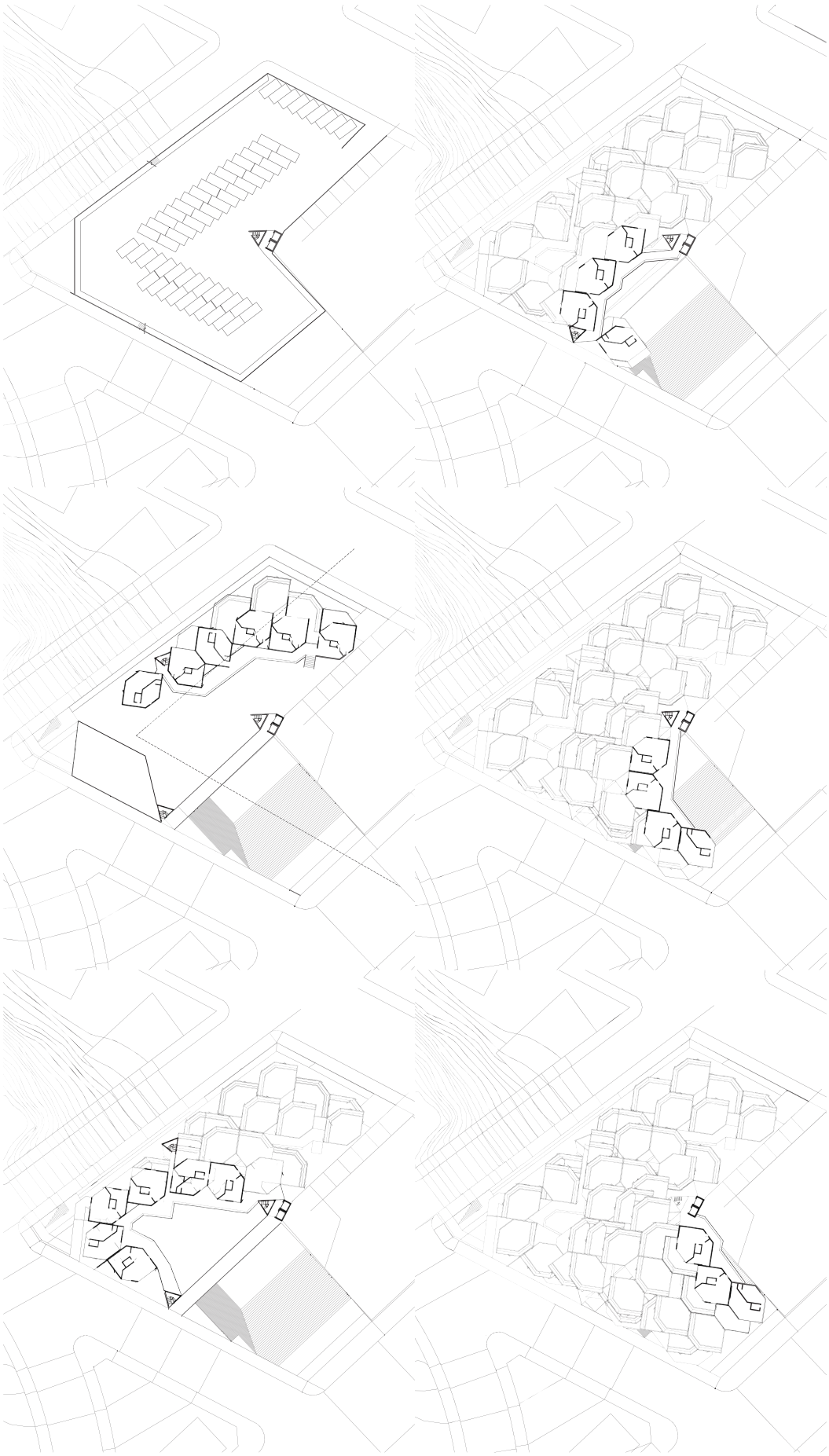


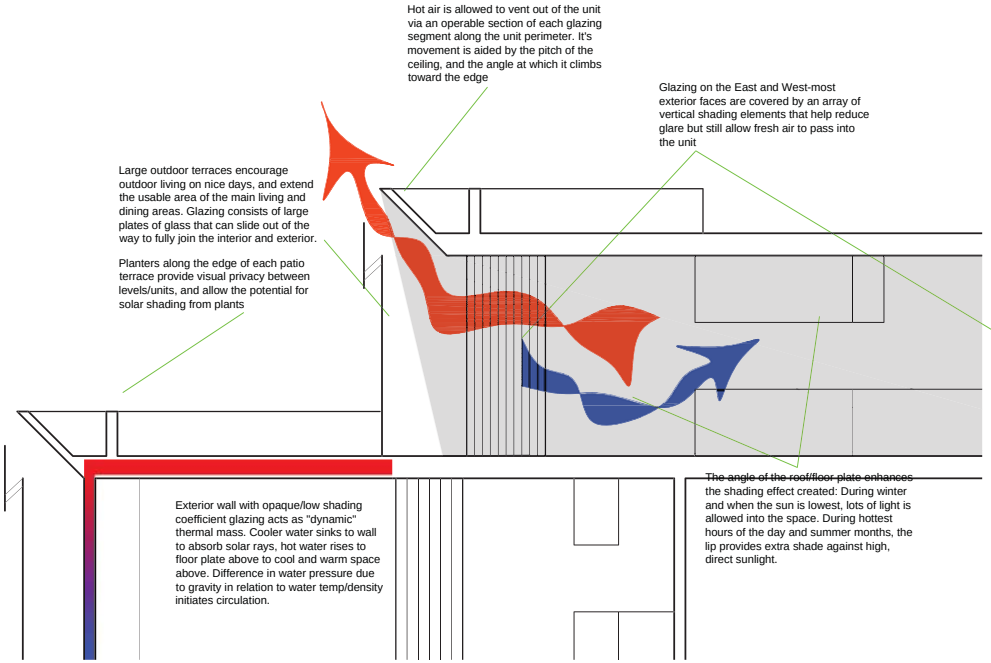


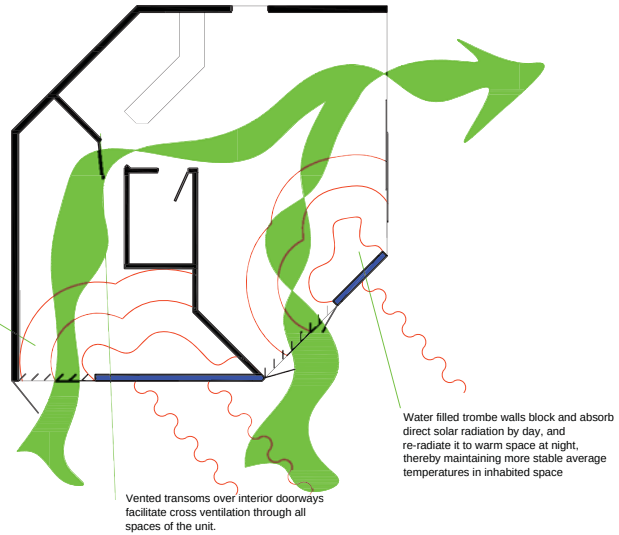


Above: 3rd parti plans.

Right page: Final plans (every other floor, starting at ground).

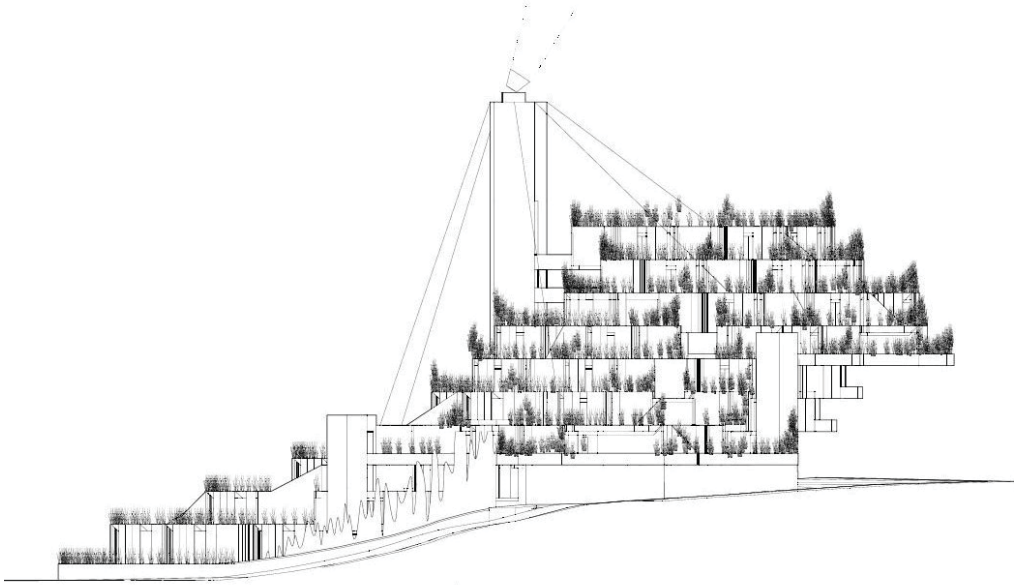




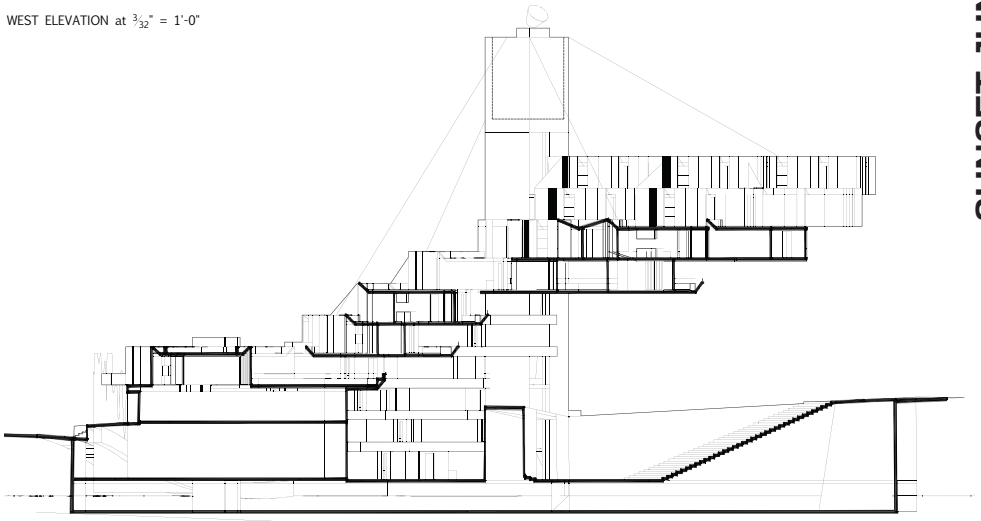


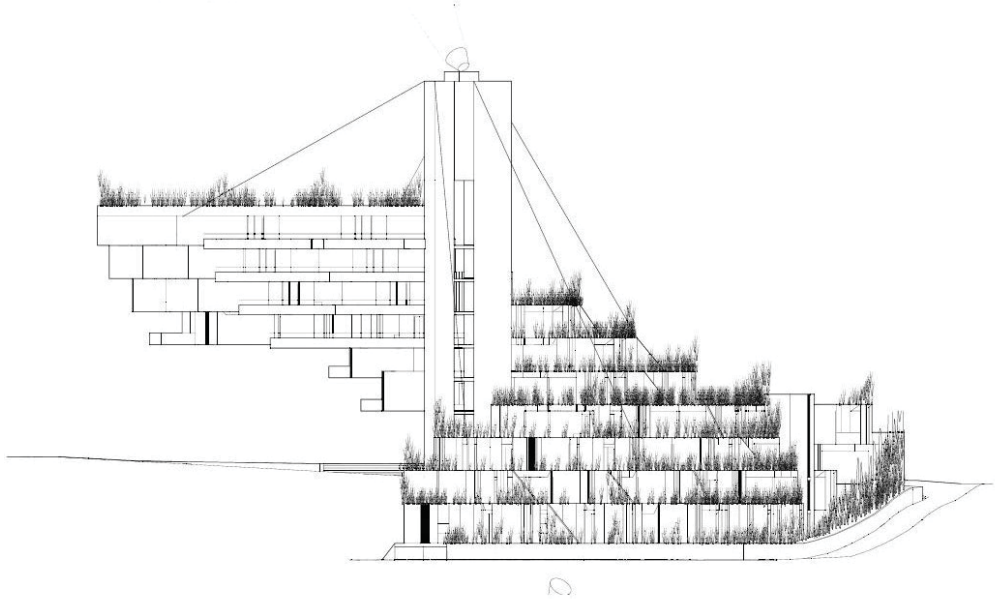
Above: Final sustainable strategies.

Right page: Final building elevations and sections.

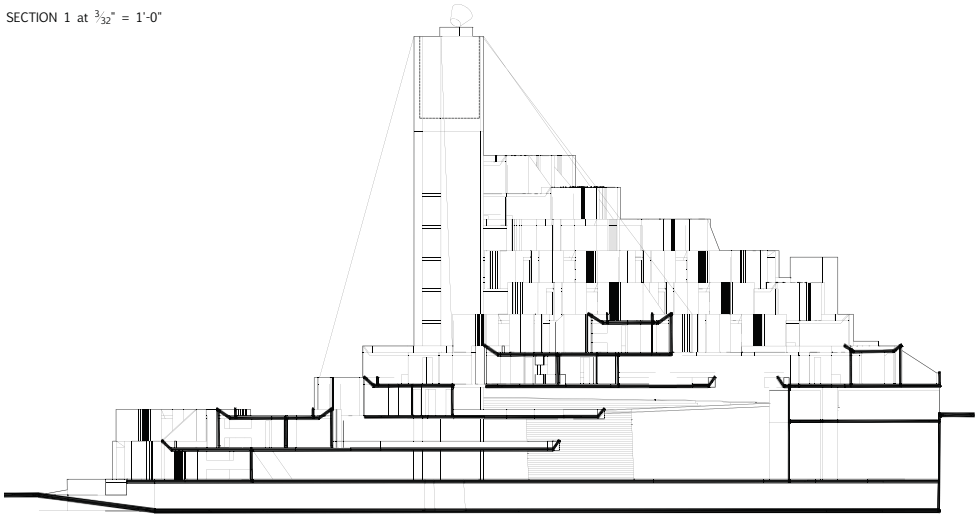


WEST ELEVATION at $^{3}/_{32}$" = 1'-0"

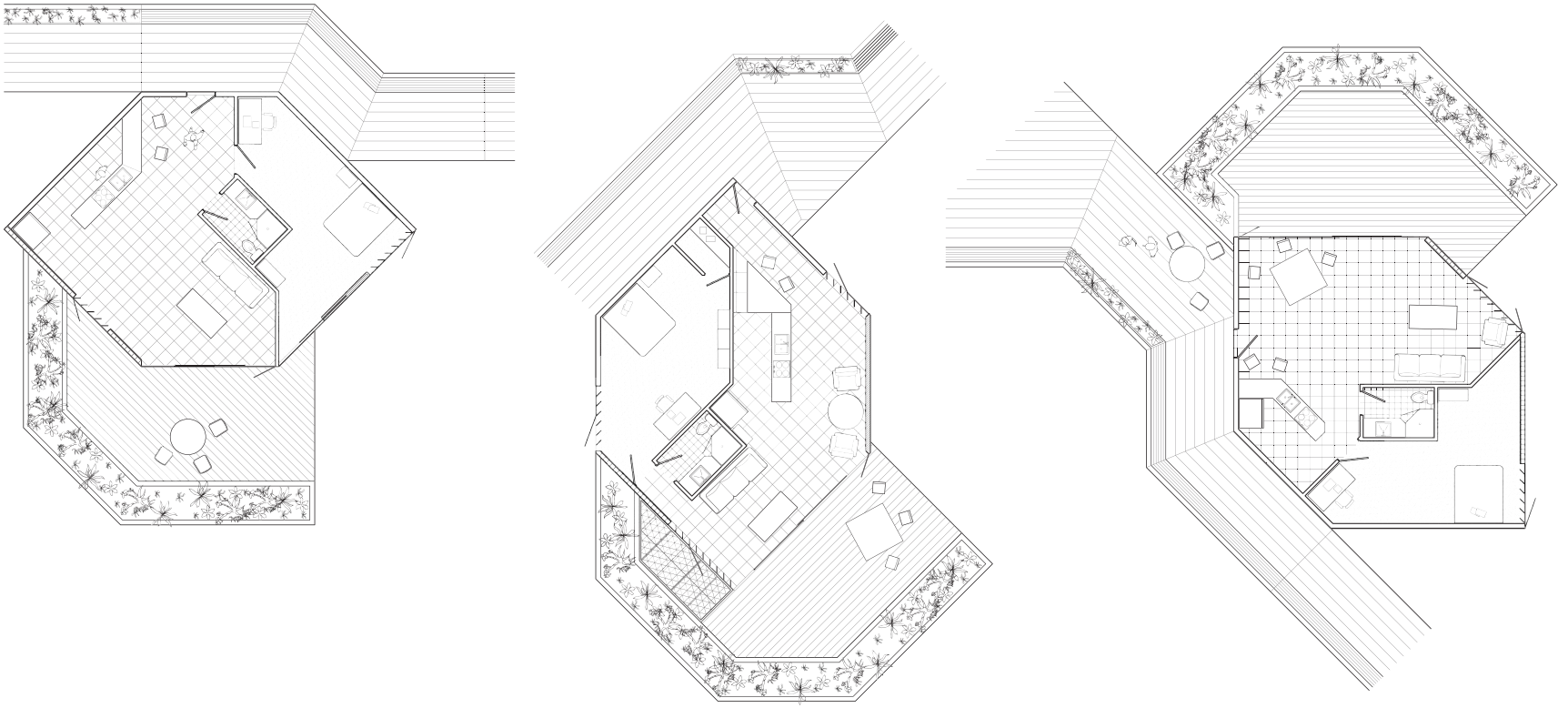




SECTION 1 at $^{3}/_{32}$" = 1'-0"

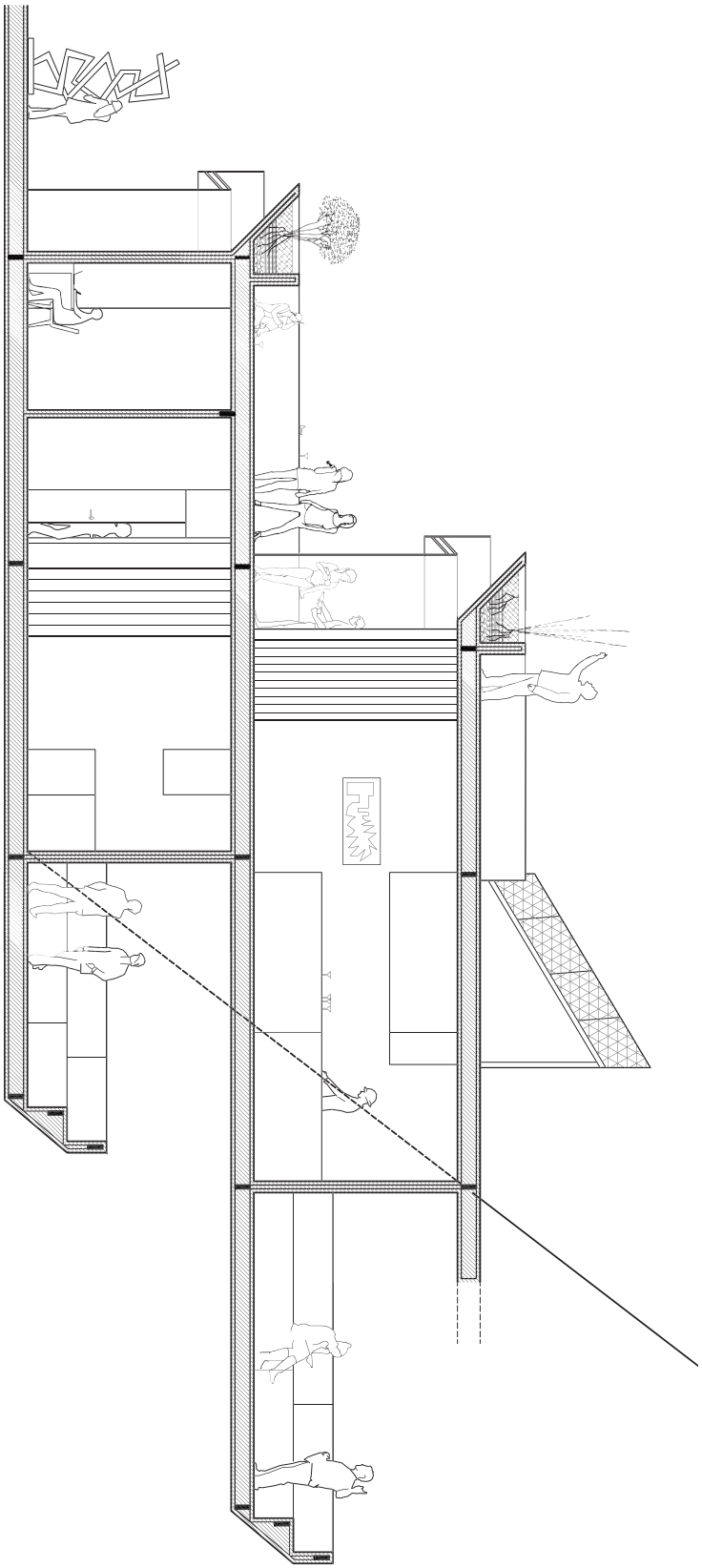


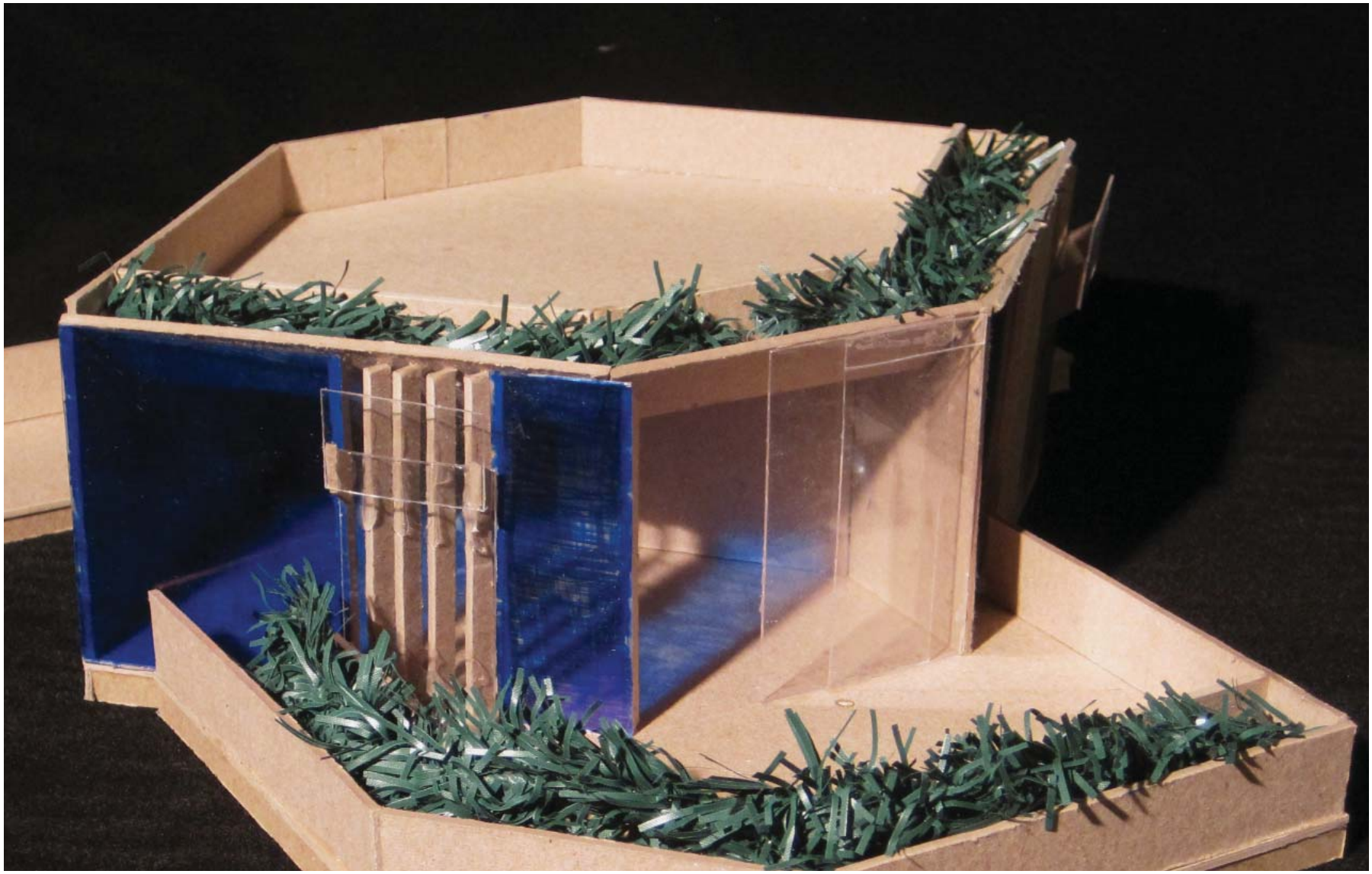
SECTION 2 at $^{3}/_{32}$" = 1'-0"



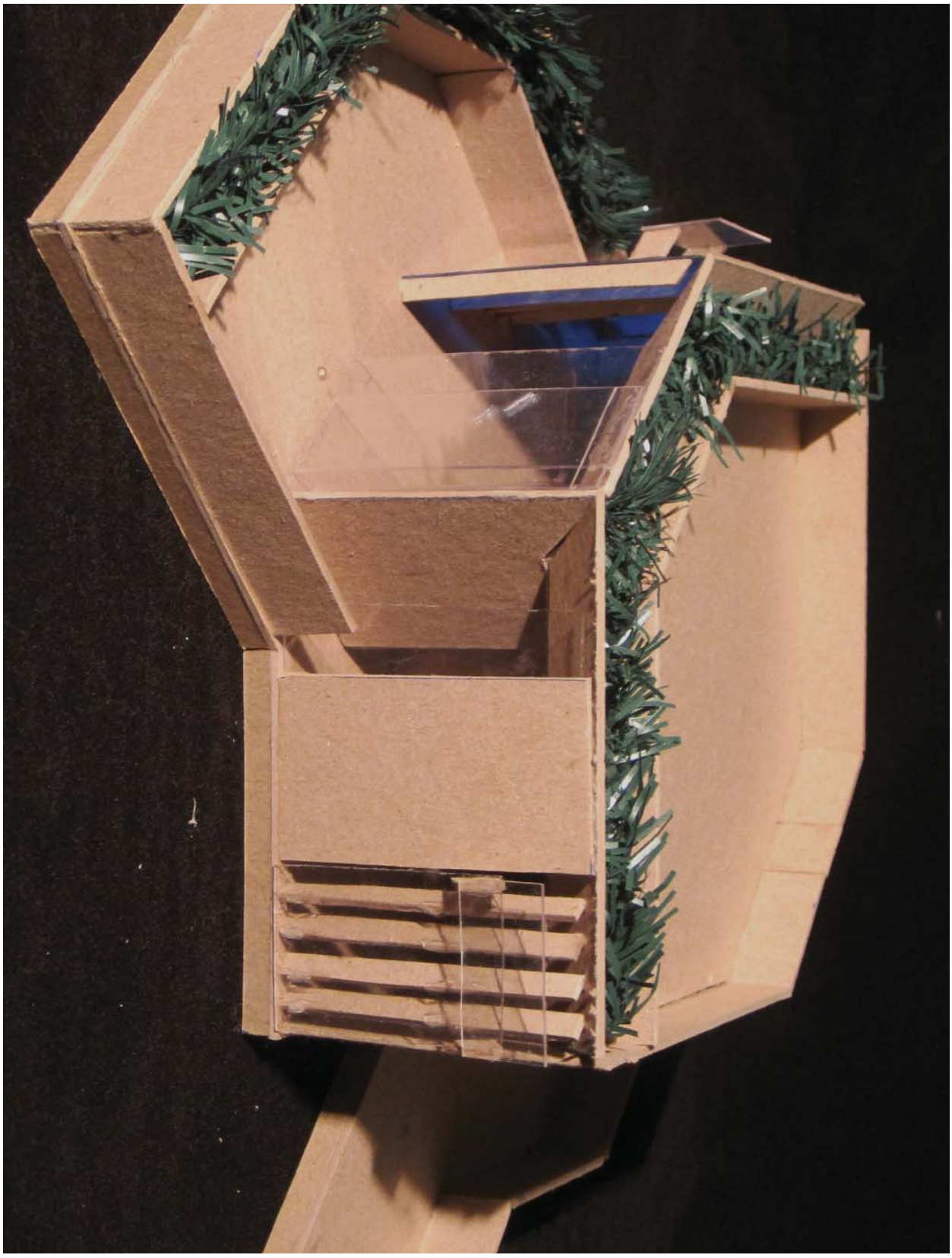
Above: Final unit plans.

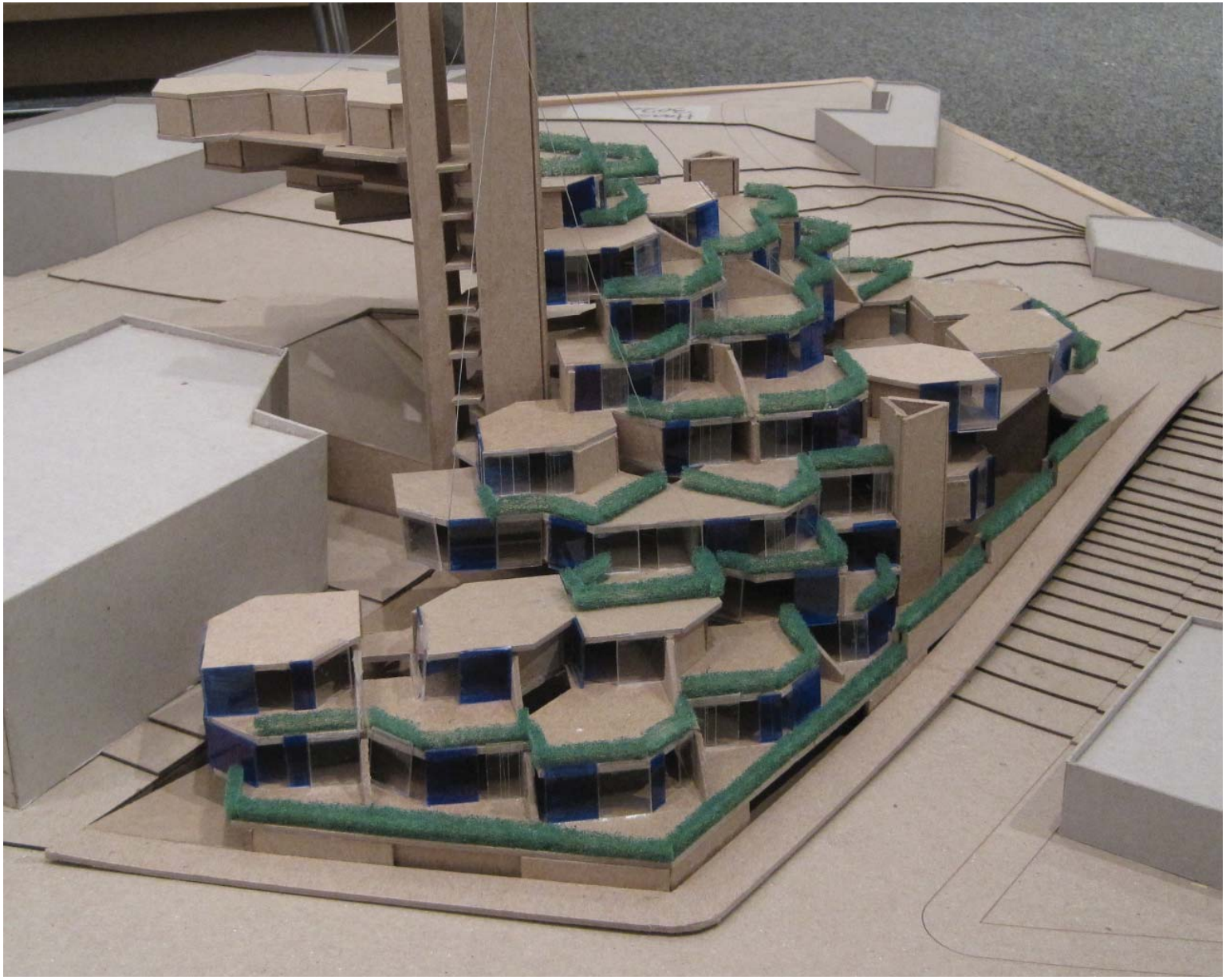
Right page: Final unit section.



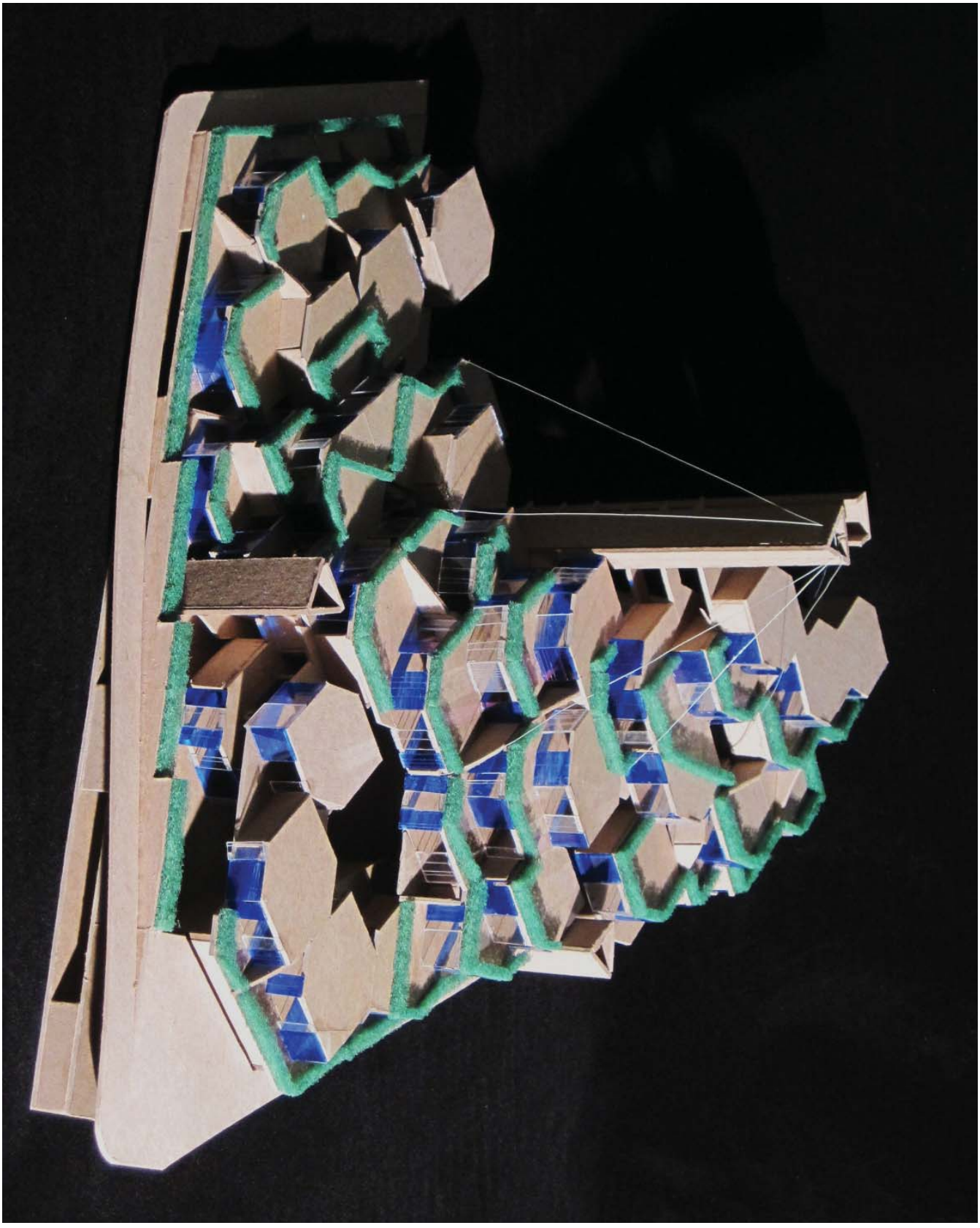


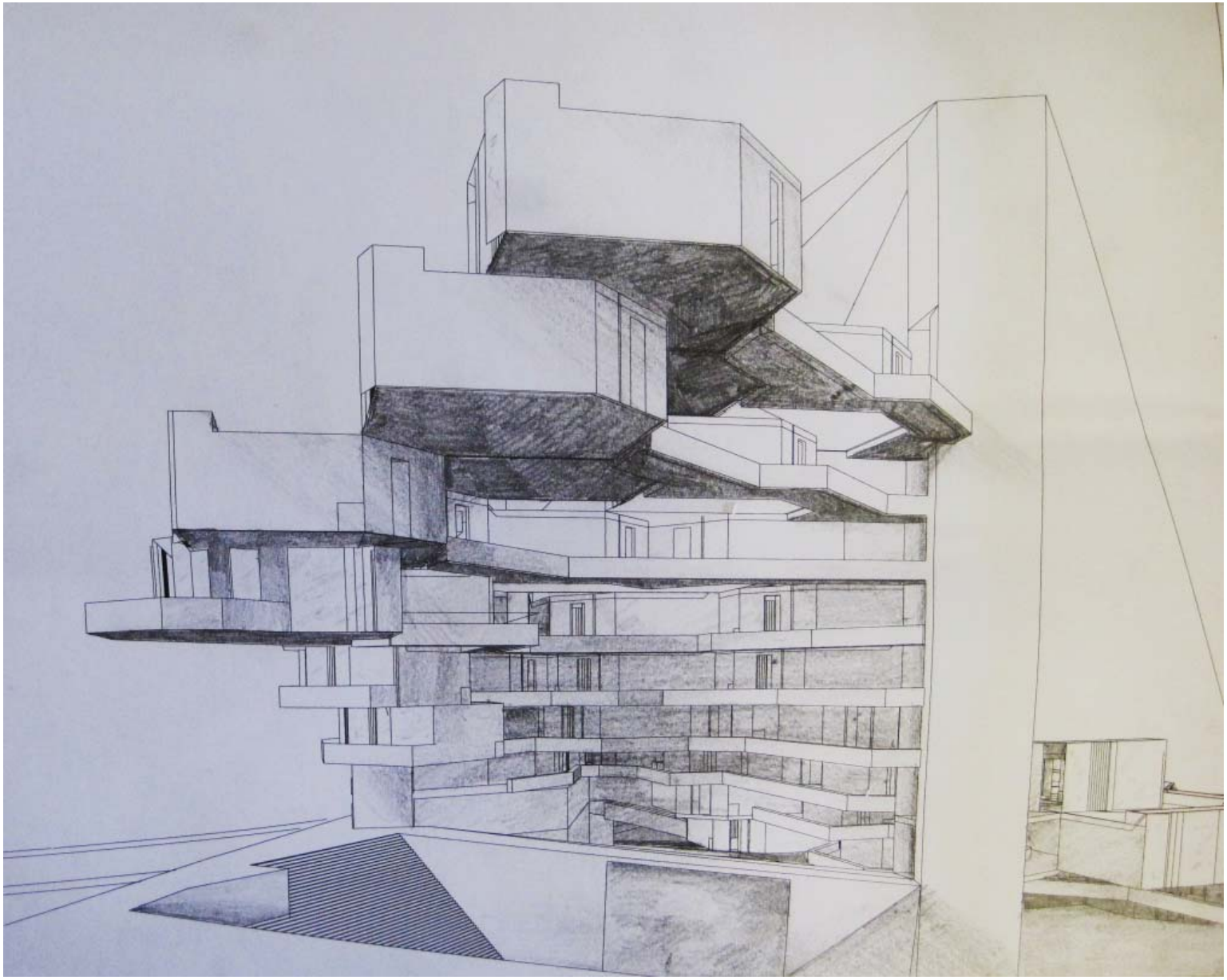
Final unit model.



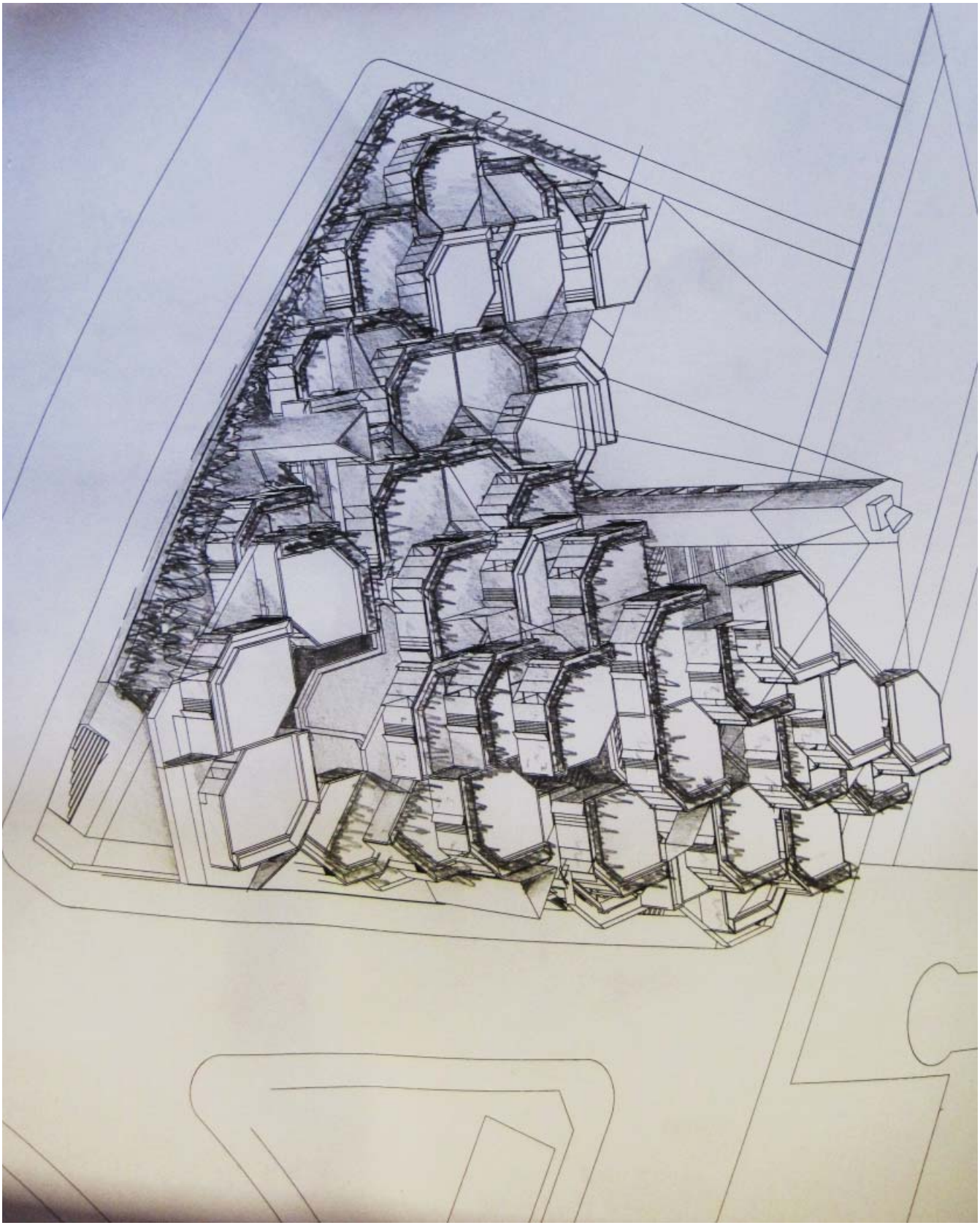


Final building model.





Final renderings.



SPECIAL THANKS

Mom & Dad
Eric Haas
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