

SUMMARY



PROJECT SUMMARY:

The Loop rethinks the typical commercial lot found on major street corners of the Tucson Superblock. Unanchored strip malls in Tucson have an average vacancy rate of over 15% , with retail losing over 1,200 jobs in the past year, the most of any sector of Tucson's economy. These vacant buildings with largely open lots provide an opportunity for each community to develop much needed affordable housing, embrace a modern identity, provide community resources and become part of the Sunblock system. Tucson ranks among the lowest-income cities in Arizona, with an average household income 26% lower than the rest of the United States. By complying with PHIUS +2018 building standards, implementing new building systems and connecting to a micro grid, The Loop reinterprets Tucson's vernacular multi-family courtyard buildings. SunBlock mixed-use housing complex provides a safe, sustainable and healthy environment to residents and the broader community, while also densifying a lot that was previously predominantly asphalt and prioritizing low-income residents of Tucson.

DESIGN STRATEGIES:

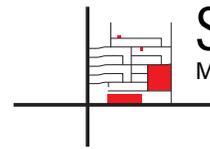
Our team approached this project with a systems thinking mindset. The proposed PV array will provide energy for operations during mid day while also providing enough energy to chill and cool stored water. This water will be used to cool the commercial and community spaces on the lot and provide chilled water to the homes of the Myers neighborhood. The existing structure that once housed a row of 1,200 sf retail units has been retrofitted into PHIUS +2018 standard homes by increasing insulation, replacing existing windows and doors, providing balanced ventilation and natural daylight to users. Larger sections of the existing structure will serve as community resources such as a daycare, library, and public transportation hub. With the same standards in mind, a mixed income multifamily mixed use apartment complex has been built along the Southern edge of the site featuring units optimized for reduced energy use. These units feature efficient layouts resulting in minimal solar heat gain and shortened utility runs, along with market-conscious retail on the ground floor. What was originally a large parking lot will become a lush courtyard with permeable tiles sustained by rainwater that provides a social space for visitors and a connection between the retrofit and new apartments.



PROJECT DATA:

- + Location: Tucson, Arizona
 - Hot, arid climate (ASHRAE Climate Zone 2B)
- + Zone: C-2 and Opportunity Zone
- + 248,342 sf lot
- + Site and buildings oriented east/west
- + New build: 56 units (24 one-bedroom, 16 two-bedroom, 16 three-bedroom), 22,780 sf
 - 3 stories 22,780 sf total
 - 86% residential (19,450 sf), 14% commercial (3,330 sf)
- + Retrofit: 34 two-bedroom units, 67,538 sf
 - 93% residential (60,780), 7% commercial (4,758 sf)
- + Occupancy: 172 people
- + Target source EUI: 19 kBtu/sf/year (less than half the DOE standard)
- + Construction cost: \$170/sf

SUMMARY



SUNBLOCK

Mixed Use Multifamily | The Loop | UA



TECHNICAL SPECIFICATIONS

	DOE	PHIUS + 2018
Exterior Wall Thermal Performance = R19	✓	✓
Roof Thermal Performance = R55	✓	✓
Foundation Edge Thermal Performance = R7	✓	
Whole Window U-Value = 0.25, SHGC: < 0.25	✓	
U-Value (North, South, East, West) < 0.3	✓	
Target Air Change Rate: 0.06 CFM/ft2	✓	✓
Peak cooling demand : 4.2 kBtu/hr	✓	✓
Peak heating demand : 2.8 kBtu/hr	✓	✓
Balanced Ventilation	✓	✓
Hot water: On Demand Recirculation System EF 1.5	✓	✓
Appliances: Energy Star	✓	
Renewable Ready	✓	
CFA = 20,663 sf	✓	
EUI = 19 kBtu/sf/yr	✓	

SYSTEMS SPECIFICATIONS:

- + Ventilation, heating and cooling: Minotair - One Pentacare V12 compact air treatment unit in each unit
 - Cooling capacity = 11,200 BTU/Hr , heating capacity = 6,700 BTU/Hr
 - MERV 15 (F9) air filtration removes 95% of particles as small as 0.3 pm
 - Fresh air range: 80-120 CFM
- + Hot water: 12 CHP-120 Fully Integrated Heat Pump by A.O. Smith
 - ENERGYSTAR qualified with an industry-leading 4.2 COP
 - Heat pump technology provides an energy efficient way to heat water with electricity integrated 119-gal tank
 - First-hour delivery exceeds 150 GPH - Dual 6 kW heating elements provide additional heating capacity for periods of high demand

PROJECT HIGHLIGHTS:

The Loop will not only rejuvenate the Myers community, but also provide a blueprint for all cities looking to create dense, walkable, community-focused urban centers. The project will be even more useful to cities in similar climate regions who can use The Loop as an example for zero energy living. In partnership with community leaders such as Pima County services and the Living Streets Alliance, this project can transform the identity of a nondescript retail lot and introduce the city of Tucson to a sustainable standard of energy consumption in residential architecture. The Loop will nurture the Myers neighborhood by providing them with resources such as affordable housing, increased walkability, access to public transit, daycare and business opportunities.

