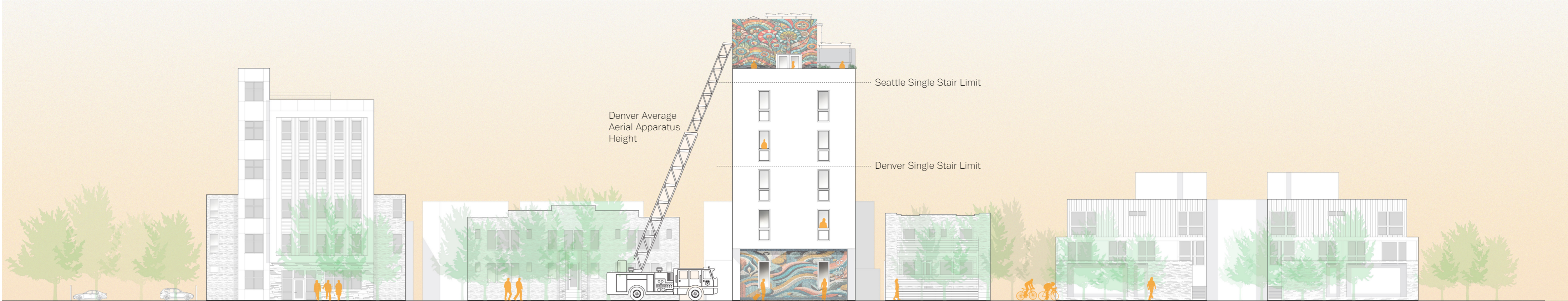


# THE ZIPPER

**1. DENSITY AT A NEIGHBORHOOD SCALE:** With a single stair stitching split-level floors, the Zipper supplies 18 units on a site that would more typically support a parking lot or small house. A compact, single core serves 6 stories, with shared amenity spaces. The typology – known as Point Access Block-is offered as an alternative to double loaded corridors, with two means of egress – extra spaces that burden a multi-family building with conditioned non-occupiable space. The Zipper's efficient massing means a low-carbon

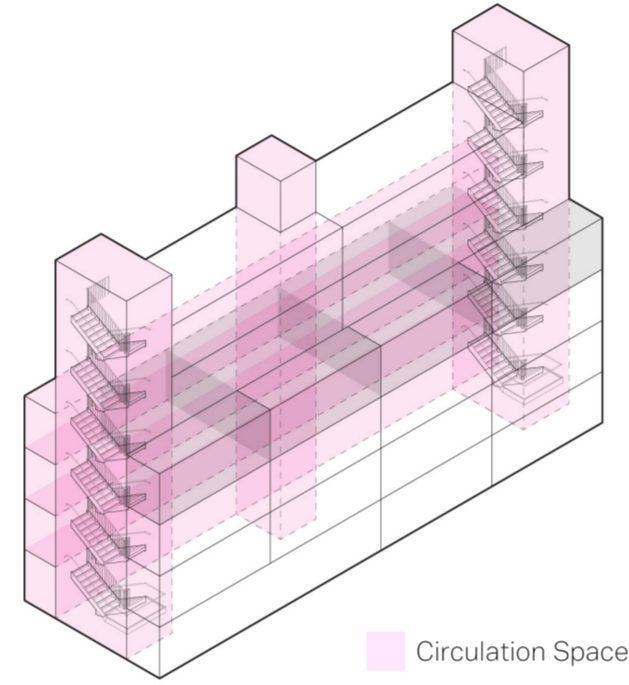
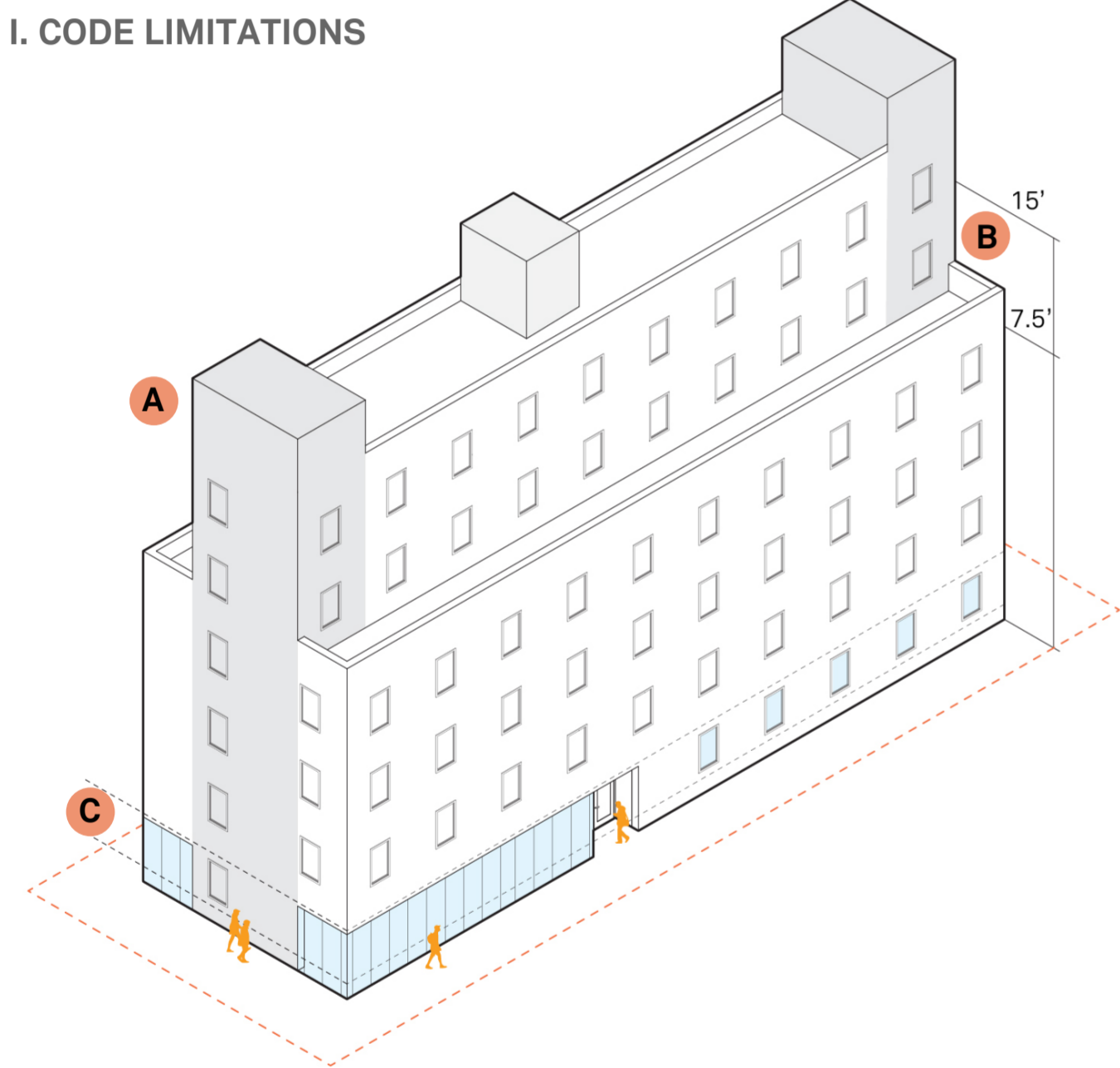
footprint and optimized use of systems: centralized fresh air ventilation and domestic hot water, decentralized heating/cooling through heat pumps, and modular, stacked plumbing systems. Integrating performance-based energy modeling for passive house and critical code review, the design proposes a replicable logic for unique Zippers appropriate to their neighborhood and climate zones, varying in community murals, vernacular materials, and plants for urban farming.

- i. Windows recessed 6" for additional solar shading without solar fins
- ii. 44% of total energy consumption will offset with on-site solar
- iii. 80% less energy pulled from electrical grid than comparable buildings



Street Elevation (1:200)

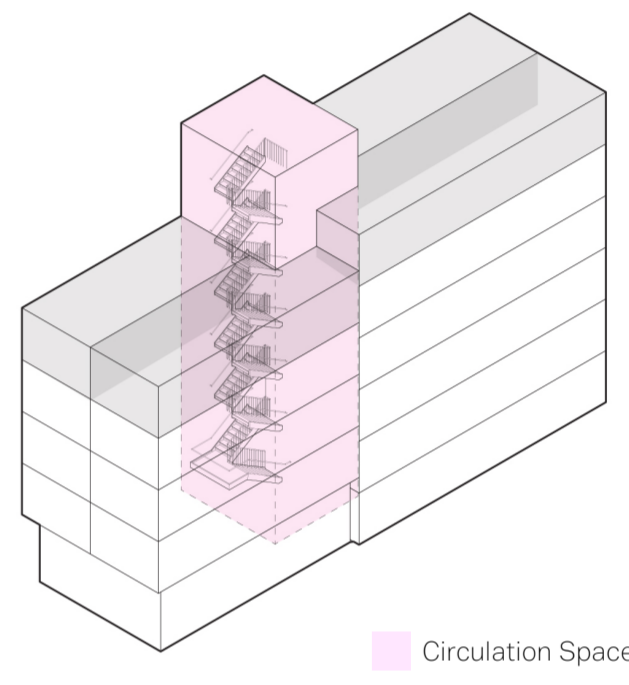
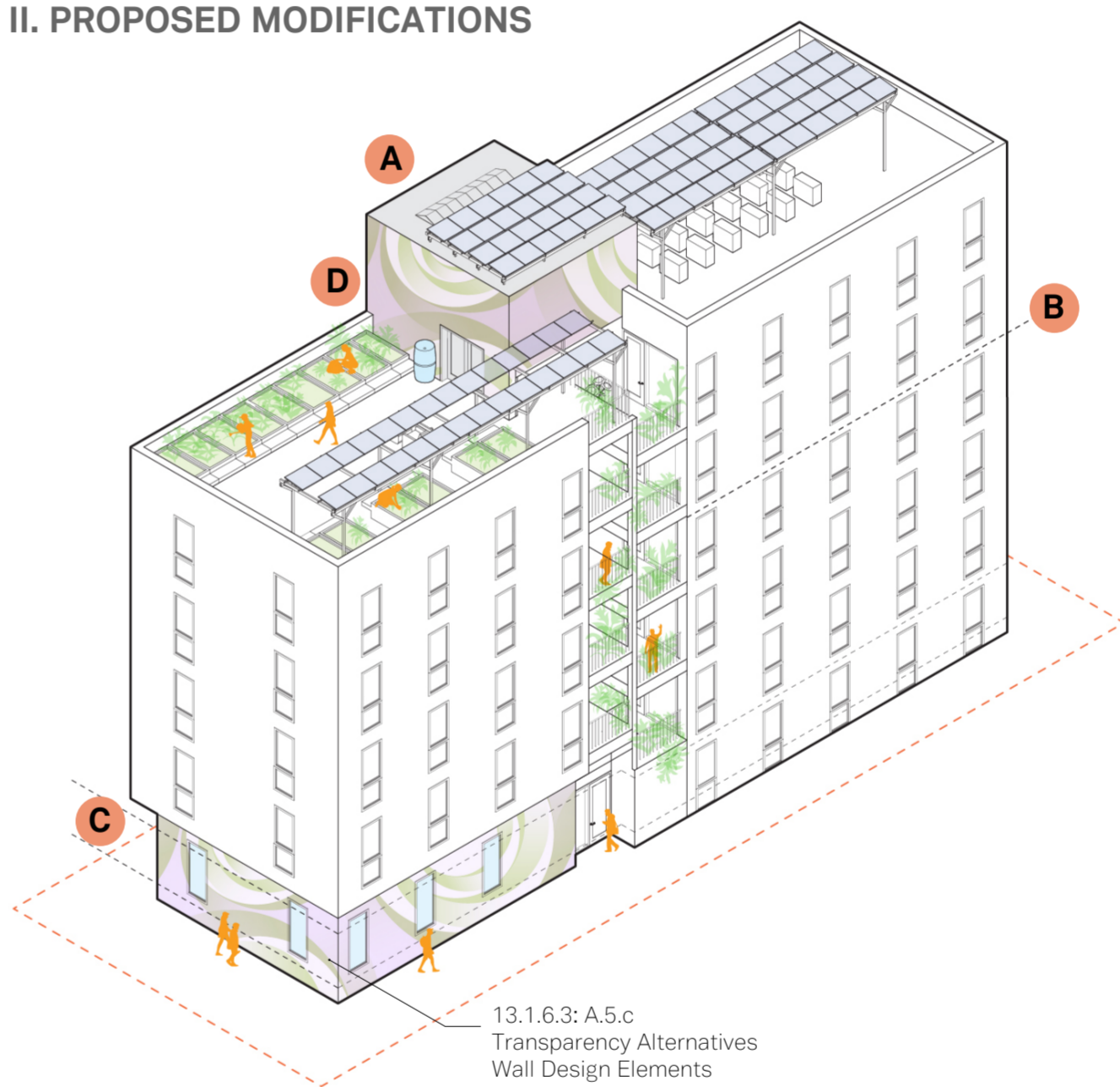
**I. CODE LIMITATIONS**



<b>Net Square Footage</b>	8,670
Unit SF (min / max)	480/650
Studio	12
1-Bed	5
Unit Count	17

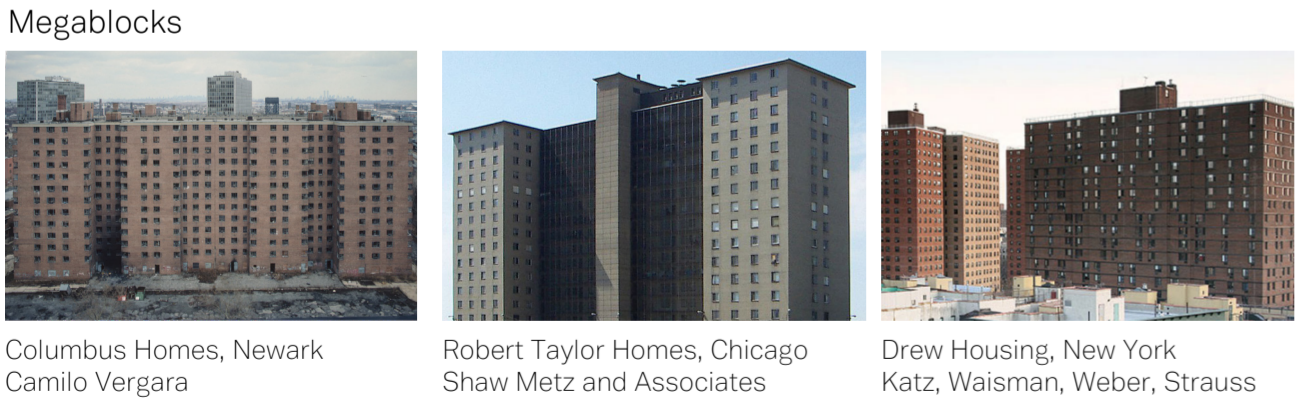
	Code	Design
<b>IBC 2021 1006.3.4</b>		
<b>A</b> Single Exit Stair	No	No
<b>DZC 6.3 Design Elements</b>		
<b>B</b> Upper Story Setback above 40' (Side Interior)	15'	15'
<b>C</b> Transparency, Primary St.	40%	50%
<b>C.R.S. 37-96.5-103</b>		
Rain Collection Barrels	No	No

**II. PROPOSED MODIFICATIONS**

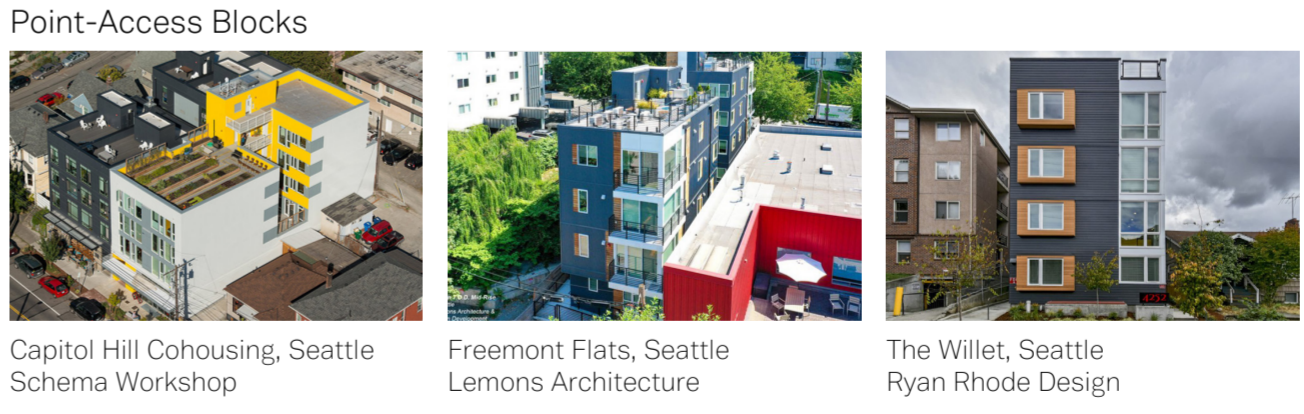


<b>Net Square Footage</b>	13,620
Unit SF (min / max)	540/780
1-Bed	10
2-Bed	6
3-Bed	2
Unit Count	18

	Code	Design
<b>IBC 2021 1006.3.4</b>		
<b>A</b> Single Exit Stair	No	Yes
<b>DZC 6.3 Design Elements</b>		
<b>B</b> Upper Story Setback above 40' (Side Interior)	15'	0'
<b>C</b> Transparency, Primary St.	40%	19%/Alt.
<b>C.R.S. 37-96.5-103</b>		
<b>D</b> Rain Collection Barrels	No	Yes



Columbus Homes, Newark Camilo Vergara  
 Robert Taylor Homes, Chicago Shaw Metz and Associates  
 Drew Housing, New York Katz, Waisman, Weber, Strauss

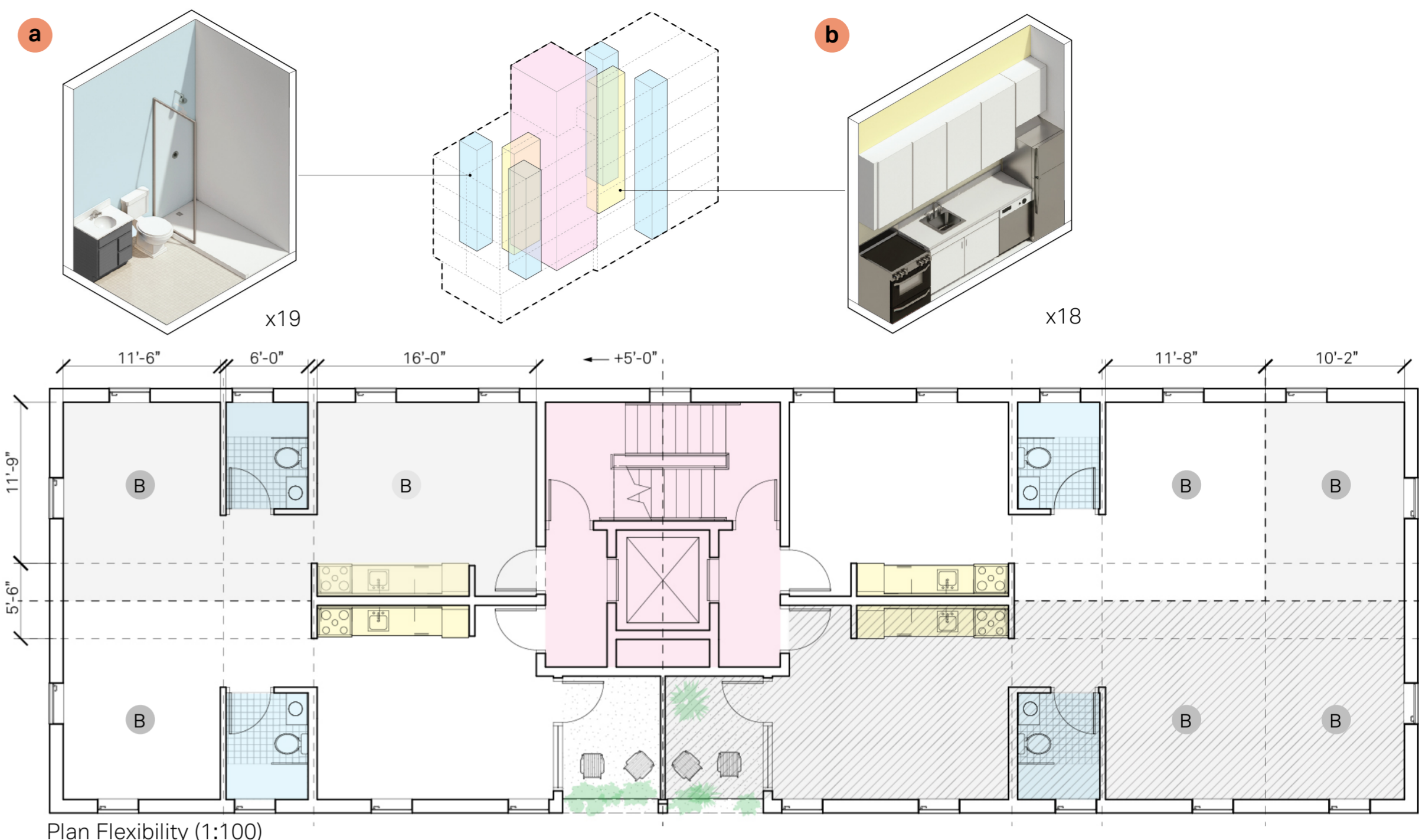


Capitol Hill Cohousing, Seattle Schema Workshop  
 Fremont Flats, Seattle Lemons Architecture  
 The Willet, Seattle Ryan Rhode Design

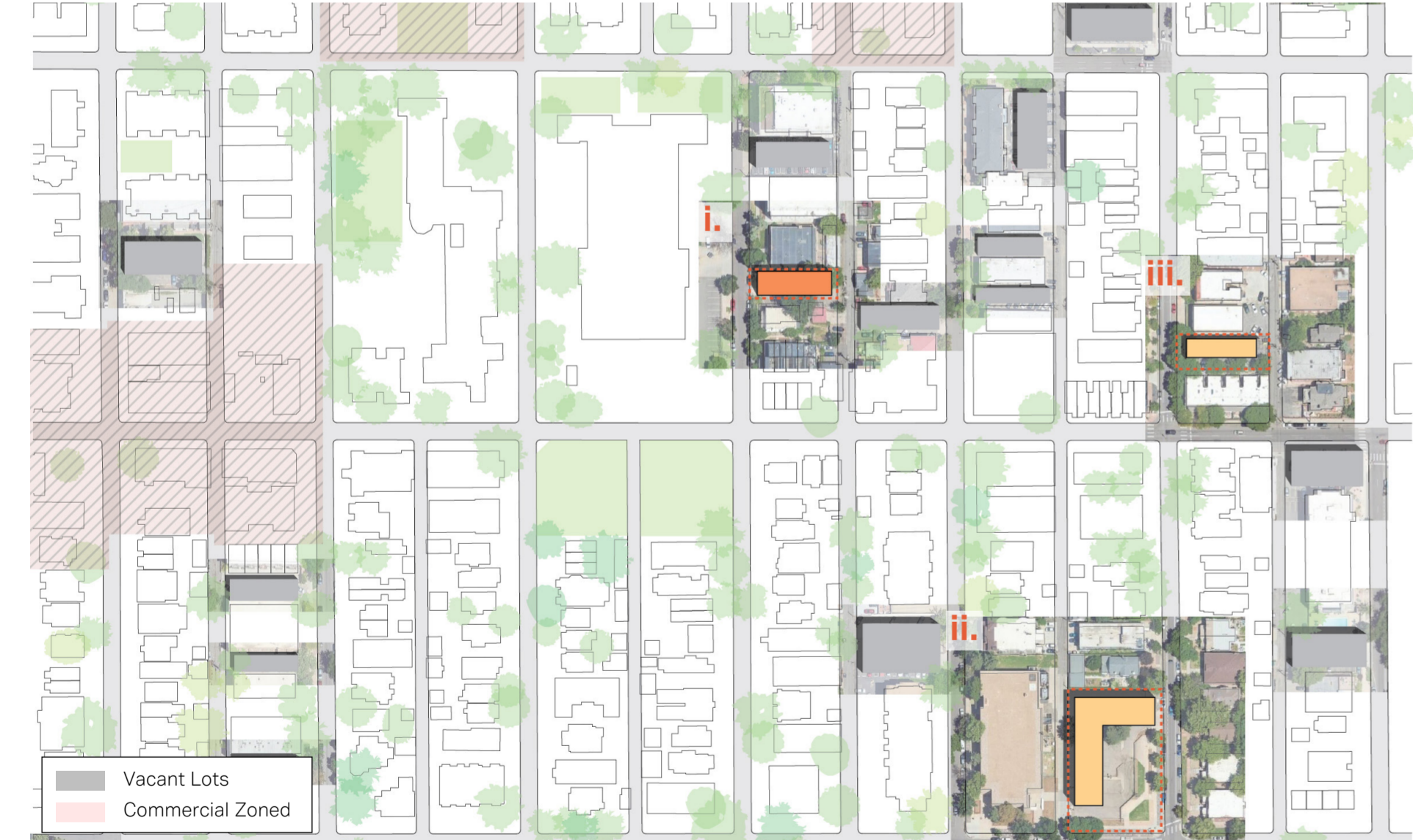
# THE ZIPPER

**2. CHALLENGING CODE** Current Denver codes- IBC, Denver Zoning Code, and Colorado regulatory statutes- can hinder the development of affordable housing that is environmentally and socially sustainable. For narrow or irregular infill lots, zoning and building code limit quantity and quality of units through height caps and exit requirements. Denver's form-based code mandates set-backs and openings that reduce spatial and energy efficiency. The Zipper challenges not only egress requirements, but also the city's aesthetically-focused design element standards by prioritizing unit livability over extensive street-front glazing and massing variation. Further, challenging rain barrel restrictions and set-backs allow a productive roofscape, including a pollinator garden and a solar canopy that exceeds Denver's renewable energy requirements.

Additional Code Related Considerations:  
 IBC C405.14 and Appendix CB exclude buildings six or more stories from Solar Ready zone requirements



**INCREASING DENSITY**



**REPLICABILITY + RECONFIGURABILITY**

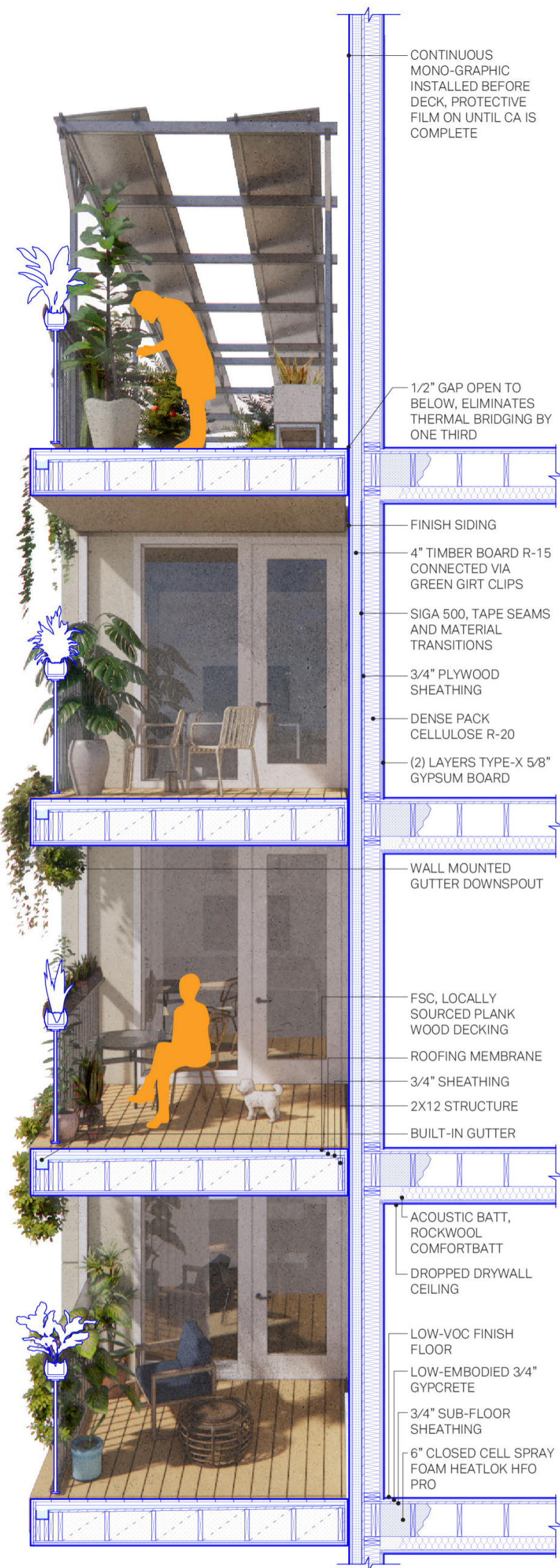


# THE ZIPPER

**3. FLEXIBILITY:** The Zipper can be a prototype for future housing, centering spatial and visual flexibility around 3 primary elements: the split-level single stair, aligned plumbing cores, and a high-performance envelope adaptable to diverse climates. A reconfigurable layout and simple wall assemblies allow site specific interventions in small, vacant lots found across Denver and other U.S. cities. Pre-fabricated bathroom and kitchen systems can increase affordability, stacking as additional cores for living spaces to populate around. With consolidated circulation, units range from 1-3 bedrooms despite the narrow footprint, even accommodating balconies to increase light and airflow in predominantly dual-aspect units.

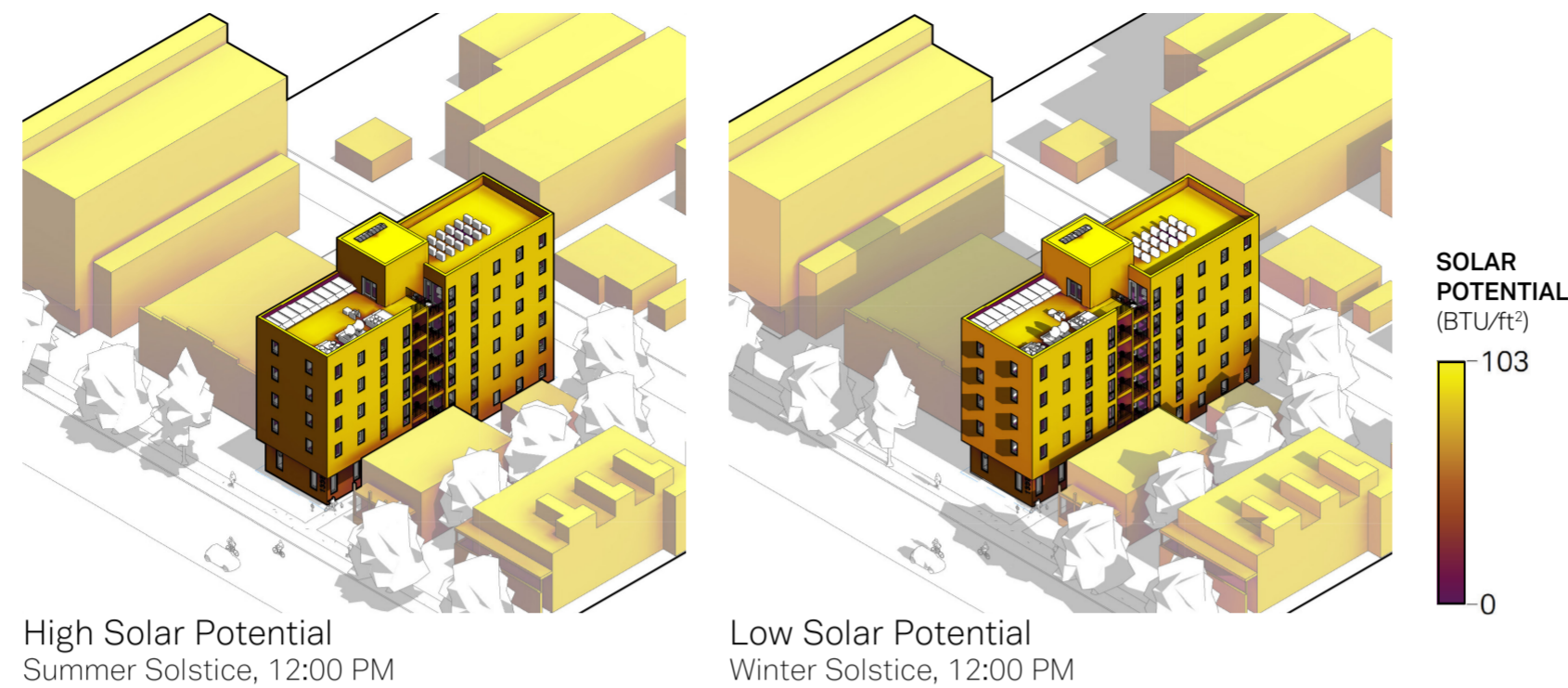
Component Construction:  
a. Pre-fab bathroom pod  
b. Pre-fab kitchen pod

Additional: Panelized fiber cement cladding

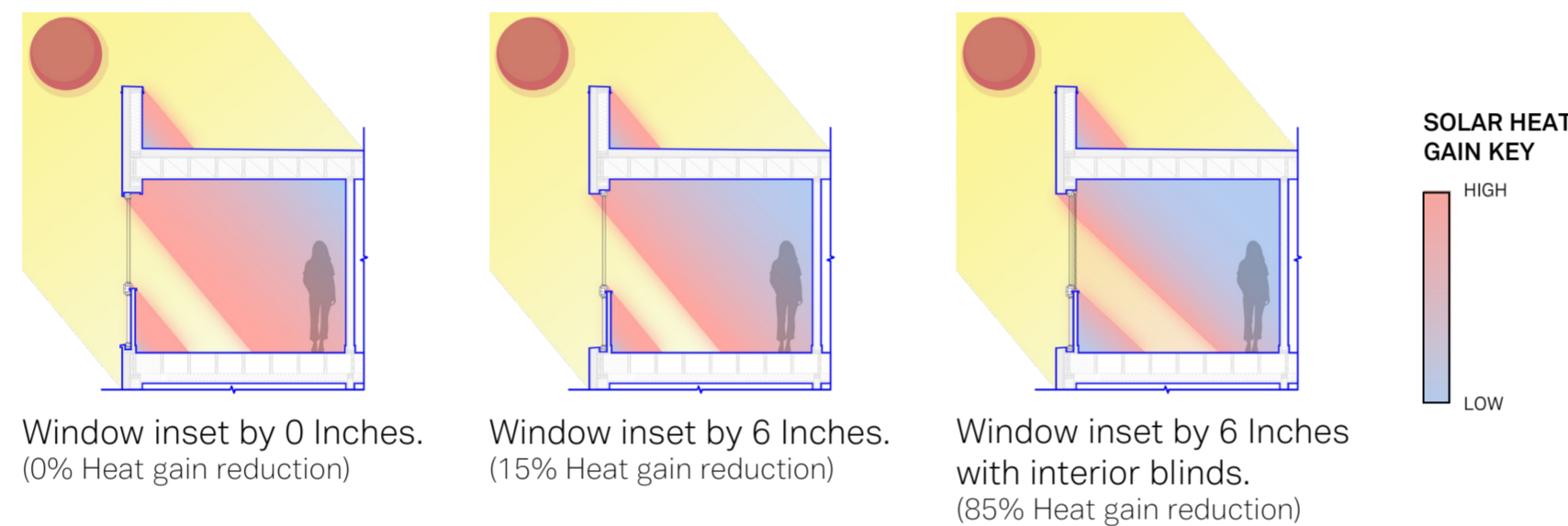


## SOLAR STUDY

### SOLAR POTENTIAL STUDY



### MANAGING PASSIVE HEAT GAINS



### PV ARRAY LAYOUT, PANEL PRODUCTION

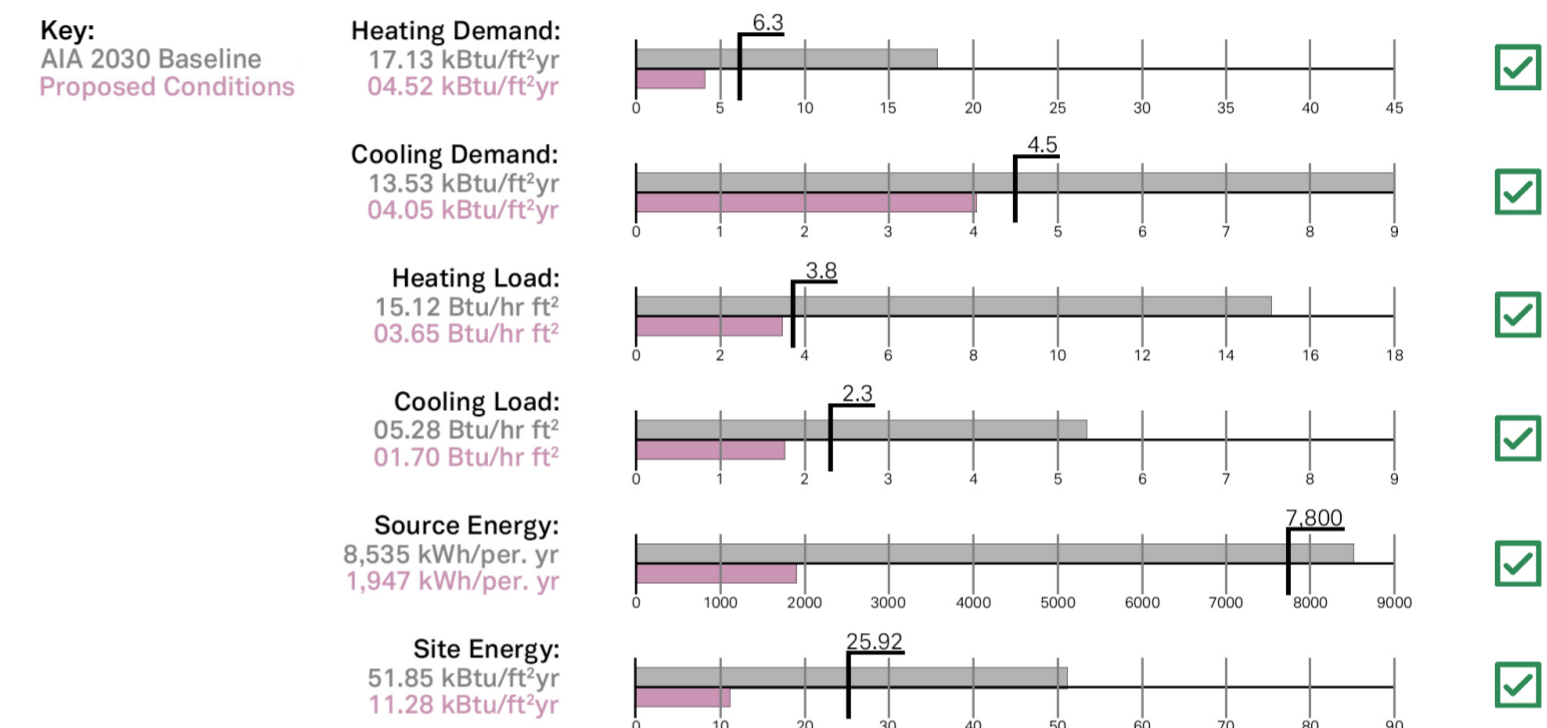


## PERFORMANCE RESULTS

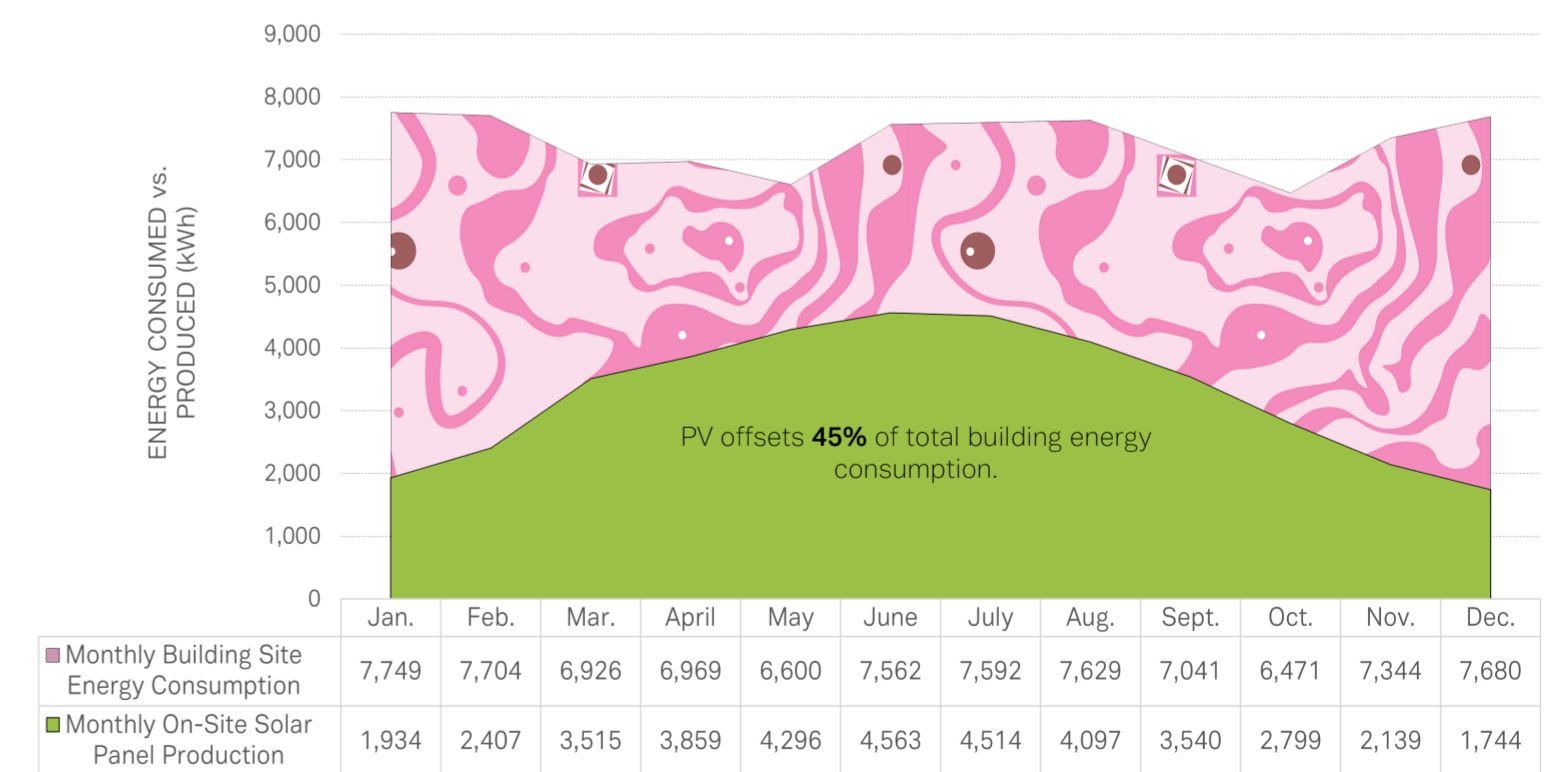
The Zipper meets and exceeds the 2022 Denver Green Code requirements, achieving higher performance across key metrics. WUFI Passive modeling confirms significant reductions in heating and cooling demands compared to baseline conditions. Performance data demonstrates substantial energy savings.

	2022 DENVER GREEN CODE		
	Max. Points Possible	Min. Points Required	Points Awarded
<b>Enhanced Use (EU) Checklist</b>			
Site Sustainability	19	15	17
Water Efficiency	10	5	6
Commercial Energy	35	N/A	22
Indoor Environmental Quality	16	6	13
Materials and Resources	10	5	6
Construction and Plans for Operation	16	10	10

## BUILDING ENERGY PERFORMANCE COMPARED TO THE AIA 2030 CHALLENGE BASELINE



## MONTHLY ENERGY BALANCE, ON SITE USAGE & PRODUCTION (kWh)



# THE ZIPPER

**4. PERFORMANCE:** The Zipper meets Passive House standards as confirmed through comprehensive WUFI Passive energy modeling. Energy efficiency informs all design decisions—south-facing balconies, less than 20% glazing facades, and an optimized wall assembly support long-term efficiency and occupant comfort. A solar energy potential study further refines the envelope, guiding the selection of high-reflective materials

and strategic window reveal depths to balance daylight and heat gain across seasons. PV panels, elevated on canopies, provide on-site energy production while offering shade for rooftop equipment and community areas below. Balconies are thermally broken from the main structure, ensuring continuous insulation and reducing thermal bridging, contributing to an efficient, high-performance envelope.

