

Gopher Field Housing

Project Brief

Create a balance between the needs of **individual household home sites** and **community open-space elements**

Six affordable homes:

- two 3 bed/2bath (approximately 1200 square feet)
- two 2 bed/1bath (approximately 800 square feet)
- two 1 bed/1 bath (approximately 400 square feet)

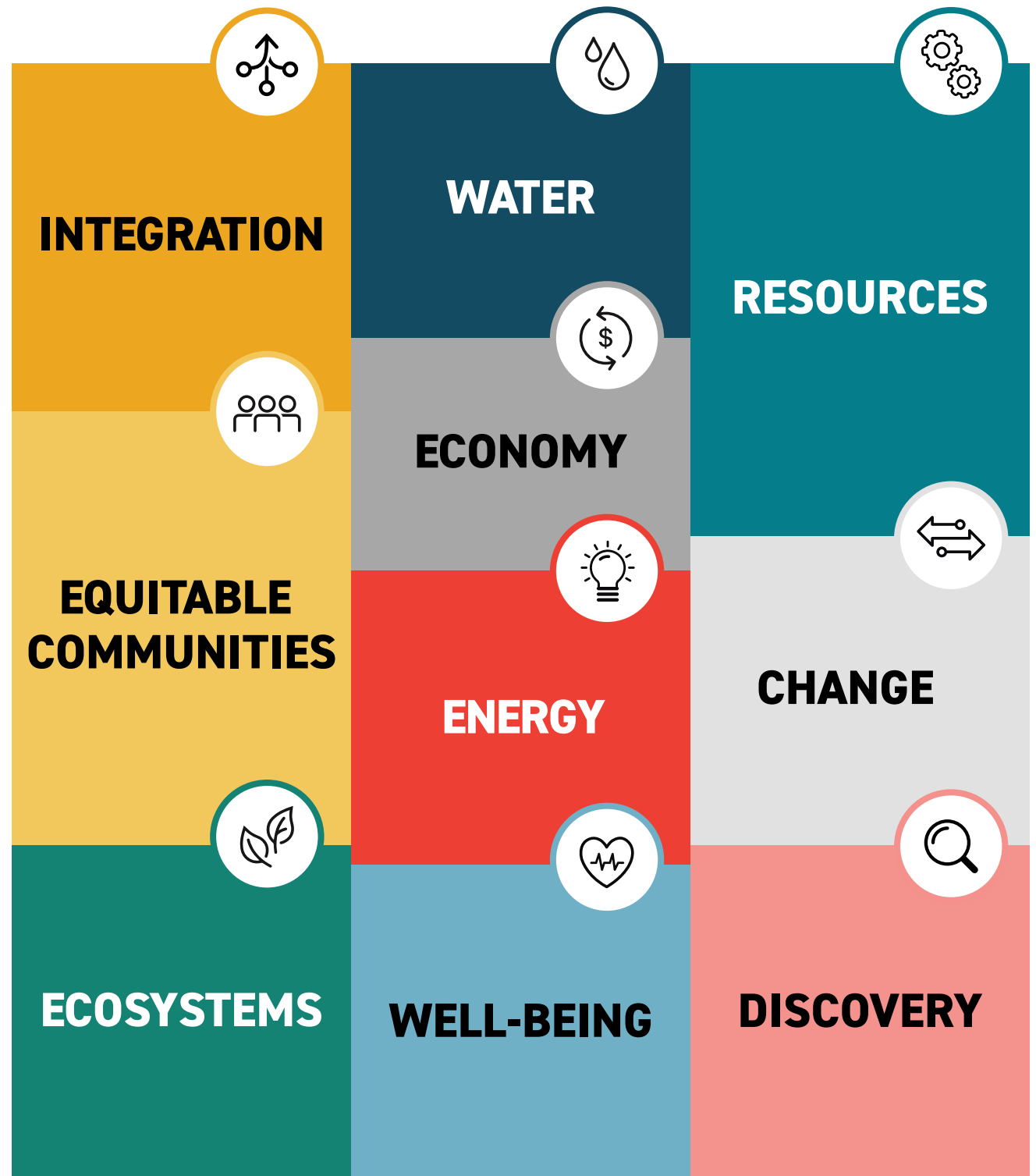
Important considerations:

- floodplain regulations
- design simplicity
- code compliance
- balance of cost, quality, and energy efficiency
- universal design
- water harvesting
- energy conservation

Design Values

Important considerations:

- floodplain regulations
- design simplicity
- code compliance
- balance of cost, quality, and energy efficiency
- universal design
- water harvesting
- energy conservation



Site and Ecology

+

Community Context

+

Wellbeing

+

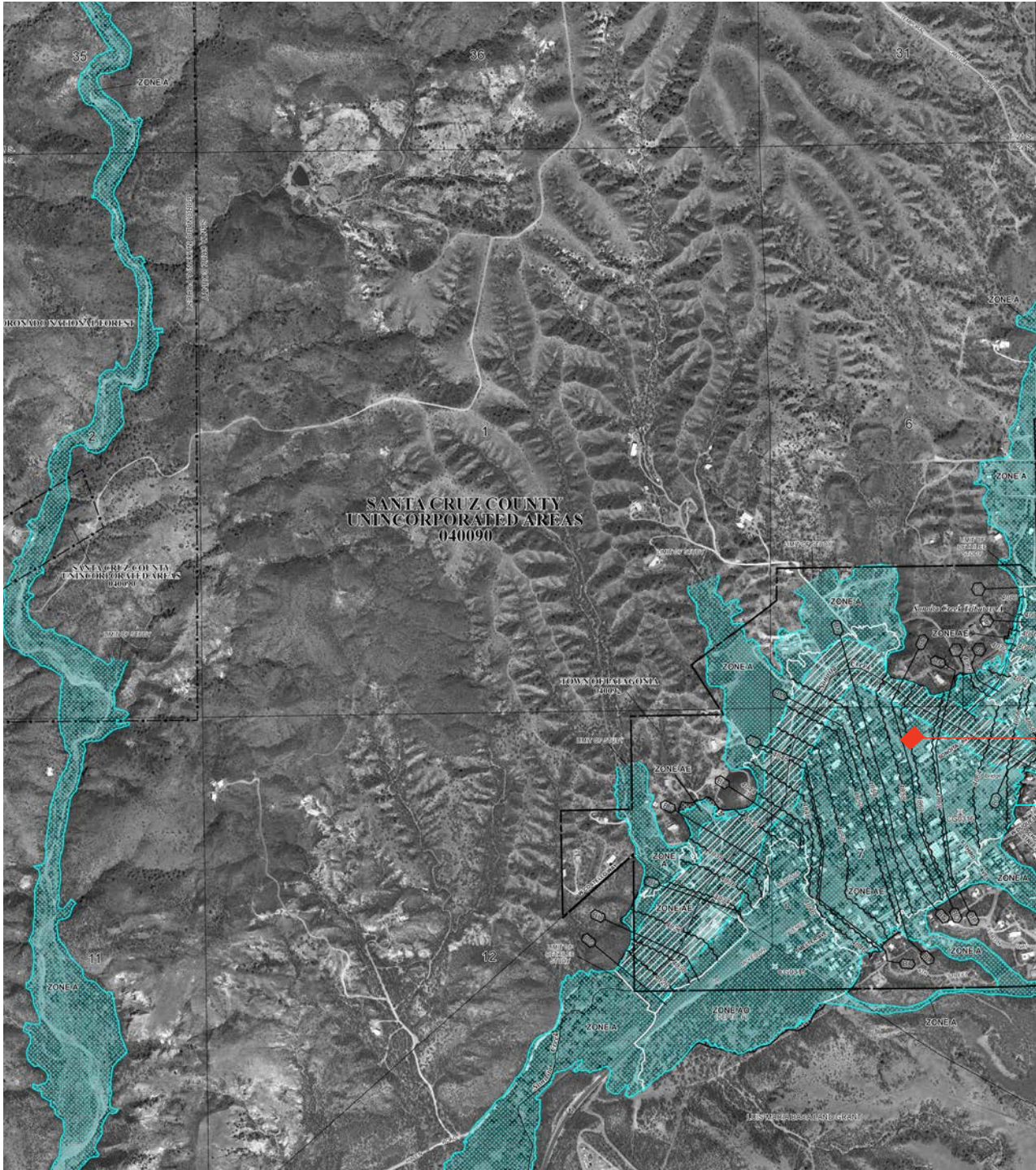
Construction Assemblies

=

Equitable, Affordable, and Contextual Housing

Site and Ecology

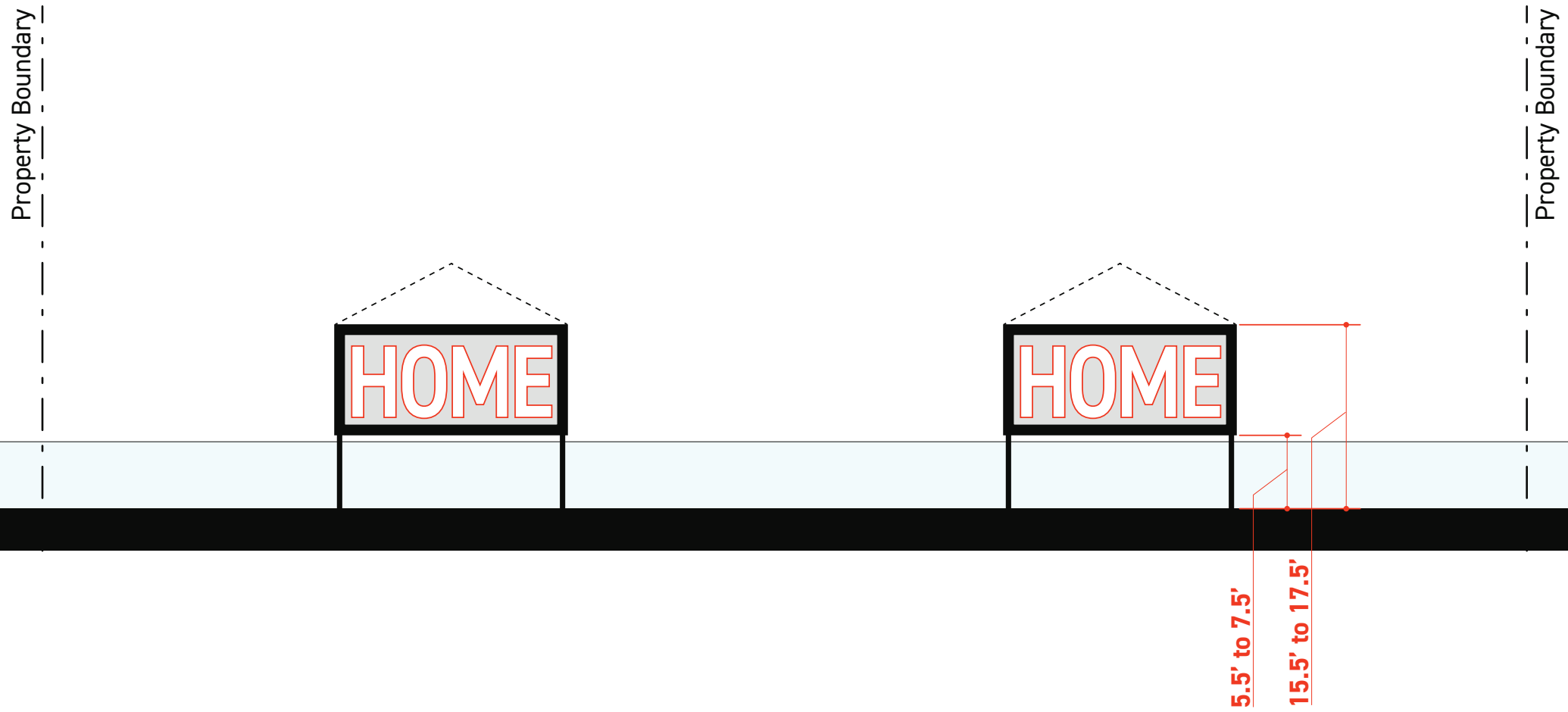




Gopher Field

FEMA Flood Zone AE

By raising homes an additional 0.5' to 2.5' above minimum flood elevation requirements (to 8' above grade), we create the potential for a full-height carport, garage, and/or exterior storage space.



Water heaters and rainwater cisterns should not be located on the ground floor, as flood velocity can uproot them and cause severe damage.

Property Boundary

Property Boundary



5.5' to 7.5'

15.5' to 17.5'

Floodway



in FEMA Flood Zone AE

Rewilding the site with passive water harvesting (basins and swales) and vegetation



Floodway

in FEMA Flood Zone AE

Passive water harvesting basins hold **20,000 to 40,000 gallons of water per rainstorm**



Slows stormwater flow, introduces habitat, passively cools, **beautifies a community asset**

Floodway



in FEMA Flood Zone AE

Community Context

“Patagonia-ness”: What is the character of Patagonia?



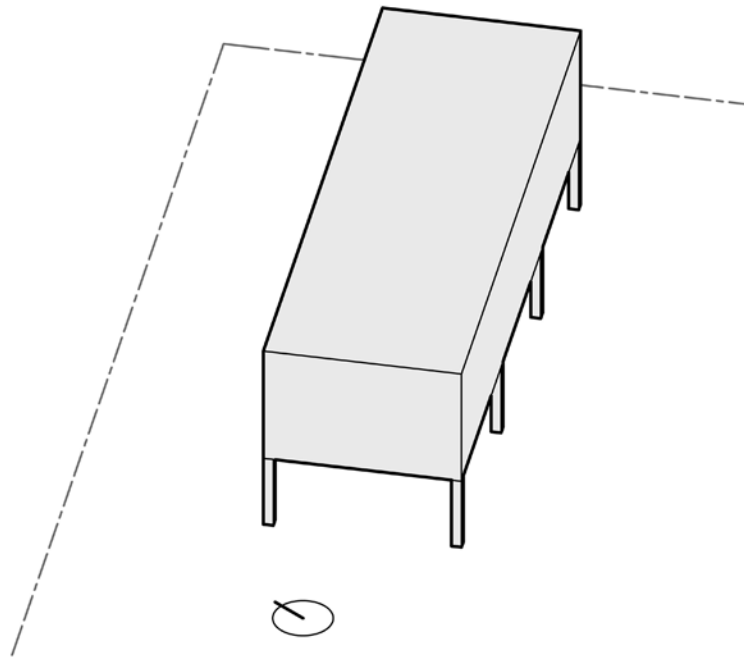
Eclectic, Expressive, Simple Beauty



How does a home have 'Patagonia-ness'?

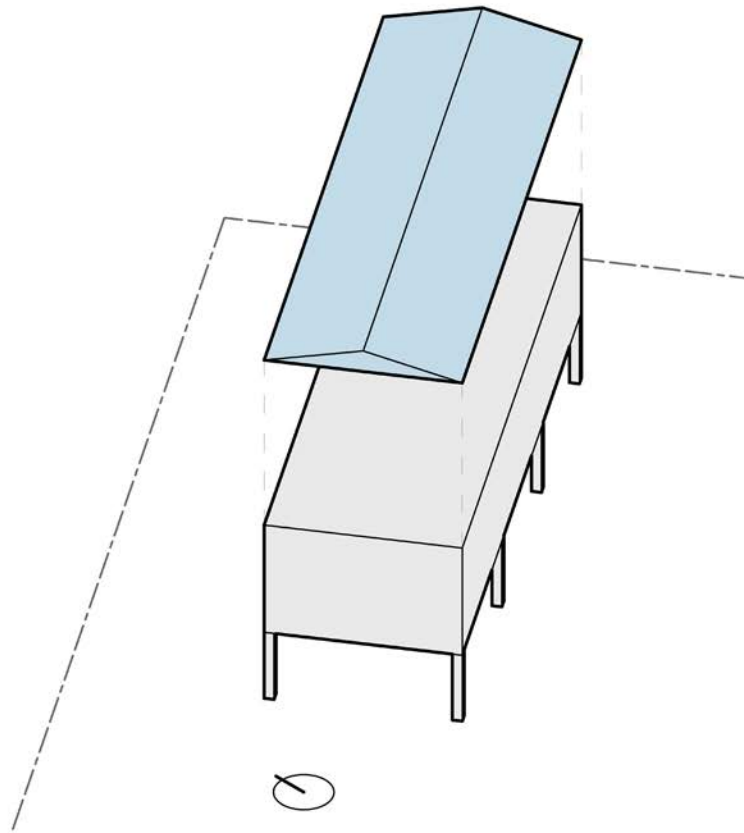
How does a home have 'Patagonia-ness'?

1. Start with simple elevated box



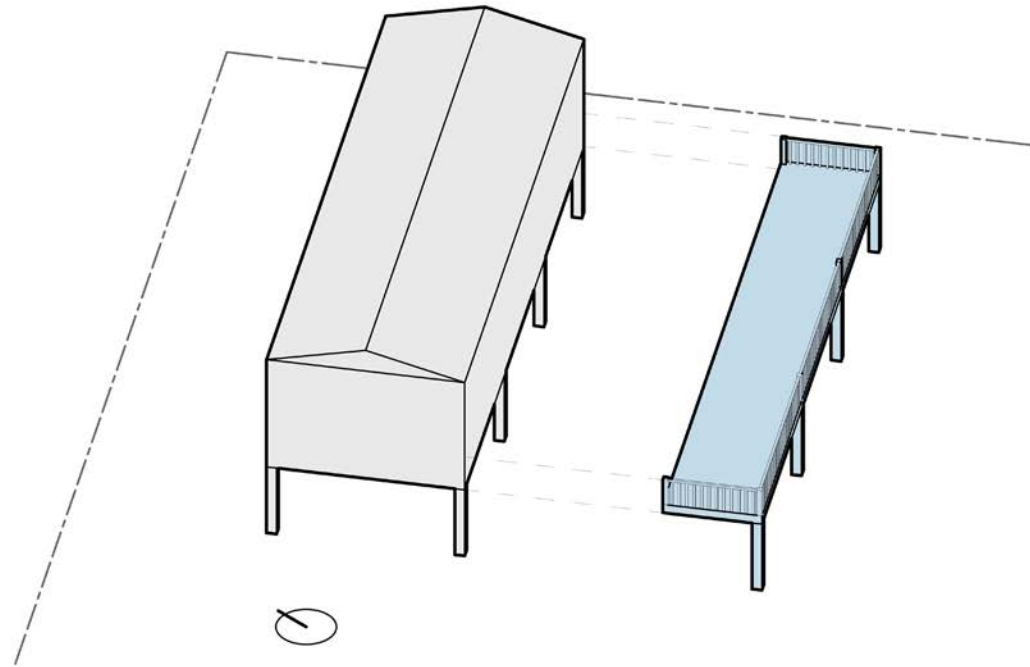
How does a home have 'Patagonia-ness'?

2. Add a pitched roof: Compatible with Patagonia's building style



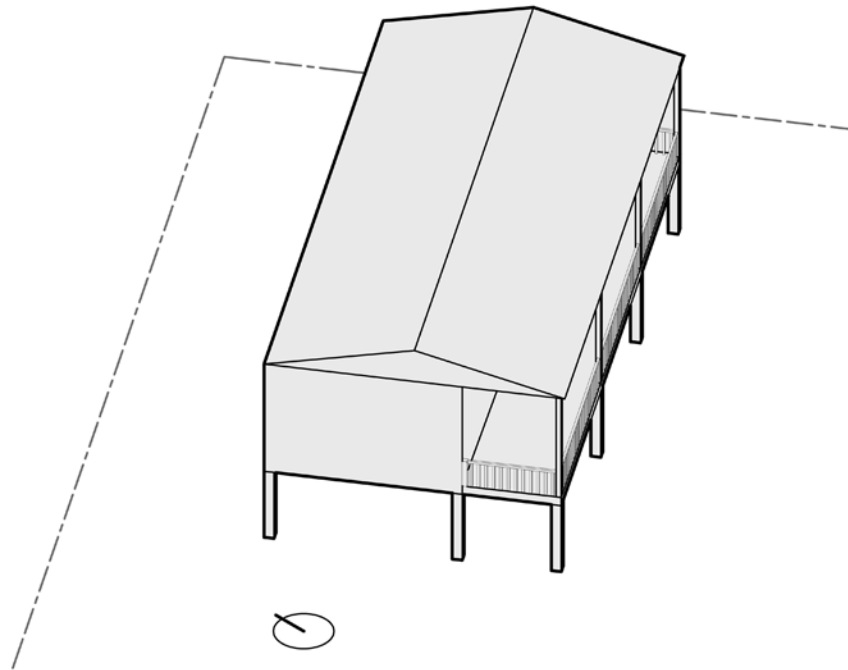
How does a home have 'Patagonia-ness'?

3. Add a porch: Softens building height and puts circulation to exterior



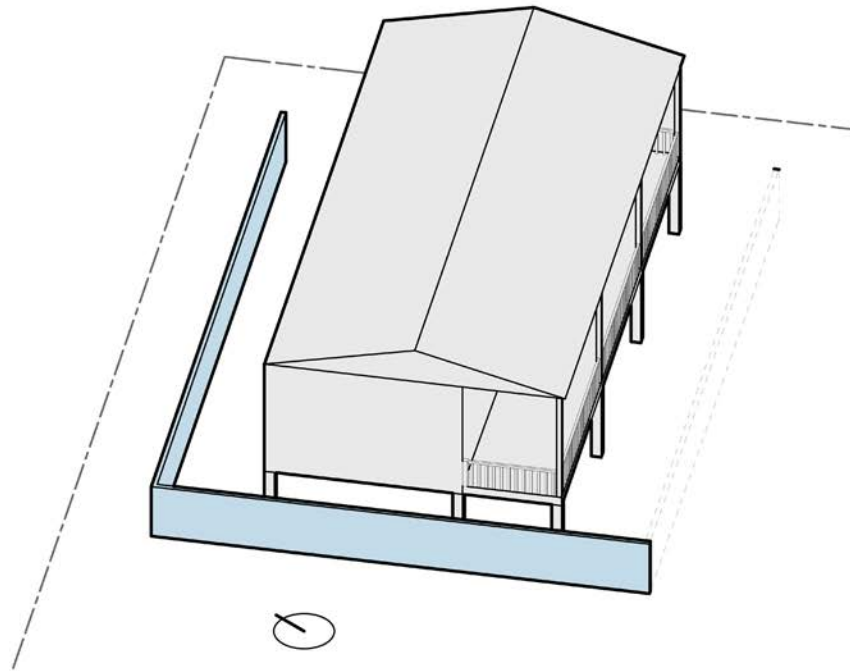
How does a home have 'Patagonia-ness'?

5. Extend the roof: Creates more usable outdoor space



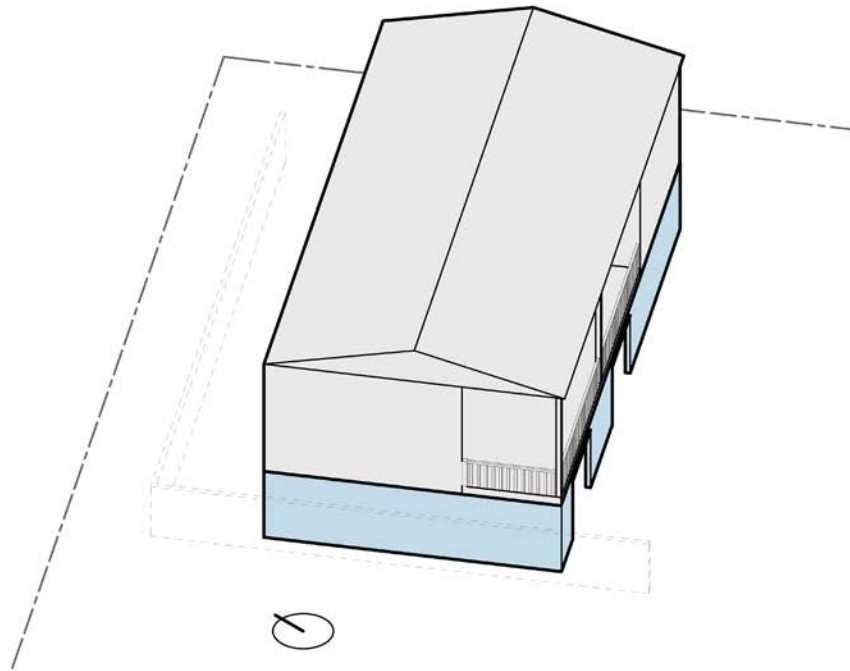
How does a home have 'Patagonia-ness'?

6. Add a site wall/fence: Hides the ground floor



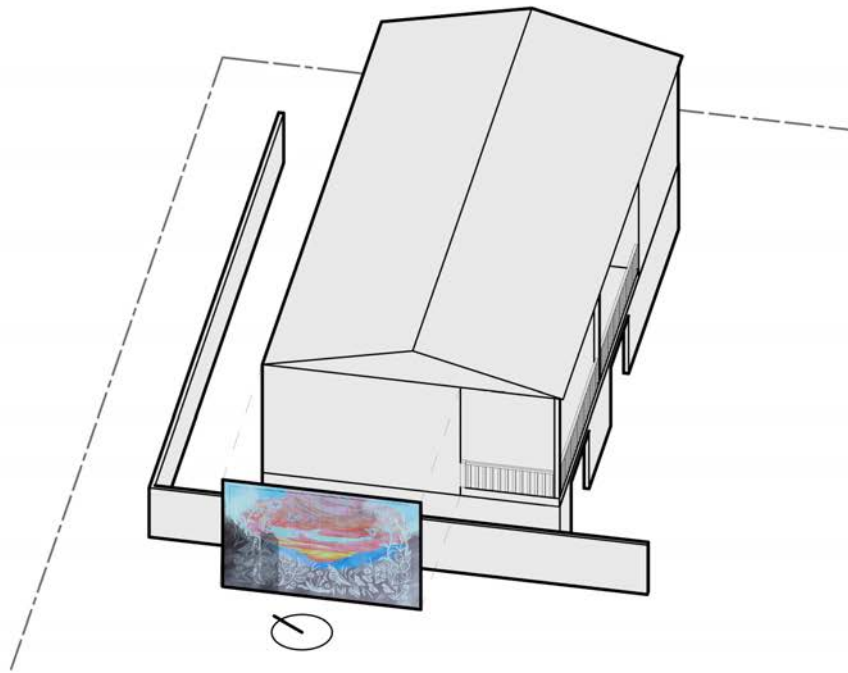
How does a home have 'Patagonia-ness'?

7. Enclose the first floor into a garage: Raises the appraisal value of home



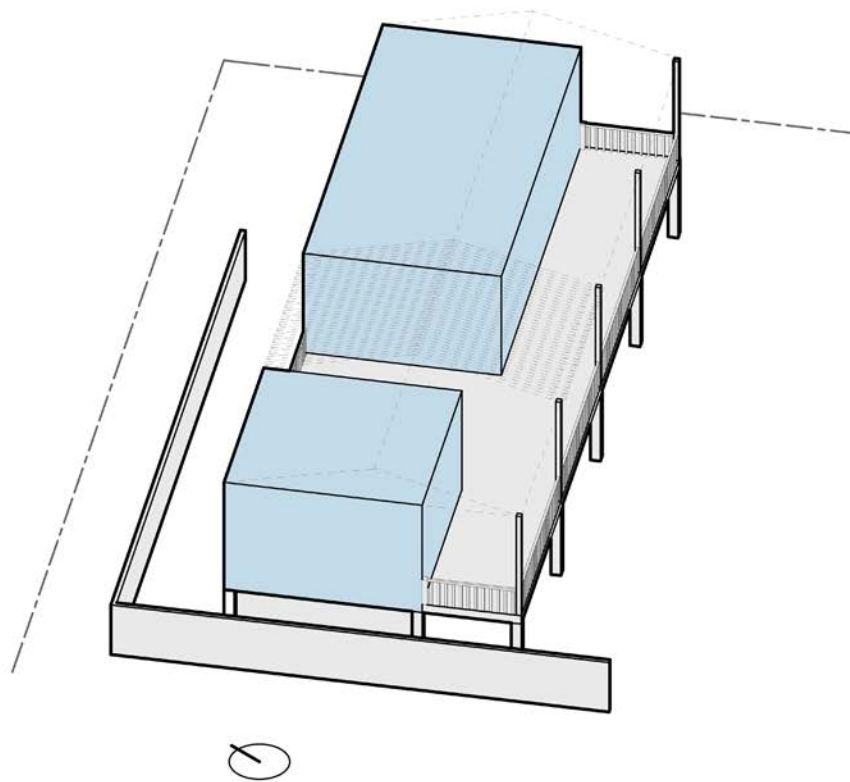
How does a home have 'Patagonia-ness'?

8. Add art: Emphasizes Patagonia's eclecticism



How does a home have 'Patagonia-ness'?

9. Combine two units: Decks and ramps are shared



What size is correct?



What size is correct?

**Make small houses
appear bigger**



Community assets

- **Daily activities:**

birdwatching
hiking and camping
trail riding

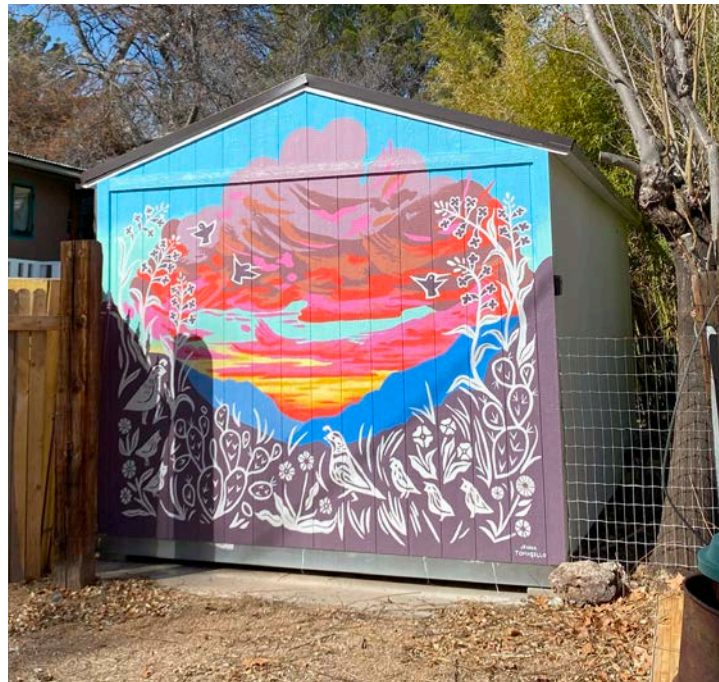
- One of the sky islands,
with **a unique ecology**

- **Expressive**
- **Artistic**
- **Tight-knit**



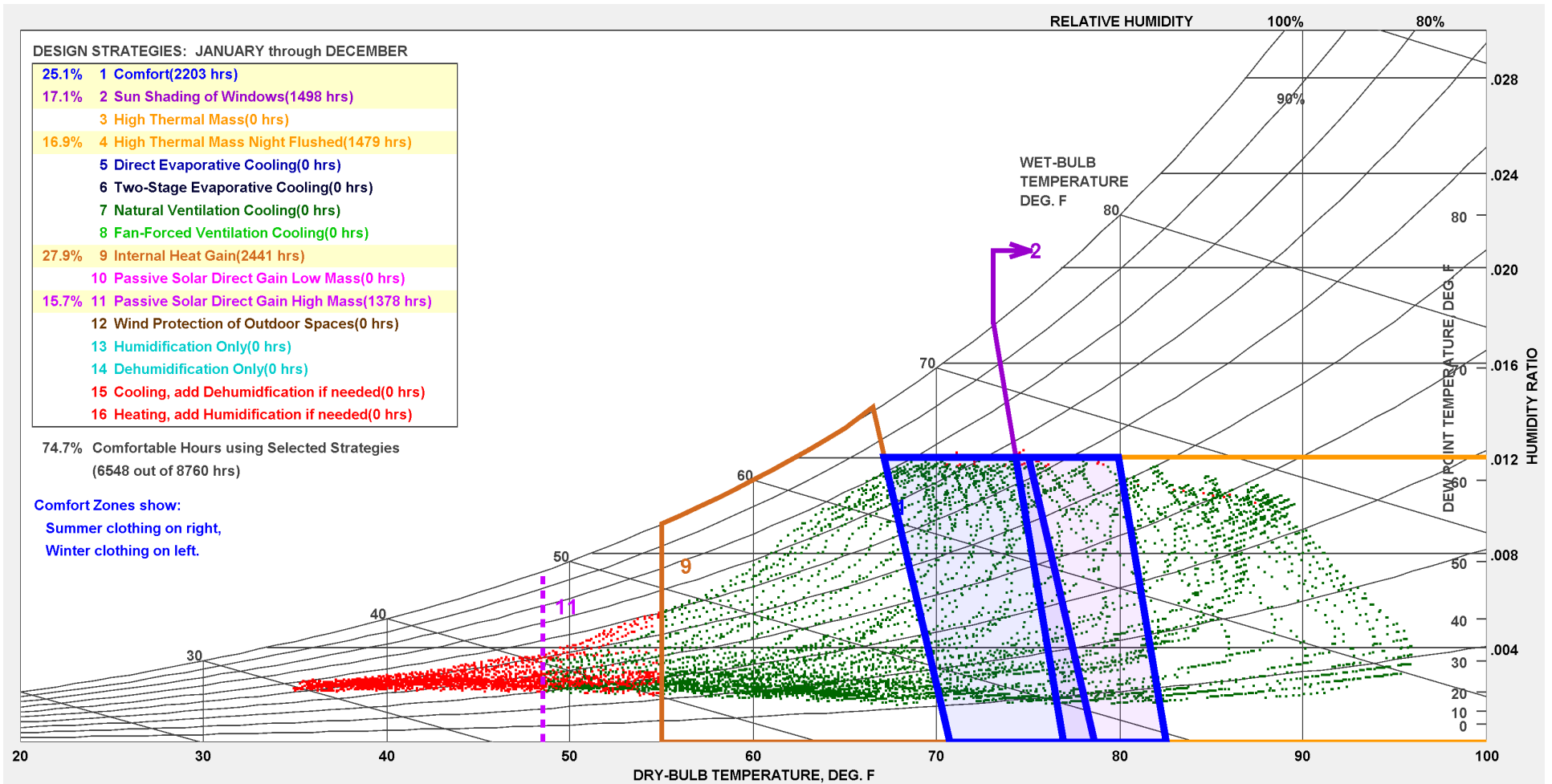
Community assets to design elements

- Community art project
- Habitat creation
- Community-designed park space / memorial



Wellbeing

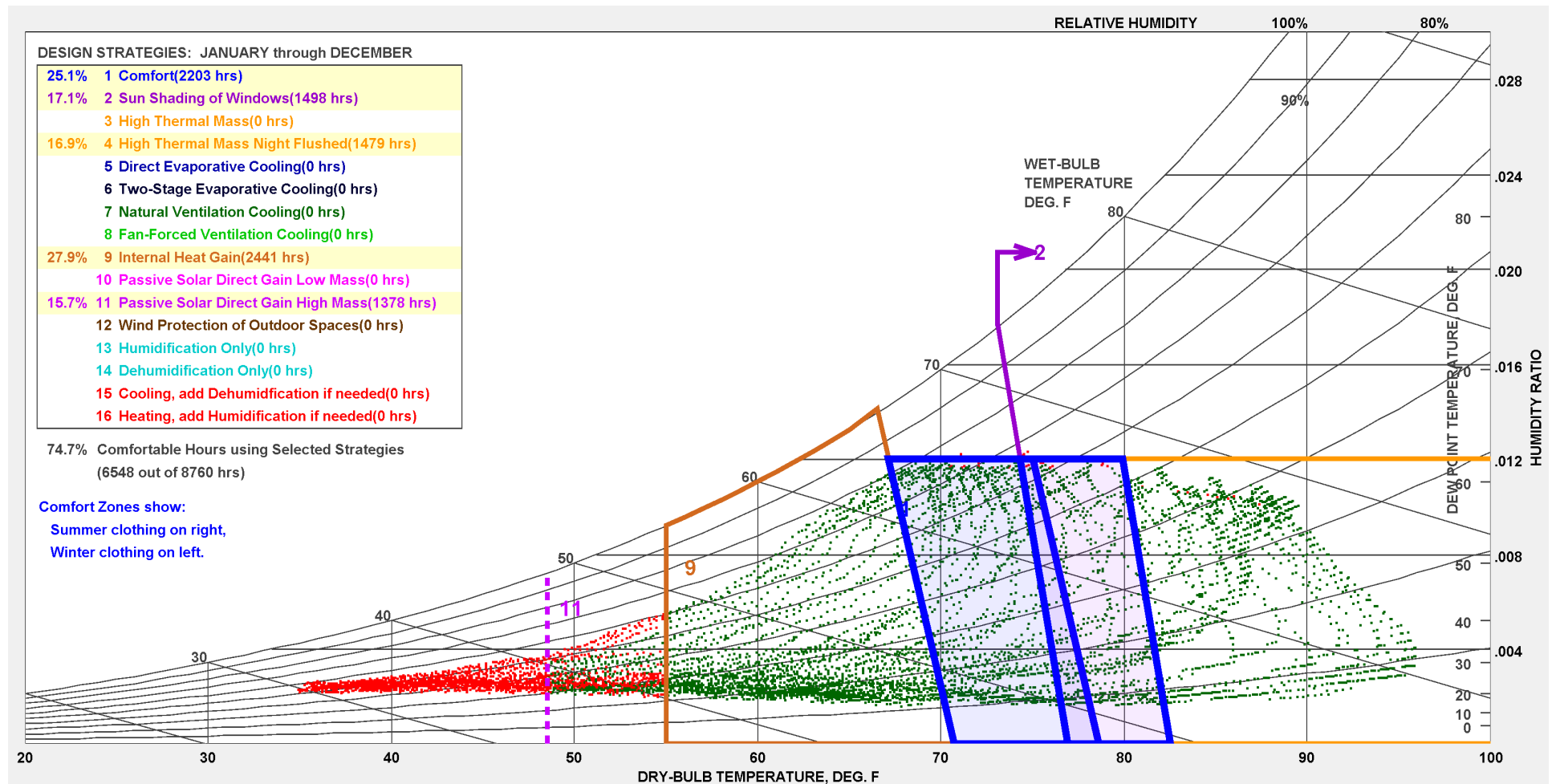
Physical Wellbeing | Thermal Comfort and Passive Design



Top 3 strategies for thermal comfort

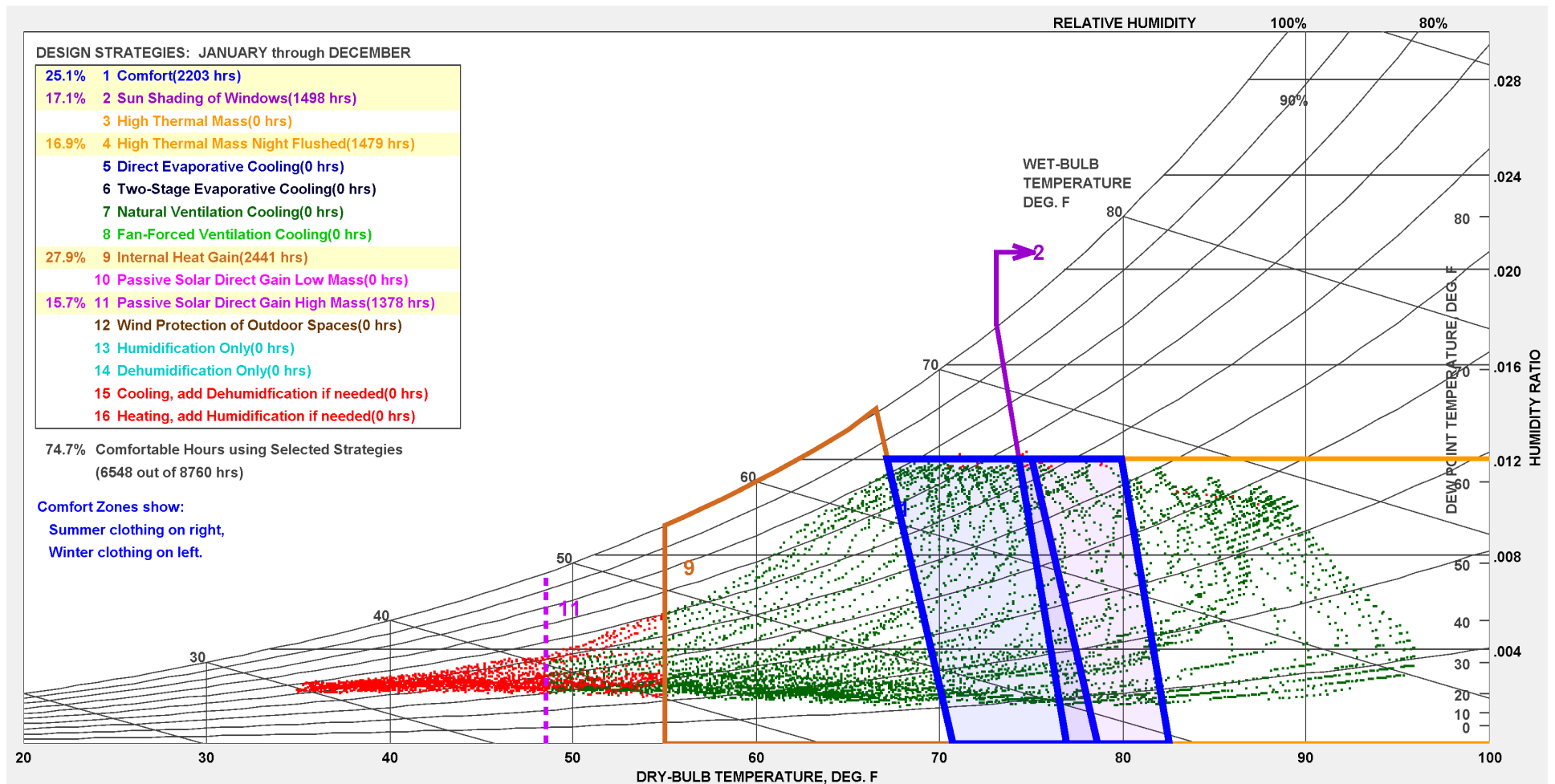
(in order of effectiveness)

1. Sun shading windows
2. Direct solar gain
3. Night-flush ventilation

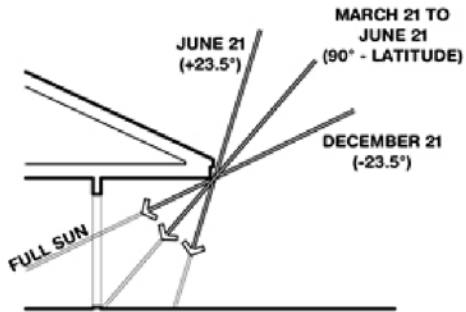
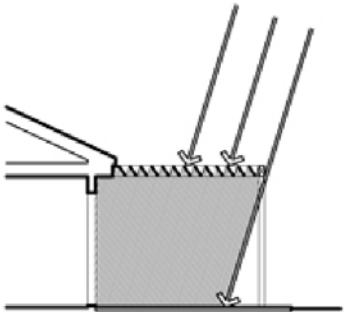
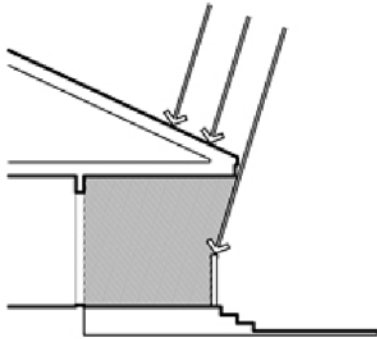
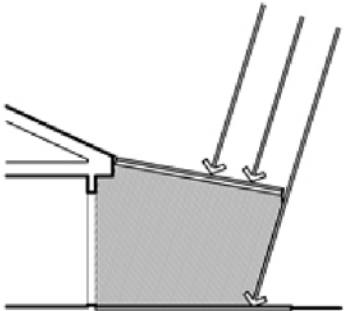
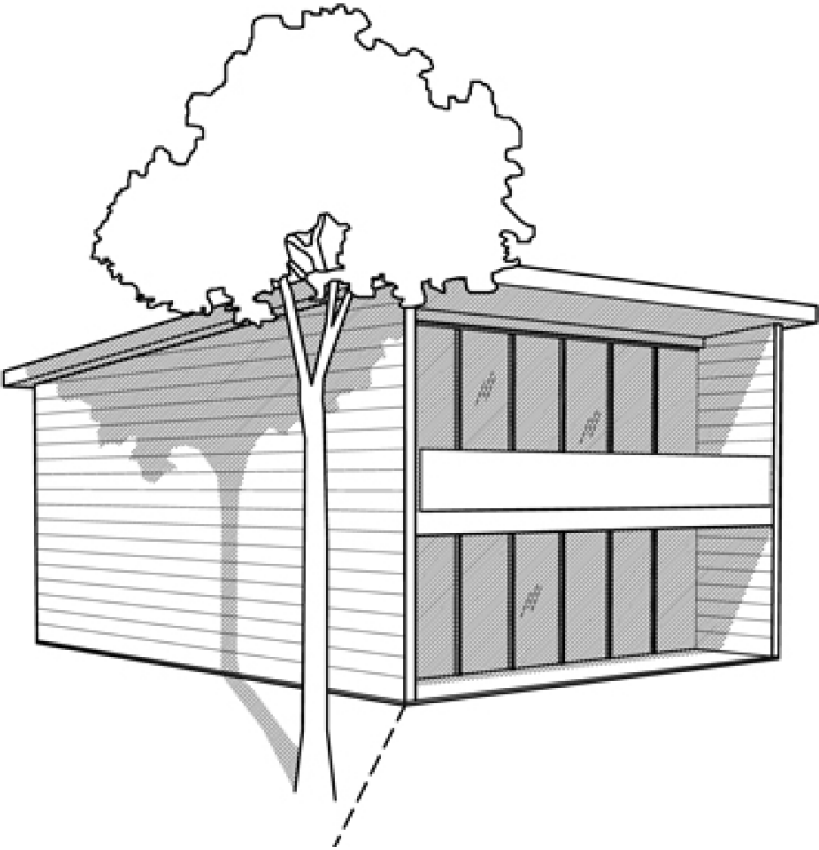


The top three passive design strategies will allow **75% of comfortable hours inside a home throughout the whole year.**

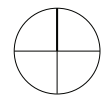
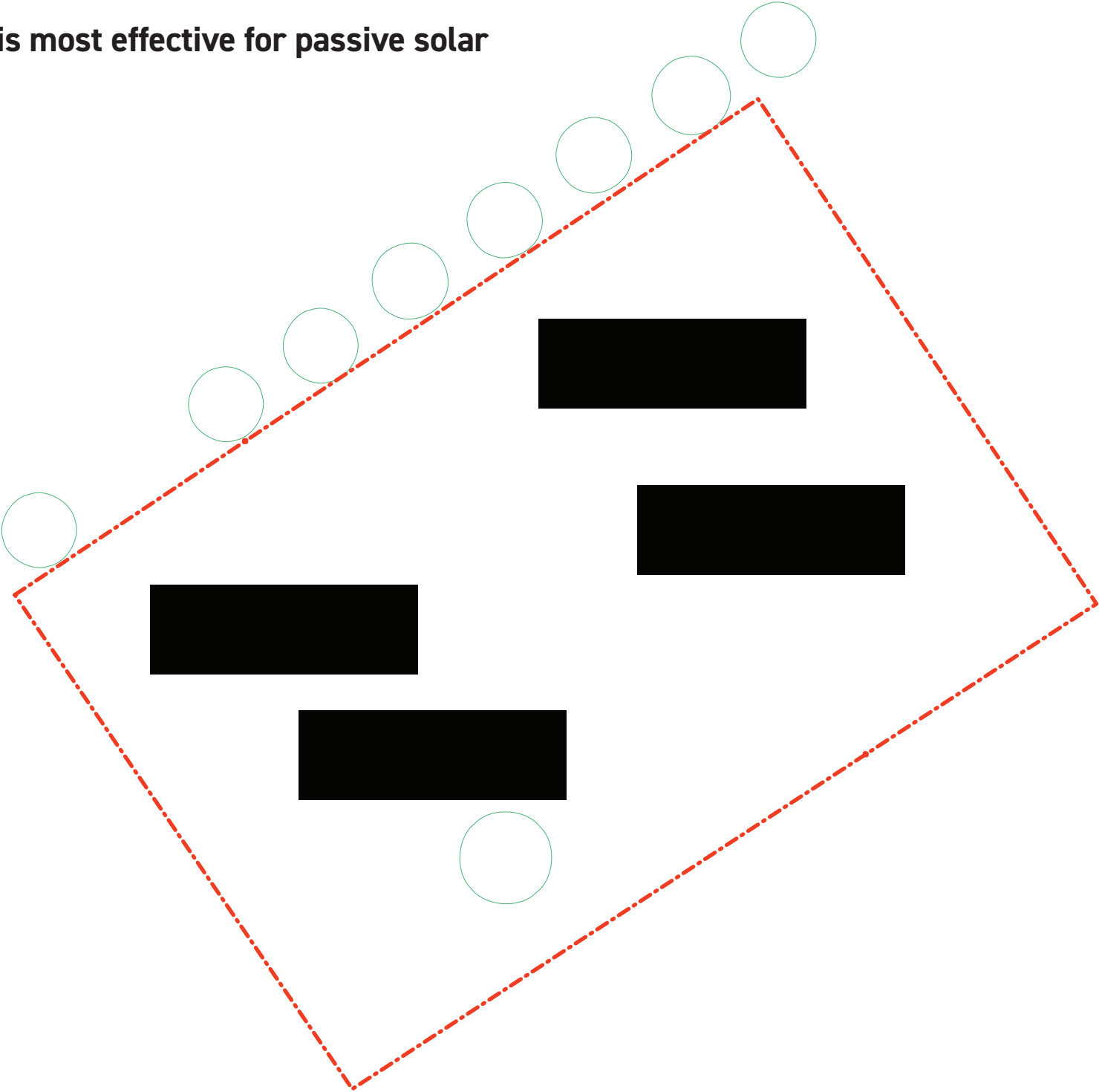
The remaining **25% of hours require heating** to reach comfort.



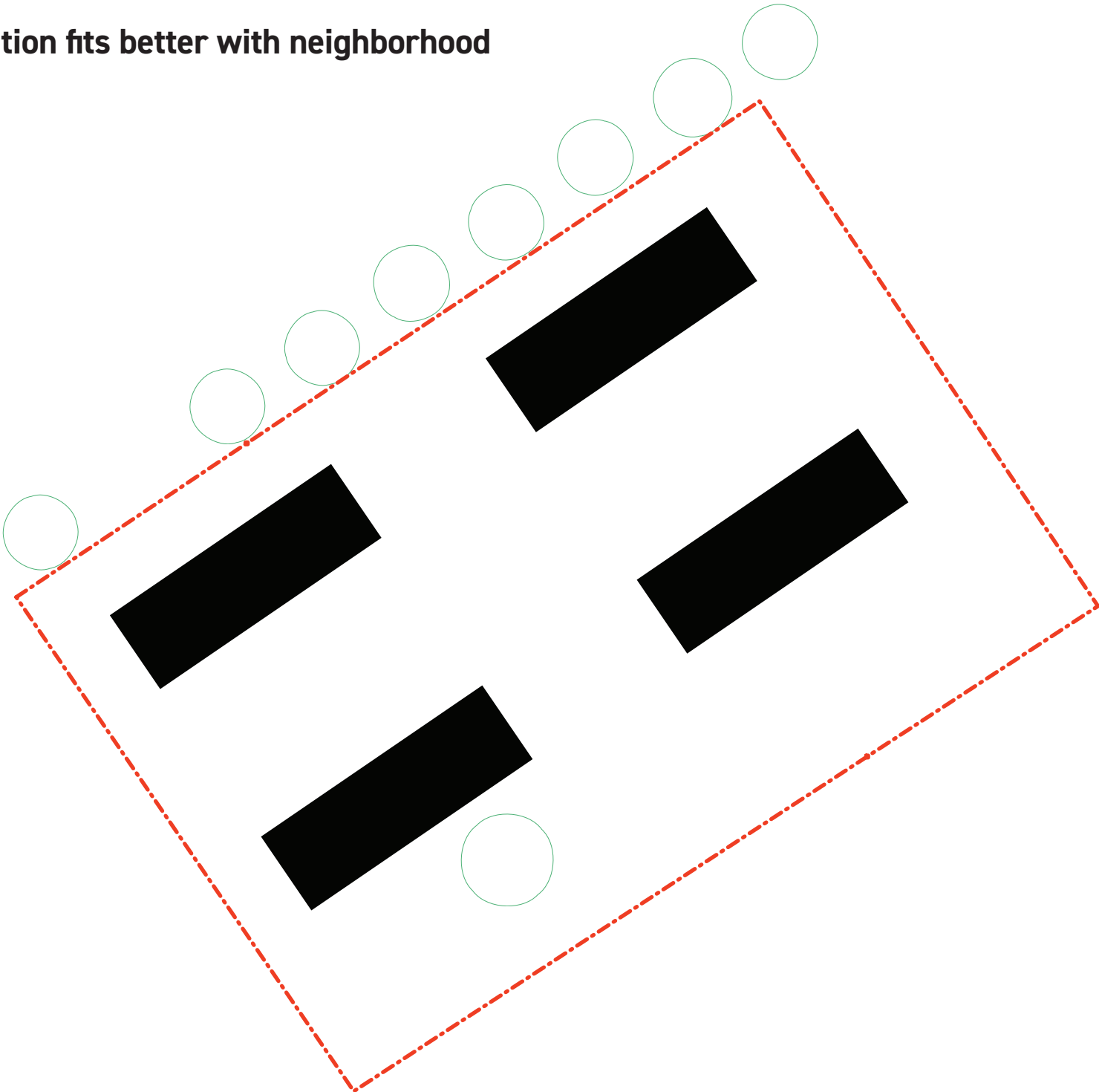
Sun shading windows and direct solar gain



True south is most effective for passive solar



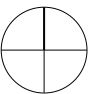
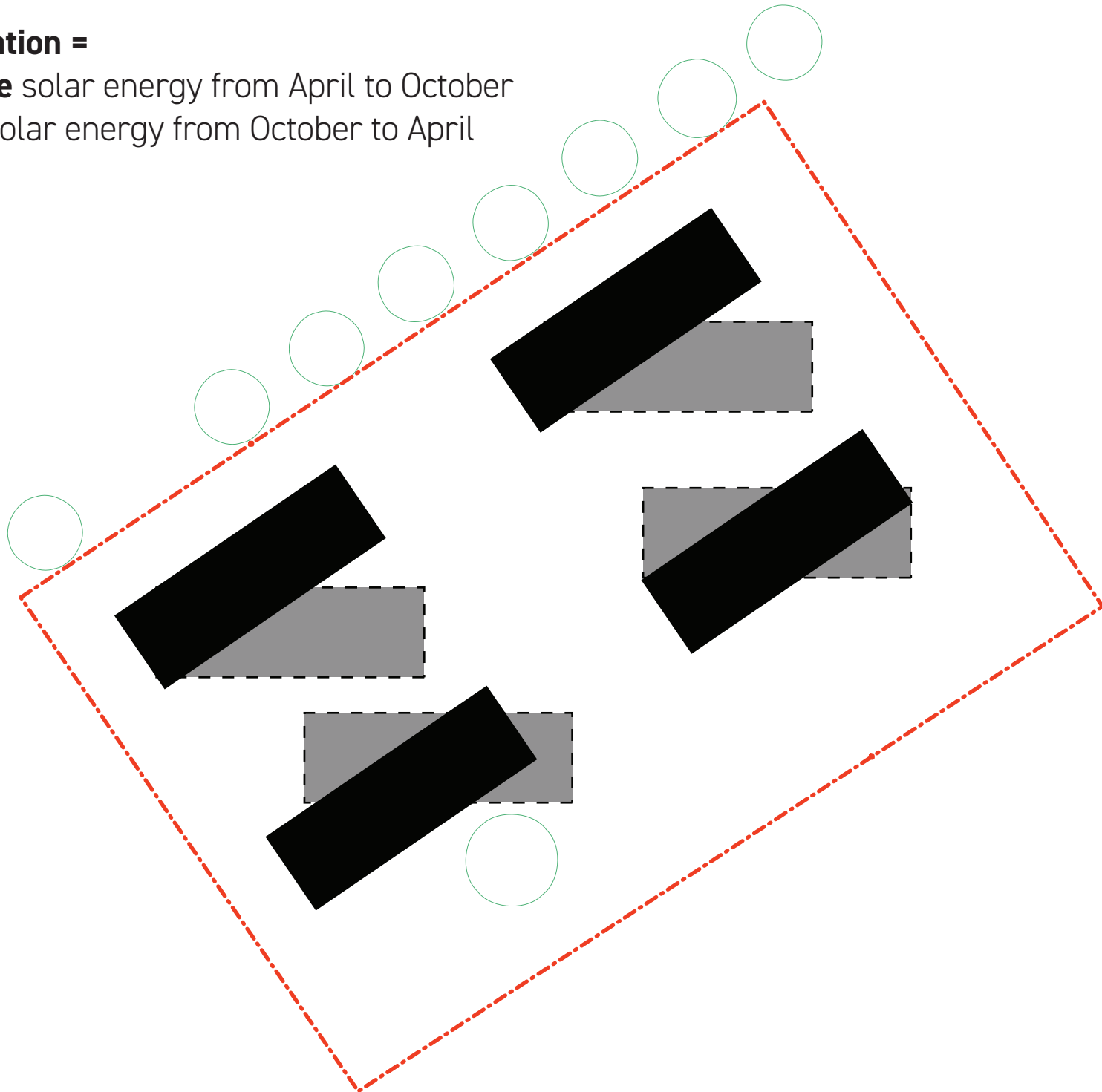
Site orientation fits better with neighborhood



Site orientation =

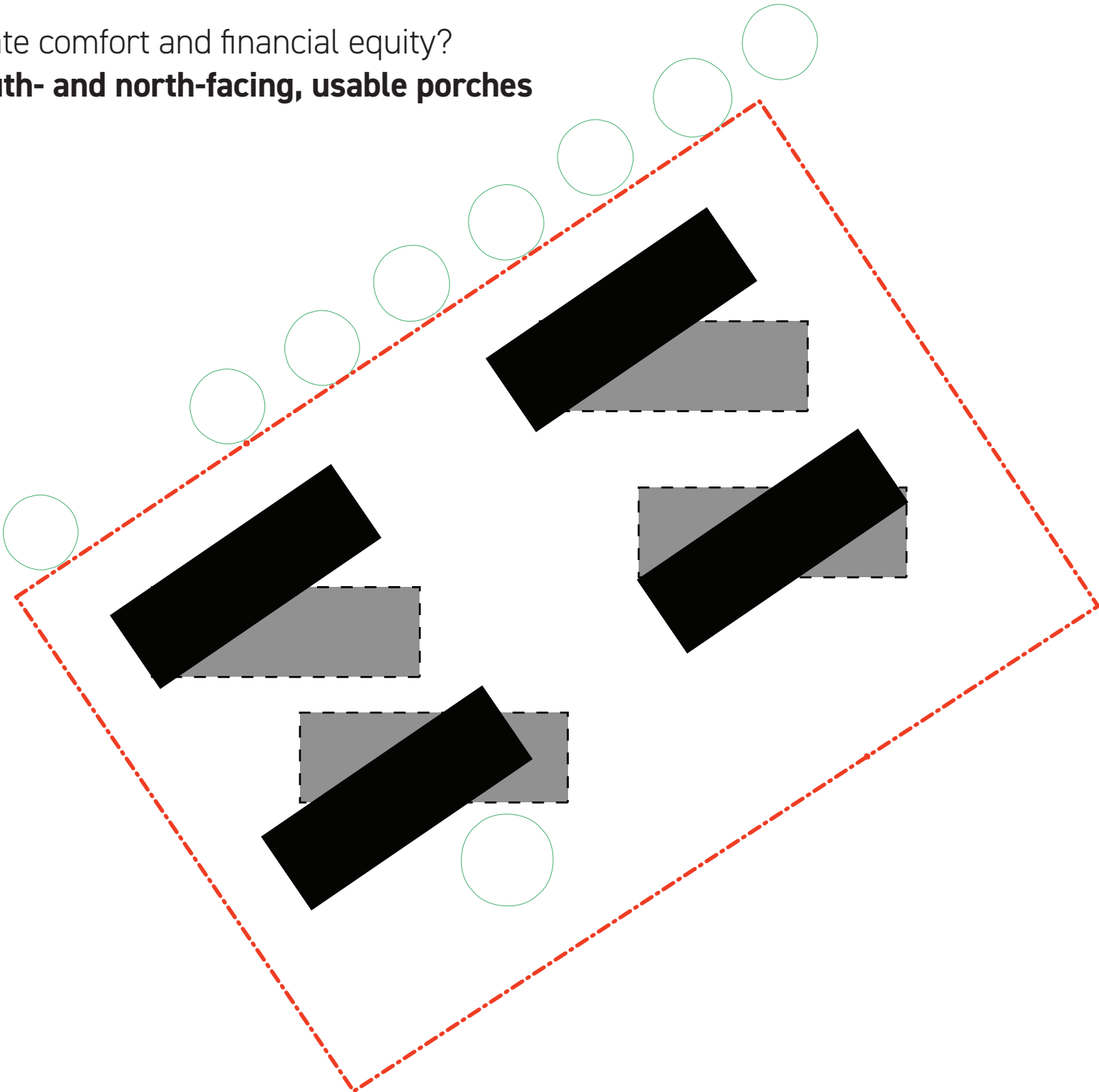
10.1% more solar energy from April to October

7.2% less solar energy from October to April

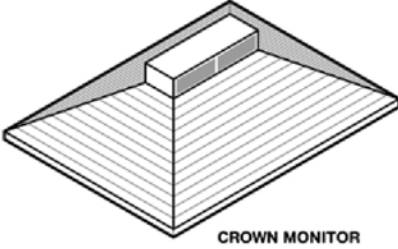
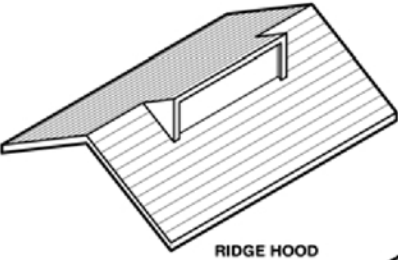
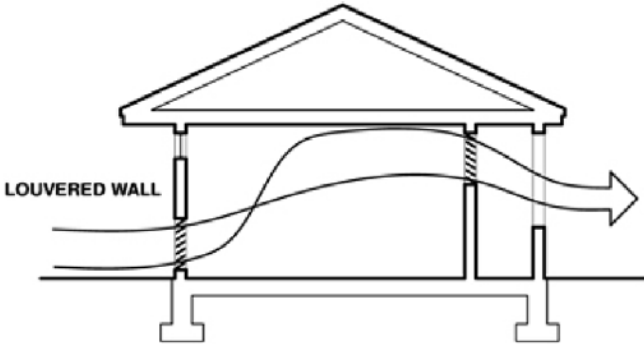
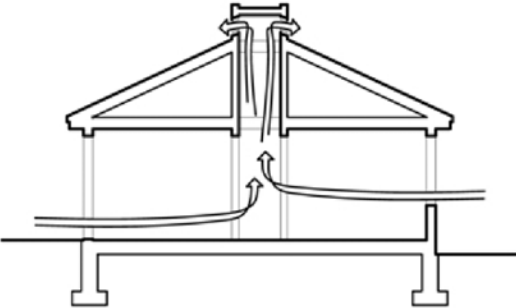
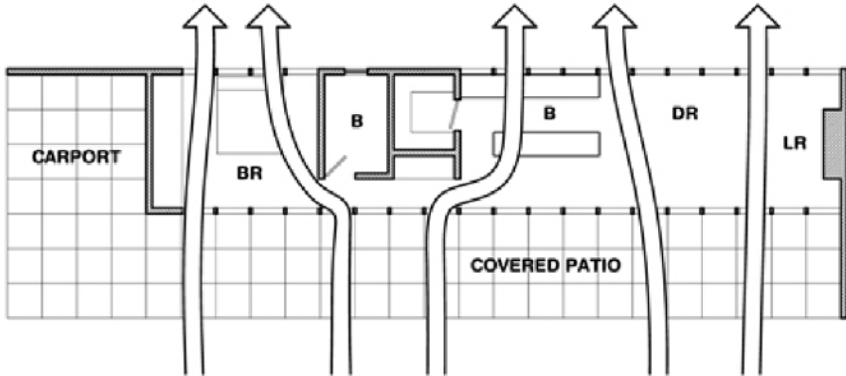


How to create comfort and financial equity?

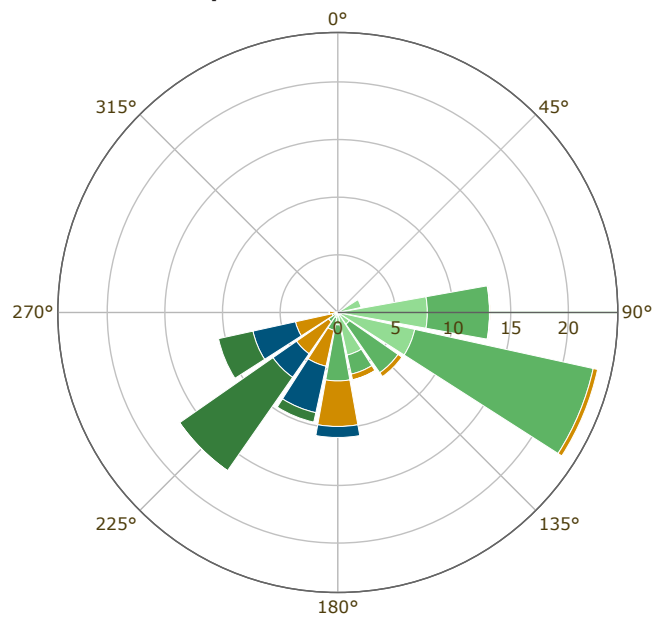
Deeper, south- and north-facing, usable porches



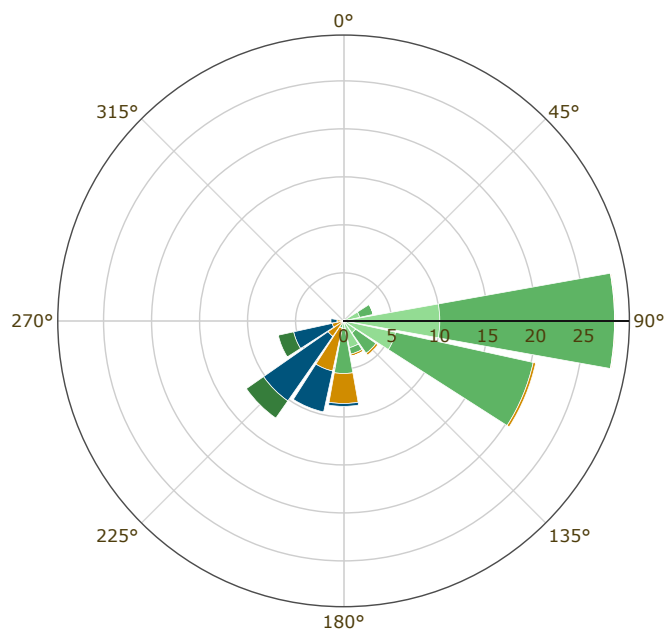
Ventilation



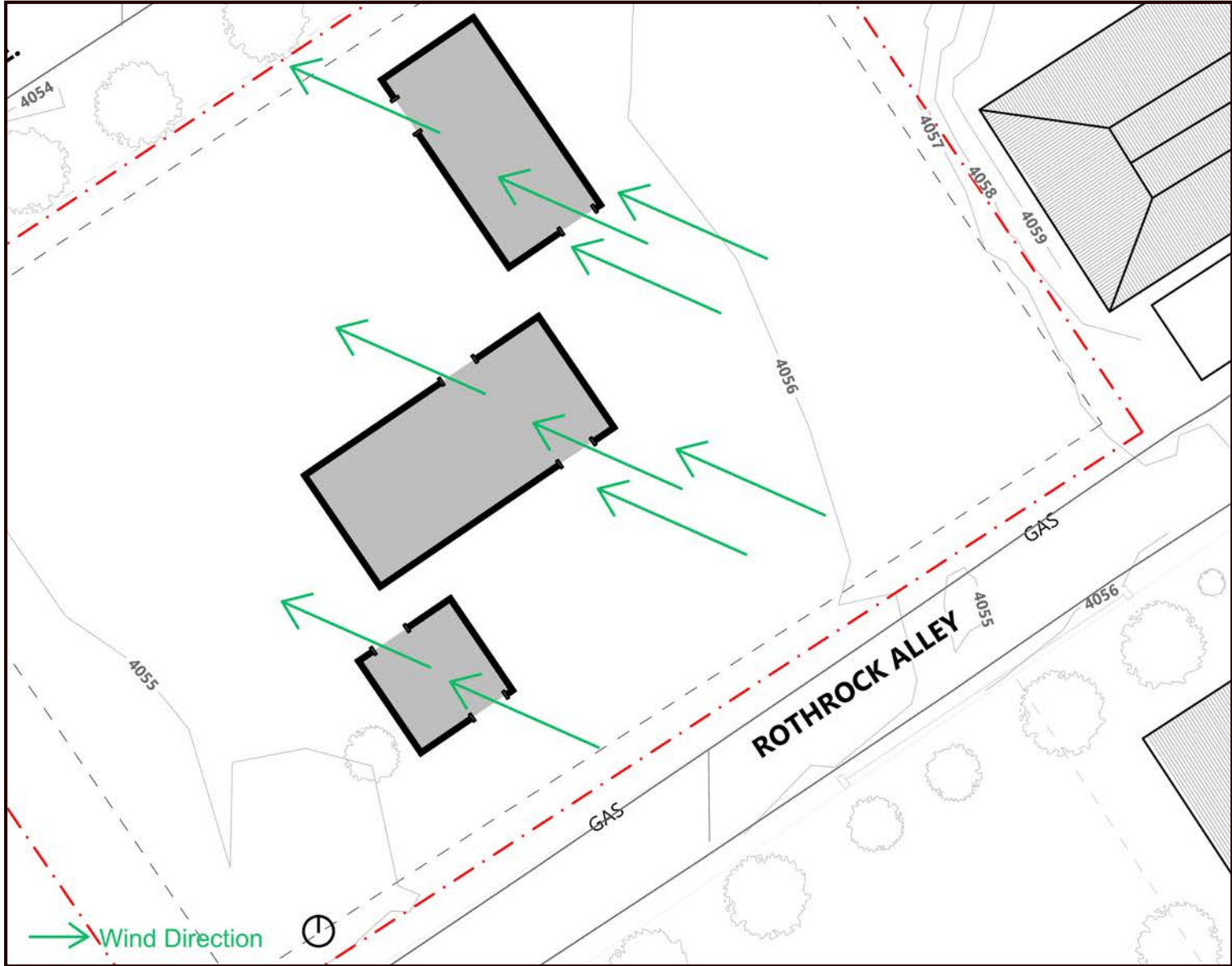
Summer Winds April - October



Winter Winds October - April

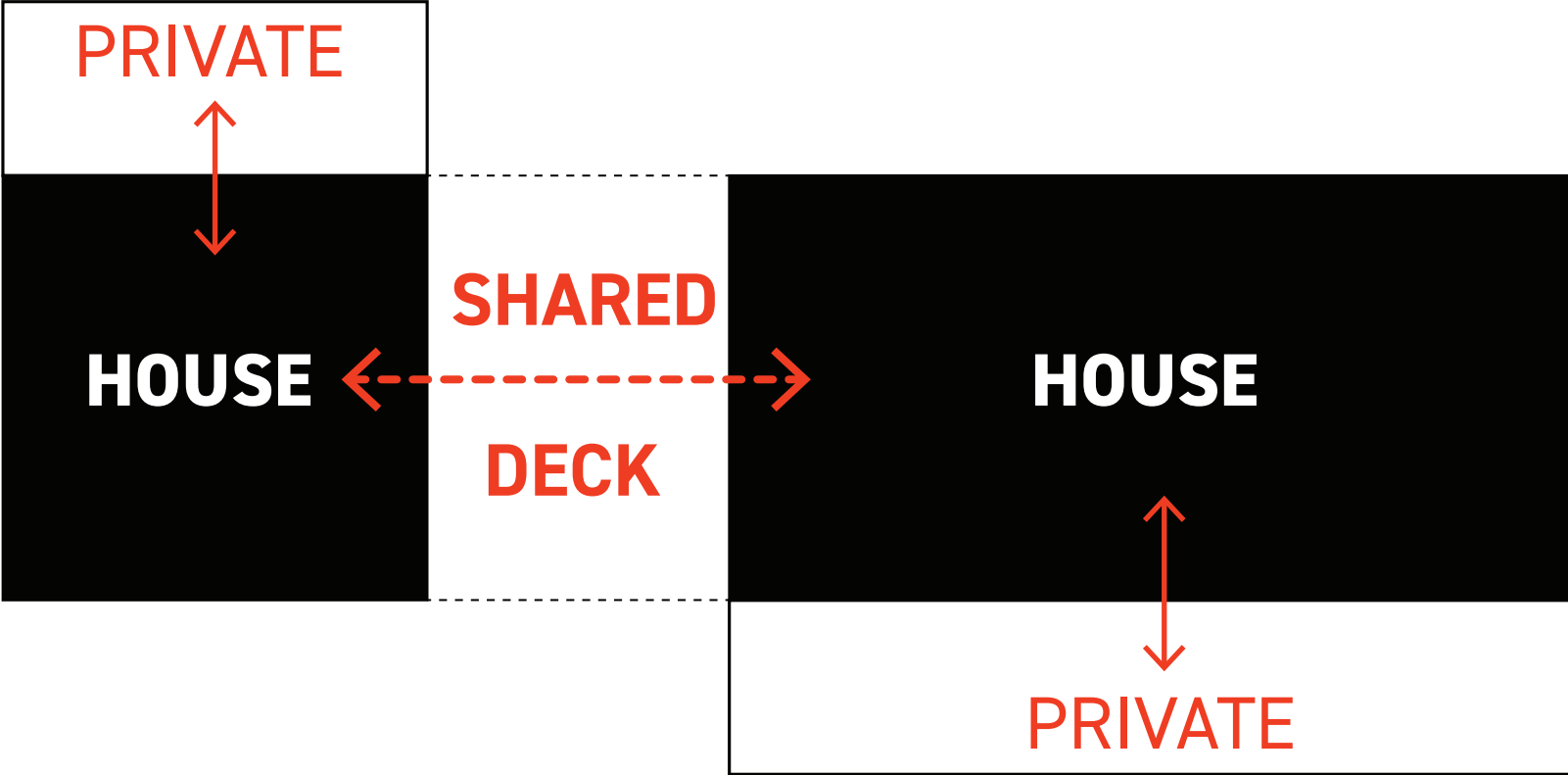


- 98.4 - 295.3 fpm
- 295.3 - 649.6 fpm
- 649.6 - 1082.7 fpm
- 1082.7 - 1555.1 fpm
- 1555.1 - 2106.3 fpm
- 2106.3 - 2716.5 fpm
- 2716.5 - 3366.1 fpm
- 3366.1 - 4074.8 fpm
- >4074.8 fpm

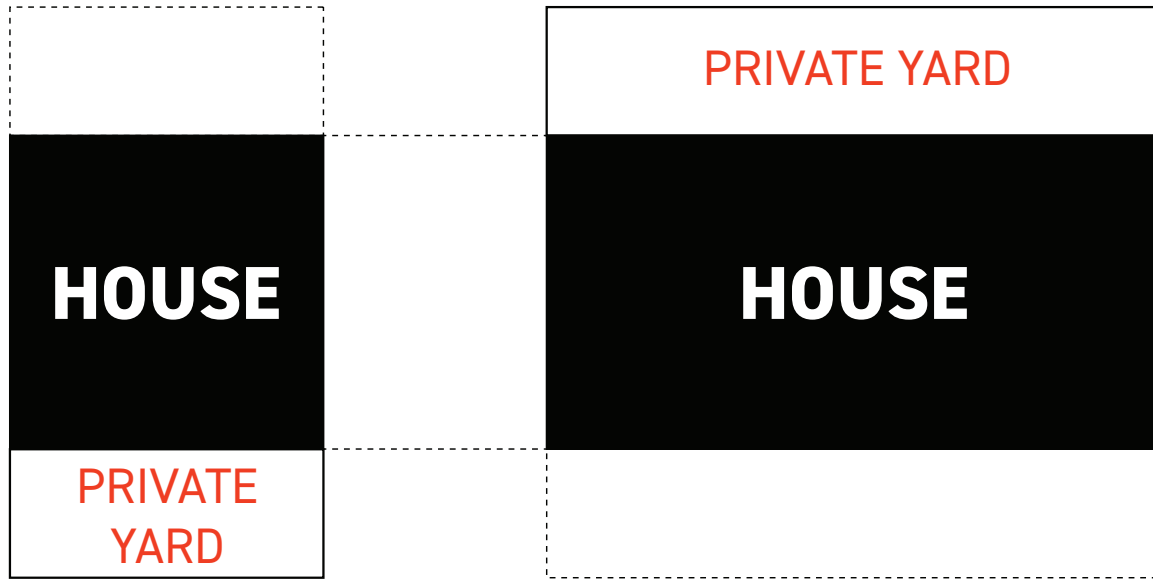


Social Wellbeing

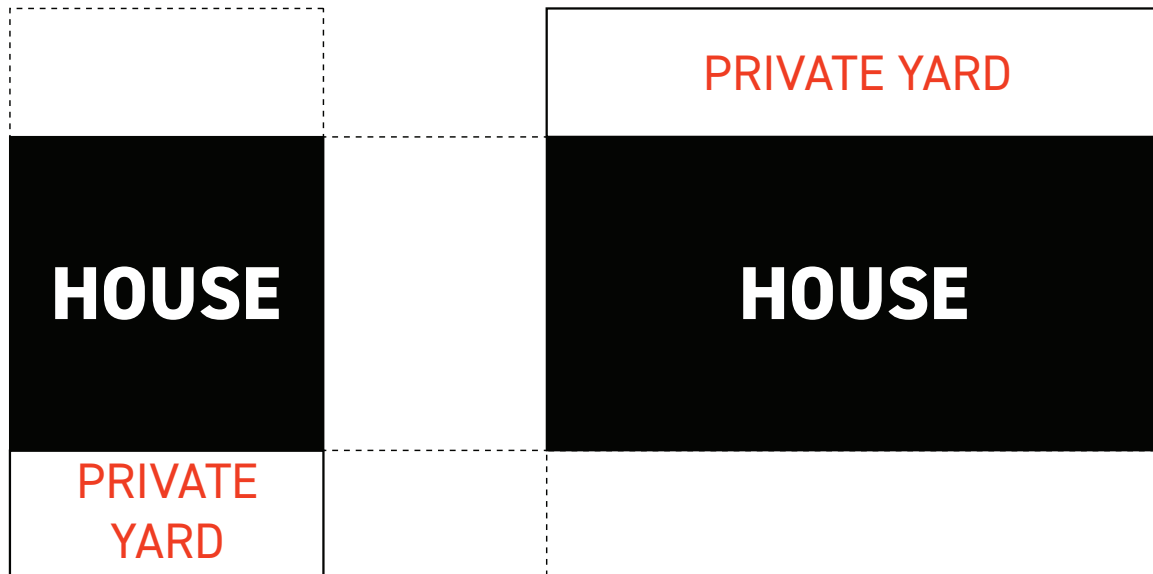
Second Floor



Social Wellbeing
Ground Floor



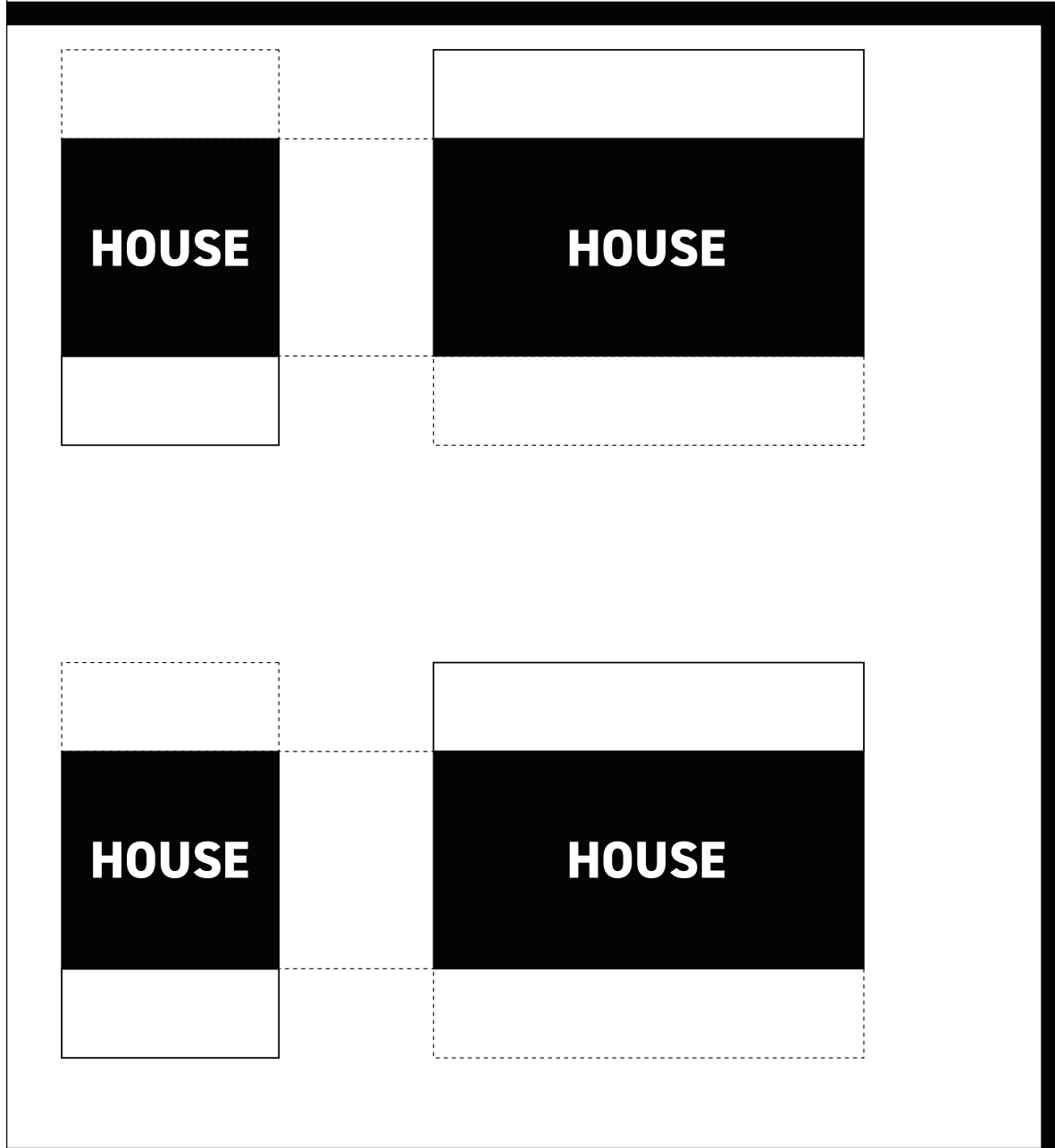
SHARED YARD



Social Wellbeing
Site

PENNSYLVANIA

3RD AVE



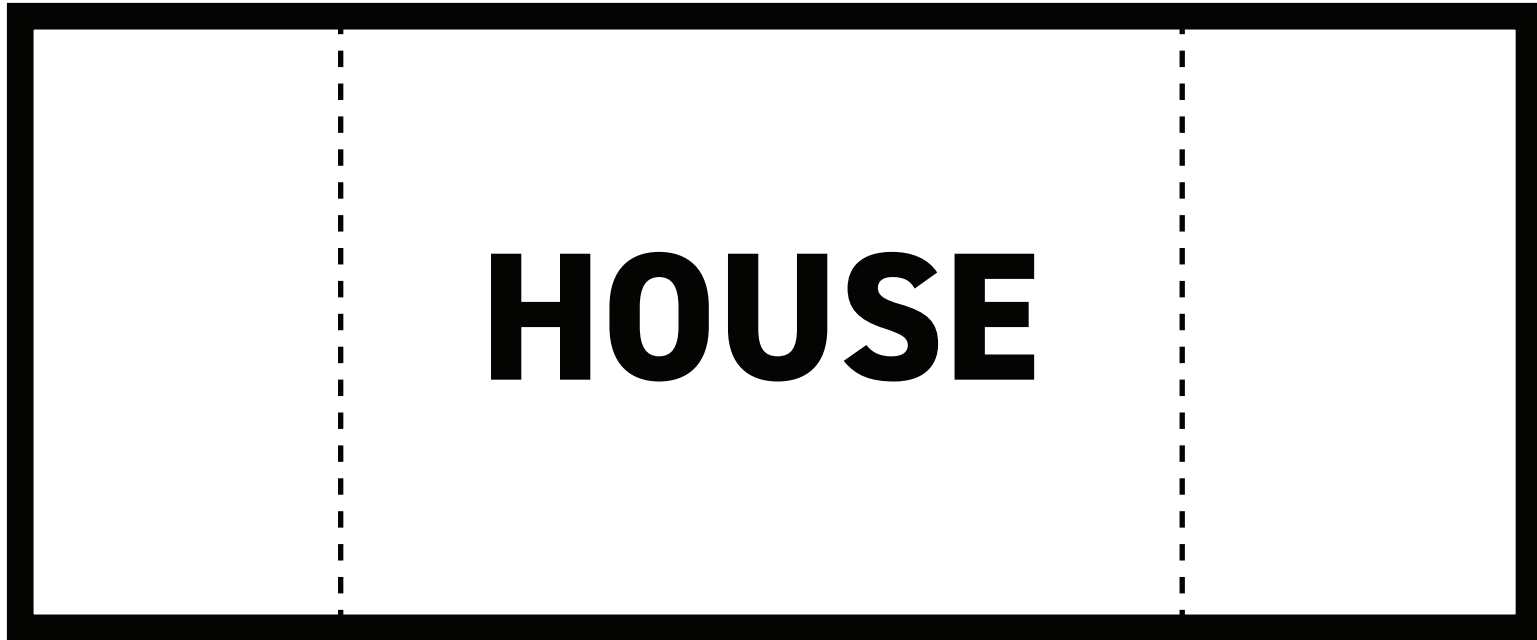
GARDEN HOMES

ROTHROCK

Construction Assemblies

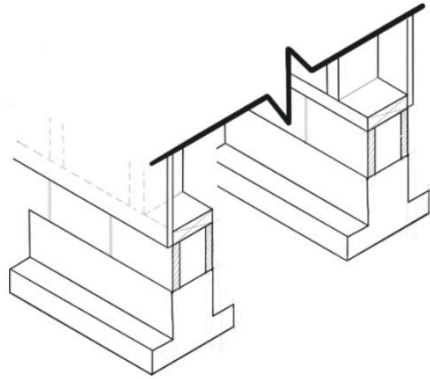
VARIABLES BASED ON HOUSE SIZE

~20'



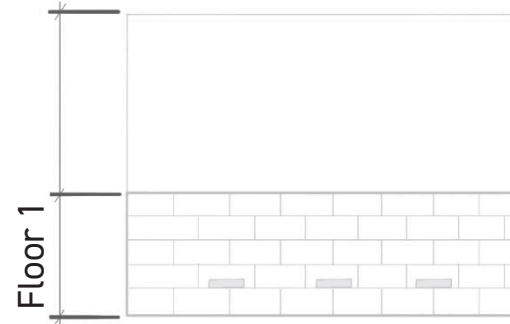
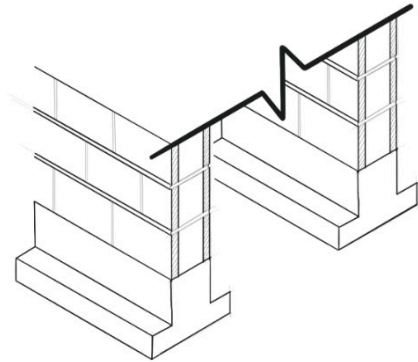
Materials below Base Flood Elevation

Wood framing



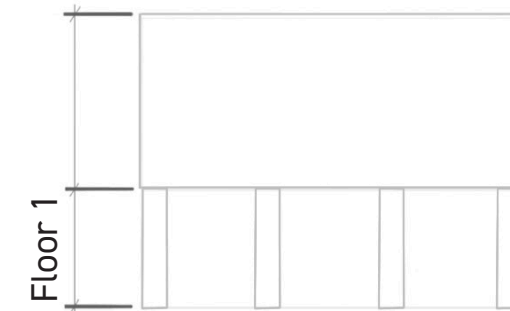
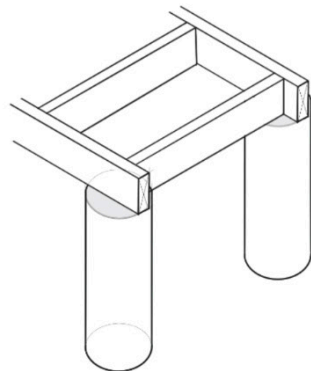
Lowest cost and durability

Concrete block



Mid cost and durability

Concrete precast or cast in place



Highest cost and durability

Materials above Base Flood Elevation

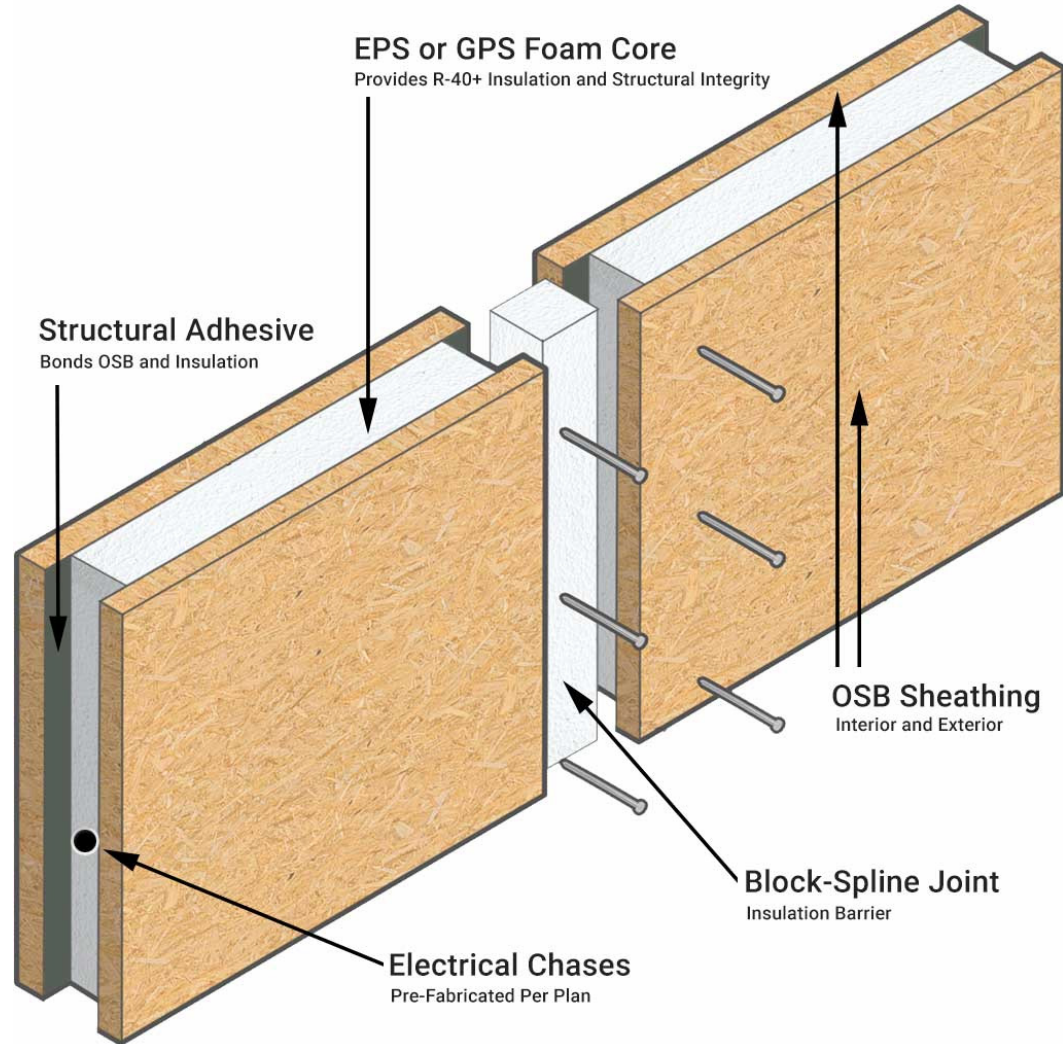
- On-site wood frame
- Pre-built wood frame walls and floors
- Wood roof trusses
- Structural Insulated Panels (SIPs)



Habitat
for Humanity®
Tucson



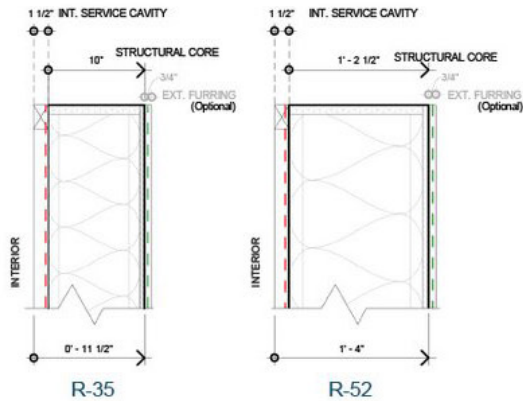
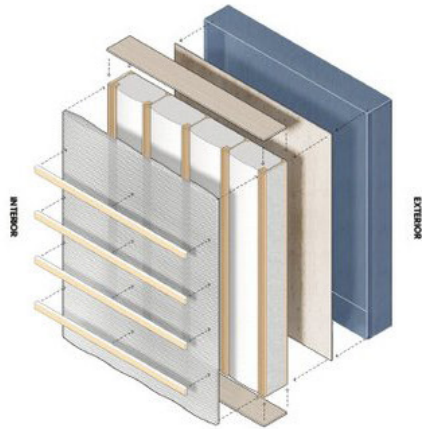
PREFLEX



Wall Panels

R-35 or R-52

9/1/21 series D

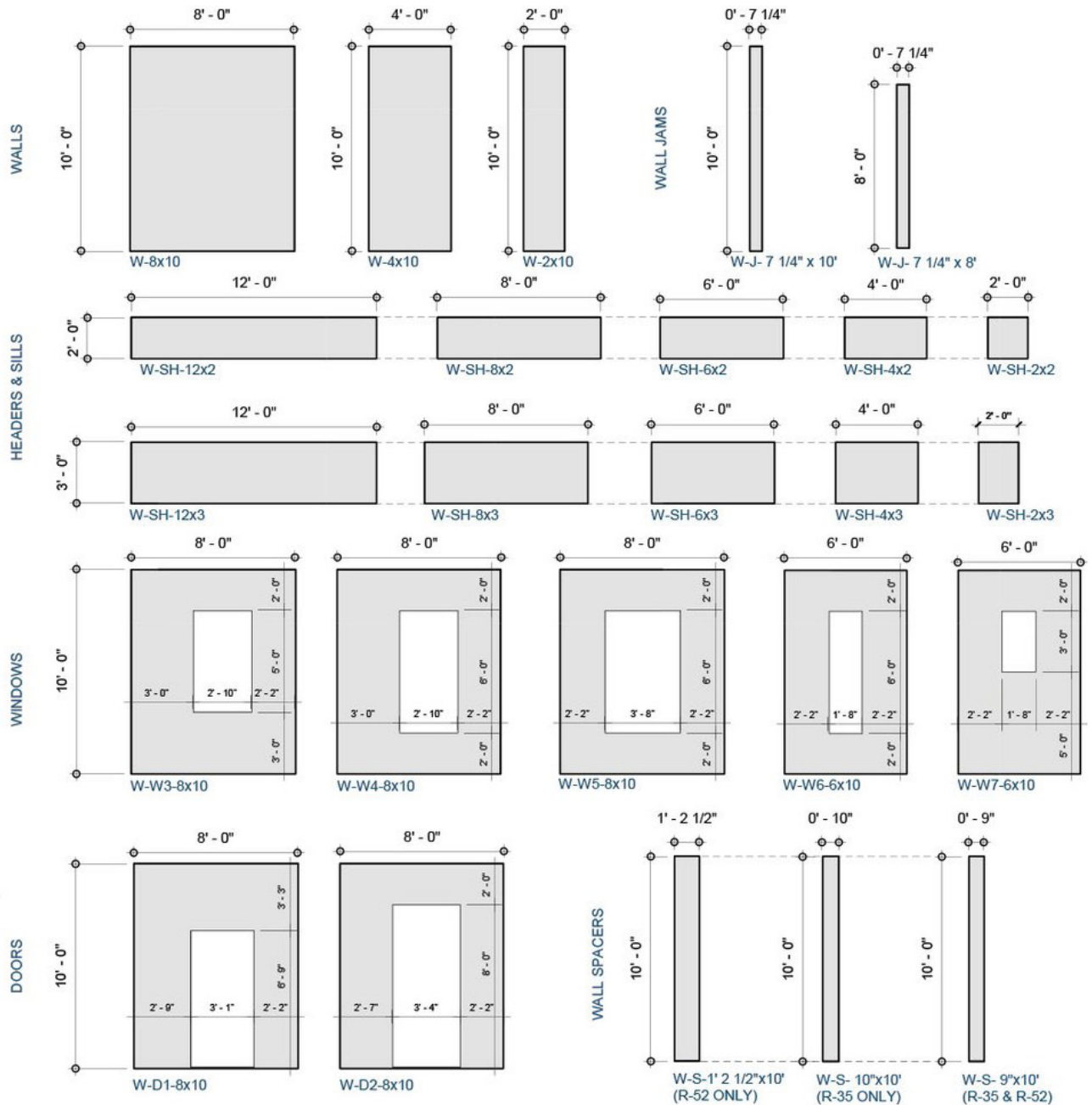


PRIMARY WALL COMPONENT DIMENSIONS & PERFORMANCE

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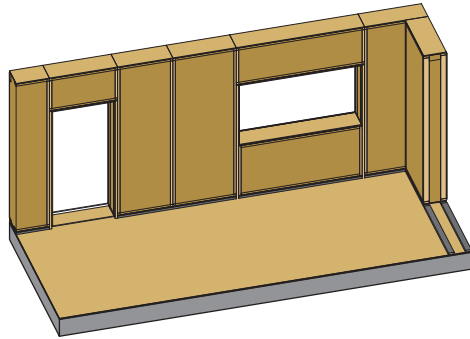
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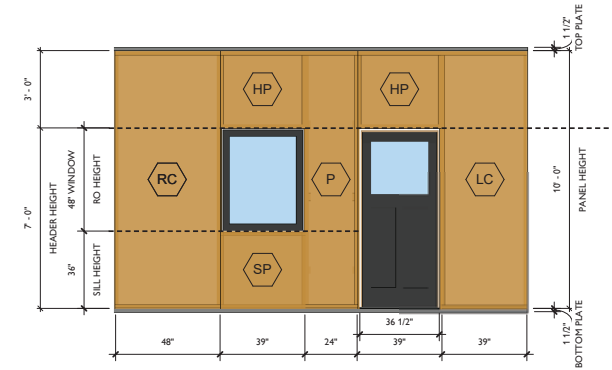
PANEL DESIGN INFORMATIONAL SHEET



EXAMPLE PANEL LAYOUT

STANDARD PANEL SIZING:

- STANDARD PANEL WIDTHS TO MEASURE 24", 39", & 48"
- STANDARD PANEL HEIGHT TO MEASURE UP TO 12'-0"
- IF PANEL HEIGHT NEEDS TO BE GREATER THAN 12'-0", PANELS CAN BE STACKED
- STANDARD PANEL HEIGHT CAN VARY FROM PROJECT TO PROJECT, BUT WITHIN THE PROJECT, MUST BE CONSISTENT TO BE CONSIDERED "STANDARD"
- STANDARD SILL WIDTH AND STANDARD HEADER WIDTH TO MEASURE 24", 39", & 48"
- WINDOWS THAT SPAN MORE THAN ONE STANDARD PANEL WIDTH MAY REQUIRE A CUSTOM SILL AND HEADER PANEL IF THEY OPENING IS NOT A MULTIPLE OF 24", 39", OR 48"
- STANDARD SILL HEIGHT AND STANDARD HEADER HEIGHT CAN BE AS SHORT AS 36" AND NOT MORE THAN TWO SILL AND HEADER HEIGHTS CAN BE CONSIDERED 'STANDARD' WITHIN A PROJECT

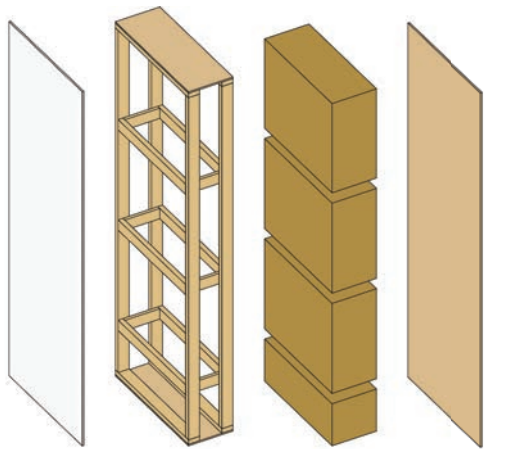


P = STANDARD PANEL RC = RIGHT CORNER PANEL

LC = LEFT CORNER PANEL HP = HEADER PANEL SP = SILL PANEL

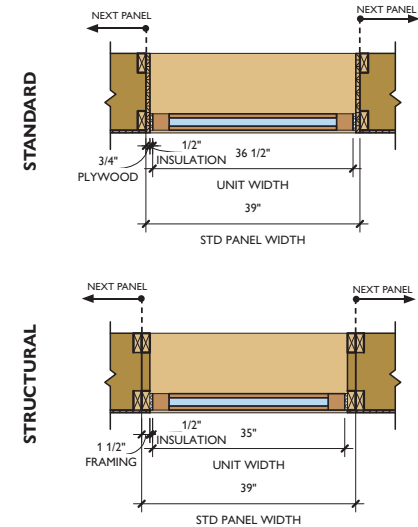
PANEL FINISHES:

- **INTERIOR:** THE PRIMARY AIR BARRIER IS TYPICALLY PLACED TO THE INTERIOR OF THE WALL ASSEMBLY. OPTIONS INCLUDE, BUT ARE NOT LIMITED TO:
 1. VAPOR-VARIABLE AIR BARRIER MEMBRANE- SEALS TO TOP AND BOTTOM OF WALL AT ALL TRANSITIONS AND ROUGH OPENINGS. TYPICALLY A 2" INTERIOR UTILITIES CHASE IS ADDED WITH HORIZONTAL STRAPPING. WALL FINISH IS APPLIED TO THE STRAPPING.
 2. NATURAL PLASTER - A BASE COAT OF LIME-STABILIZED CLAY PLASTER, TO BE SITE-APPLIED OR PRE-APPLIED IN SHOP WHERE POSSIBLE. CONNECTION TAPE IS USED AT THE TOP AND BOTTOM OF WALL AT ALL TRANSITIONS AND ROUGH OPENINGS. FINISH PLASTER MUST BE APPLIED ON SITE AND IS SEPARATE OF THE PANEL COST.
- **EXTERIOR:** THE EXTERIOR OF THE PANEL PROVIDES THE SHEAR STRENGTH OF THE PANEL WALL ASSEMBLY, AS WELL AS THE SECONDARY AIR BARRIER. OPTIONS INCLUDE, BUT ARE NOT LIMITED TO:
 1. 1/2" PLYWOOD SHEATHING. SEAMS ARE TAPED WITH AIR SEALING TAPE. DRAINAGE PLANE AND RAINSCREEN SIDING ARE SEPARATE OF THE PANEL COST.
 2. DIAGONAL BRACING AND NATURAL PLASTER (IF SITE ALLOWS) - A BASE COAT OF LIME-STABILIZED CLAY PLASTER, TO BE SITE-APPLIED OR PRE-APPLIED IN SHOP WHERE POSSIBLE. FINISH PLASTER MUST BE APPLIED ON SITE AND IS SEPARATE OF THE PANEL COST.



AIR BARRIER FRAMING STRAW BALES SHEATHING

WINDOW PLAN DETAILS



Design Elements

Ground floor

- enclosed or open spaces
- carport or garage
- size of private yards
- size shared residential outdoor space
- size and location community park space
- wall and fence materials

Second floor

- open plan or designated rooms
- room sizes
- stairs or ramps
- exterior siding and roofing materials
- plumbing fixtures location
- windows
- decks

Schematic Designs

VEGA'S HOUSES

DESIGN FEATURES

SHARED CIRCULATION

- UNITS SHARE STAIRS + ACCESSIBLE RAMPS
- SHARED ENTRY DECK
- CIRCULATION LOCATED NEAR PARKING

INTERIOR

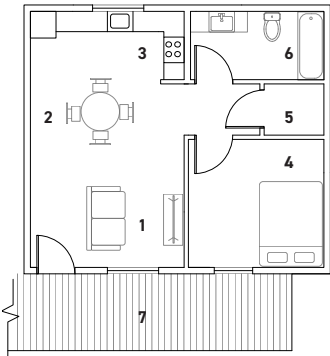
- DEDICATED DINING AREA
- KITCHEN SPACE
- CENTRAL FLEXIBLE CORE

EXTERIOR

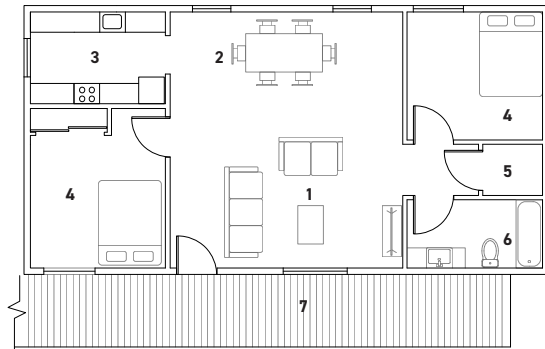
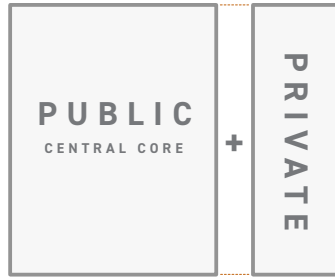
- 2 COVERED PARKING SPACES/UNIT
- CENTRAL BASIN/GREEN SPACE
- DURABLE/AFFORDABLE MATERIAL SELECTION

KEY:

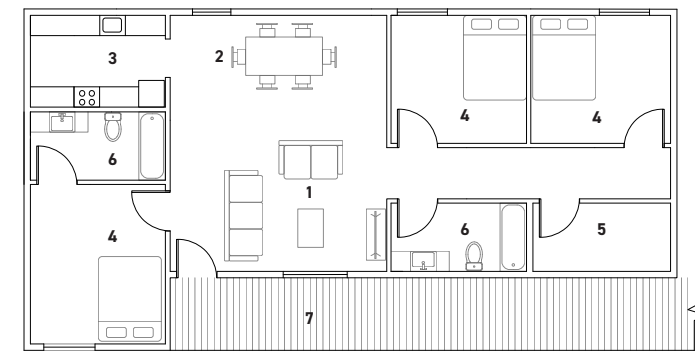
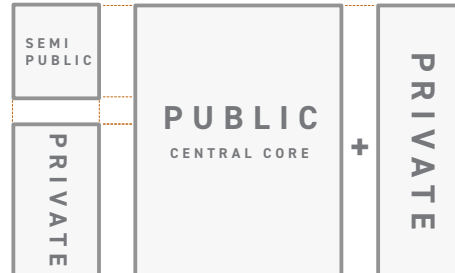
- LIVING AREA 1
- DINING AREA 2
- KITCHEN 3
- BEDROOM 4
- STORAGE/WASHER/DRYER 5
- BATHROOM 6
- ENTRY DECK 7



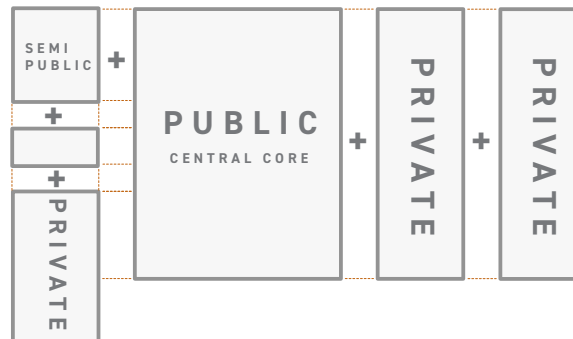
STUDIO 441 SQFT

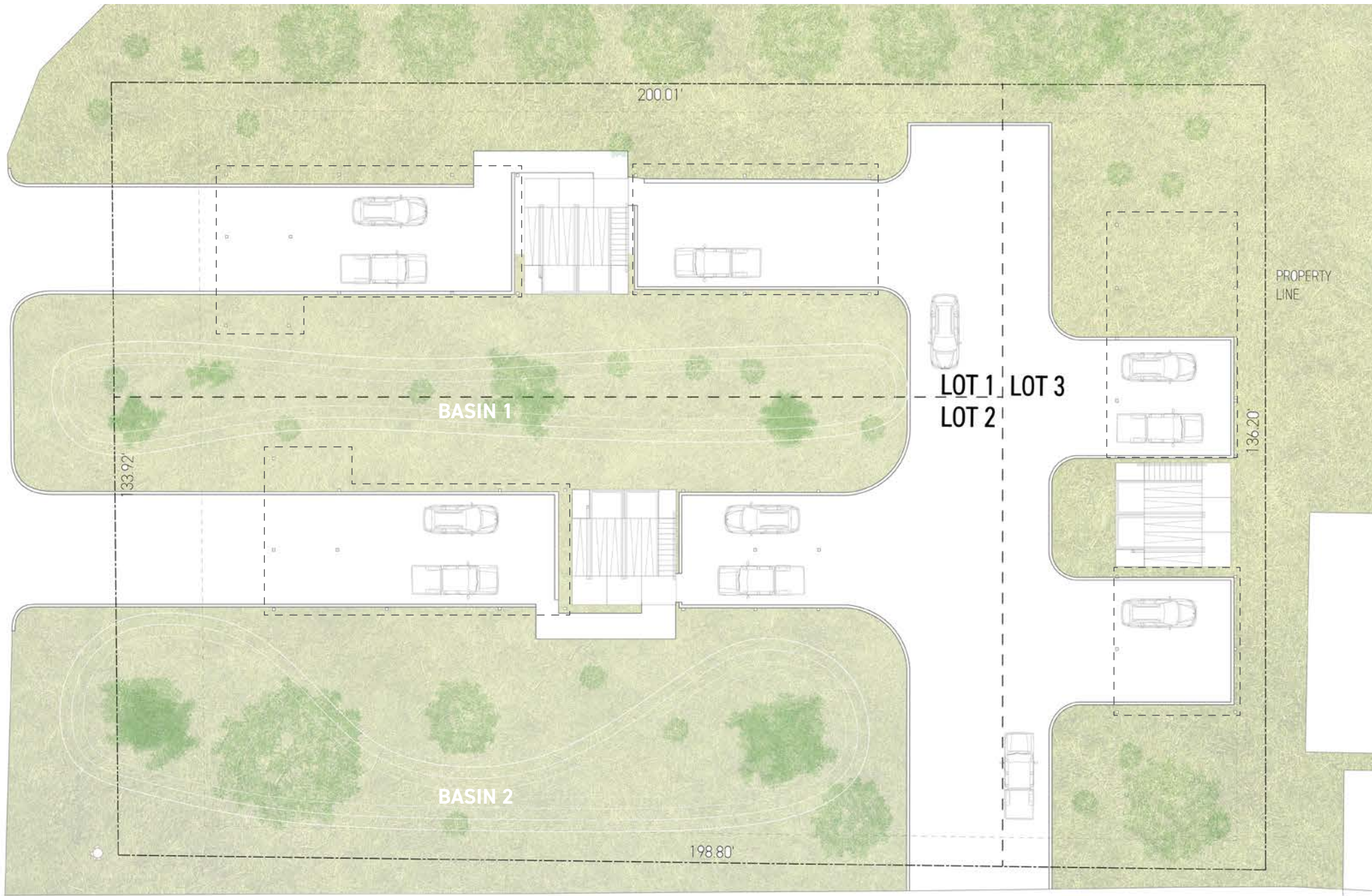


2 BED 861 SQFT



3 BED 1174 SQFT

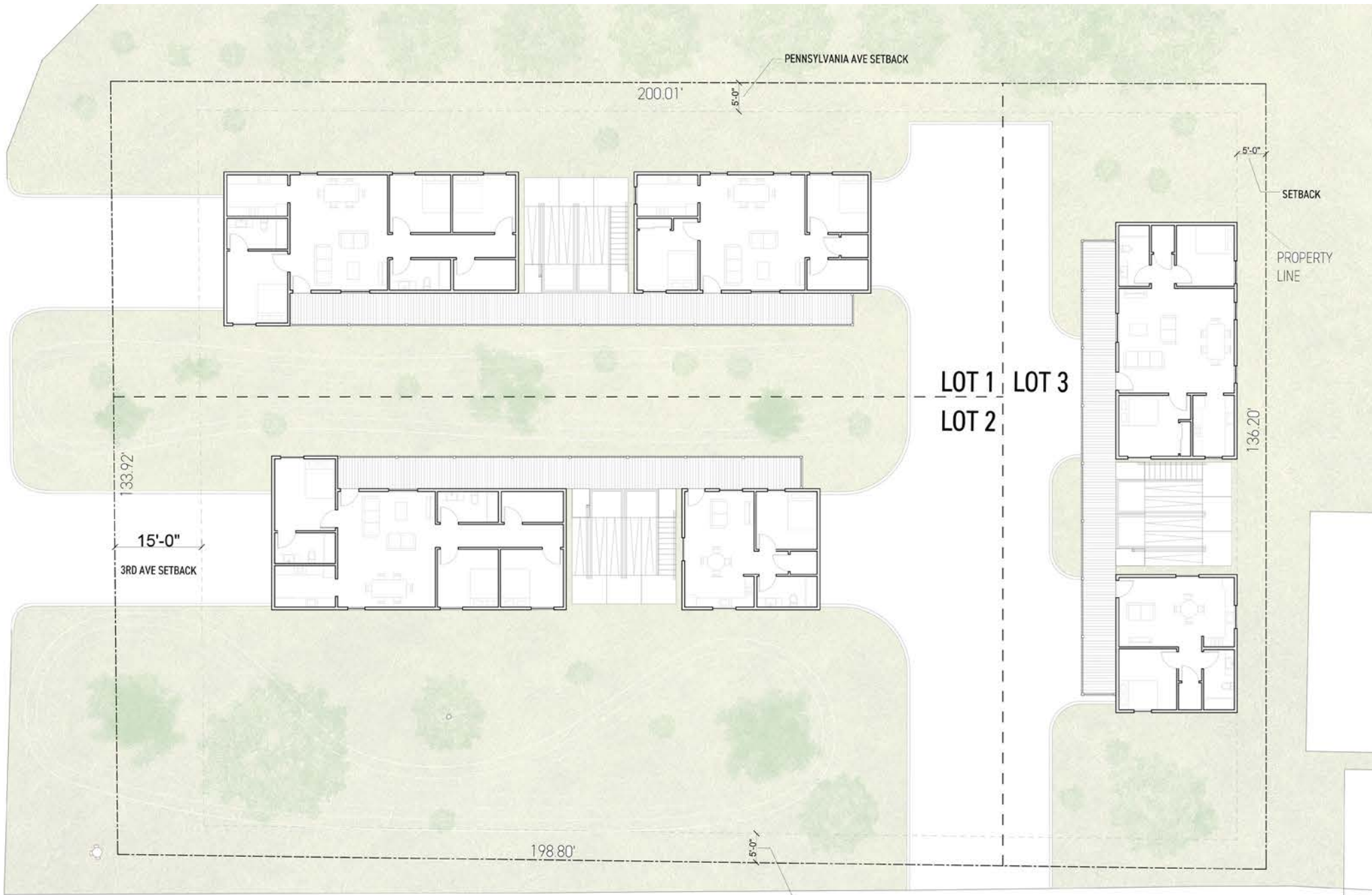




GROUND LEVEL PLAN

3/32" = 1'-0"





FIRST LEVEL FLOOR PLAN

3/32" = 1'-0"







FARAG MODEL

DESIGN FEATURES

INTERIOR PROGRAM:

- OPEN FLEXIBLE PLAN
- LARGE LIVING/DINING ROOM
- SMALL KITCHEN
- LARGE ADAPTABLE BEDROOMS

ENTRANCE / ACCESSIBILITY:

- INTERIOR / PRIVATE STAIR ACCESS
- SHARED DECK ENTRY
- ACCESSIBLE RAMP TO SHARED DECK

PARKING:

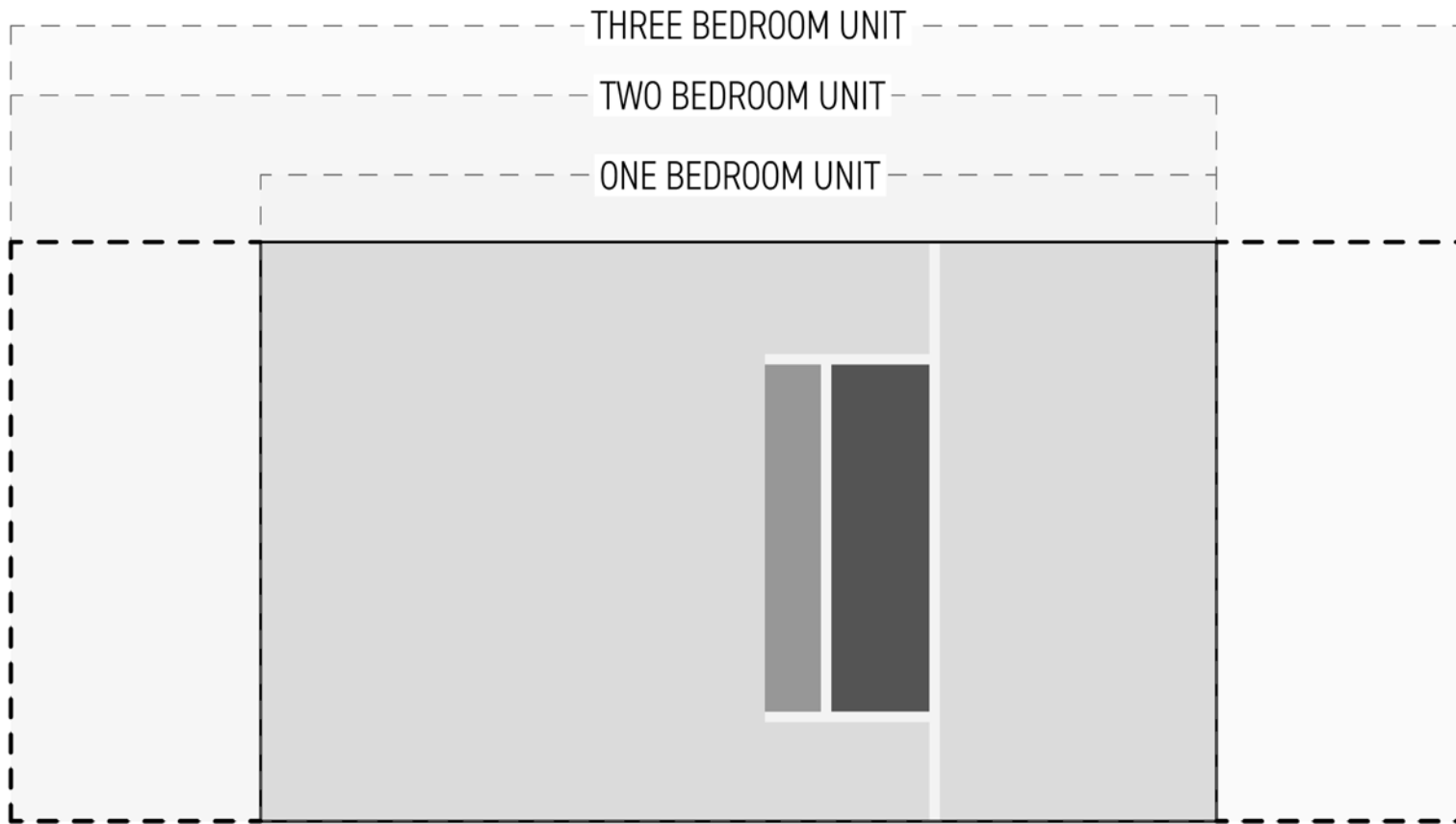
- ENCLOSED GARAGE

OUTDOOR PROGRAM:

- COMMUNITY SPACE OFF ROTHROCK
- RESIDENTIAL SHARED OUTDOOR SPACE
- SMALL RESIDENTIAL PRIVATE BACKYARD

EXTERIOR DESIGN:

- MURAL SITE WALL



KEY:

- LIVING / DINING
- KITCHEN
- STAIR
- BEDROOM(S)
- EXPANSION



GROUND FLOOR PLAN

3RD AVE.

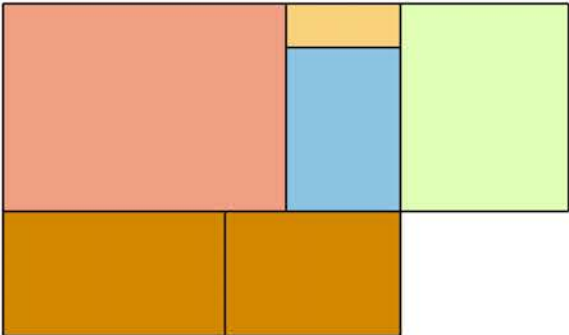


FIRST LEVEL FLOOR PLAN

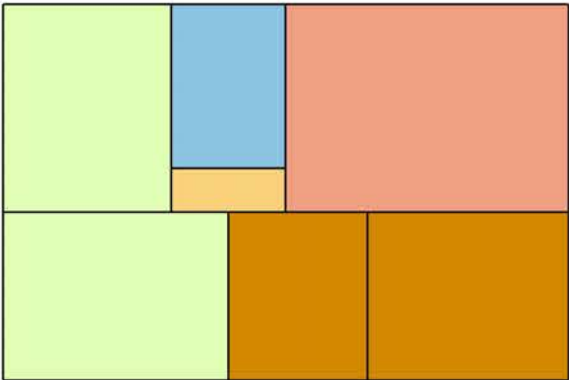


NELSON'S DWELLINGS

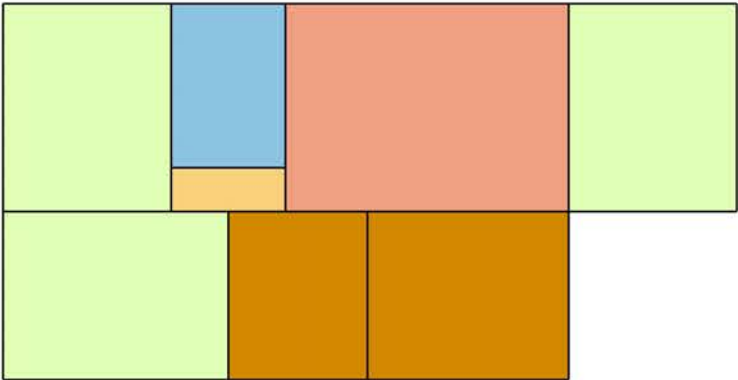
1 BEDROOM UNIT ~667 SQFT



2 BEDROOM UNIT ~854 SQFT



3 BEDROOM UNIT ~1052 SQ FT

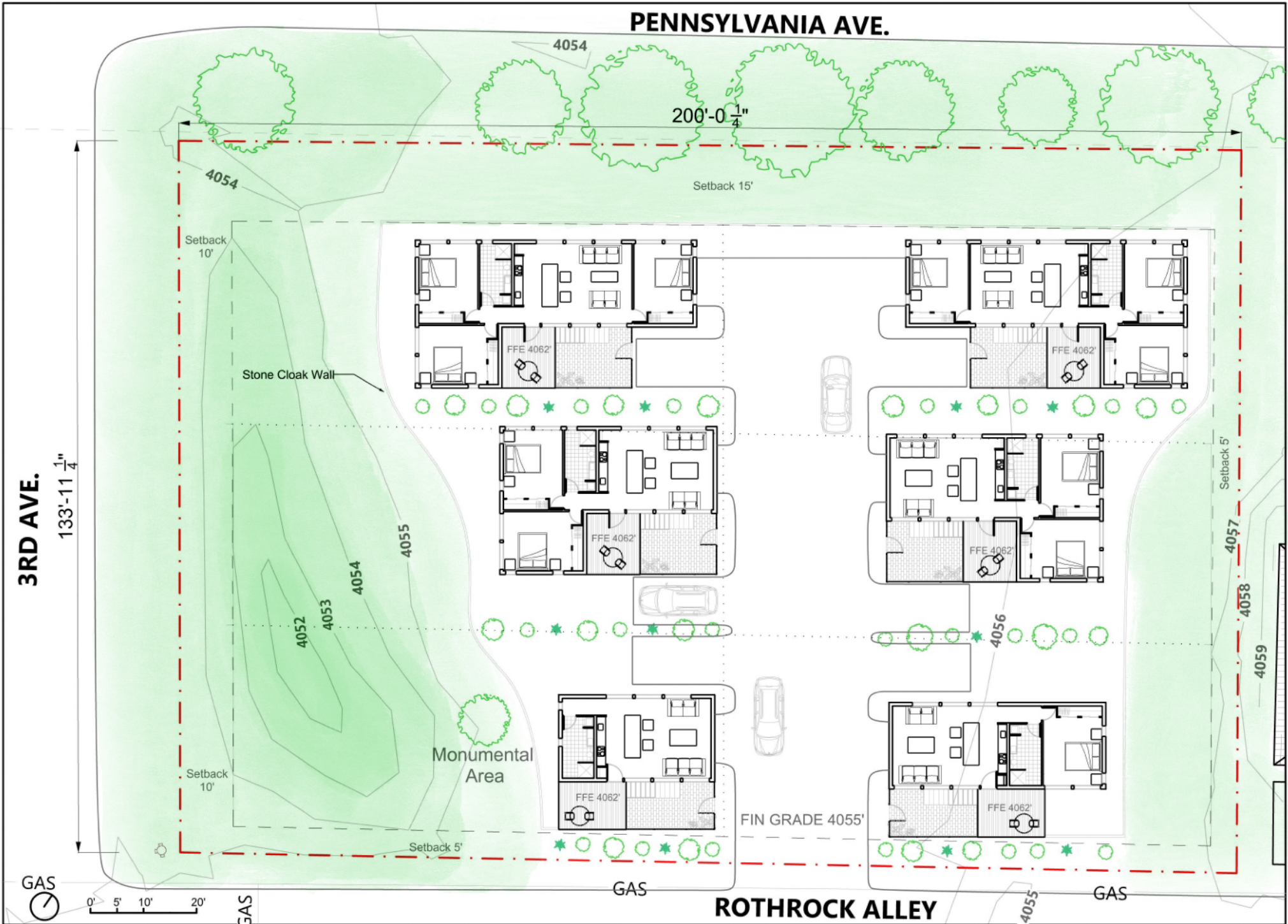


DESIGN FEATURES

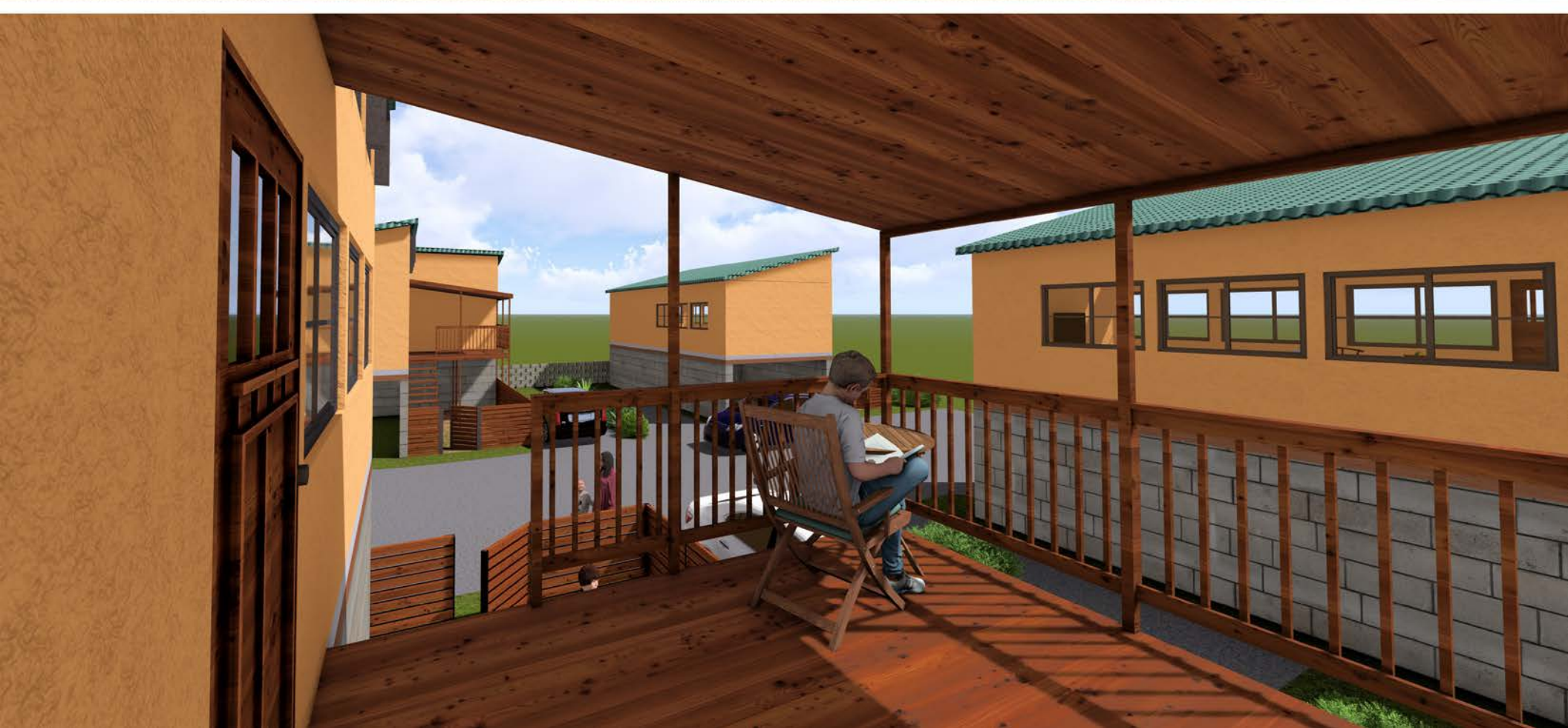
- CONCRETE BASE (7' ABOVE GROUND)
- NO DINING SPACE (BAR WITH STOOL SEATING)
- FRONTYARD AND PORCH ENTRANCE (PRIVATE)
- 2 PARKING SPOTS PER UNIT (10 TOTAL)
- CLERESTORY WINDOWS
- STONE WALL
- WET CORE

- KEY:**
- WET CORE ■
 - LIVING/KITCHEN ■
 - BEDROOM ■
 - HALLWAY/CIRCULATION ■
 - FRONT YARD/PORCH ■

- KEY:**
- FRONT YARD **1**
 - PORCH **2**
 - KITCHEN/BAR **3**
 - LIVING ROOM **4**
 - WET CORE **5**

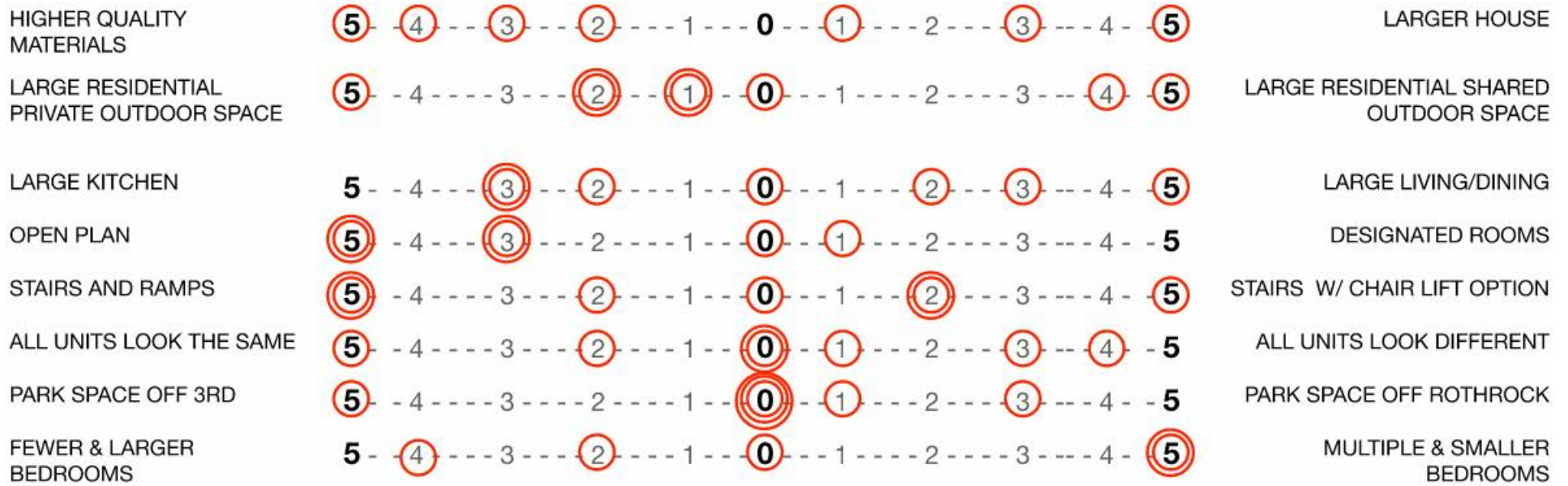


FIRST LEVEL FLOOR PLAN





Community Feedback



PLAN	THE FARAG	THE NELSON	THE VEGA
What works?	<ul style="list-style-type: none"> - covered storage - indoor staircase - parking - adaptable bedroom - shared courtyards - accessibility ramp - covered parking - shared walkways 	<ul style="list-style-type: none"> - private deck - porch / front yard entry - pitched roof with clerestory windows - consolidated wet core - private outdoor space 	<ul style="list-style-type: none"> - entry deck - kitchen layout - designed for generational housing - material choice on exterior - concrete block garage / storage area - shared stairs
What doesn't work?	<ul style="list-style-type: none"> - shared outdoor space - one wall kitchen - same size houses on the same sized lots - cars parked too far from entry ramp - blank facade on 3rd - indoor stairs - no wet core 	<ul style="list-style-type: none"> - small dining room - Rothrock entry doesn't work - needs a ramp - bedrooms have shared walls 	<ul style="list-style-type: none"> - open space under the house - storage under the house - entry faces the parking - needs deeper roof overhangs