PROJECT SUMMARY
The core design concept approaches a mixed-use block scale development with a business model that incorporates existing homeowners and repurposes vacant structures. Exterior walkways and an elevated podium provide universal access to units on all floors (existing and new) via a heavily landscaped exterior corridor. The podium supports several prefabricated wood-frame structures, each two to three stories in height and angled towards solar. South to optimize solar radiation collection for passive heating, natural interior daylighting, and the conditions for public/private greenspace. Units are mixed-rate, to offset the costs of affordable housing without compromising quality interior space. Materials are spec’d through an optimization sequence, eliminating extraneous materials and the impact on indoor air quality (avoiding VOCs and sprayed treatments or adhesives). After designing with analysis driven passive strategies, the next step towards optimal performance is a super-insulated airtight envelope. Compartmentalization of spaces create thermal buffers at envelope penetrations which enables the building’s air systems to source from preconditioned air, saving energy on cooling in the Summer and heating in the Winter.

DESIGN STRATEGIES
- Earth Berming w/ Native Plants
- Super Insulated Pre-Fabricated Envelope
- Air-Tight Details w/ Drained Assembly
- Low-Carbon Materials
- Energy Recovery Ventilator (ERV)
- Variable Refrigerant Flow (VRF)
- Blockscale Stormwater Management
- Water Collection/Recycling
- Carbon Sequestration
- Vegetative Shading (Deciduous)
- Geothermal Energy Piles
- Passive Ventilation/Cooling
- Clip-Mounted PV Array
- Solar Hot Water Panels
- Pollinator Roof
- Multi-source Water Harvest
- Waste Water Heat Recovery

PROJECT DATA
Philadelphia, PA [Climate Zone 4a]
Total Site Area: 40,604 sq. ft.
Existing Building Area: 18,600 sq. ft.
Zoning: RMX-1

Baselines:
PASSIVHAUS: Detailing, Assemblies, and Air Tightness of 1-1.5 ACH @50pa
LIVING BUILDING CHALLENGE: Rigorous Performance with dedicated response to surrounding ecosystems.
HERS Score: -6

A. Wall Assemblies: R-38 Holzraum System Prefabricated Envelope
B. Foundation insulation: R-28
Podium insulation: R-38 in select locations
C. Roof insulation: R-52 w/ staggered insulation + drainage board
D. Window Performance: Triple glazed, fixed & operable
Uw value = 0.15 W/(m²K), (SHGC and VT vary per orientation)
F. Renewables: PV panels, Preconditioning Ext. Air, Water Recirculation System, Food Production

Energy Star Baseline EUI: 59.6 kBTU/ft²/year
Target EUI: 20 before renewables
Energy from Renewables: 247,987 kWh/year
(4333m² / 6.5m²) x (18.9%) x (2613 hrs/yr) x (0.75)