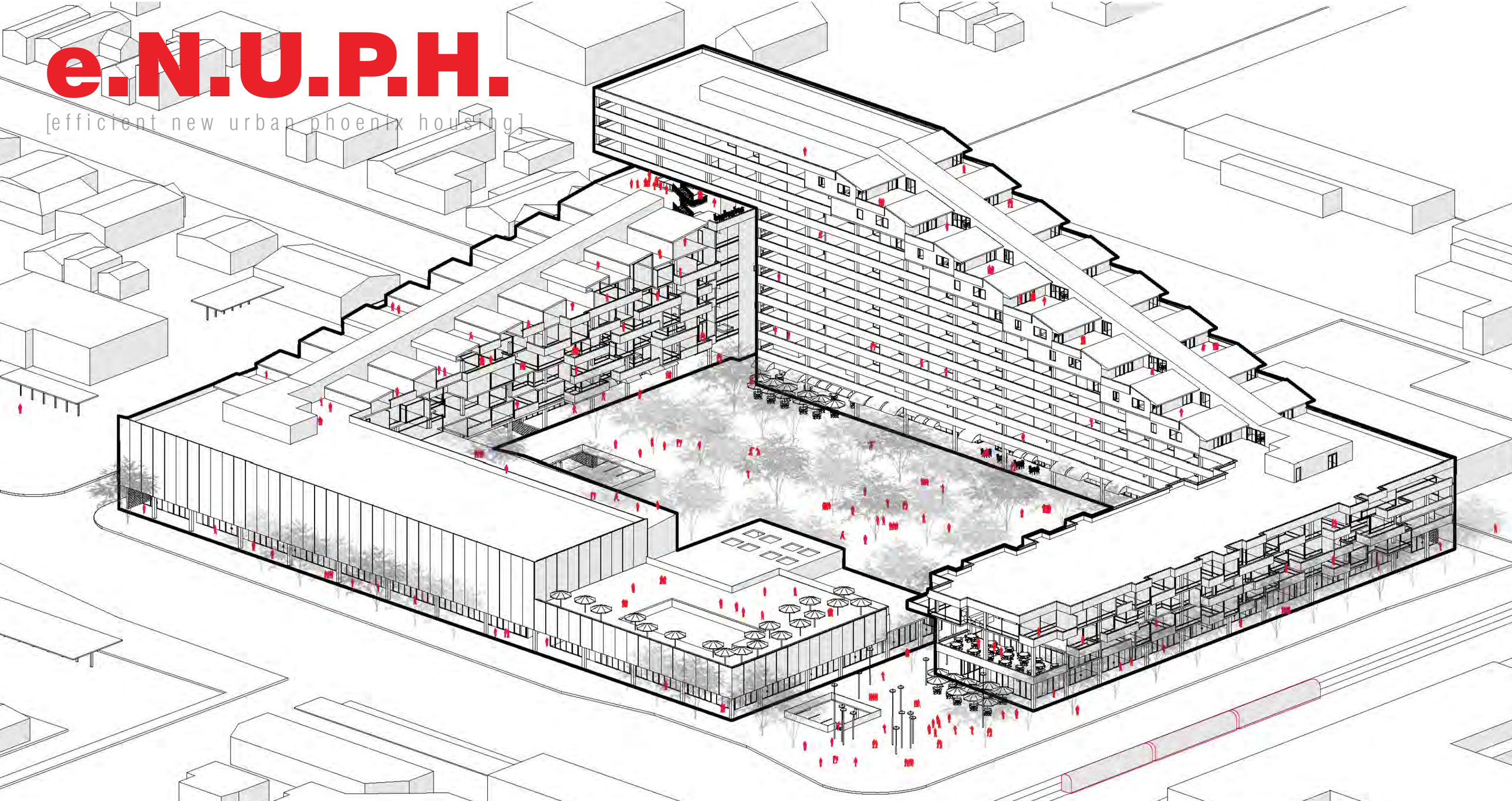
# e.N.U.P.H.

[efficient new urban phoenix housing]



*Matt Troia*
*iiT M.Arch Candidate 2012*
*Master's Project; May 2012*
*Adviser: George Schipporeit*

*Dedicated to my parents:*

*Thank you so much for allowing me to pursue my interests and encouraging me on my endeavors, no matter how discouraged I became...I never could have accomplished any of this without you.  I love you and am forever grateful for your support.*

*-Matt*

# CONTENTS

# PART ONE (1/3)

***RESEARCH***

Phoenix grew

**12,777%**

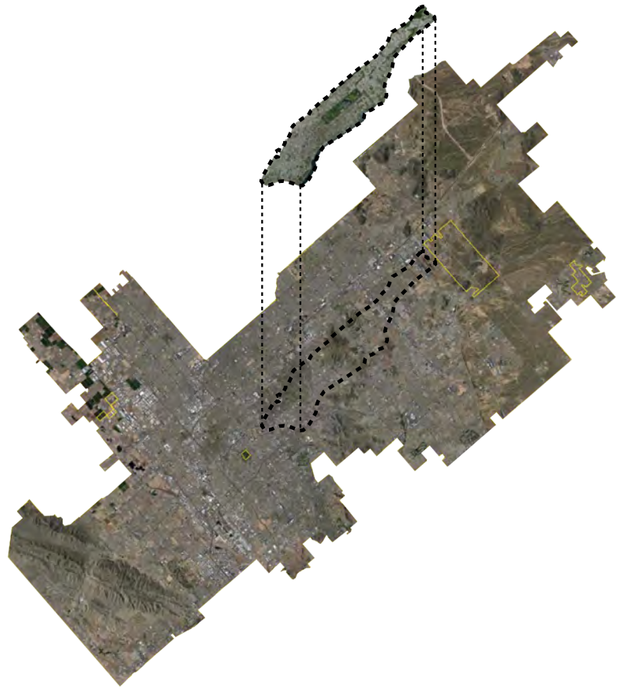
from *1910 - 2010*

That's an average growth rate of **127%**

***PER YEAR...***

*Source: U.S. Census Bureau*

# ...IN SPRAWL



| | POPULATION | AREA [mi²] | DENSITY [people/mi²] |
|---|---|---|---|
| **Phoenix** | **1,445,632** | **517.95** | **3,071** |
| Manhattan, NYC | 1,585,873 | 22.96 | 70,951 |
| Boston | 617,594 | 89.63 | 12,752 |
| Chicago | 2,695,598 | 234.0 | 11,684 |
| San Francisco | 805,235 | 231.89 | 17,179 |

*Source: U.S. Census Bureau*

In addition...

**40%** of Phoenix **HOME SALES** in 2010 were

# FORECLOSURES

partly due to increased strain on transportation spending

**$7,091**

in car-related expenses per Arizona household per year

*Source: W.P. Carey School of Business, www.bundle.com*

## [ So how can Phoenix grow responsibly without taking up new land? ]

..... [It begins with housing]


No privacy
Not attractive to Phoenicians
Massive capital required
Too crowded

Inefficient
Automobile expense
Wasted commute time
Expensive utilities

## Efficeint New Urban Phoenix Housing
## [e.N.U.P.H.]

A new, mixed-use housing typology catered to Phoenix


Neighborhood-centered
Reduced utility costs
Access to public transportation
Mixed-use...with privacy
Ecologically responsible
Attractive


How truly attainable is the

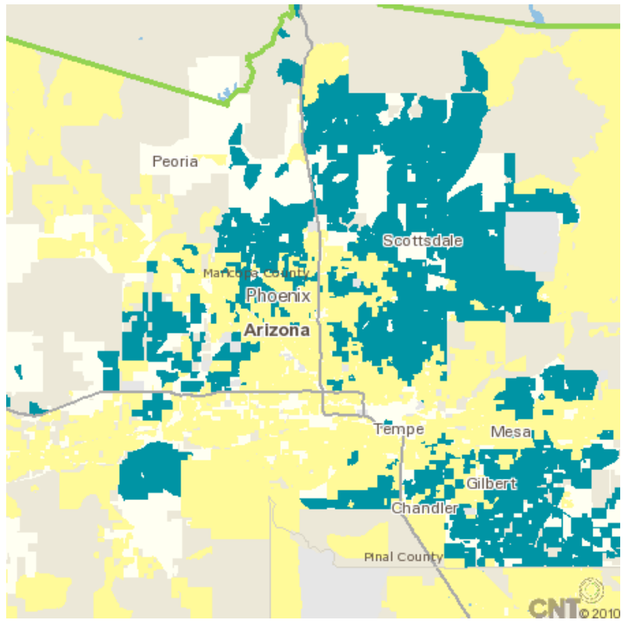
# *AMERICAN DREAM*

in Phoenix during an era of

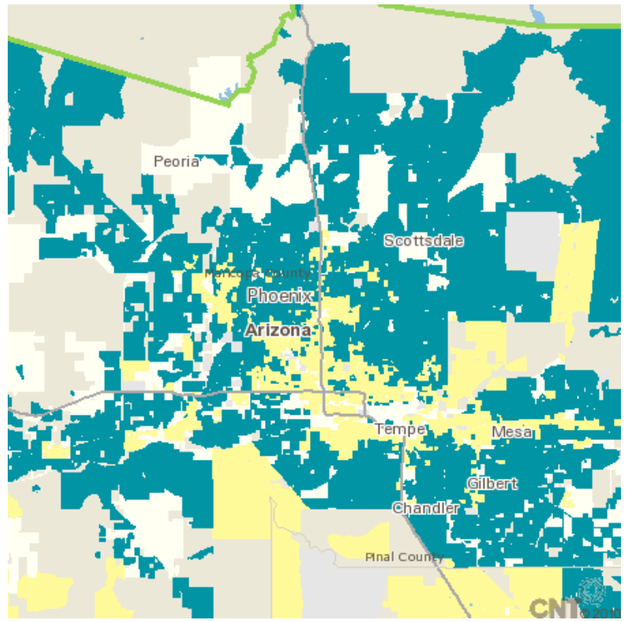
*persistent unemployment*
*economic stagnation*
*foreclosure epidemic*
*rising cost of credit*

?

## HOUSING COSTS AS % OF INCOME

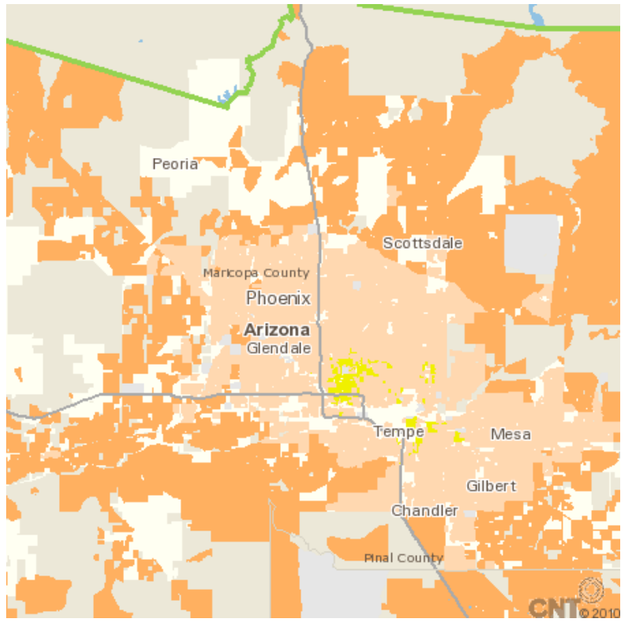



## HOUSING & TRANSPORTATION COSTS AS % OF INCOME

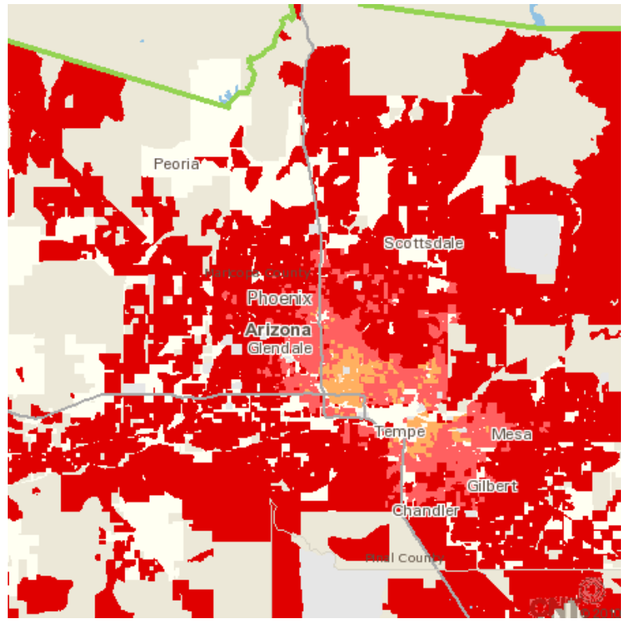



*Data not available*
*Less than 30%*
*Greater than 30%*

## ANNUAL HOUSEHOLD GASOLINE EXPENSES *(2000 GAS)*




## ANNUAL HOUSEHOLD GASOLINE EXPENSES *(2008 GAS)*



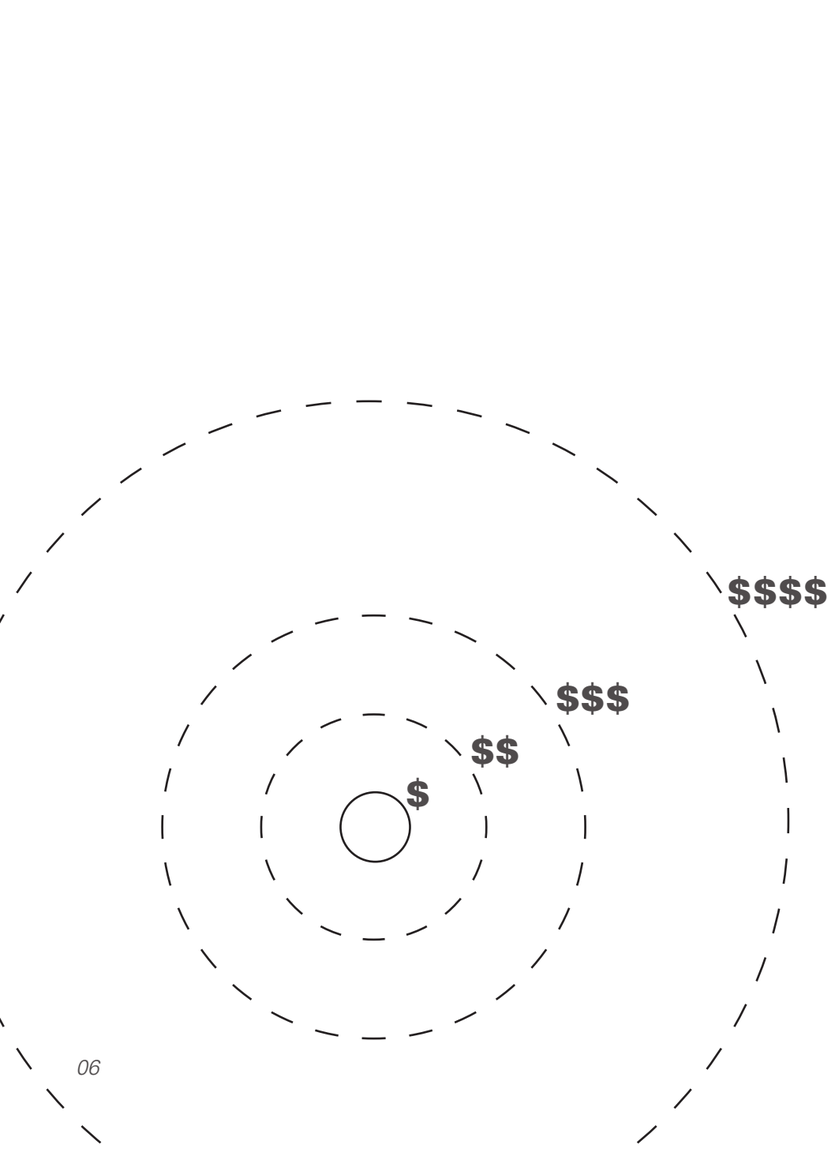

*Data not available*
*Less than 900 $/year*
*900 to 1,800 $/year*
*1,800 to 2,700 $/year*
*2,700 to 3,600 $/year*
*3.600 $/year and greater*

*Source: True Affordability and Location Efficiency, H+T Affordability Index*

# Long commutes & a bad market

make living in the newer outskirts of Phoenix

*more and more* **EXPENSIVE**

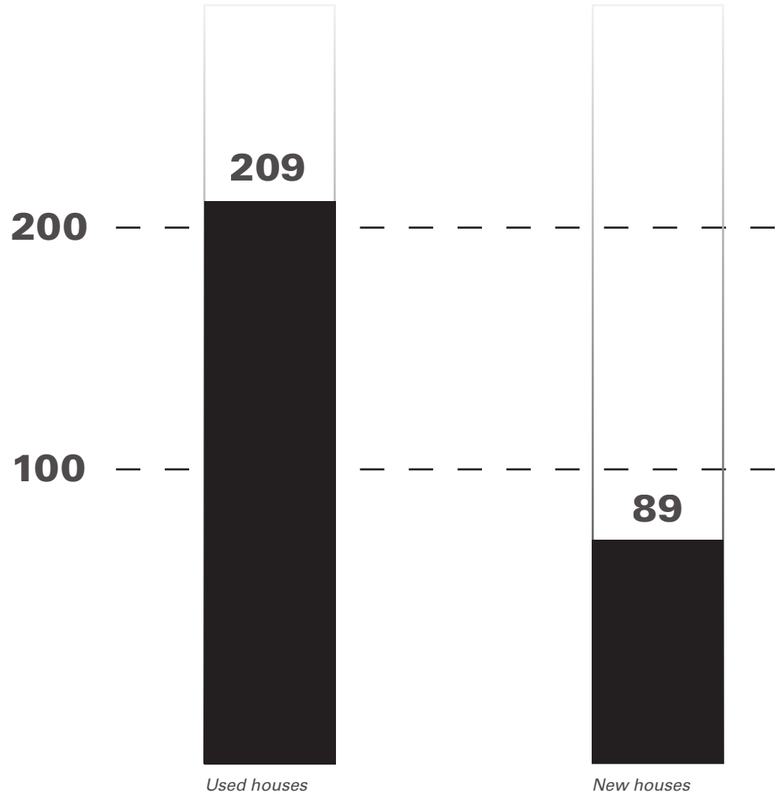



"Drive 'till you qualify"
*-Phoenix realty saying*

*As expected,*

*USED HOMES CLOSER TO THE CITY CENTER ARE MORE AFFORDABLE THAN NEW SUBURBAN TRACT HOMES*

*2011 Phoenix Housing Affordability Index*




*A number below 200 means that a family is spending just over 25% of its household income on housing, a healthy figure according to financial analysts*

*A number below 100 means that a family is spending more than 50% of its houshold income on housing*

*Source: ASU W.P. Carey School of Business Realty Studies, 2011*

## Resources for the Future

only ***8mm***
of rain falls on average
in Phoenix each ***YEAR...***

and with about
***3,761,859***
***VEHICLES*** on the road in the city, gasoline use is at an all-time high

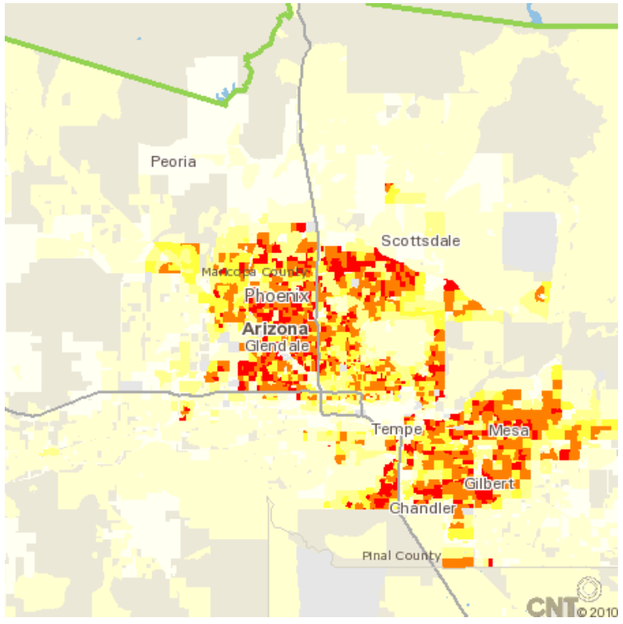
*Sources: www.wikipedia.org, Arizona Department of Transportation*

# Long commutes =

from the suburbs into downtown Phoenix

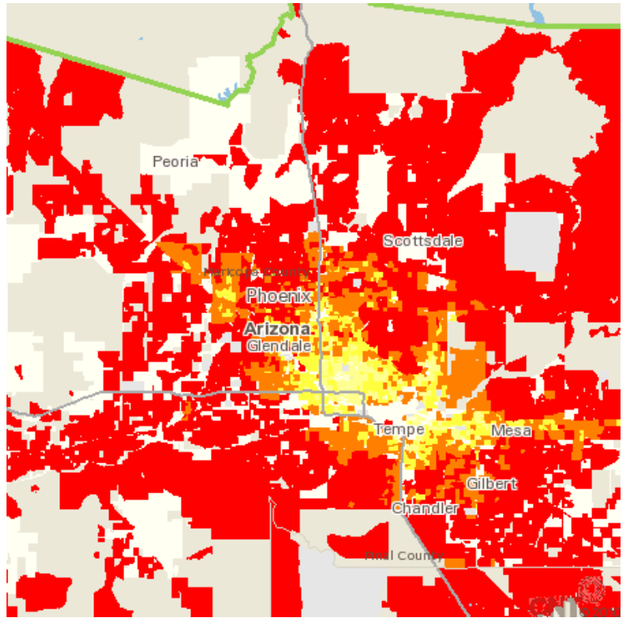
***MORE EMISSIONS & USE OF RESOURCES***

**CO2 PER ACRE FROM HOUSEHOLD AUTO USE**




- *Data not available*
- *Less than 6 metric tons/acre*
- *6 to 14 metric tons/acre*
- *14 to 20 metric tons/acre*
- *20 to 30 metric tons/acre*
- *30 metric tons/acre and greater*

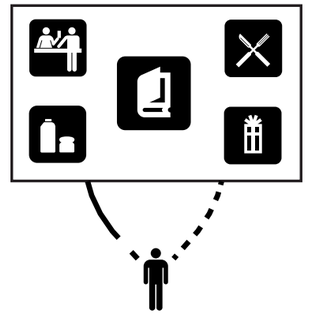
**CO2 PER HOUSEHOLD FROM HOUSEHOLD AUTO USE**




- *Data not available*
- *Less than 3.3 metric tons/HH*
- *3.3 to 5.1 metric tons/HH*
- *5.1 to 6.5 metric tons/HH*
- *6.5 to 8.6 metric tons/HH*
- *8.6 metric tons and greater*

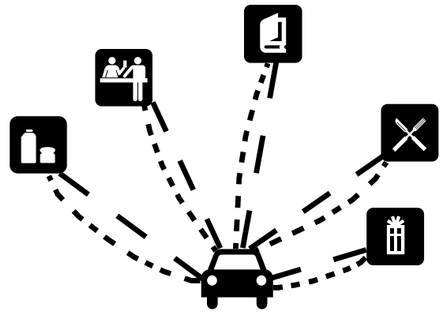
*Source: True Affordability and Location Efficiency, H+T Affordability Index*

## e.N.U.P.H.



*Efficient*

e.N.U.P.H. can be implemented in both urban and suburban contexts. By focusing on the first tier suburbs outside the urban core, e.N.U.P.H. can help attract people who still want to live outside the main center of Phoenix but who still desire convenient access to the downtown area as well as entertainment and sporting venues.



*Inefficient*

A walkable environment results in not just healthier residents, but an overall decrease in emmissions and use of resources. Both **WATER** and **FUEL** usage will decrease as residents move from single family homes to mixed-use developments like e.N.U.P.H.

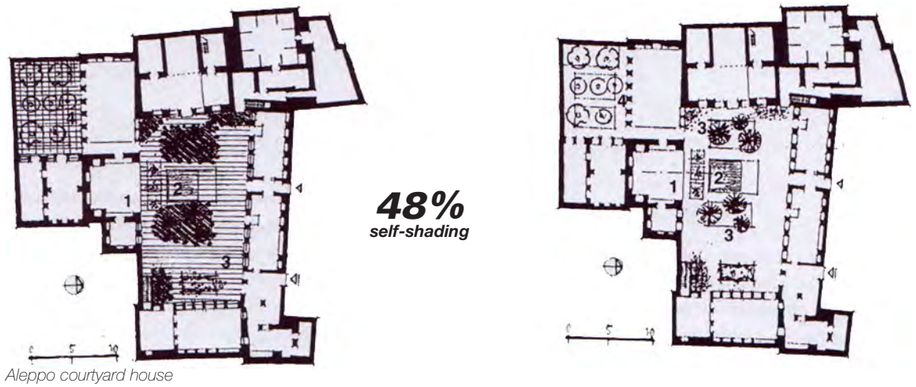

# Courtyard houses,

once a common typology in hot, arid regions, are

# NOT

as prevalent in Phoenix as they were, replaced by standard developer-driven homes with the advent of

## *air conditioning*




*Aleppo courtyard house*

*Source: Courtyard Housing: Past, Present, Future*

# Can Phoenix embrace
courtyard housing once again?

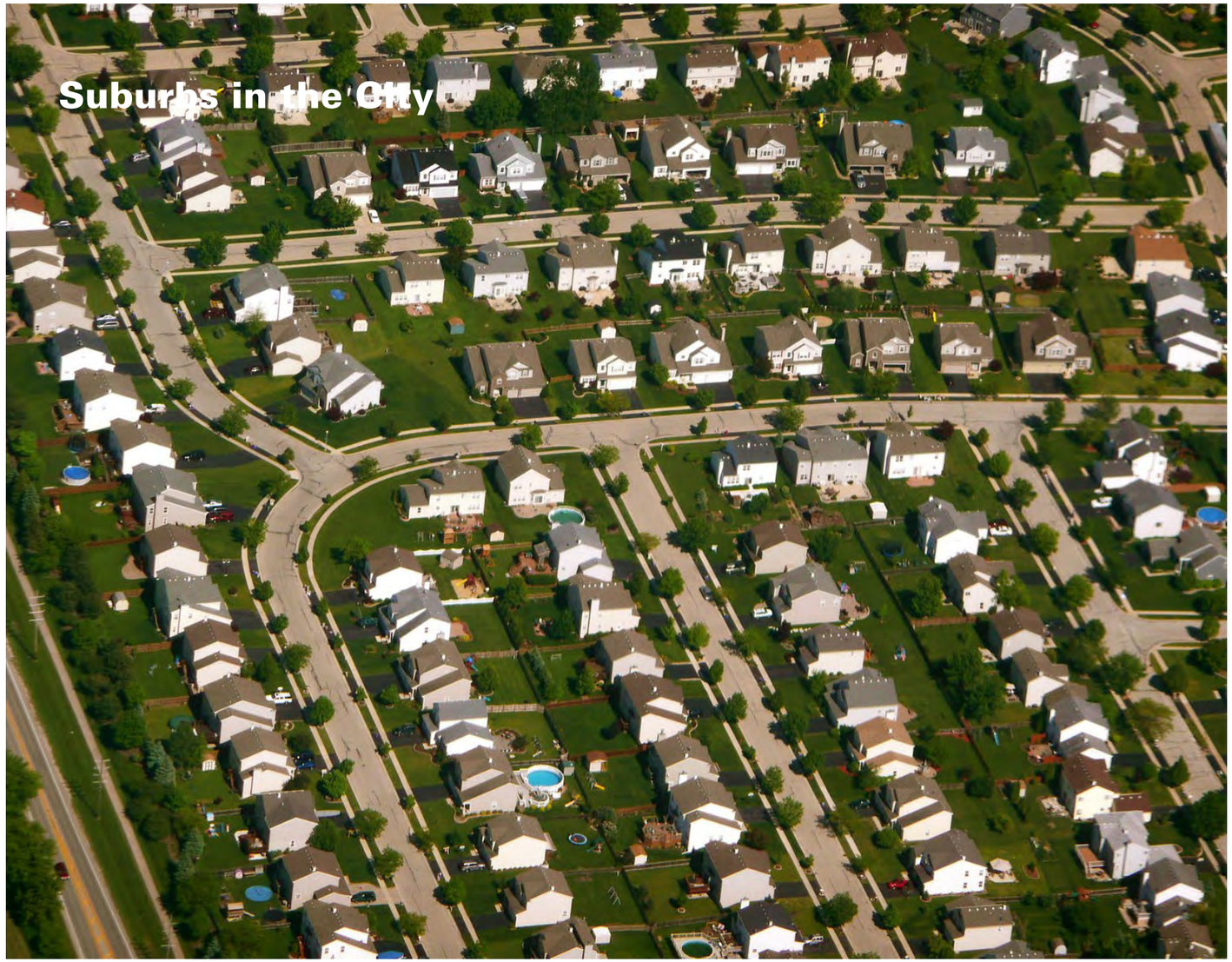

## AleppoPhoenix

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | YEAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Record high | 6388 | 7092 | 88100 | 93105 | 106114 | 117122 | 115121 | 109116 | 106116 | 99107 | 8696 | 6487 | 117122 |
| Average high | 5067 | 5570 | 6477 | 7585 | 8495 | 93104 | 97106 | 97104 | 91100 | 8188 | 6675 | 5466 | 7586 |
| Average low | 3445 | 3748 | 3953 | 4860 | 5569 | 6377 | 7083 | 7082 | 5976 | 5464 | 4552 | 3744 | 5263 |
| Record low | 916 | 1424 | 1925 | 2835 | 3239 | 4849 | 6163 | 5958 | 4547 | 4134 | 2727 | 1822 | 916 |
| Precipitation(mm) | 89.91 | 64.92 | 38.98 | 28.27 | 8.11 | 3.02 | 01.05 | 01.00 | 0.64 | 25.58 | 56.64 | 84.88 | 3958 |

Although Aleppo is classified as a semi-arid region and recieves approximately 390mm more rain than Phoenix each year, the two cities have similar climate patterns. Studying the effect that the harsh environment of Aleppo has on the courtyard house can help predict how a similar typology would react in Phoenix.

**e.N.U.P.H.**

will be driven by a courtyard typology




# “Urbs in Horto”

[CITY IN A GARDEN]

*-Daniel Burnham, Plan of Chicago*

Hmm...can an architectural

***typology***

breath life into a city through vegetation and gardens?

# Case Study #1


HABITAT 67
Montreal, Canada
Moshe Safdie
1967
x 158
x 240,000 ft²
Habitat 67 investigates how private outdoor space can still be maintained even in an urban, multifamily development. Built as part of Expo 67 in Montreal, the project was designed to illustrate the new lifestyle people in which people would live in increasingly crowded cities around the world.
EVEN WITHIN DENSE CITIES, PEOPLE CAN STILL HAVE AFFORDABLE HOUSING WITH PRIVATE GARDENS.

# Case Study #2

## MOUNTAIN DWELLINGS

**Copenhagen, Denmark**
**B.I.G. Architects**
**2008**

**x 80**

**x 398,000 ft²**

**The Mountain House, by BIG, explores the typology of combined housing and parking. Located in the Ørestad development south of Copenhagen, the project resembles a mountain sloping towards the southeast, with each unit receiving its own outdoor space and unobstructed views.**

*** PARKING AND HOUSING CAN BE BEAUTIFULLY COMBINED IN A SYMBIOTIC MANNER THAT ENABLES MORE PRIVACY AND OUTDOOR RESOURCES FOR RESIDENTS.**

# Case Study #3

## OPTIMA CAMELVIEW

**Scottsdale, Arizona**
**David Hovey Architects**
**2006-2011**

**x 720**

**x 398,000 ft²**

**Optima Camelview proves that with the right design and location, many wealthy Arizonans are willing to live in multi-family projects. Located adjacent to the Scottsdale Fashion Square mall, Camelback's design results in nearly every residence having its own patio or outdoor space. A shared courtyard contains a pool and lush vegetation; helping to cool the air while improving the quality of life for residents.**

**THE PROJECT IS A MULTI-FAMILY MIXED-USE DEVELOPMENT CATERING TO UPSCALE CONSUMERS THROUGH THE EMPHASIS ON PRIVATE SPACE AND VEGETATION.**

# Case Study #4

## COUNTRY CLUB PLAZA

Kansas City, MO
J.C. Nichols
1922

N/A

N/A

The Country Club Plaza in Kansas City was one of the first outdoor shopping centers in the country which catered to the automobile. Surrounded by mixeduse buildings and residential towers, J.C. Nichols was able to create a bustling and successful 'mini-town' outside of the urban core of Kansas City

*** THE PROJECT FOCUSES ON THE INTERSECTION BETWEEN PEDESTRIANS AND AUTOMOBILES, AND SUCCEEDS IN COMBINING MULTIPLE USES IN A RELATIVELY DENSE AREA.**


Americans are the most

# INDIVIDUALISTIC

people in the ***WORLD...***

***according to Geert Hofstede***

## HOFSTEDE'S CULTURAL DIMENSIONS THEORY

Geert Hofstede, an influential Dutch psychologist and anthropologist, developed the Cultural Dimensions while working for IBM in the 1970's. With the ability to access extensive amounts of information at IBM, Hofstede began aggregating individuals as societal units, allowing him to examine national cultures rather than individual personalities. He developed six dimensions of values; Equality vs. Inequality, Collectivism vs. Individualism, Uncertainty Avoidance vs. Tolerance, Masculinity vs. Femininity, Temporal Orientation, and Indulgence vs. Restraint. While his results are certainly not indicative of every citizen of particular country, anthropologists and international business leaders use these values to assess different cultures and countries as accurately as possible.

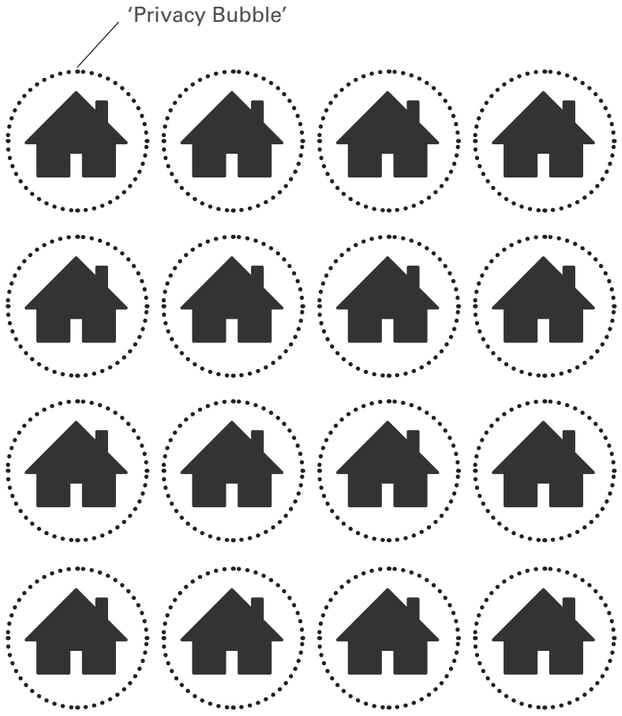
10 MOST INDIVIDUALISTIC COUNTRIES

| COUNTRY | SCORE |
|---|---|
| **United States** | **91** |
| Australia | 90 |
| United Kingdom | 89 |
| Netherlands | 80 |
| New Zealand | 79 |
| Italy | 76 |
| Belgium | 75 |
| Denmark | 74 |
| France | 71 |
| Sweden | 71 |

10 LEAST INDIVIDUALISTIC COUNTRIES

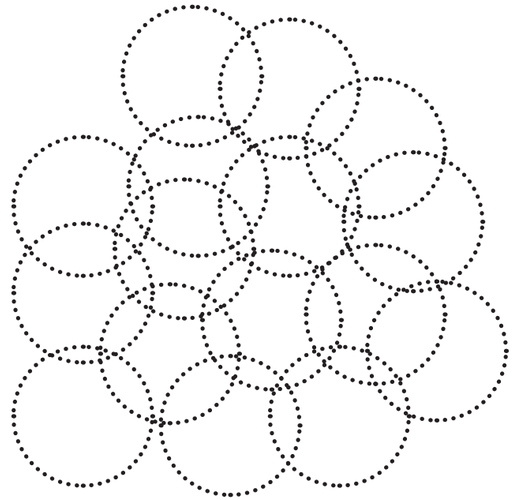
| COUNTRY | SCORE |
|---|---|
| **Guatemala** | **6** |
| Ecuador | 8 |
| Panama | 11 |
| Venezuela | 12 |
| Columbia | 13 |
| Pakistan | 14 |
| Indonesia | 14 |
| Costa Rica | 15 |
| Peru | 16 |
| Taiwan | 17 |

*Source: www.clearlycultural.com*




Contemporary American housing model

***So how do you preserve***
# PRIVACY
in a collectivistic programmatic organization?



**e.N.U.P.H.**

# MOUNTAIN DWELLINGS

*Detailed Case Study*

**Copenhagen, Denmark**
**B.I.G. Architects**
**2008**

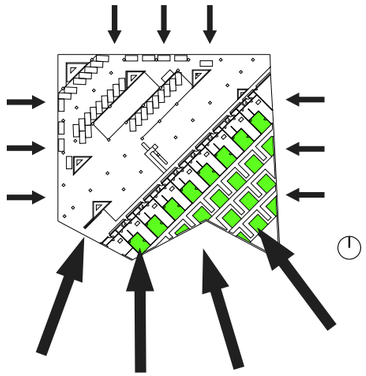
**x 80**

**x 398,000 ft²**

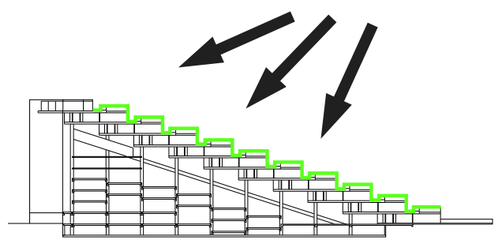
*1. View from southeast*
*2. Approach from north*
*3. Interior of garage*

**1** [BEAUTY, SHAPE]

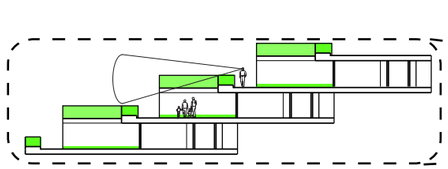
*No two sides of the building appear the same. The building slopes up towards the denser city beyond, and reveals its more private, less-obtrusive side to the adjacent neighborhood.*



**2** [NATURAL LIGHT]



*Vegetation exposed to greatest amount of sunlight*



*Hedges provide privacy from upper units*


*Diagonal circulation path inhabits the interstitial space between parking and housing*

*Circulation confined to one linear spine*

*Each floor has a separate entrance from the parking garage*

*Similar unit plan throughout, variation occurs at corners*

*Areas for private patios or gardens, open to walkway*

*Walkway is similar to neighborhood sidewalk, only accessible to units on a particular level*

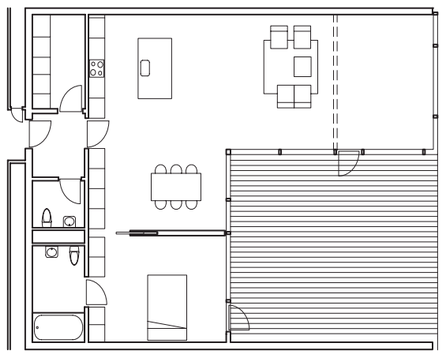
**3** [PLAN TO SECTION RELATIONSHIP]

**e.N.U.P.H.**

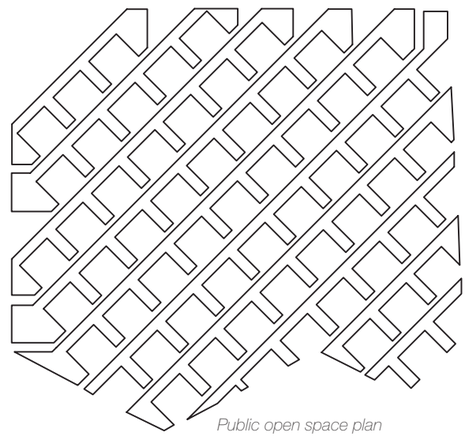
## CASE STUDY PROGRAM: MOUNTAIN DWELLINGS

| PROGRAM | QUANTITY | GSF | NSF | NOTES |
|---|---|---|---|---|
| **HOUSING** | | | | |
| Mixed unit types | 80 | 103,000 ft² | 74,000 ft² | Front doors fed by interior circulation |
| Interior circulation | N/A | 13,800 ft² | | |
| **PUBLIC SPACE** | | | | |
| Gathering space | 5 | 11,000 ft² | 10,500 ft² | These spaces only open to residents |
| Outdoor space | N/A | 31,000 ft² | | |
| **PARKING** | | | | |
| Parking spaces | 480 | 225,000 ft² | | |
| **RETAIL** | | | | |
| Various retail | 3 | 4,000 ft² | 3,600 ft² | |
| **SERVICE** | | | | |
| Mechanical | 1 | 4,000 ft² | | |
| Storage | 3 | 5,475 ft² | | Located on 3 floors around parking |
| **TOTAL** | | **397,275 ft²** | **88,100 ft²** | |

**.3** ft² public green space / **1** ft² condo



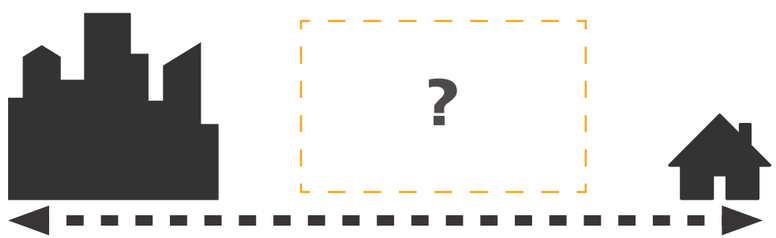
*Typical unit plan*



*Public open space plan*

In order for **e.N.U.P.H.**
to work effectively,
***it needs to find a balance***
between

# PRIVACY *COMMUNITY* &




**Description**

This project is a prototype for an urban mixed-use use housing development in Phoenix, Arizona which aims to improve the **quality of life** for its residents by integrating **suburban amenities**, like open space and privacy, into an urban setting.

***NUPH is a sustainable mixed-use development in Phoenix, AZ.***

**Case Statement**

This project will be developed because I have a strong interest in how Phoenix can sustainably grow in the future. Clearly, unchecked sprawl and inefficient dwelling units cannot continue indefinitely, especially in an area where many resources are scarce. However, most people do not move to Phoenix for the city, but for the natural areas outside the city. Many of the high-rise building near the urban core are near vacant and empty lots sit like missing teeth in the urban fabric. This project will fill such voids and bring **vitality** back to the city.

Furthermore, I am interested in becoming an architect/developer in Phoenix in the future and would like to approach this project not only from an architectural perspective, but also from a developer's point of view. If there is a financially-feasible way to create beautiful, efficient, and universally **appealing housing stock** in urban Phoenix as opposed to new cookie-cutter developments far outside the city, it could help reduce the amount of sprawling track homes and arguably create a better quality of life for all residents.

# GOALS

## Typology for a New American Dream

Individuals living in the mixed-use project and people within the city will be inspired by the development and residents, in particular, will feel a sense of place.

## Alternative for Suburbanites

This idea will be successful by celebrating suburban amenities in existing urban conditions, leading to a better quality of life for residents and more affordable housing without sacrificing conveniences.

## Catalyst for Sustainable Growth

This idea will be successful by celebrating suburban amenities in existing urban conditions, leading to a better quality of life for residents without sacrificing conveniences.

## Stitch Ruptured Urban Fabric

This idea will help remedy the tearing of the urban fabric in Phoenix by encouraging reestablishment of urban vitality.

# GUIDING PRINCIPLES

## Creating and Maintaining Identity

Individuals living in the mixed-use project and people within the city will be inspired by the development and residents, in particular, will feel a sense of place.

## Community Establishment

Creating community among individuals who value their privacy but also want to engage in social interaction should be considered in all decisions.

## Urban Revitalization

The project will give back to the City of Phoenix by revitalizing the static urban conditions that currently exist through the influx of additional residents and needed program(s).

## Ecologically-Responsible

The project should acknowledge its location in a warm through all design decisions, and leave a positive mark on the local environment.

## Better Quality of Life

All decisions made on the project should result in at least an equal or better quality of life for residents than suburban living.

# STAKEHOLDERS

## Homeowners

These are the people who will actually live in the mixed-use development and contribute to its success.

## Developer

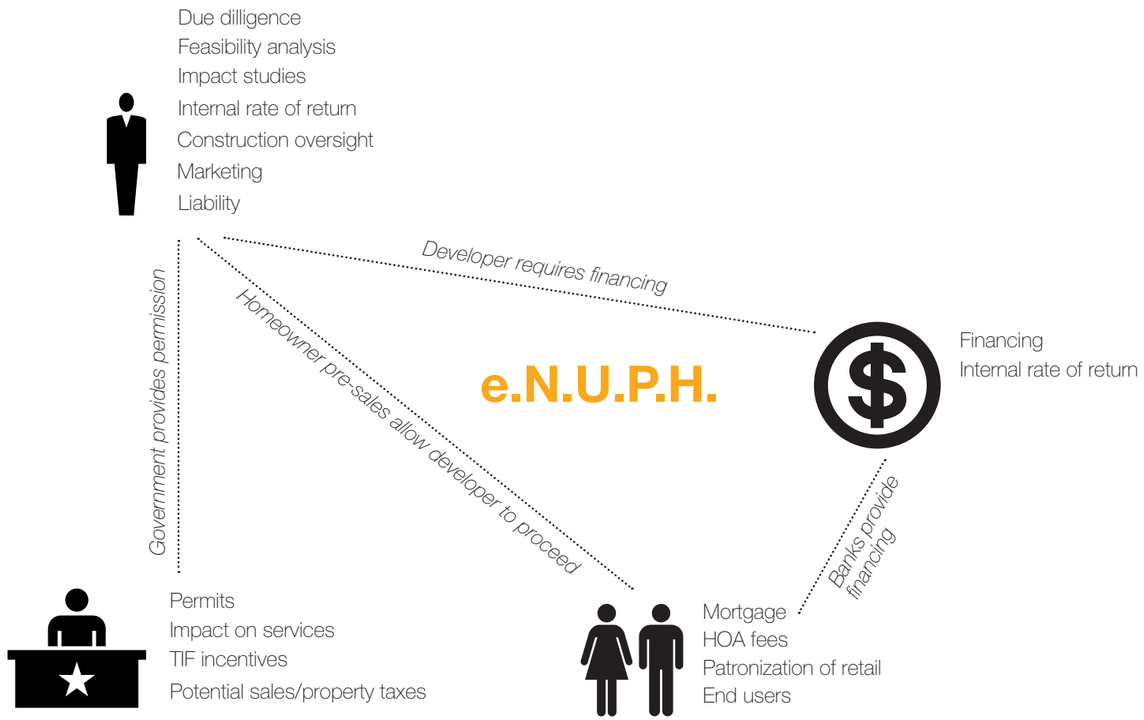
The individual(s) responsible for the actual manifestation of the project; stands to benefit or lose financially.

## Phoenix City Government

The government will be interested in how the project not only improves the quality of life for people living in the development, but also how it improves the urban fabric of the city in general; also interested in additional tax revenue created from the project.

## Banks / investors / Lending Authorities

The agencies that provide funding to the developer to actually get the project built; they are interested in profits from their investment.



## SPATIAL RELATIONSHIPS BY PROGRAM

entry/exit to street

secondary adjacency

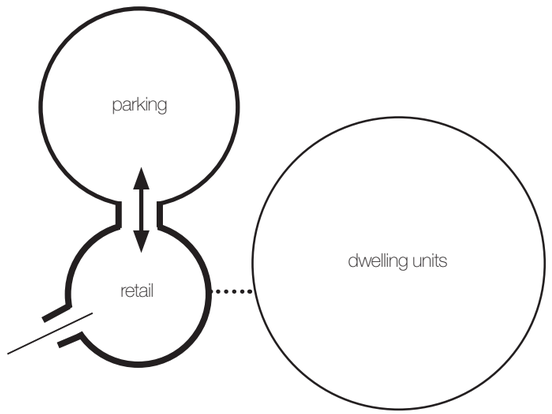
primary adjacency

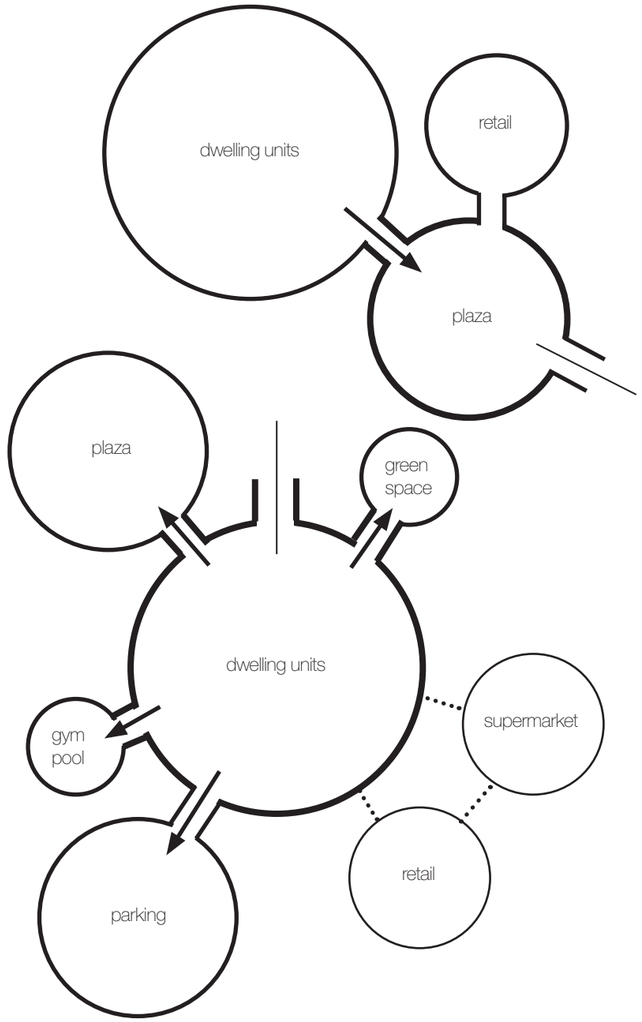
target space

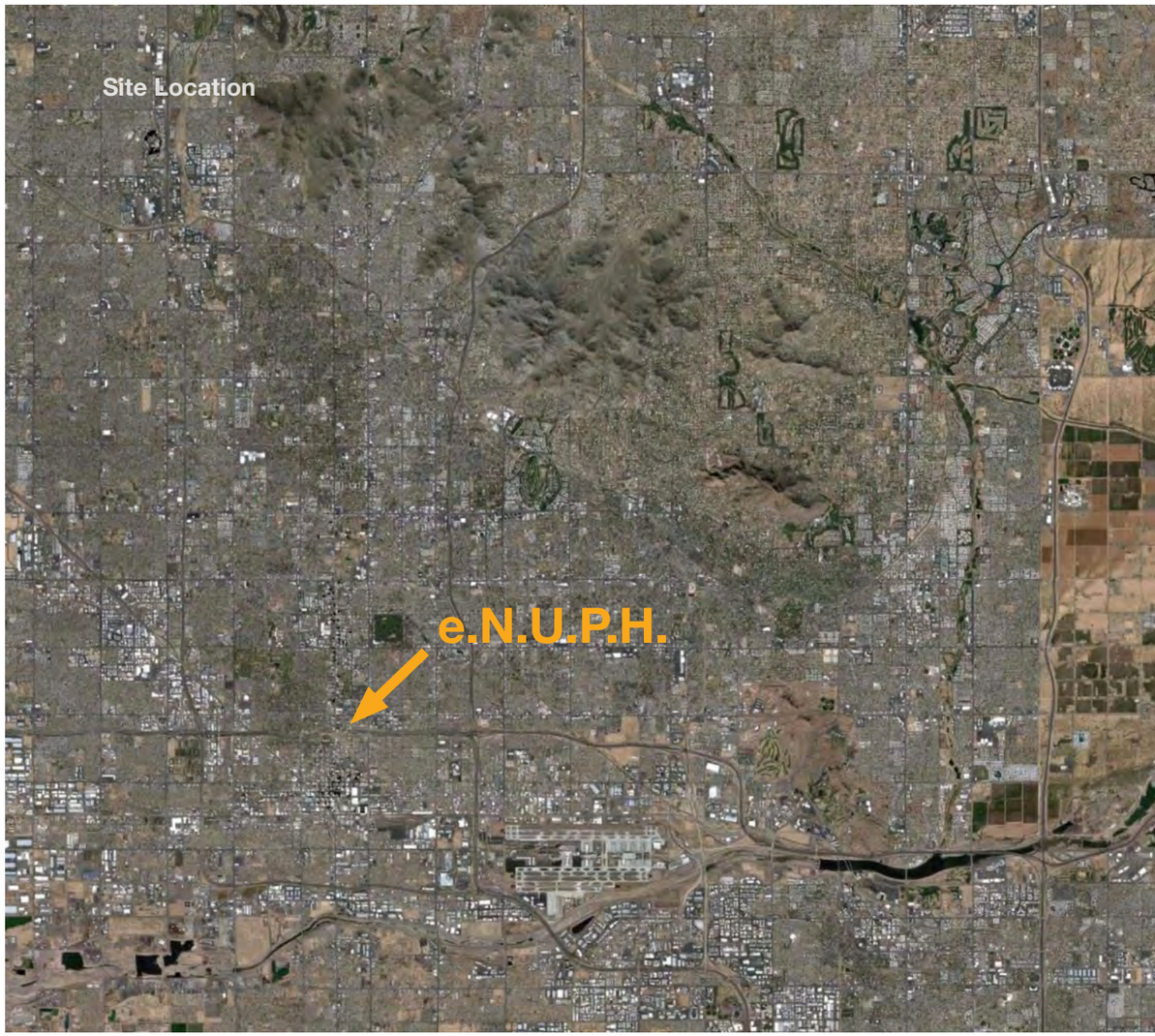
vital connection

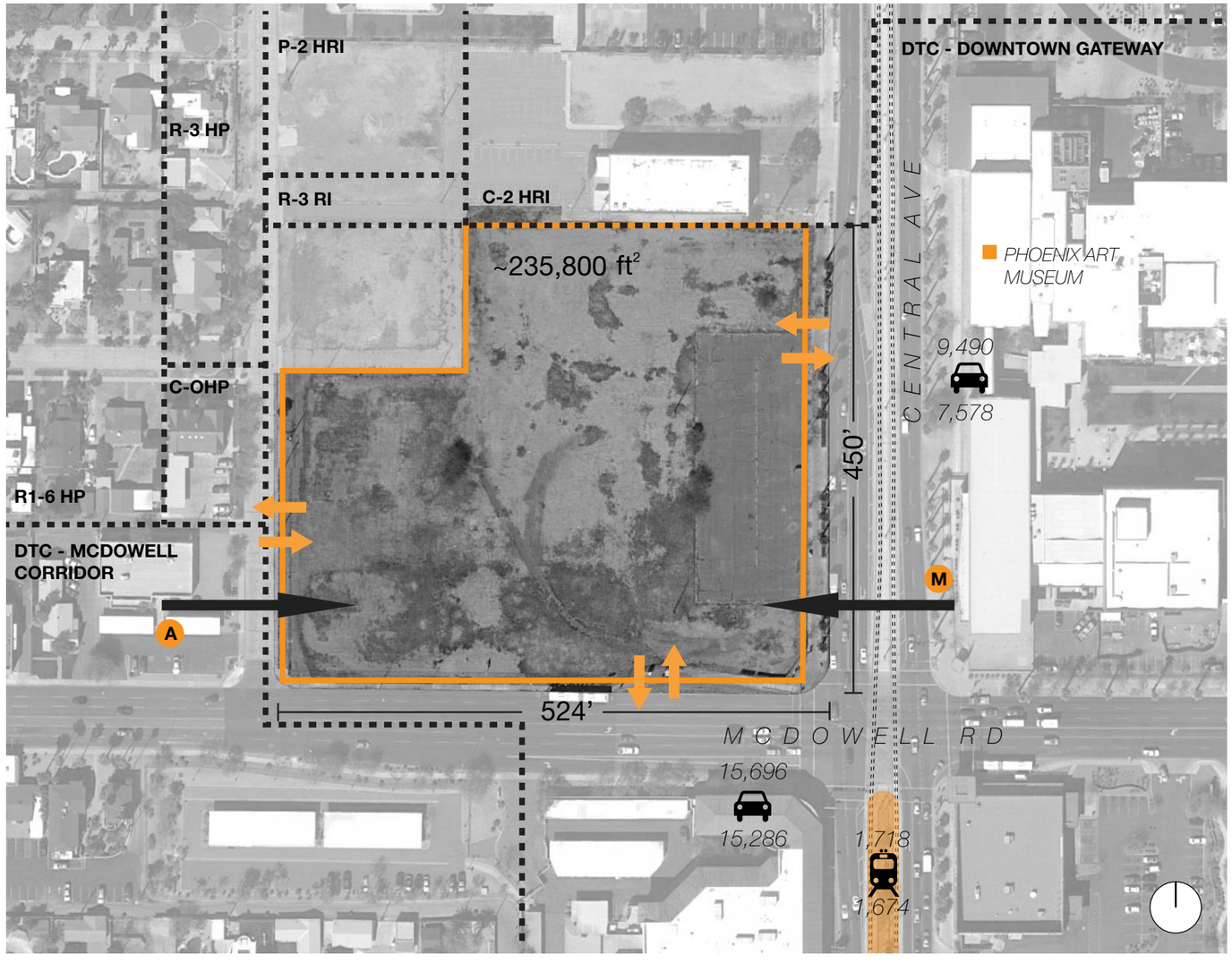
secondary connection

tertiary connection



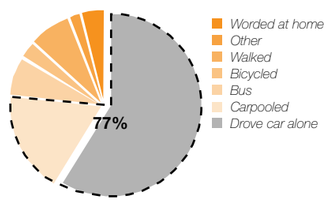





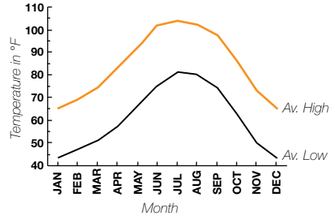

**Legend**

- Light rail tracks
- Light rail station
- 15,696 Cars per day (in and out)
- 15,286
- R-3 RI Zoning
- Cultural attractions
- Physical site boundary
- 1,718 Daily light rail boardings (in and out, at station)
- 1,674
- Preferred site access
- Prevailing winds (morning)
- Prevailing winds (afternoon)

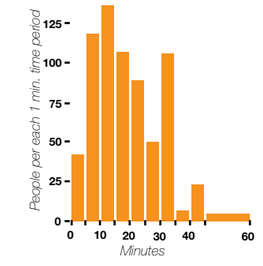
**Local Commute Methods**



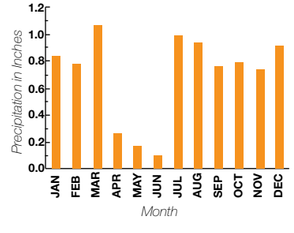

**Average Monthly Temperature**




**Local Commute Times**




**Monthly Precipitation**




**Density**

| | |
|---|---|
| **Site** 7,102/sq. mi. | |
| **Phoenix** 3,071/sq. mi. | |
| **Chicago** 11,684/sq. mi. | |


*View of site from the SE corner of McClinktock & Central*

*View from rear of site, looking towards the skyline of Downtown Phoenix to the South*

The ***SUN CORRIDOR*** from Phoenix to Tucson

## IS EXPECTED TO GROW BY

# 118%

from 2010 to 2050...

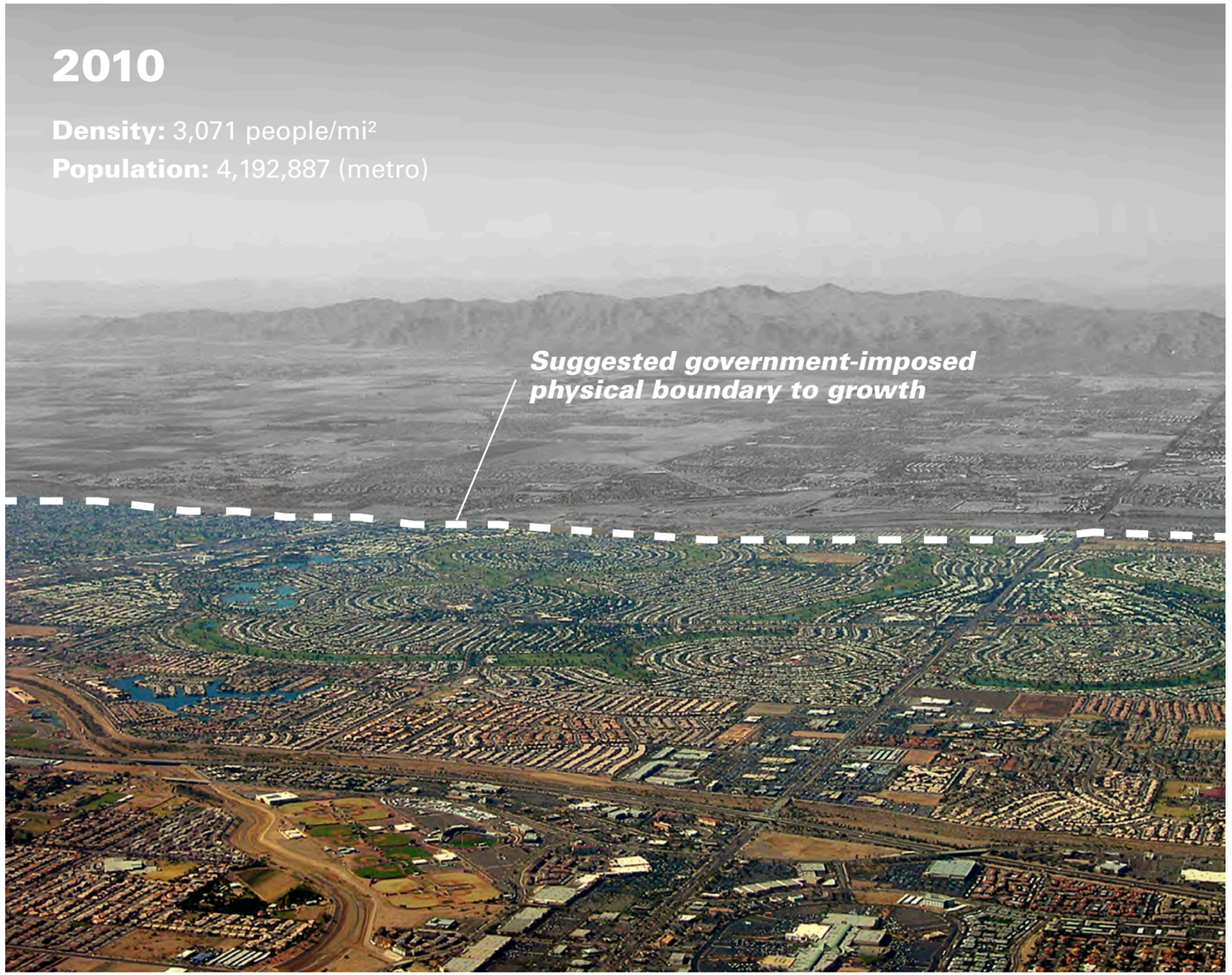
*Which means a metropolitan area of nearly*

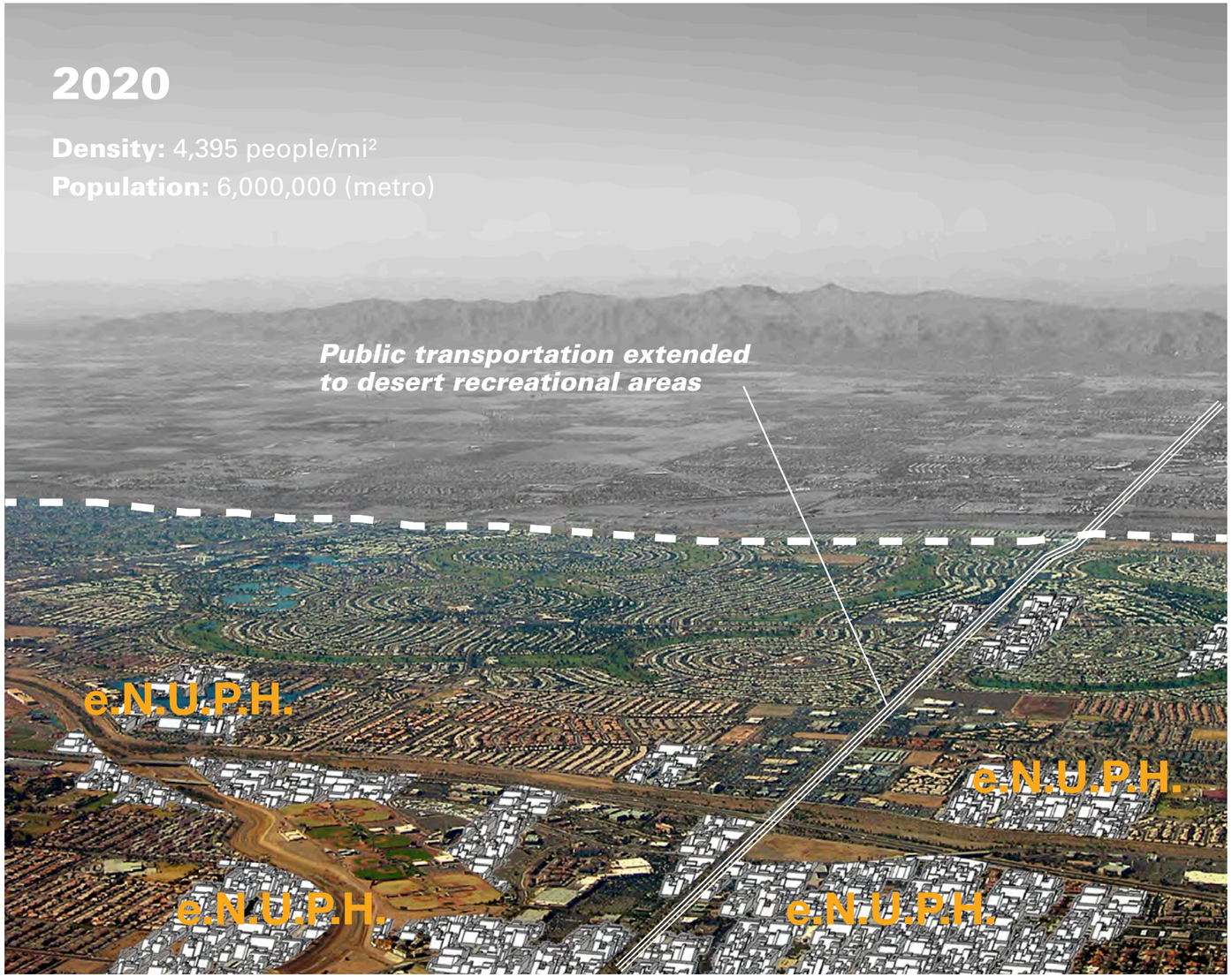
# 12,400,000

Where will all those people live?

## e.N.U.P.H.

AT AN URBAN SCALE




2020
Density: 4,395 people/mi²
Population: 6,000,000 (metro)
Public transportation extended to desert recreational areas
e.N.U.P.H.
e.N.U.P.H.
e.N.U.P.H.
e.N.U.P.H.


2035
**Density:** 5,714 people/mi²
**Population:** 7,800,000 (metro)
*Preserve existing green spaces and parks*

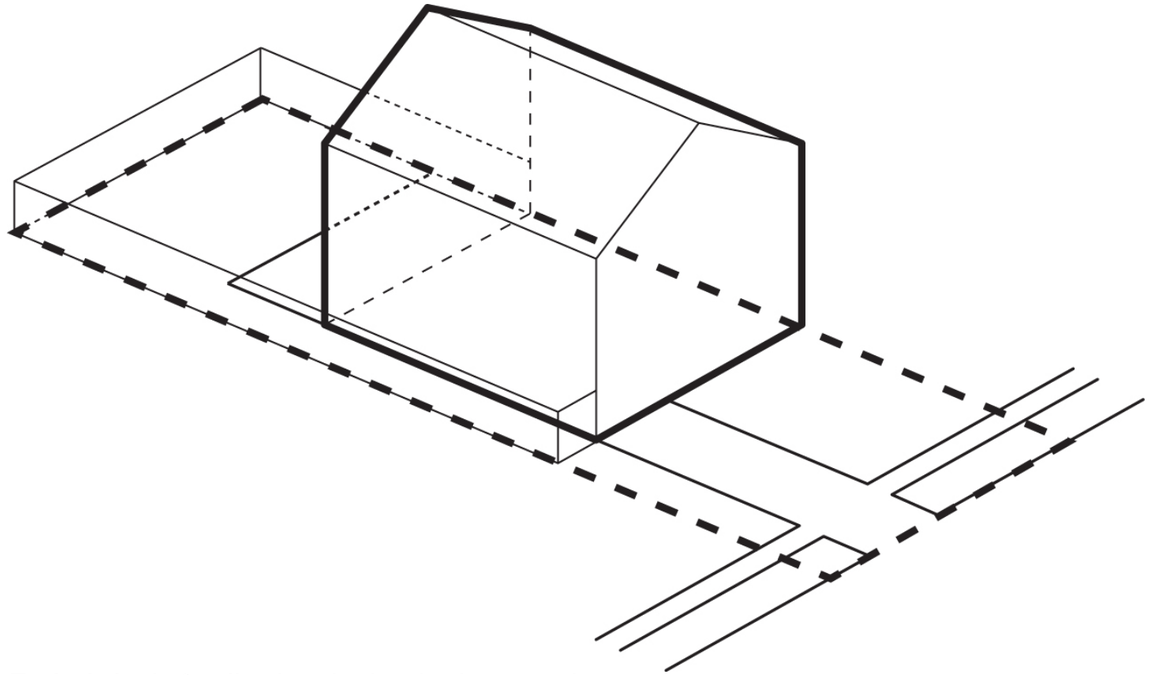

2050
Density: 7,326 people/mi²
Population: 10,000,000 (metro)
PRESERVED DESERT ENVIRONMENT
Local economic, recreational, and residential nodes

# PART ONE (2/3)

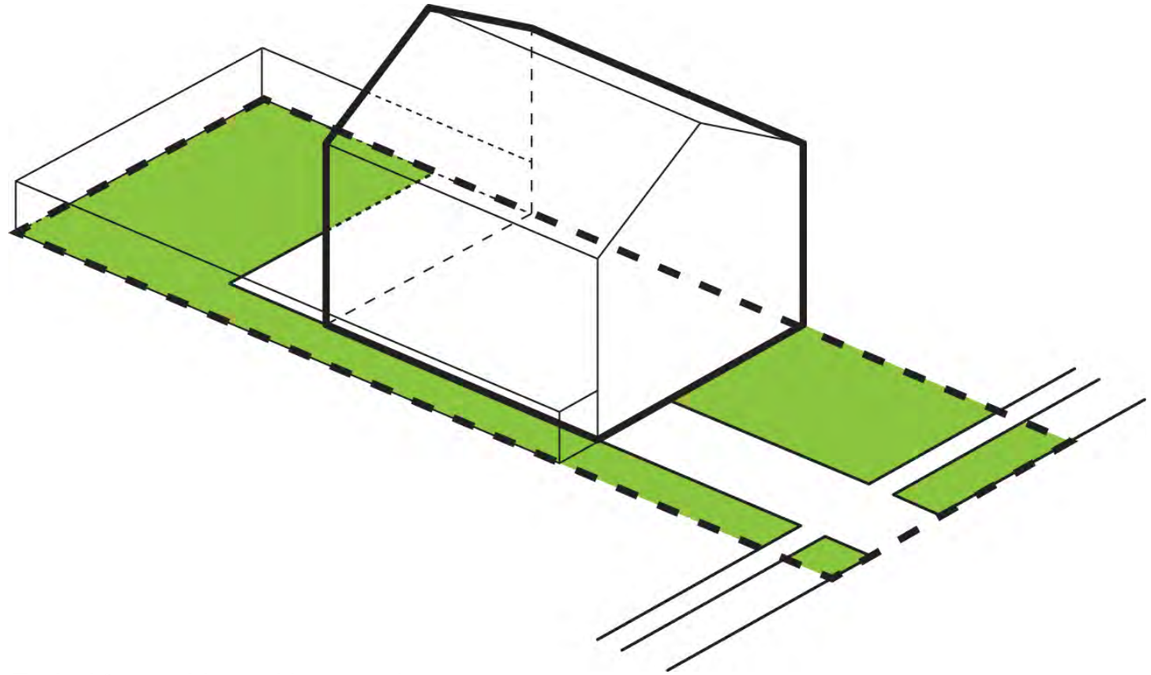
***PROCESS***

# UNIT CONCEPTS:

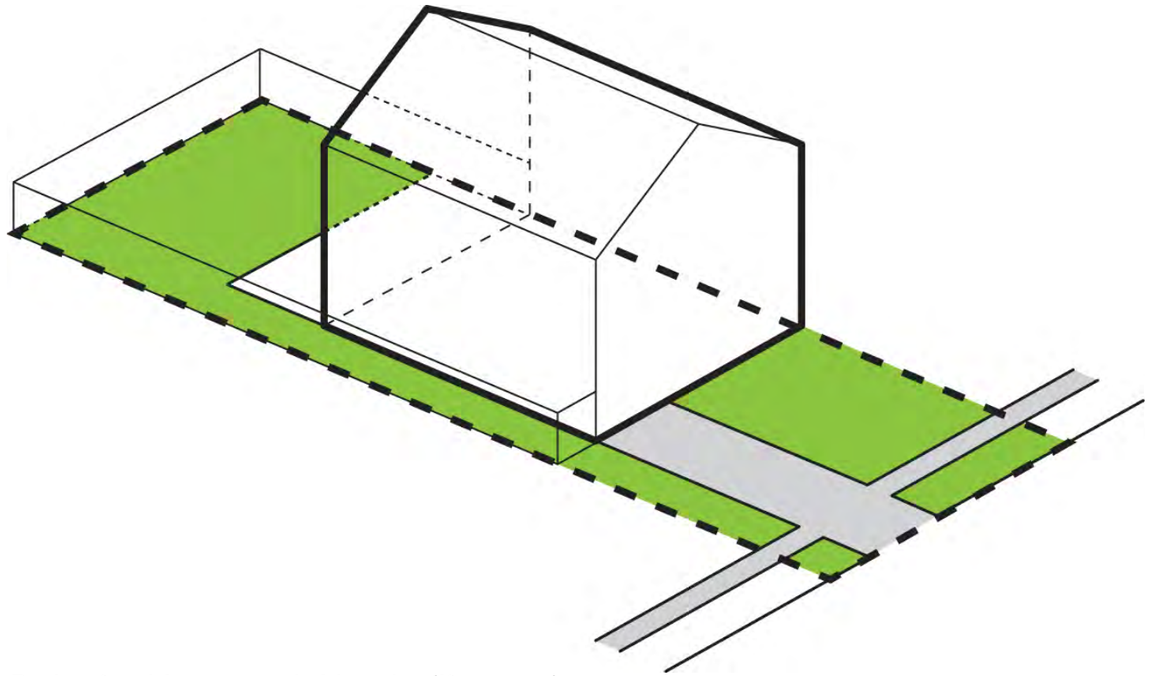
*Maximizing usable space, focusing on outdoor living areas*



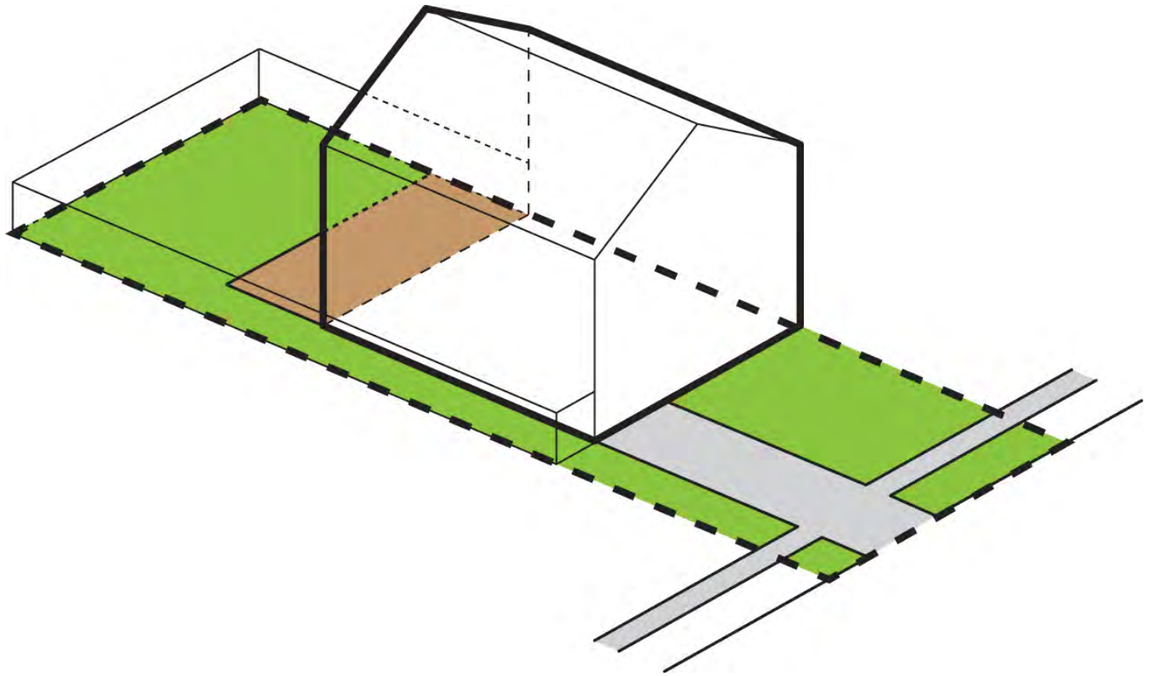
*Typical single-family, detached, suburban tract home*



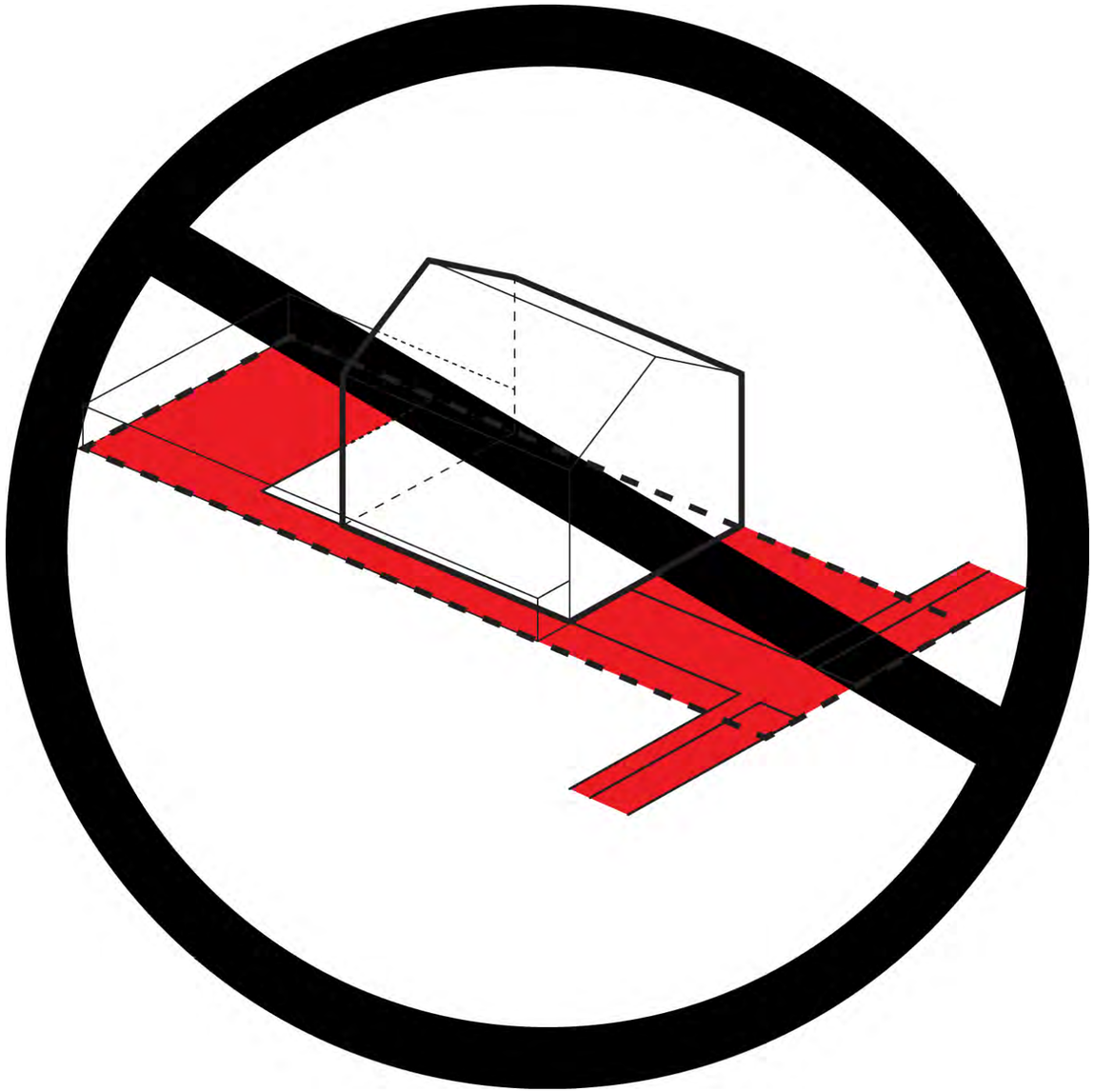
*Typical front, side, and back yards*



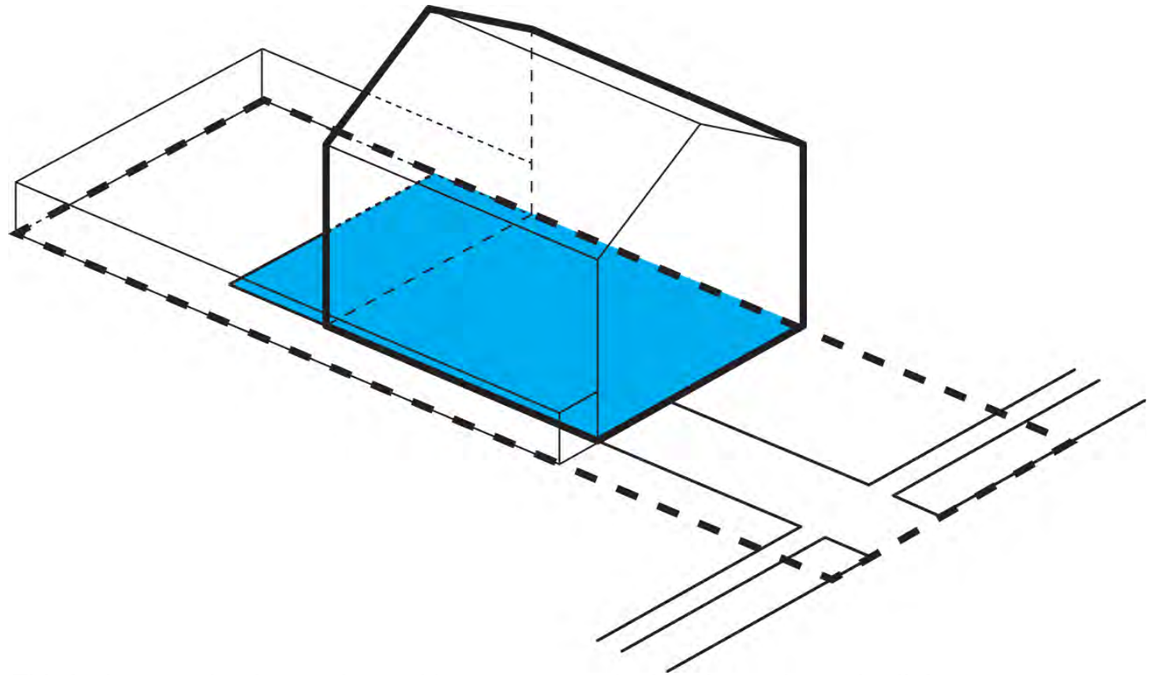
*Paving for driveway and sidewalks (if present)*



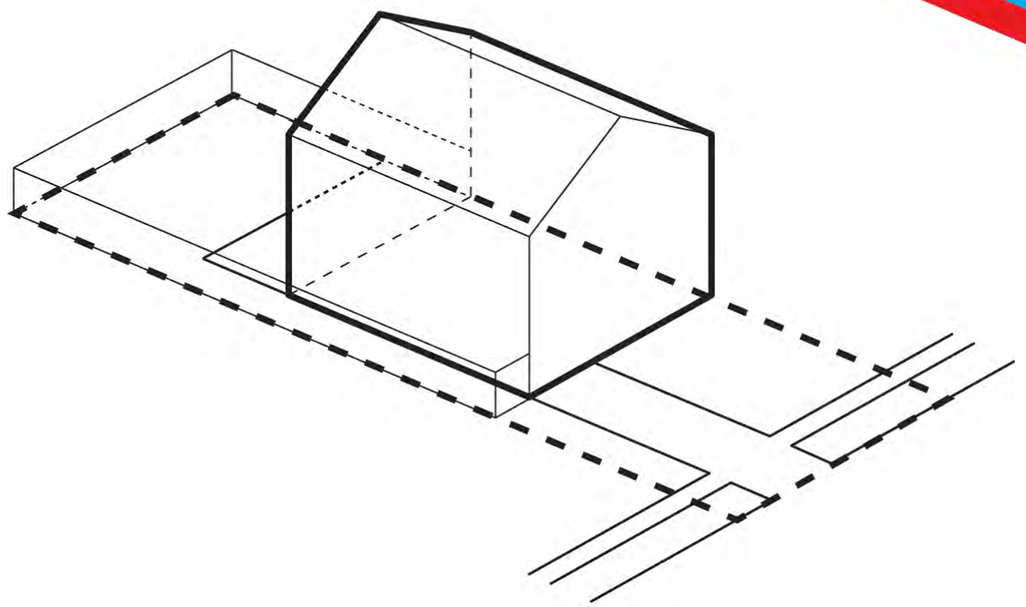
*Back porch / outdoor living space*

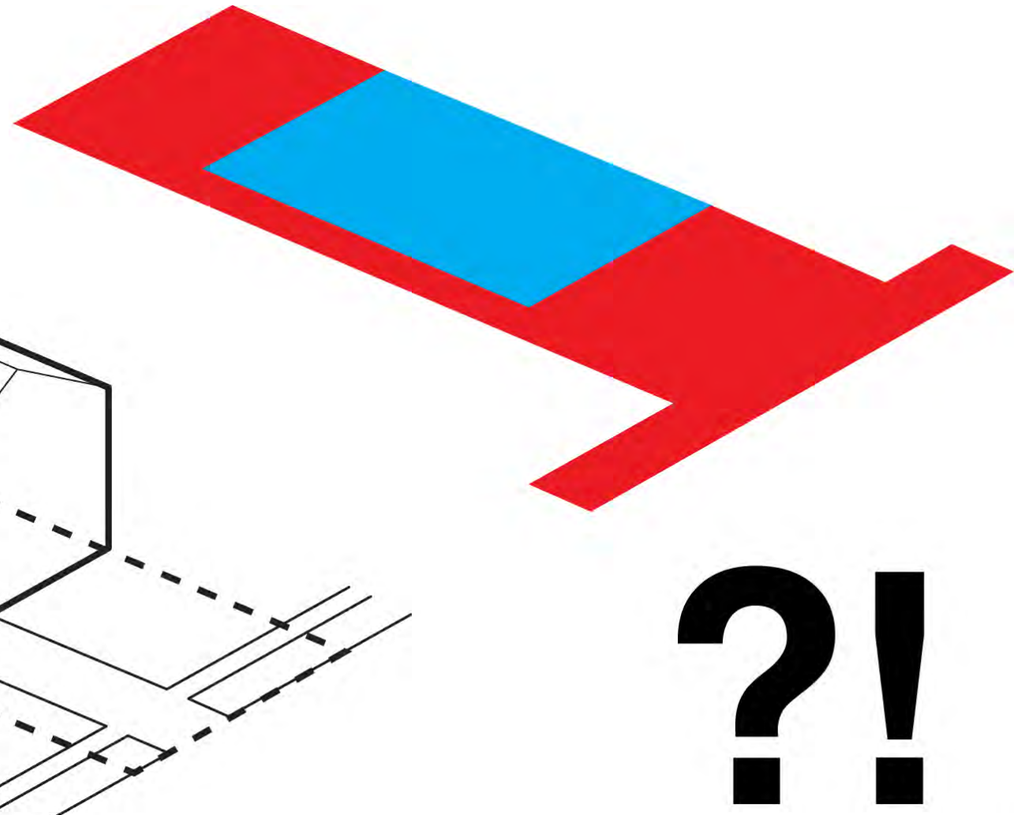


*Why does temporarily-used space make up most of a tract home's plot area?*

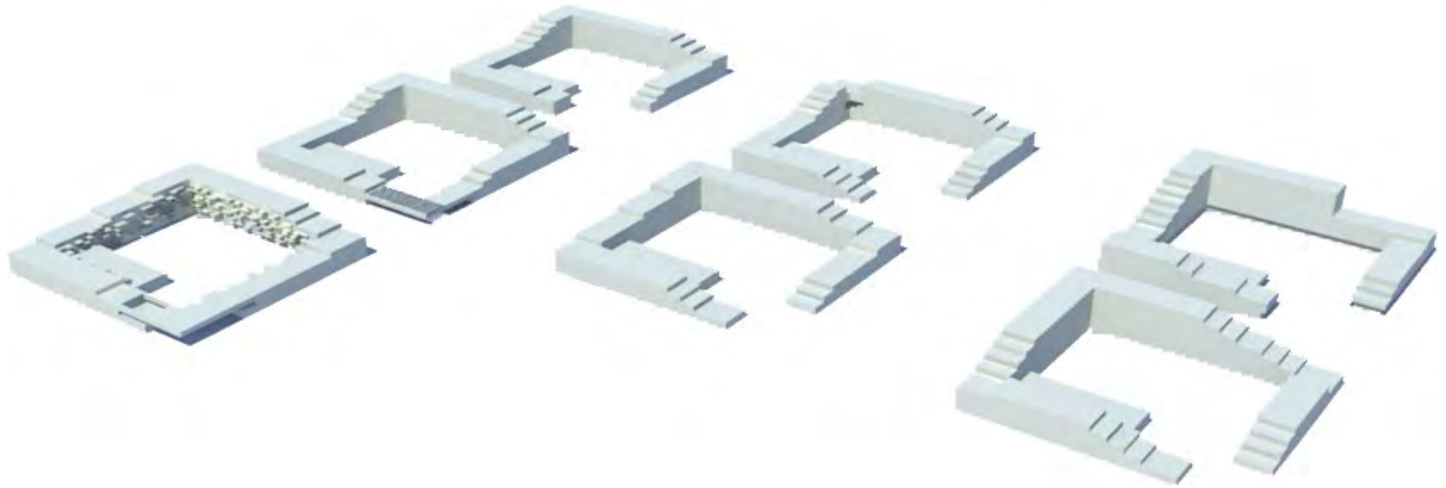


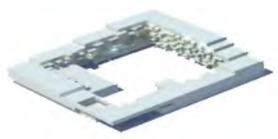
*This is the area that is mostly used by occupants; the interior and exterior living spaces*

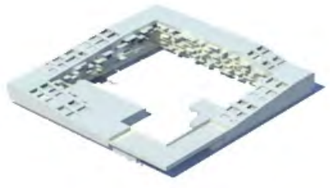


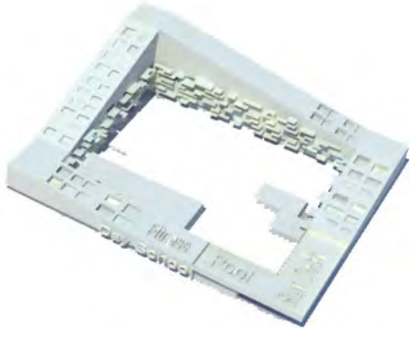



*Why is there such a disconnect between used and unused space?  Can we maximize blue space and minimize red space?*

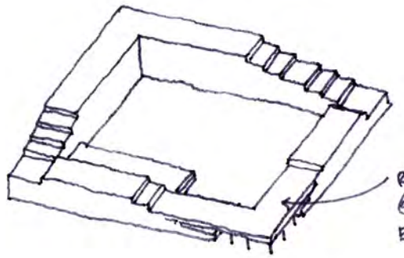




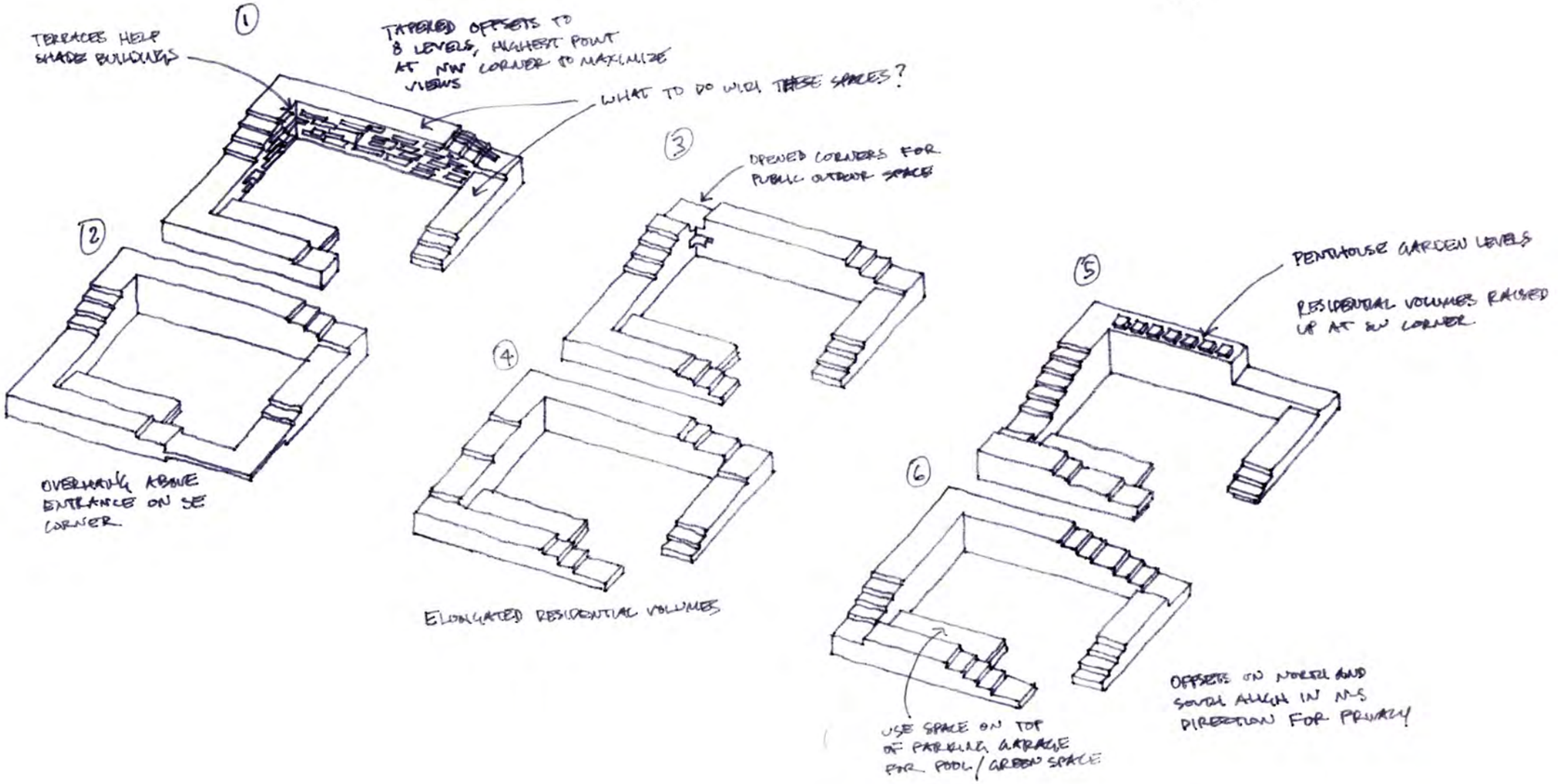


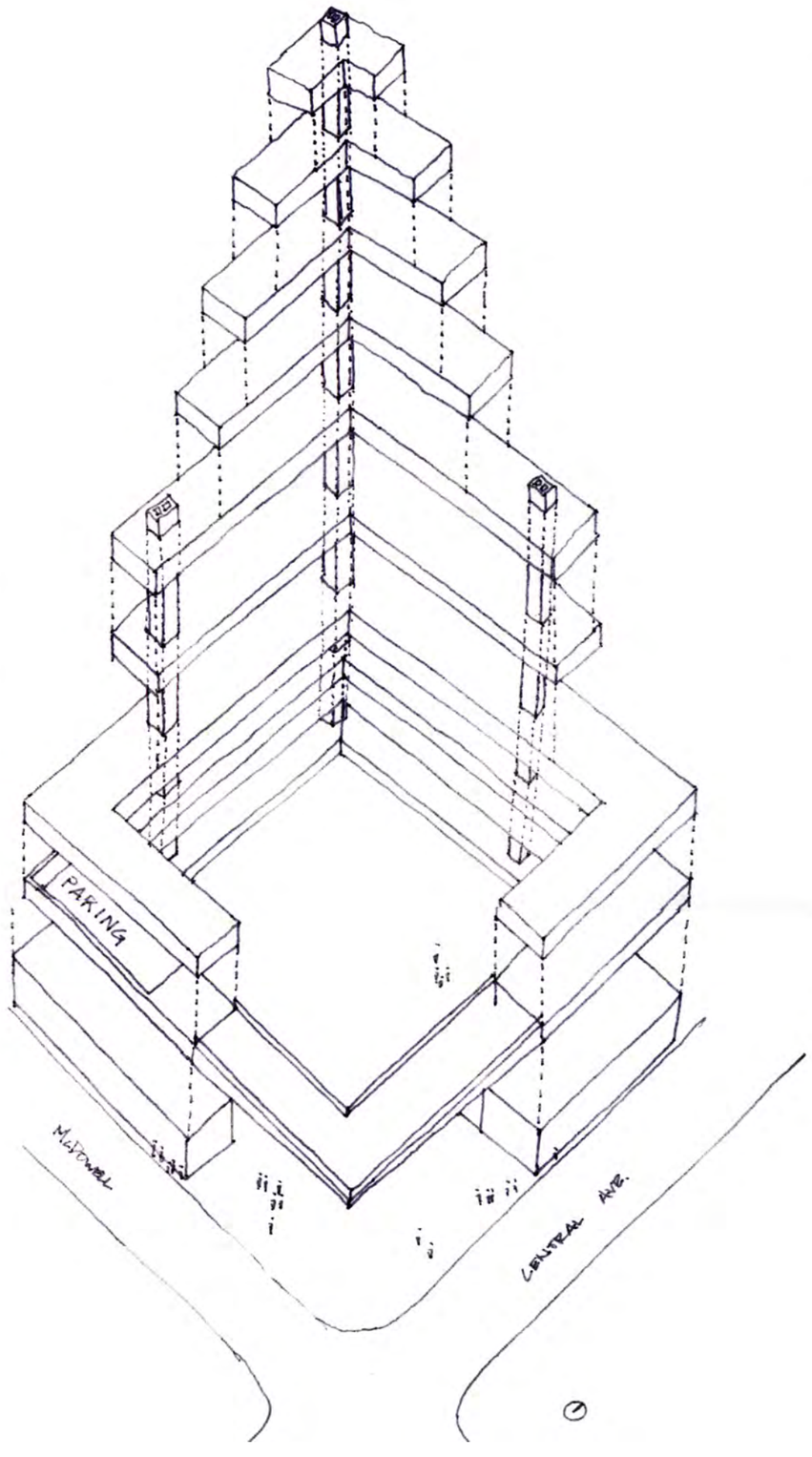


# MASSING SCHEMES



RESIDENTIAL LEVEL @ 3RD FLOOR SPANS ENTRANCE TO PLAZA






— $L_9$ (RESIDENCES) (2 UNITS)

— $L_8$ (RESIDENCES) (6 UNITS)

— $L_7$ (RESIDENCES) (12 UNITS)

— $L_6$ (RESIDENCES) (18 UNITS)

— $L_5$ (RESIDENCES) (34 UNITS)

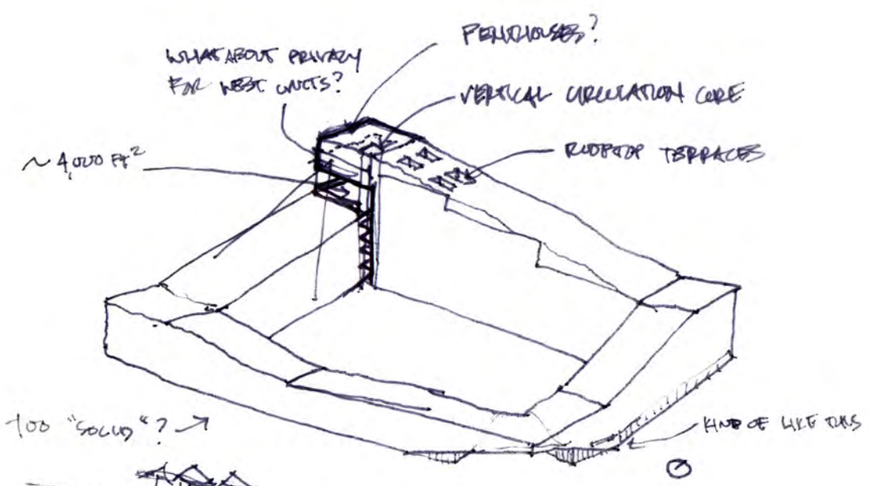
— $L_4$ (RESIDENCES) (34 UNITS)

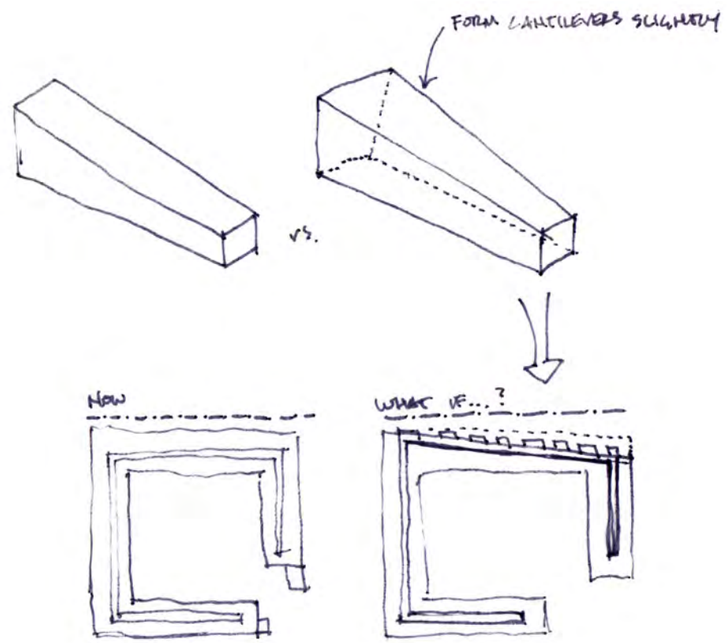
— $L_3$ (RESIDENCES) (57 UNITS)

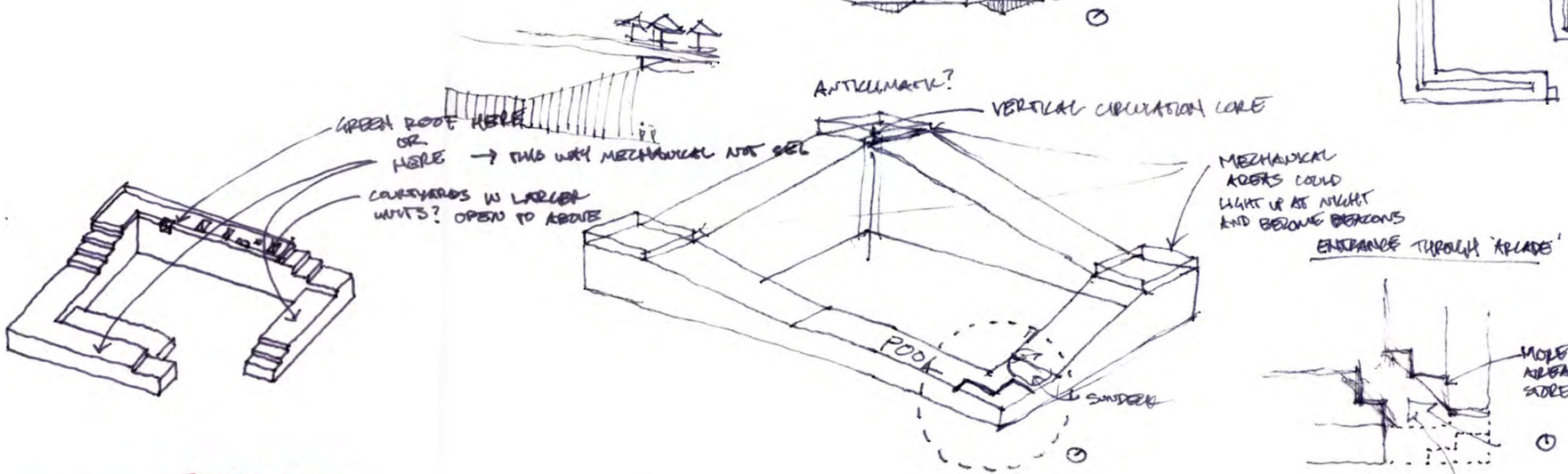
— $L_2$ (GROCERY PARKING, RESIDENT AMENITIES, RESIDENCES) (47 UNITS)

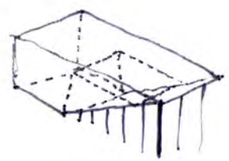
— $L_1$ (RETAIL, GROCERY, RESIDENT LOBBIES)

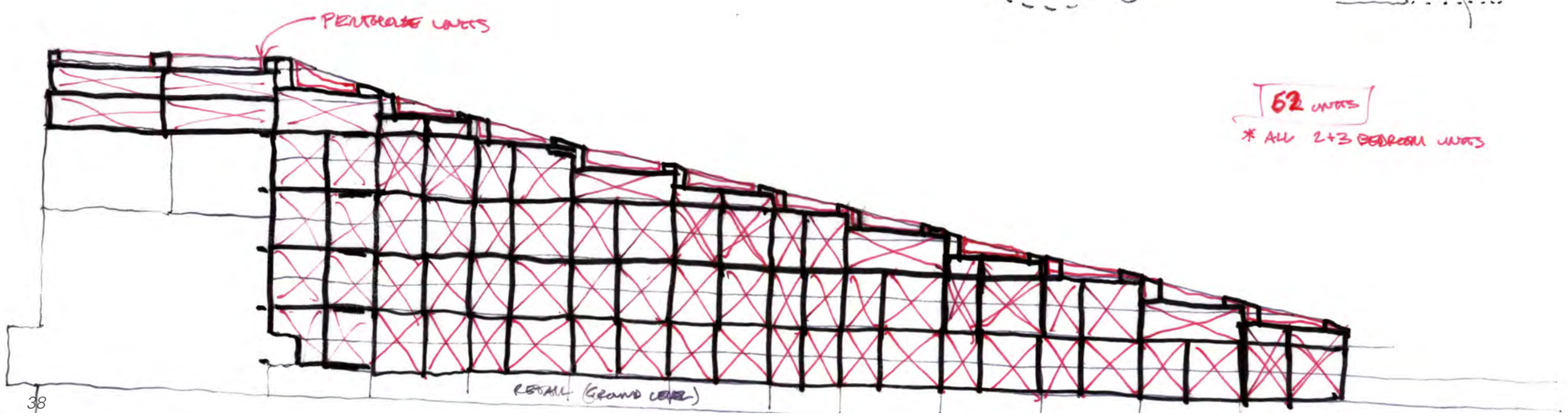
210 UNITS TOTAL.



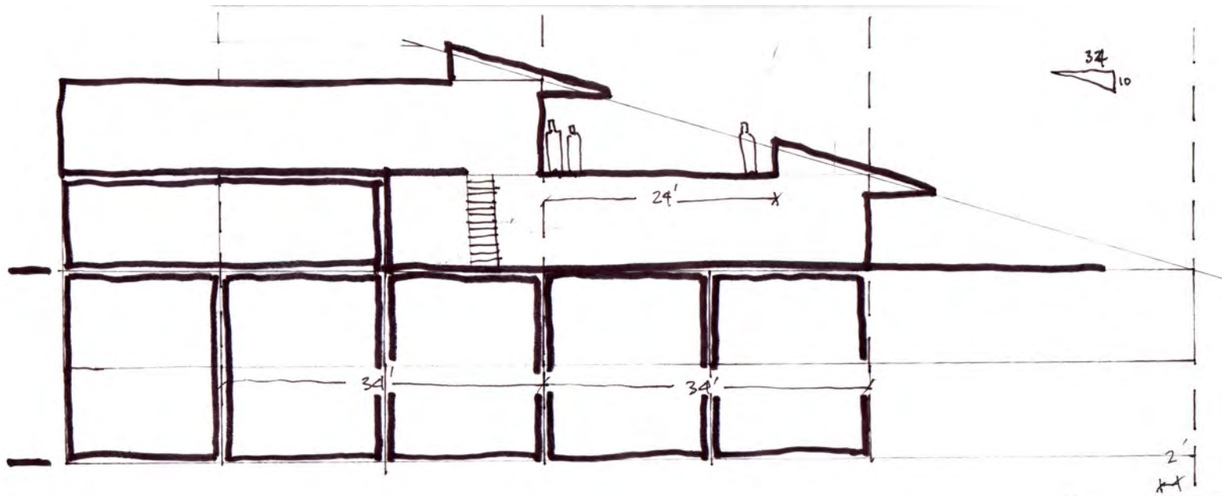



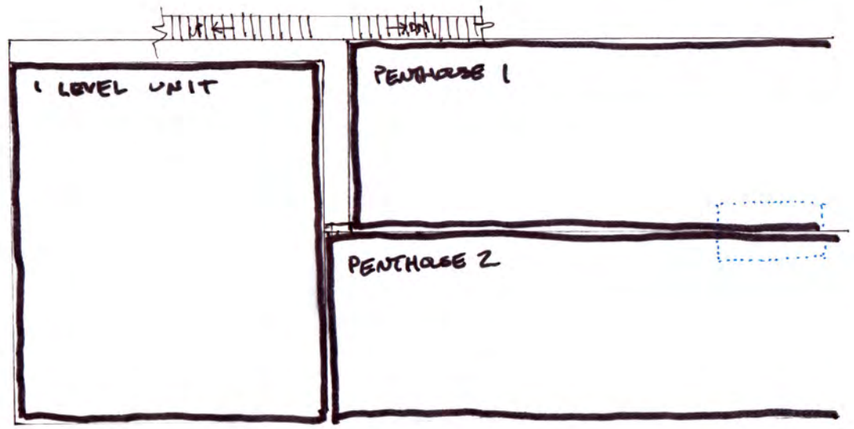



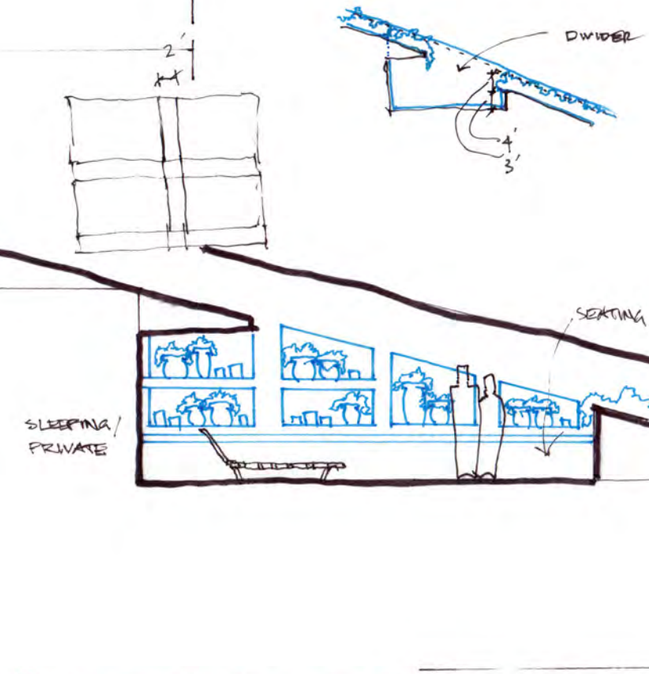




62 UNITS
* ALL 2+3 BEDROOM UNITS



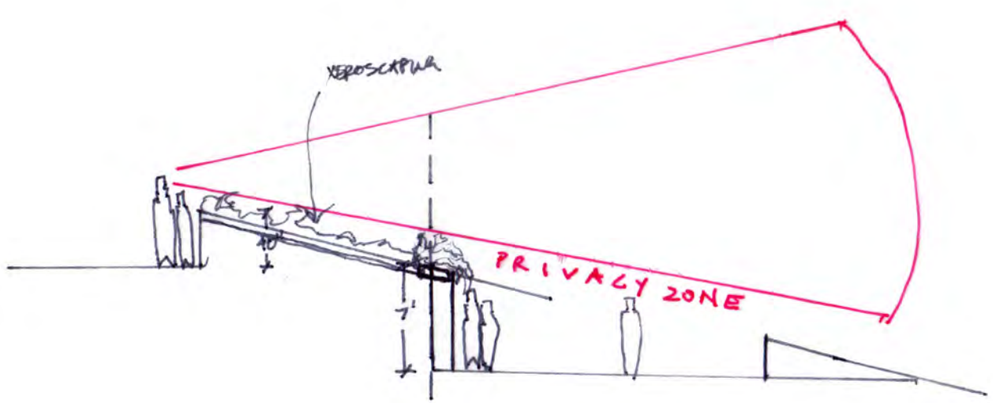



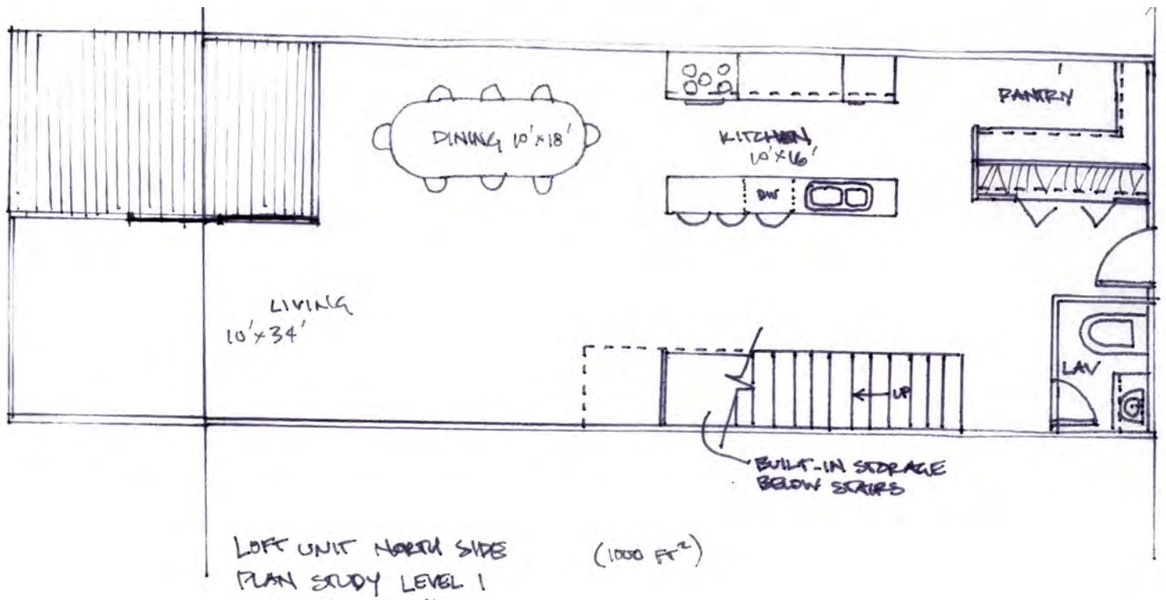

SECTION LOOKING NORTH
SCALE: 1/8" = 1'-0"

BATHROOM FOR EACH BEDROOM ON PENTHOUSE LEVEL
INCREASE SPINE TO 8'
18" PIPE WALL O-O
PUT GRID ON TERRACE

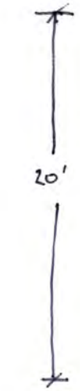
* MOVE KITCHEN TO N TO S
* BREAKFAST NOOK IN SAME
  - 5x8 DINING TABLE
  - 3' CIRCULAR BREAKFAST TABLE




1. 2 LEVEL LOFT (17'w) w/ TERRACE
2. 2 LEVEL LOFT (17'w)
3. 3 LEVEL LOFT (20',34'w) w/ TERRACE
4. 2 LEVEL LOFT (14'w)
5. 2 LEVEL LOFTS (20'w)
6. 2 LEVEL LOFT (14'w)
7. 1 LEVEL APT (34'w) w/ TERRACE

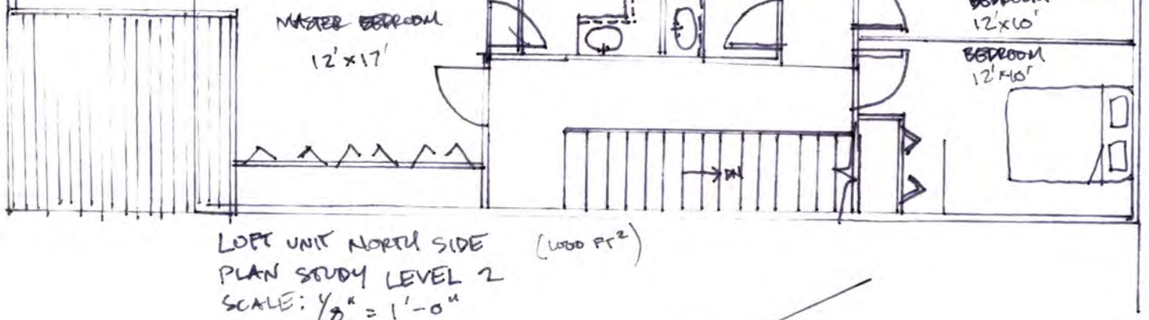



LOFT UNIT NORTH SIDE (1000 FT²)
PLAN STUDY LEVEL 1
SCALE: 1/8" = 1'-0"




PRO: • TWO-LEVEL UNIT IS ATTRACTIVE
• TWO LEVELS OF OUTDOOR SPACE
• CAN BUILD RIGHT UP TO LOT LINE

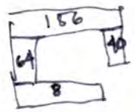
CONS: • LIMITED VARIATION IN FRONTAGES
• UNITS CAN BECOME TOO LARGE FOR 1-BEDROOMS
• NO LIVING SPACE ON NORTH SIDE




LOFT UNIT NORTH SIDE (1000 FT²)
PLAN STUDY LEVEL 2
SCALE: 1/8" = 1'-0"

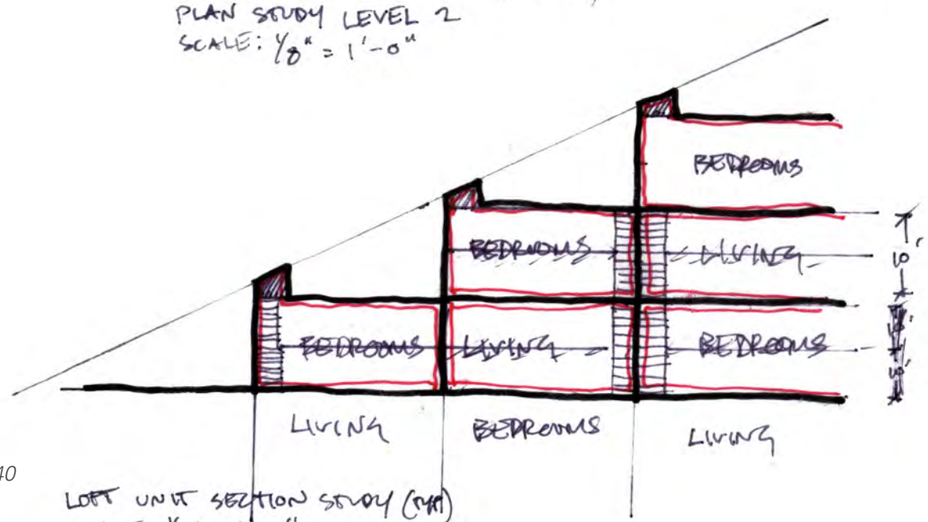

20 | 380 | 19 UNITS/FLOOR
20
180

| LOFT | NO LOFT |
|---|---|
| 19 × 4 | |
| + 17 | |
| + 15 | |
| + 13 | = SAME |
| + 11 | |
| + 9 | |
| + 7 | |
| + 5 | |
| + 3 | |
| 156 | |

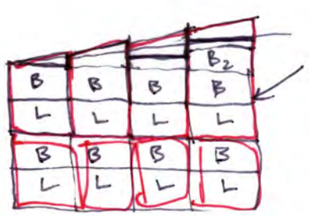



= ~~268~~ 260 UNITS

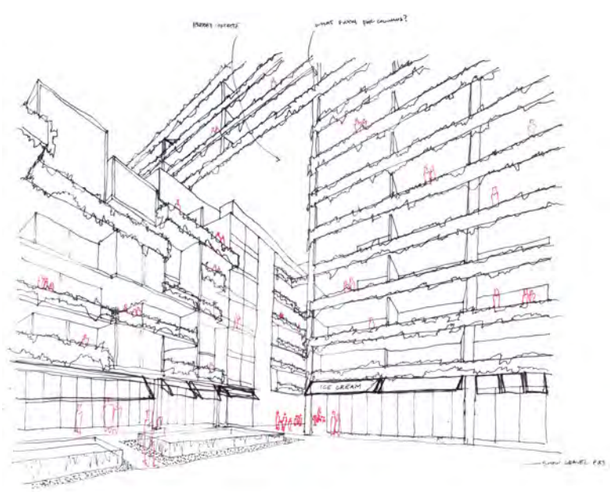
@ 13 STORIES

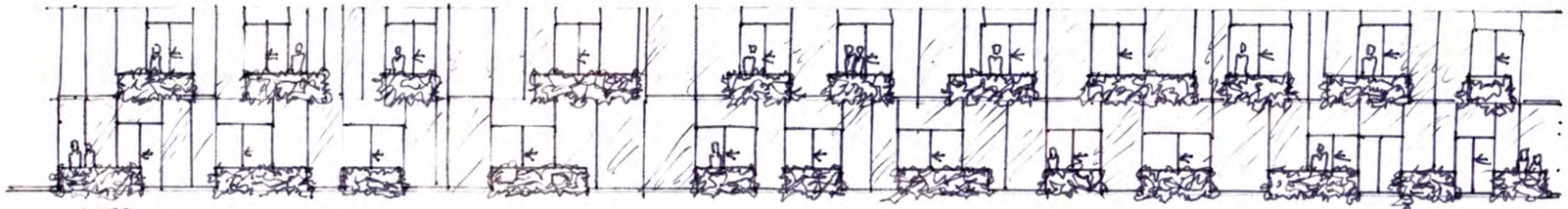



LOFT UNIT SECTION STUDY (SW)
SCALE: 1/16" = 1'-0"



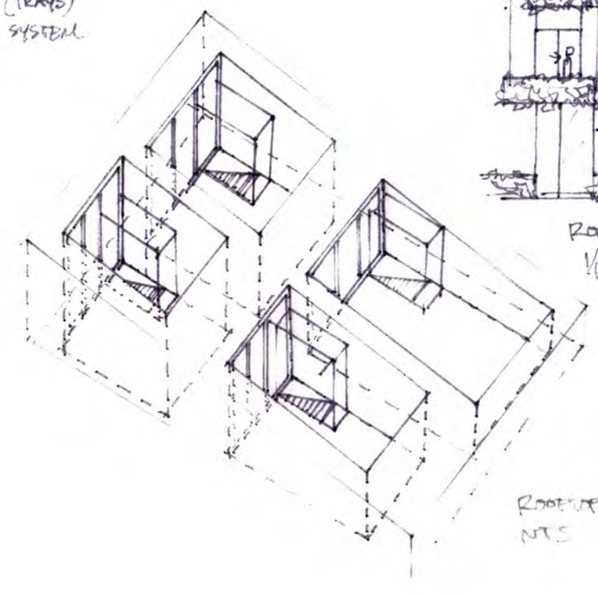

3 LEVEL LOFT UNIT



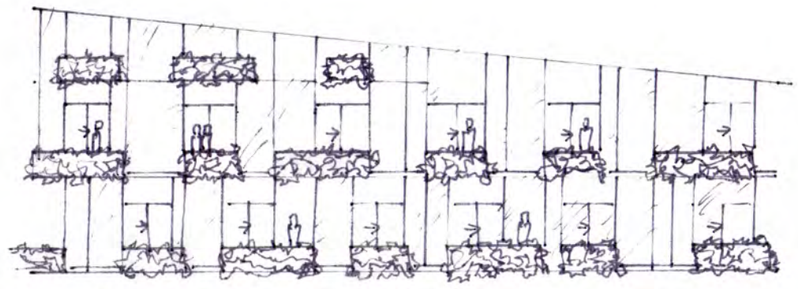



INTERIOR UNITS ELEVATION (TYP)
1/16" = 1'-0"

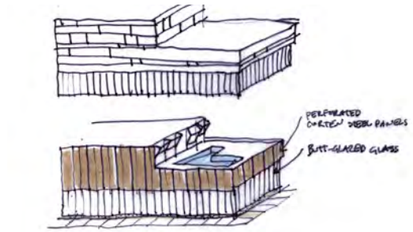

PLANTERS (TYP)
1/8" = 1'-0"

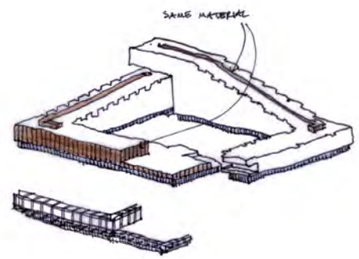


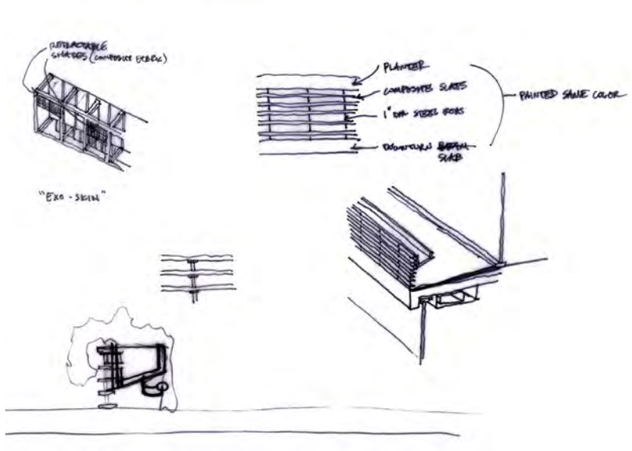
ROOFTOP UNITS AXON SECTION
NTS

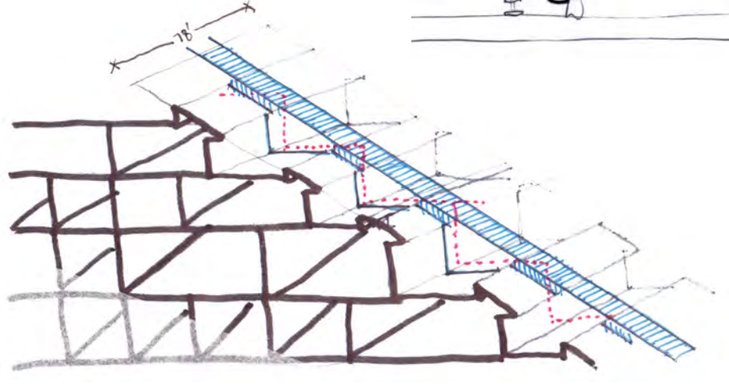


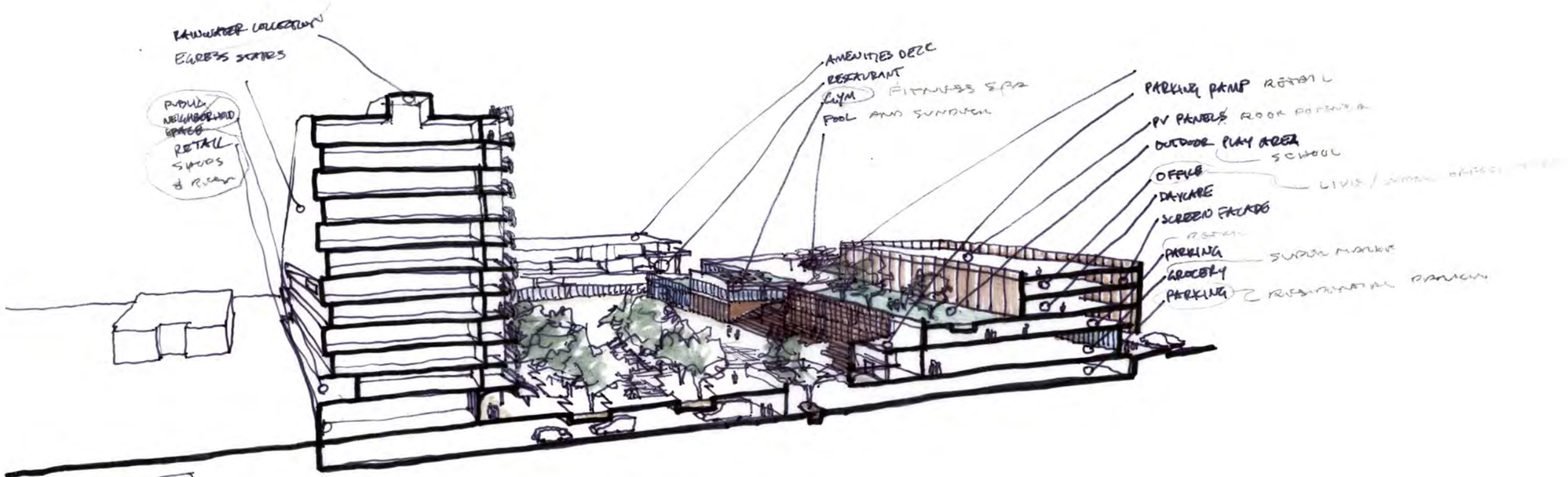
ROOFTOP UNITS ELEVATION (TYP)
1/16" = 1'-0"



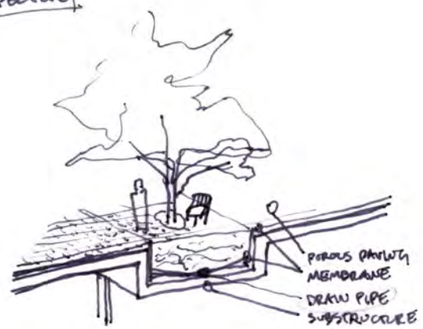



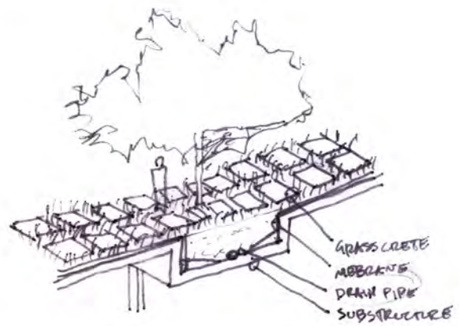






SECTION PERSPECTIVE

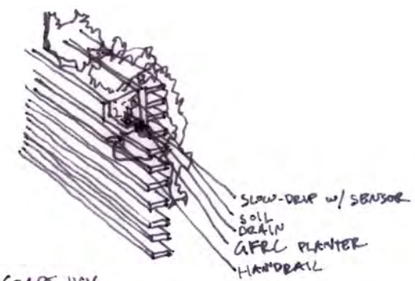



PALO VERDE
SIZE:
WATER USE: VERY LOW



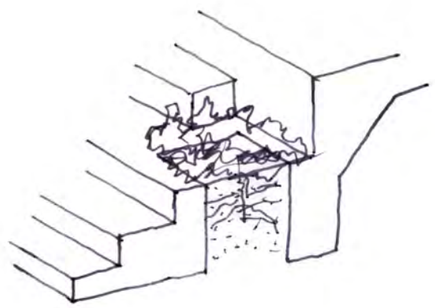

ARIZONA SYCAMORE
SIZE:
WATER USE: VERY LOW

RAIN WATER RETENTION SYSTEM




GRAPE IVY
SIZE:
WATER USE: VERY LOW

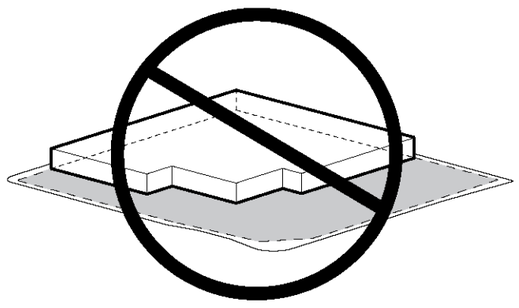
GUAYACAN
SIZE:
WATER USE: VERY LOW

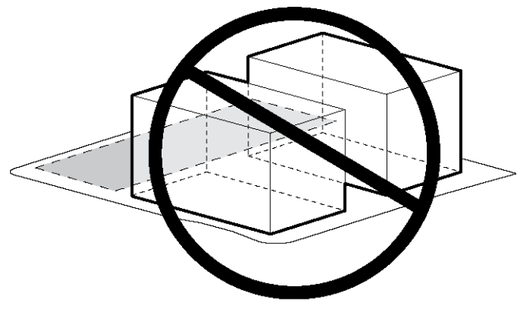


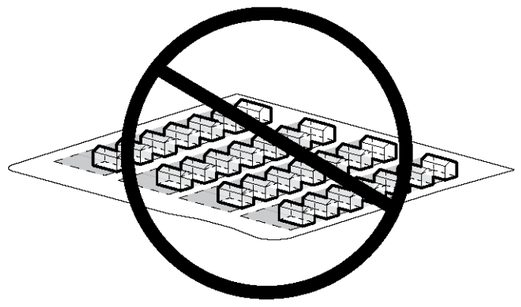
LANDSCAPE SELECTION

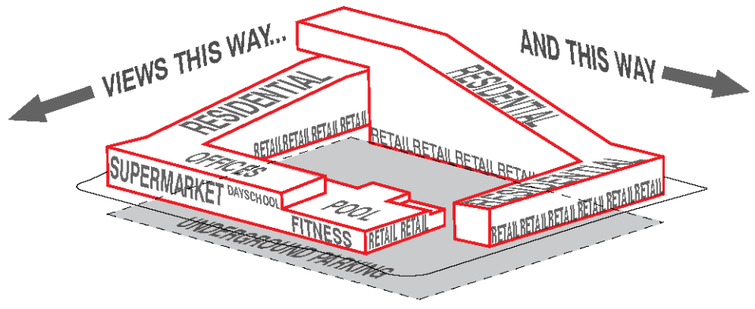
# PROGRAM


48%
LANDSCAPED/PEDESTRIAN
6%
ROADS
54%
UNCOVERED AREA
(FOOTPRINT)
120,000 FT²
46%
COVERED AREA
(FOOTPRINT)
113,000 FT²
PROGRAM
817,000 FT²
SITE SURFACE: 248,000 FT²
F.A.R.: 3.29
RESIDENTIAL [206 UNITS] 445,000 FT² 54%
AMENITIES [FITNESS CENTER/SPA/POOL] 40,000 FT² 5%
RETAIL [34 BAYS, DIVISIBLE] 47,000 FT² 6%
OFFICE [LIVE/WORK CENTERED] 40,000 FT² 5%
SUPERMARKET [GOURMET-QUALITY] 30,000 FT² 4%
PARKING [RESIDENTIAL & RETAIL] 215,000 FT² 26%





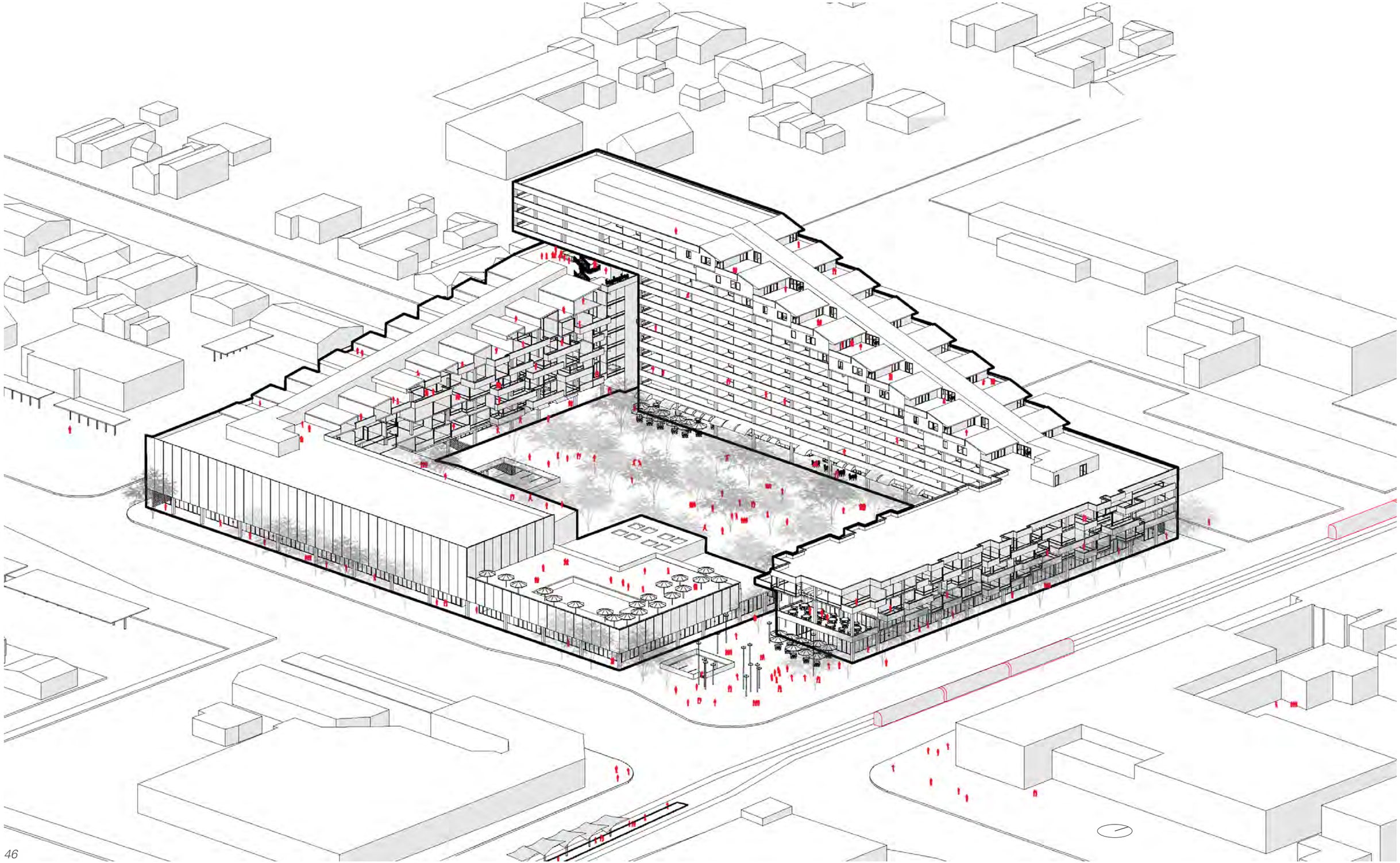


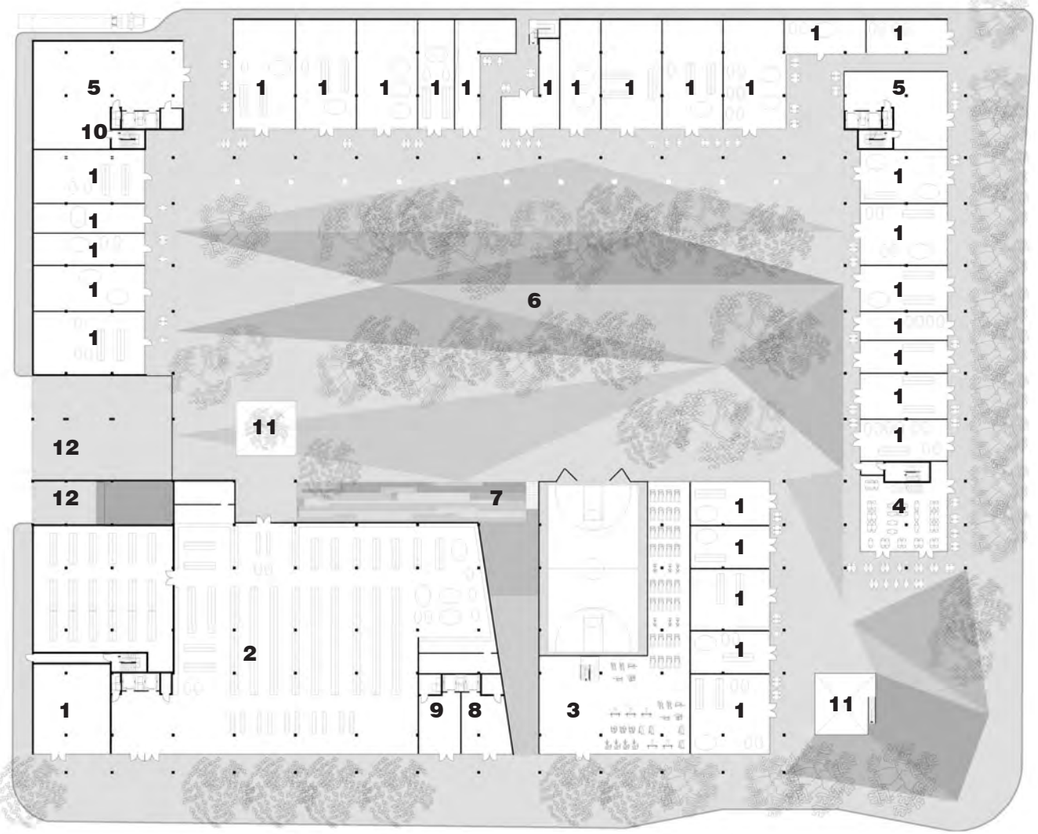

VIEWS THIS WAY...
AND THIS WAY
RESIDENTIAL
RESIDENTIAL
RETAIL RETAIL RETAIL RETAIL
RETAIL RETAIL RETAIL RETAIL
OFFICES
SUPERMARKET
DAYSCHOOL
POOL
FITNESS
RETAIL RETAIL
RETAIL RETAIL RETAIL RETAIL RETAIL RETAIL

# PART THREE (3/3)

***FINAL PROJECT***

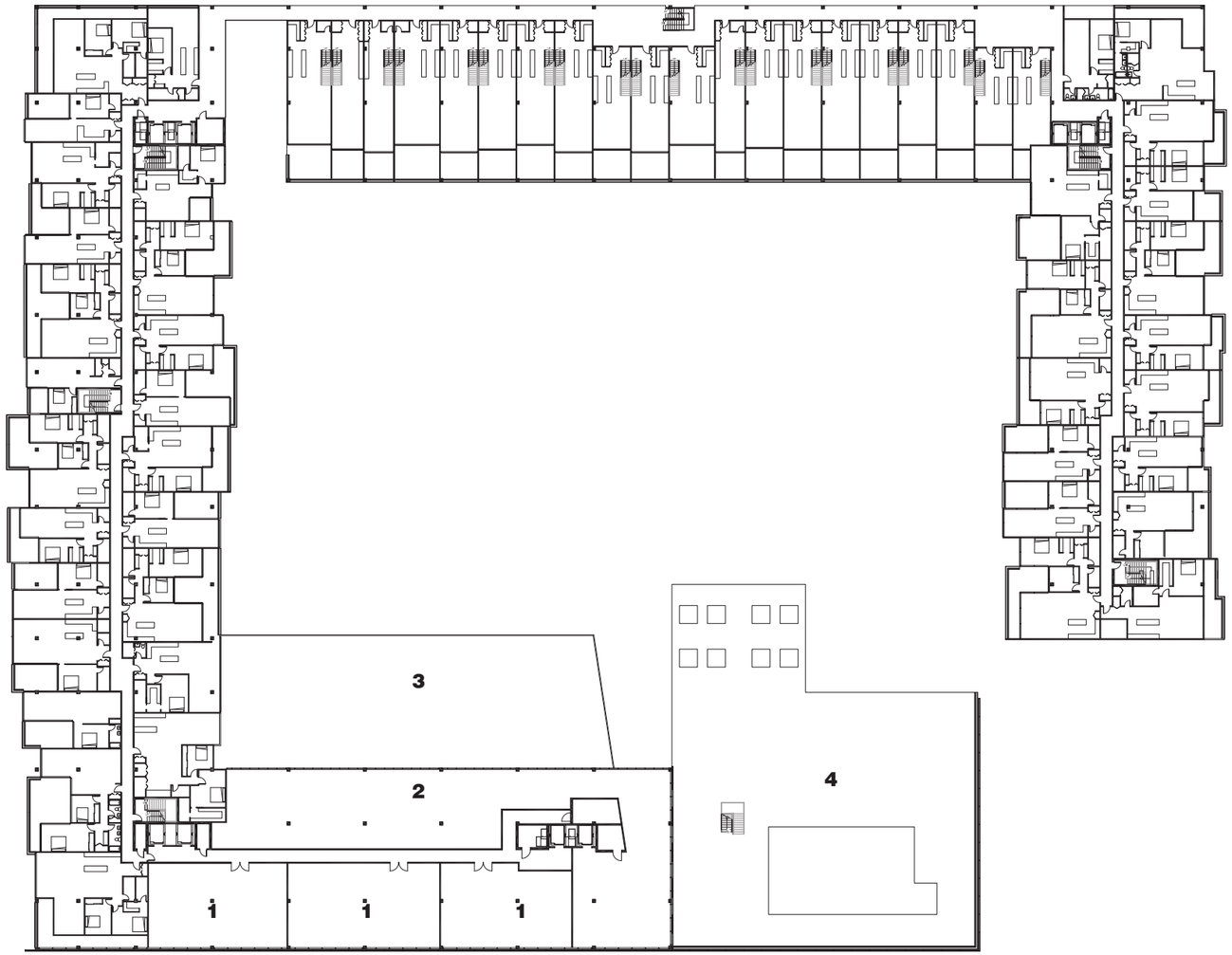
*Central courtyard, looking to the northwest*



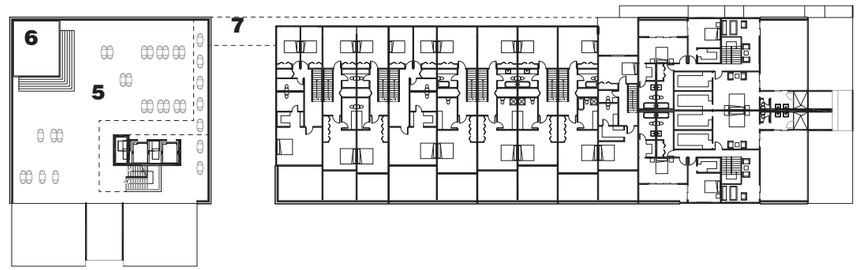



1 *Retail Shops*
2 *Supermarket*
3 *Fitness center/Spa*
4 *Restaurant*
5 *Residential lobby*
6 *Courtyard*
7 *Stairs/Amphitheatre*
8 *Circulation to dayschool*
9 *Circulation to offices*
10 *Mechanical*
11 *Open to parking below*
12 *Ramps to parking*
13 *Light rail station*
14 *Phoenix Art Museum*

***Ground Level Plan***



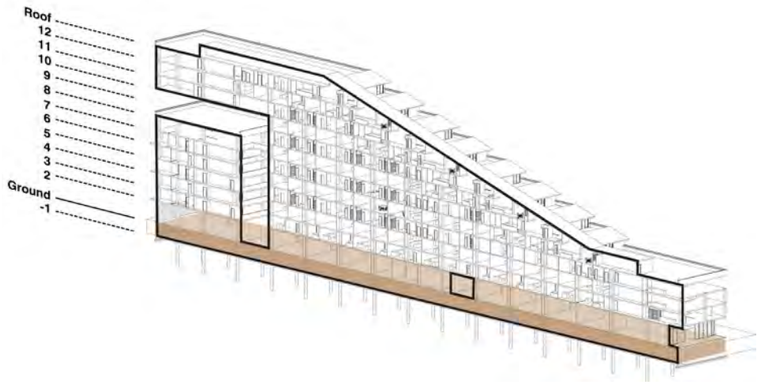

*Level 3 Plan*



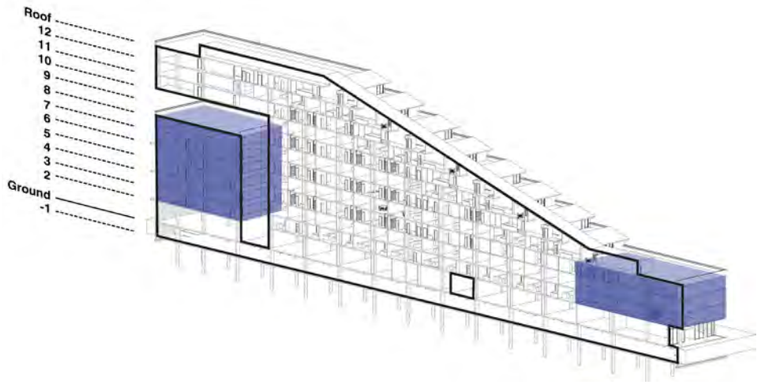

*Level 8 Plan*

**1** *Offices*
**2** *Dayschool*
**3** *Dayschool outdoor play area*
**4** *Pool & Sun deck*
**5** *Residential amenities deck*
**6** *Hot tub*
**7** *Walkway (above & below)*

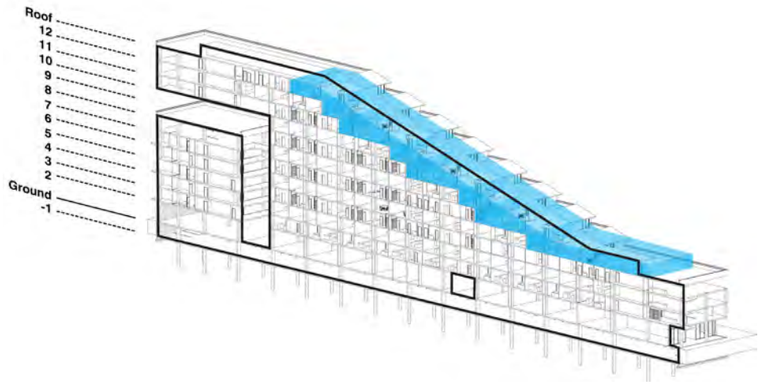
PARKING



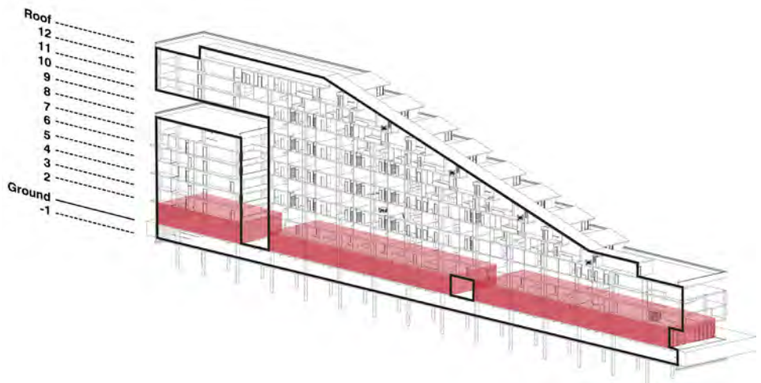

APARTMENT-STYLE UNITS




PENTHOUSE TYPE 'A'

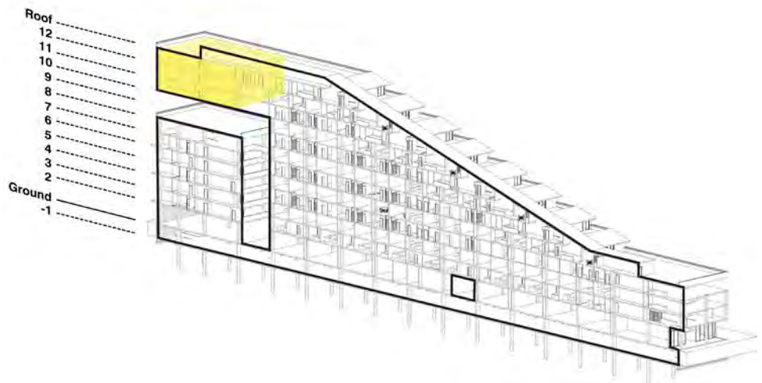



RETAIL

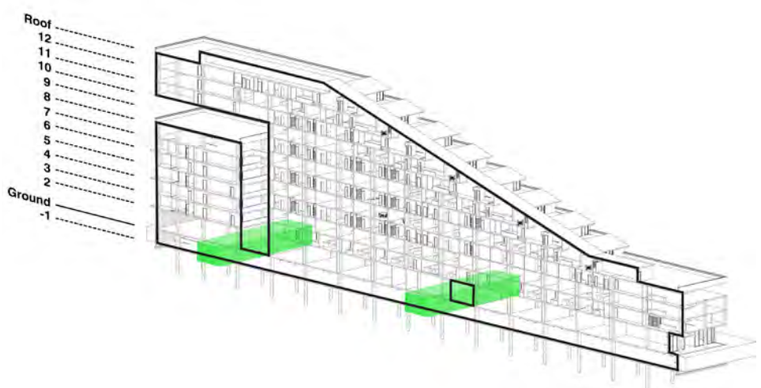



SINGLE-LEVEL UNITS 'A'

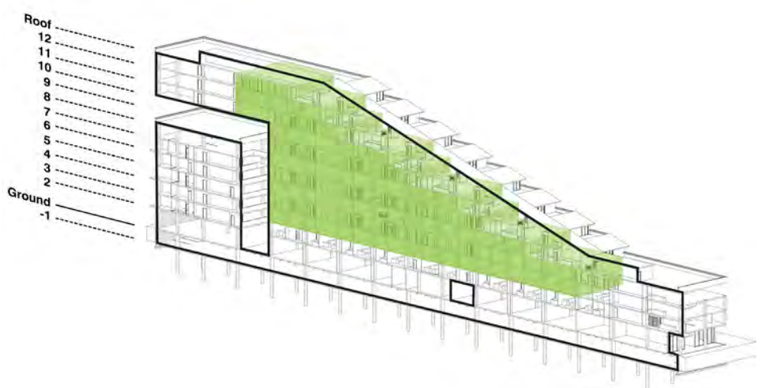

PENTHOUSE TYPE 'B'

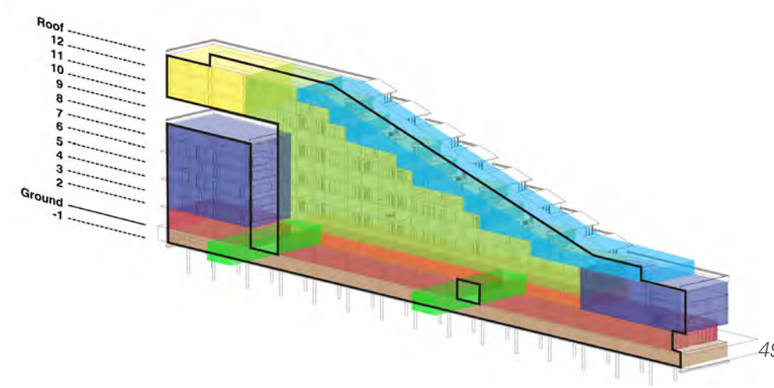



COURTYARDS



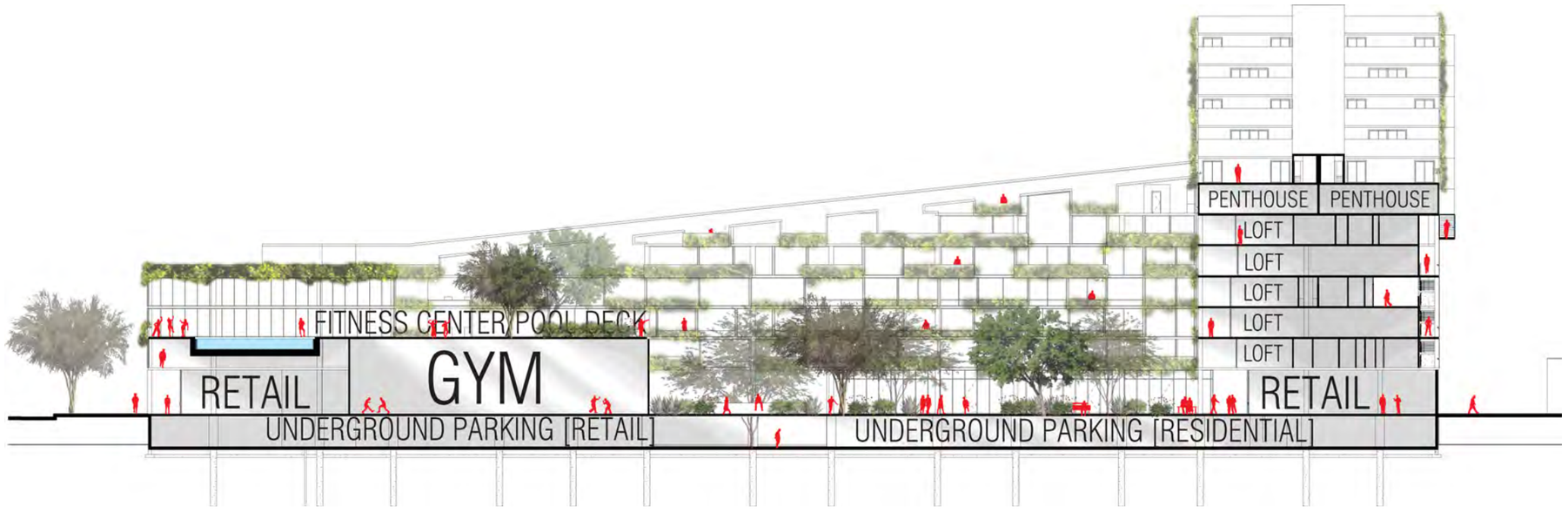

LOFT UNITS

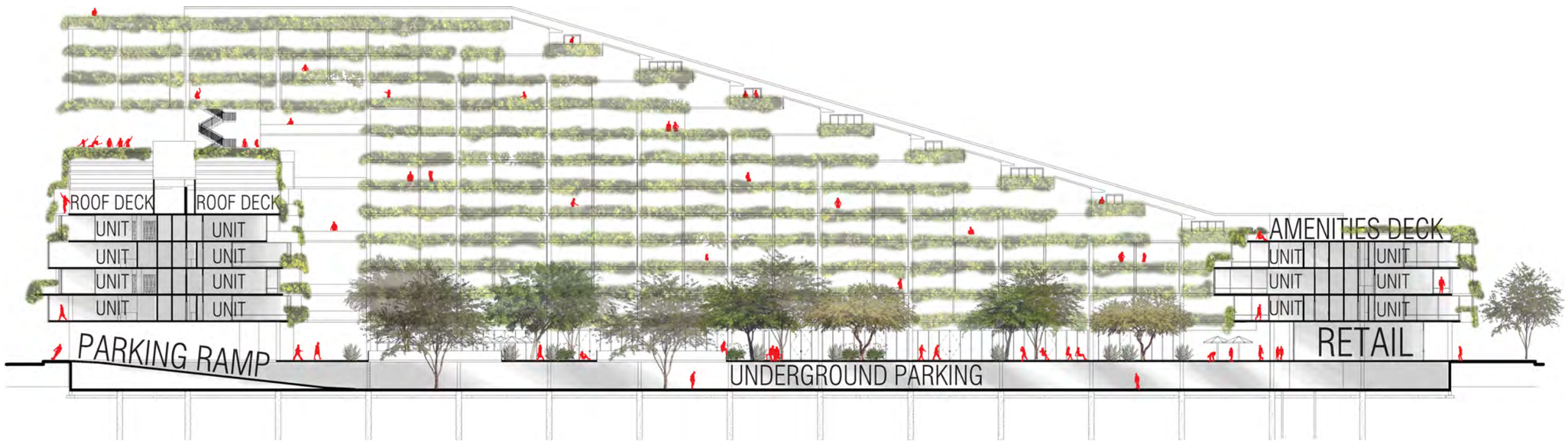


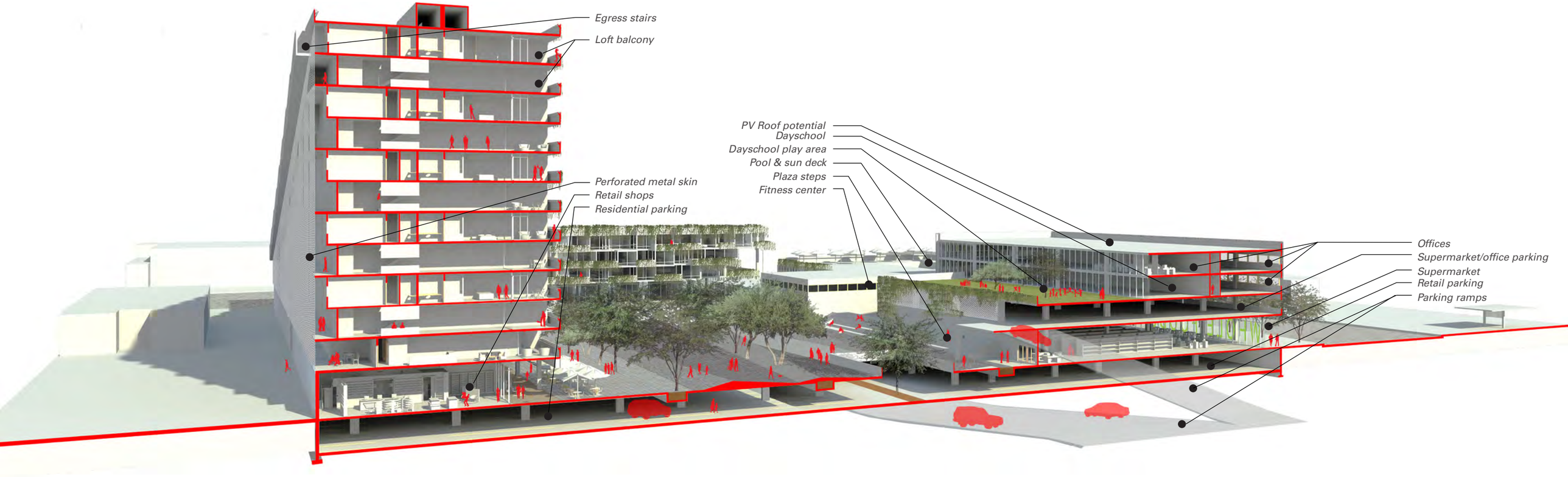



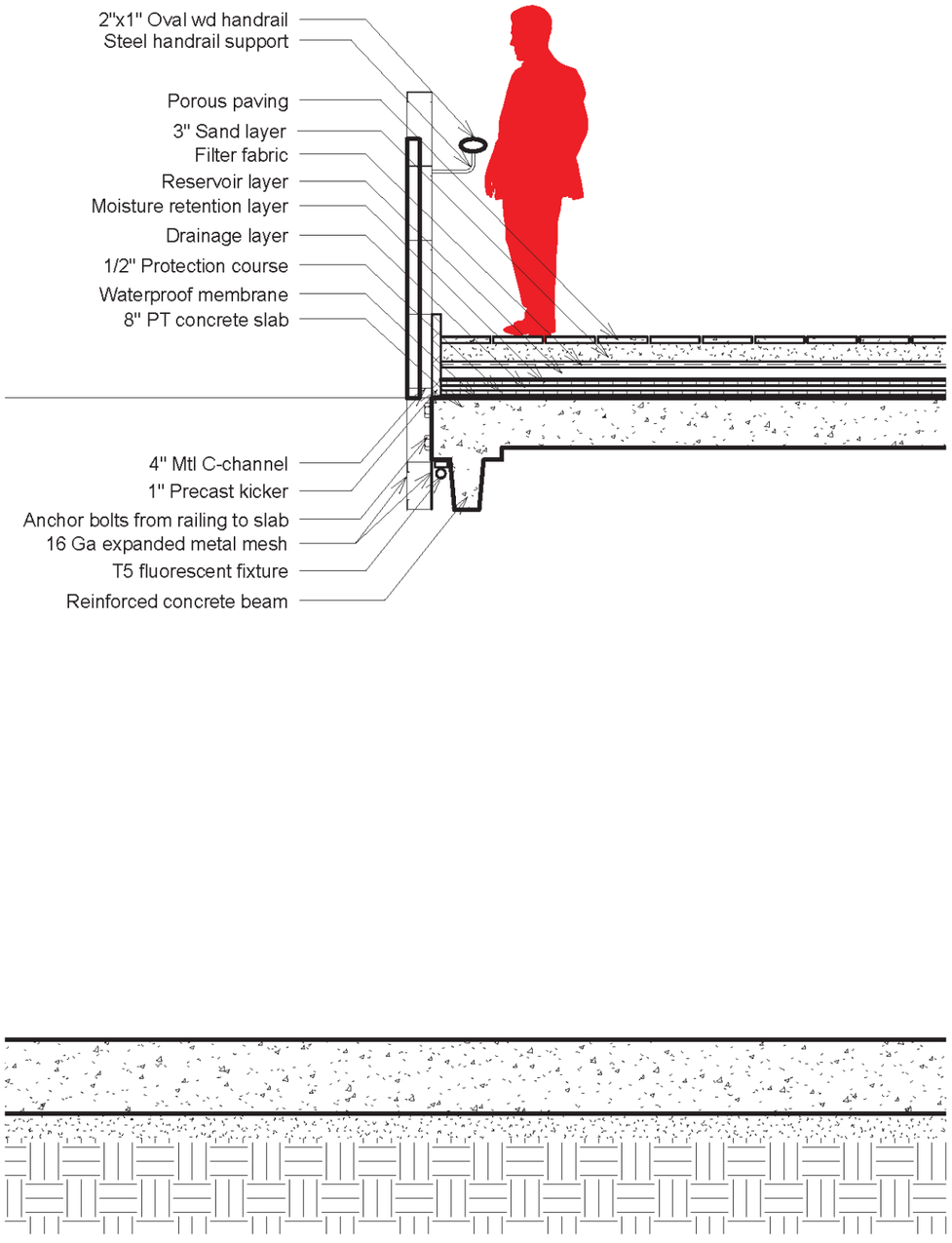

*Entrance to the courtyard through the corner plaza on McClintock & Central, sculptural lighting elements*

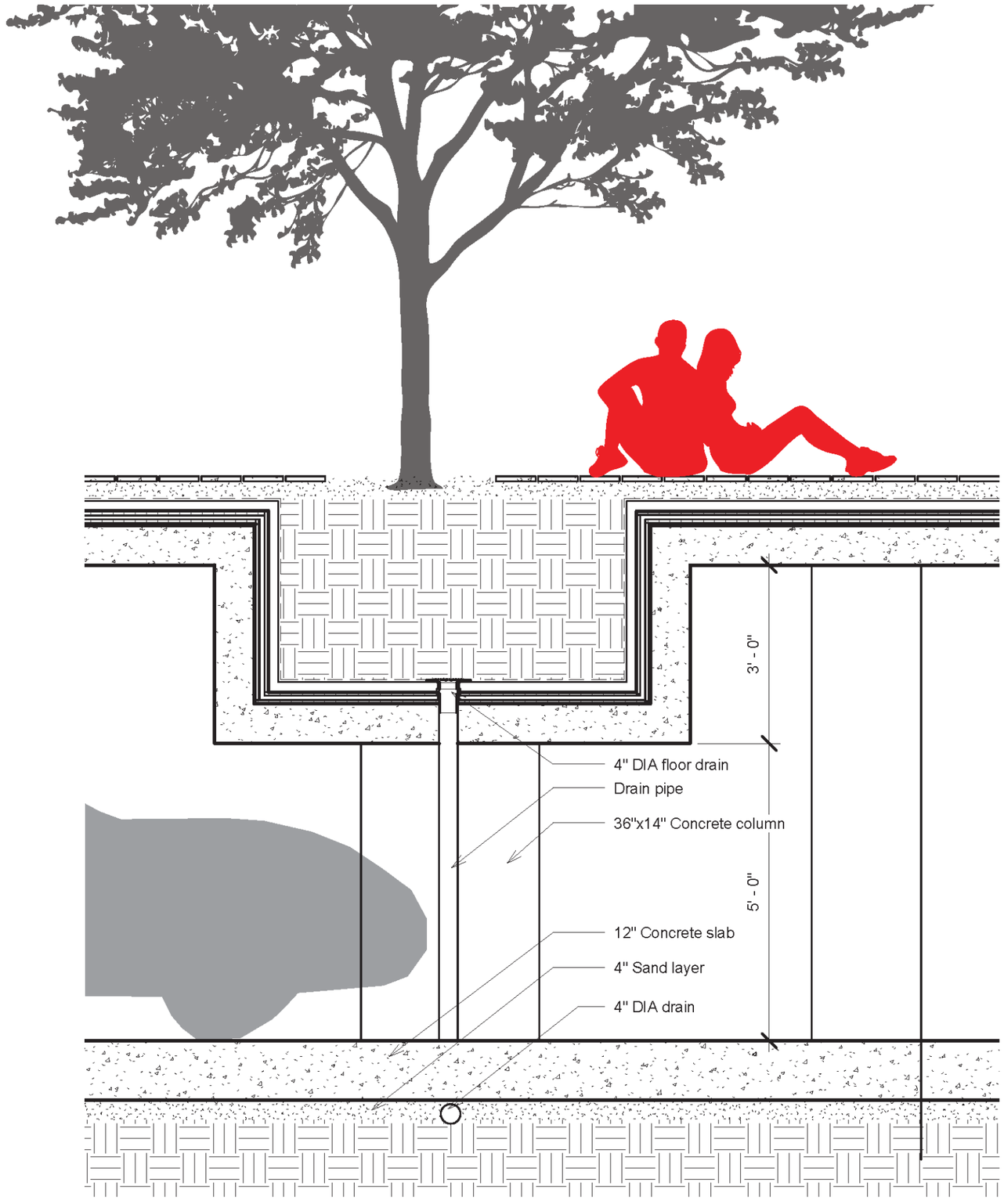
*Dusk view into courtyard and towards downtown from penthouse patio; public events in courtyard*

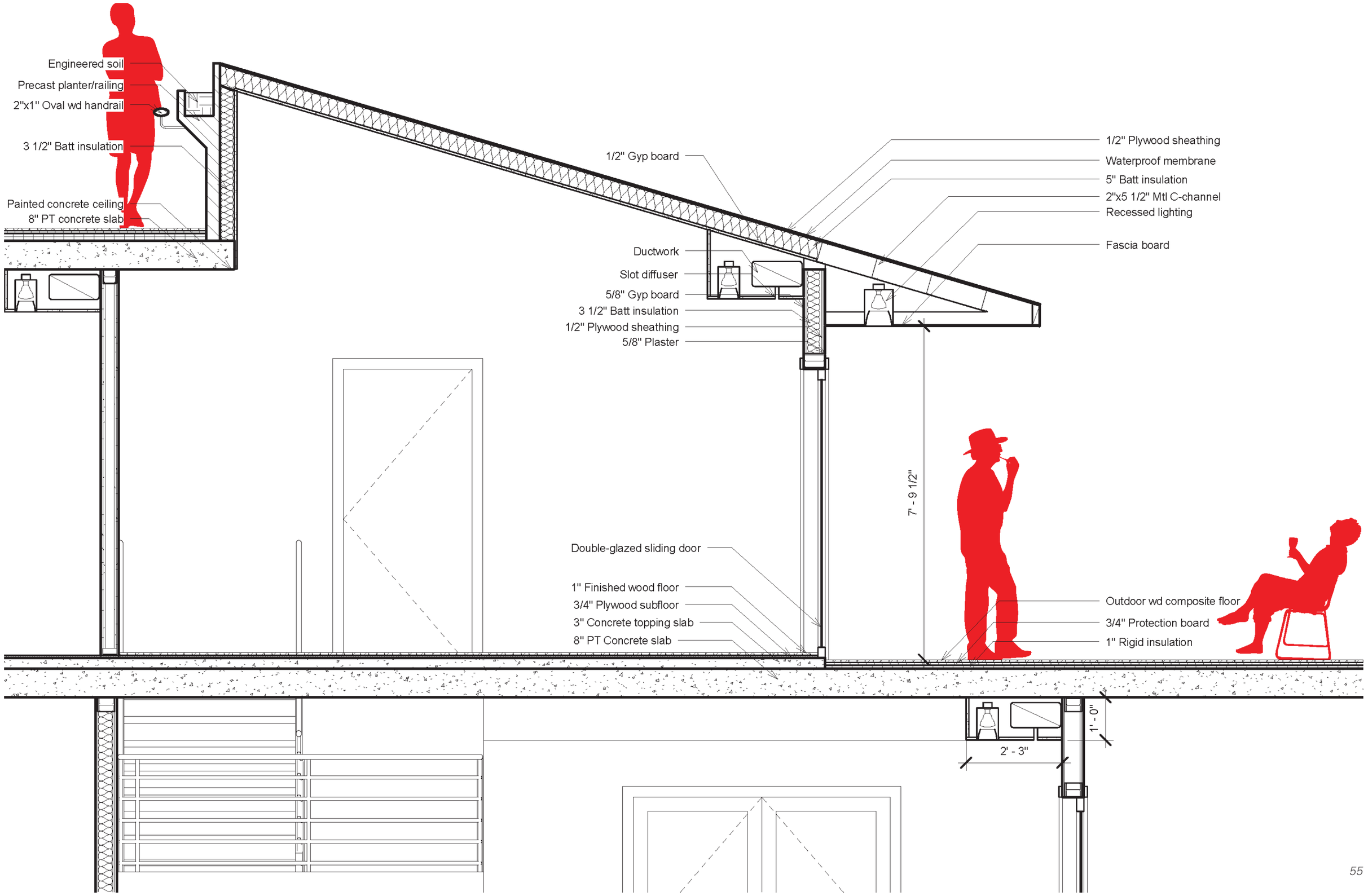

PENTHOUSE
PENTHOUSE
LOFT
LOFT
LOFT
LOFT
LOFT
FITNESS CENTER/POOL DECK
RETAIL
GYM
RETAIL
UNDERGROUND PARKING [RETAIL]
UNDERGROUND PARKING [RESIDENTIAL]

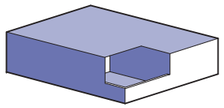

ROOF DECK
ROOF DECK
UNIT
UNIT
UNIT
UNIT
UNIT
UNIT
UNIT
UNIT
PARKING RAMP
UNDERGROUND PARKING
AMENITIES DECK
UNIT
UNIT
UNIT
UNIT
UNIT
UNIT
RETAIL


Egress stairs
Loft balcony
Perforated metal skin
Retail shops
Residential parking
PV Roof potential
Dayschool
Dayschool play area
Pool & sun deck
Plaza steps
Fitness center
Offices
Supermarket/office parking
Supermarket
Retail parking
Parking ramps


2"x1" Oval wd handrail
Steel handrail support
Porous paving
3" Sand layer
Filter fabric
Reservoir layer
Moisture retention layer
Drainage layer
1/2" Protection course
Waterproof membrane
8" PT concrete slab
4" Mtl C-channel
1" Precast kicker
Anchor bolts from railing to slab
16 Ga expanded metal mesh
T5 fluorescent fixture
Reinforced concrete beam


3' - 0"
4" DIA floor drain
Drain pipe
36"x14" Concrete column
5' - 0"
12" Concrete slab
4" Sand layer
4" DIA drain

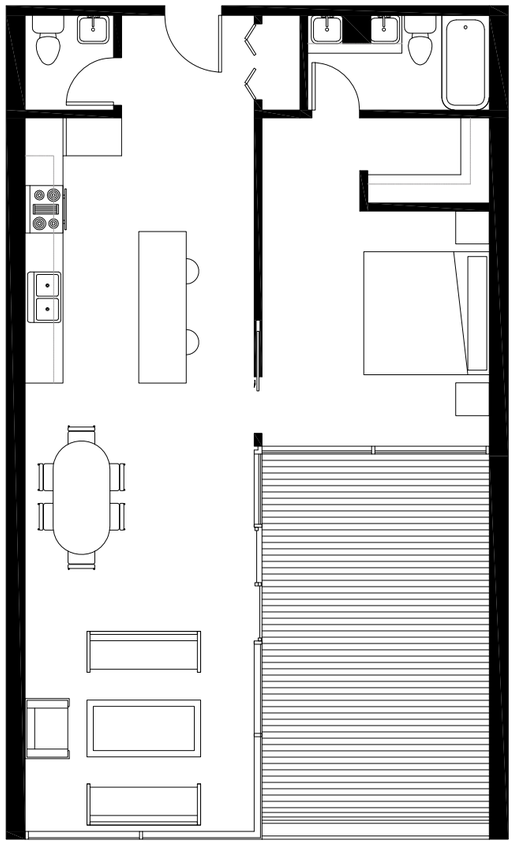

Engineered soil
Precast planter/railing
2"x1" Oval wd handrail
3 1/2" Batt insulation
Painted concrete ceiling
8" PT concrete slab
1/2" Gyp board
Ductwork
Slot diffuser
5/8" Gyp board
3 1/2" Batt insulation
1/2" Plywood sheathing
5/8" Plaster
1/2" Plywood sheathing
Waterproof membrane
5" Batt insulation
2"x5 1/2" Mtl C-channel
Recessed lighting
Fascia board
Double-glazed sliding door
1" Finished wood floor
3/4" Plywood subfloor
3" Concrete topping slab
8" PT Concrete slab
7' - 9 1/2"
Outdoor wd composite floor
3/4" Protection board
1" Rigid insulation
1' - 0"
2' - 3"

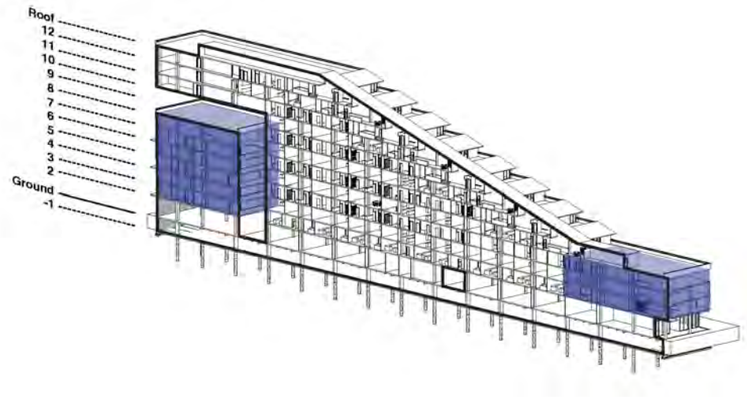


## MESQUITE

1

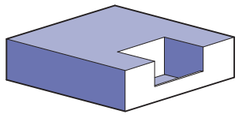
**Indoor Area:** 800 ft²
**Outdoor Area:** 245 ft²






## RESIDENTIAL CONCEPT

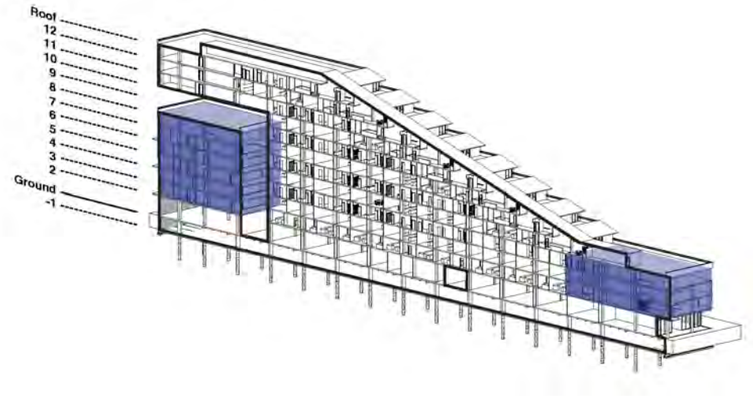
In order to provide an alternative to suburban sprawl living which entices with its offer of outdoor space, all units have extensive outdoor living areas equaling at least 20% of the interior area. These large outdoor areas can be opened up to the interior of the units through sliding glass doors to enjoy the pleasant Phoenix weather and people watch in the courtyard below.

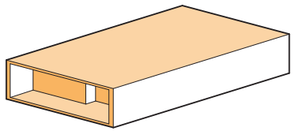


## IRONWOOD

2

**Indoor Area:** 1,225 ft²
**Outdoor Area:** 220 ft²

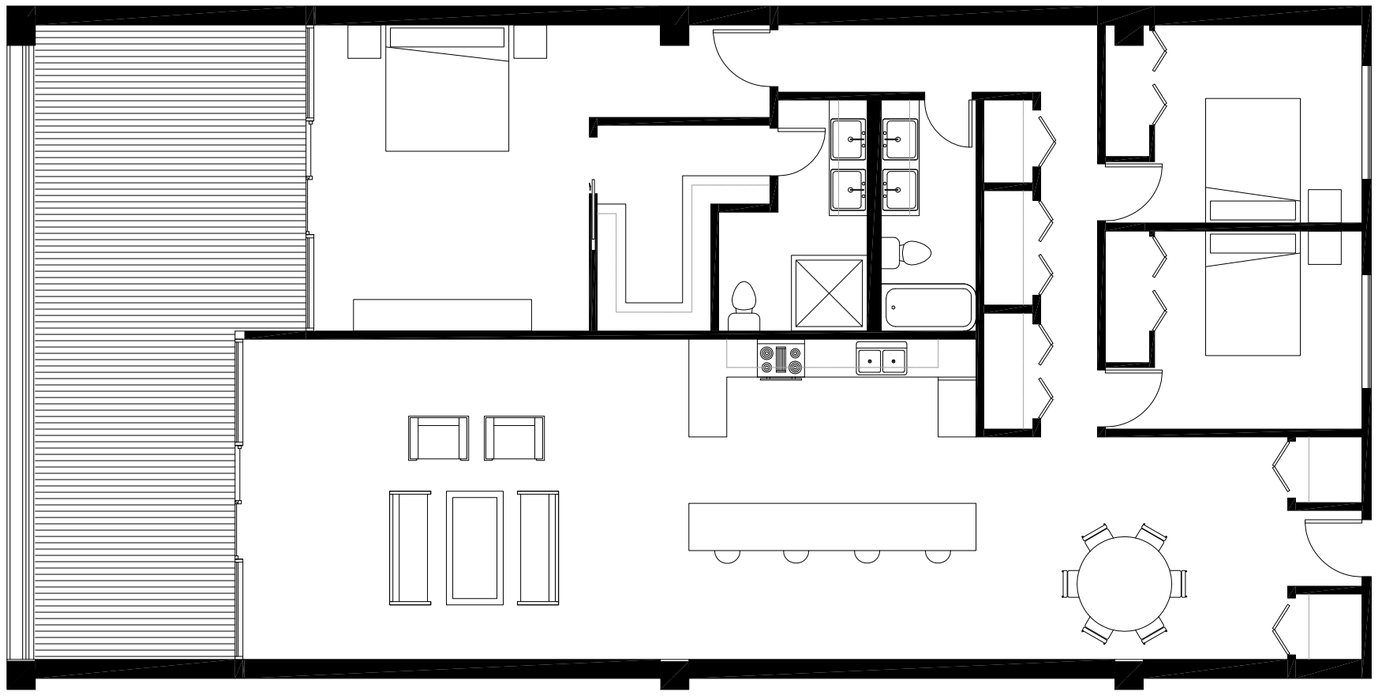


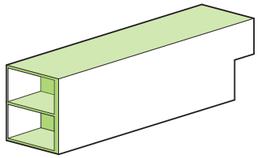



## AGAVE

**3**

**Indoor Area:** 1,900 ft²
**Outdoor Area:** 460 ft²

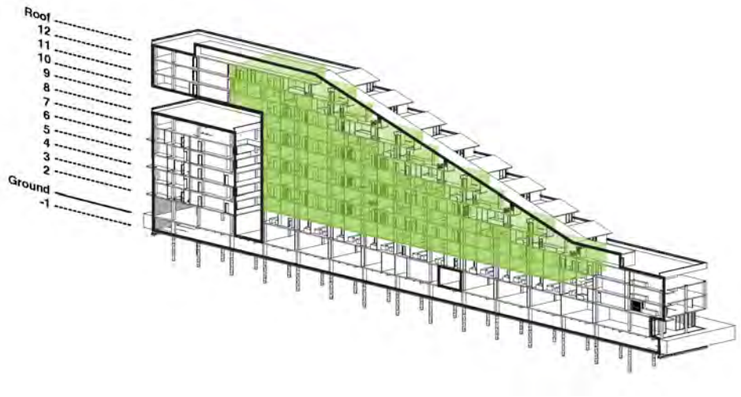



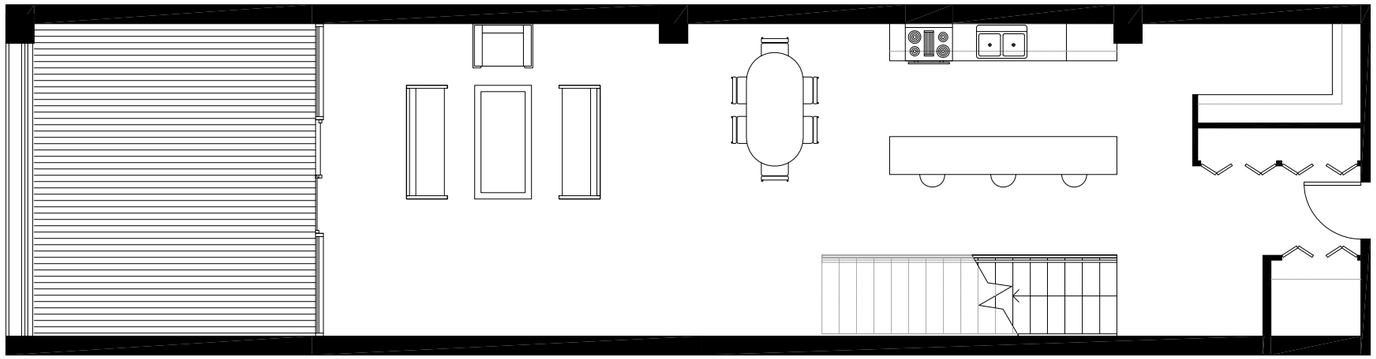


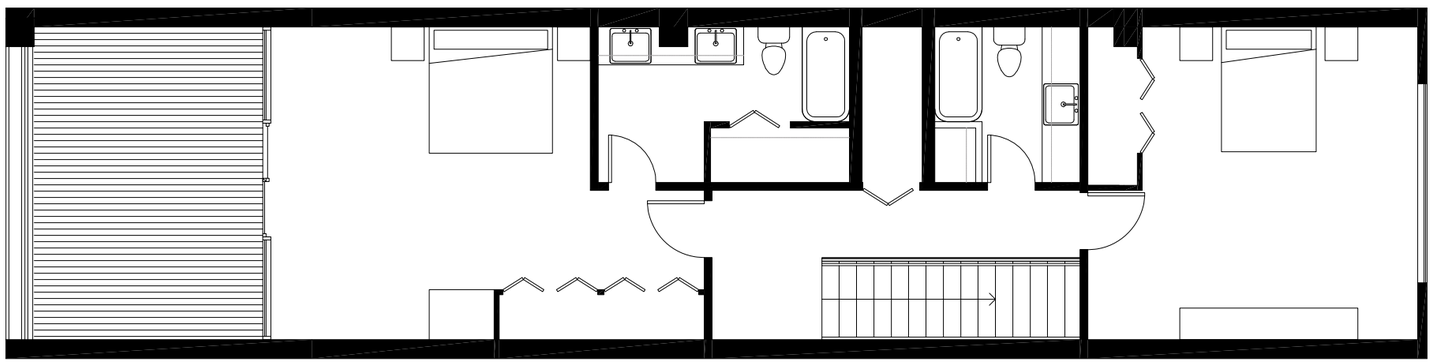
## PALO VERDE

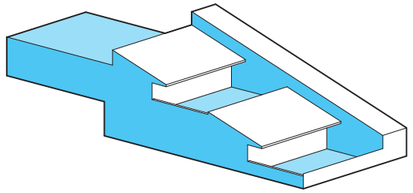
**2**

**Indoor Area:** 1,900 ft²
**Outdoor Area:** 490 ft²



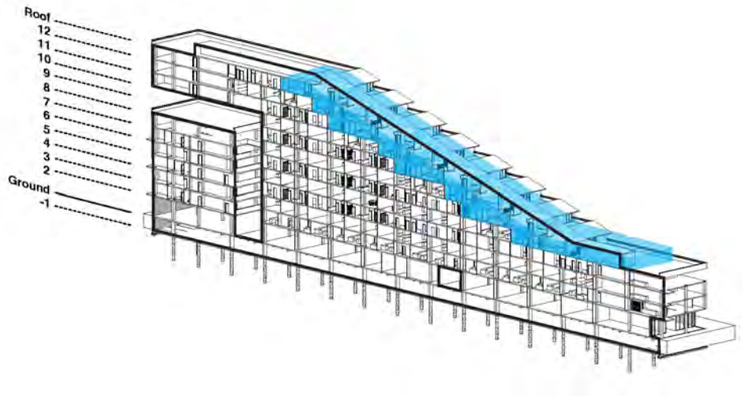


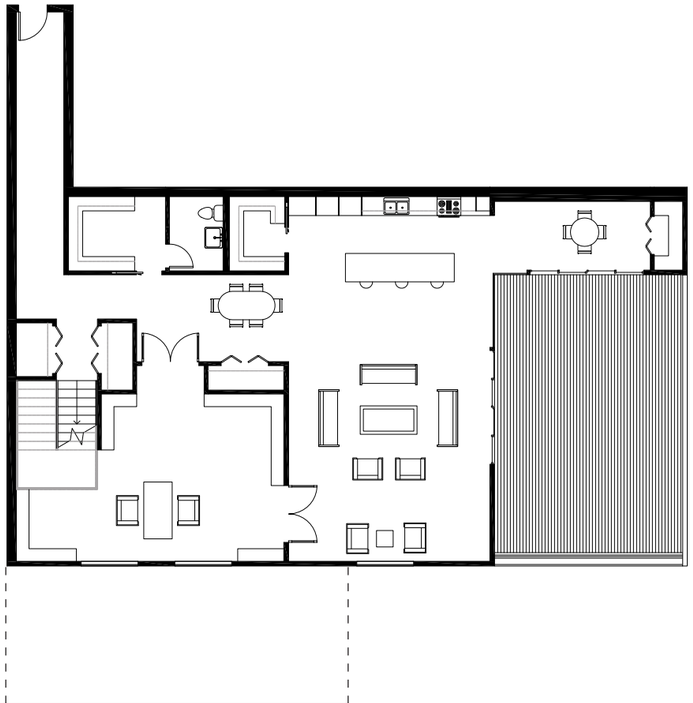


## THE SAGUARO

3

**Indoor Area:** 4,000 ft²
**Outdoor Area:** 1,380 ft²



*Amenities deck located on level 8; looking towards mountains to the southeast*

e.N.U.P.H.

# REFERENCES

# REFERENCES

## IN PRINT


**Aalto, Alvar, Peter Reed, and Kenneth Frampton. Alvar Aalto: *Between Humanism and Materialism*. New York: Museum of Modern Art, 1998. Print.**

*This book contains many examples of Alvar Aalto's work as well as essays which evaluate his synthesis of architecture and landscape. As I will be working toward a certain architectural typology that works well in the desert with regards to sustainability and comfort, I plan to study the ways that Aalto was successful in linking these issues together through his architecture.*

**Lusk, Paul, and Alf Simon. *Building to Endure: Design Lessons of Arid Lands*. Albuquerque: University of New Mexico, 2009. Print.**

*This book examines the underlying environmental issues, such as water, energy, and habitat, with regards to building in warm, arid climates. It also touches on cultural issues such as how to design for a thriving desert community and historical settlement patterns. Most importantly, it offers suggestions to improve sustainability when building in the desert. This will be a valuable resource as I begin to develop sustainable methods to apply to an architectural typology.*

**Petruccioli, Attilio. *After Amnesia: Learning from the Islamic Mediterranean Urban Fabric*. Bari, Italy: ICAR, 2007. Print.**

*This book carefully studies the organization and composition of many ancient Islamic cities, which share a very similar climate to Phoenix. A study of ancient architectural typologies, mainly courtyard-focused, can also be found in this book, which explains why these types of houses were desirable for residents in terms of engaging society, tightening the urban fabric, and maintain privacy. Some of these typologies also include examples of courtyard housing coupled with mixed-use; something I'm very interested in studying for the Phoenix area.*

**Schipper, Janine. *Disappearing Desert: the Growth of Phoenix and the Culture of Sprawl*. Norman: University of Oklahoma, 2008. Print.**

*This book explains the growth phenomenon experienced in Phoenix and the resulting suburban sprawl. It focuses mainly on Cave Creek, a suburb of Phoenix, and lists reasons why suburban typologies have continued to enjoy popularity even at the expense of the environment. As I'm interested in studying how more urban architectural typologies could be made desirable for people in the suburbs, this resource should come in handy to understand the deep-seeded roots of suburbanization and sprawl in this area.*

**Kotkin, Joel. "Urban Legends: Why Suburbs, Not Cities, Are the Answer." *Foreign Policy* 181 (2010): 128-31. Print.**

*This article in Foreign Policy discusses some of the ills of cities and benefits of suburbs. For example, Kotkin notes that city-dwellers typically use more energy per-capita than their suburban counterparts. The article also examines the underlying economic concerns behind increasing urban density and compares the quality of life of those in the city and those in the suburbs. This resource will be particularly important because I plan on studying why cities are supposedly better than suburbs and how suburban quality of life can still be maintained within an urban setting.*

**Mozas, Javier, Aurora Fernandez Per, and Javier Arpa. *D Book: Density, Data, Diagrams, Dwellings*. Victoria-Gasteiz: Graficas Santamaria, 2007. Print.**

*This book analyzes dozens of multi-family residential projects around the world and categorizes them by type, location, cost per square foot, density, funding, and target residents. Typologies include mid-rise buildings as well as townhouse-type attached residences. This resource will be valuable to my project because one of the end goals will be designing an architectural typology that is not only appropriate for a desert environment, but is also economically feasible; issues which are well-addressed in the book.*

**Ebner, Peter. *Typology+: Innovative Residential Architecture*. Basel: Birkhäuser, 2010. Print.**

*Typology +: Innovative Residential Architecture looks at multiple examples of mixed-use and multi-family housing across the globe, focusing primarily on unit design and planning. I plan to use this book in addition to D Book for inspiration in developing unit plans and overall unit composition.*


## REFERENCE


**www.wsj.com [Wall Street Journal]**

*Website for referencing recent real estate movement and trends*

**www.knowledge.wpcarey.asu.edu [ASU's W.P. Carey School of Business]**

*Reference site with specific information on Phoenix-area real estate*

**www.bundle.com [Partner with MSN Money]**

*Popular personal finance website with relevant segments on real estate, home ownership, and renting.*


## ONLINE


**DESIGN INSPIRATION**

**www.big.dk [Bjarke Ingels Group]**

**www.willbruder.com [Will Bruder, Phoenix architect]**

**www.s-ehrlich.com [Steven Ehrlich Architects]**

**www.jonesstudioinc.com [Jones Studio, Phoenix architects]**

**www.behnisch.com [Behnisch Architekten]**

**www.baumschlager-eberle.com [Baumschlager Eberle Architekten]**


## PHOTO CREDITS


**www.wikipedia.org**

**www.ecosair.blogspot.com**

**www.picasaweb.google.com**

**www.camelviewph.com**

**www.space1999.net**

**www.archdaily.com**

**Google Earth**

*Matt Troia*
*iiT M.Arch Candidate 2012*
*Master's Project; May 2012*
*Adviser: George Schipporeit*

*matthewtroia.com*