

PEACH SPRINGS STAFF QUARTERS



DES Project Manager	Bruce Kemmet, P.E.
Location	Peach Springs AZ Box Canyon Subdivision
Area Office	Phoenix
Tribe(s) Served	Hualapai
Design Start	April 14, 2023
Construction Start	April 15, 2024
Construction Completion	Est April 14, 2025
Size	2 SF, 2 Duplex, 2 Triplex Total 12,345 s.f.
Procurement Method	\$3.8M Fed funds, \$5M M&I/M&M funds
Delivery Method	Design-Bid-Build
Architect of Record	JSRa
Prime Contractor	Low Mountain Construction
Energy Efficiency	2018 IECC (minimum is 30%, see below betterments) Single-Family Home (3 bedrooms): with/30% solar water heating and 7.5% solar PV array resulted in an 82.78% improvement over the baseline standard; Duplex Home (1 bedroom): with/30% solar water heating and 7.5% solar PV array resulted in an 95.30% improvement over the baseline standard; and Triplex Home (1 and 2 bedrooms): with/30% solar water heating and 7.5% solar PV array resulted in an 94.24% improvement over the baseline standard.
LEED Certification	N/A (meets the 2020 Guiding Principles for Federal Sustainable Buildings)
Sustainable Design Features (Planned)...	ENERGY STAR appliances and/or specific HVAC equipment specified. In addition, new on-site renewable energy systems incorporated into the buildings.
Services Programmed for New Facility....	Staff Quarters
Design Concept	Quarters

Peach Springs Staff Quarters: Sustainability Profile

Building owner: IHS/Phoenix Area Office
Location: Peach Springs, Arizona
Climate zone: 3B-Dry (Desert/Xeric Shrubland)
Project size: 14,156 sq. ft. (Total Building Area)
Elevation: 4,780 feet above sea level
Completion date: Design Only: April 13, 2023



On-Site Renewable Energy Systems: Based on utilizing (11) 420 watt AC modules, the (11) module solar array photovoltaic (PV) system will produce approximately 38% of the annual electrical demand for each home or 7,540.58 kWh of electricity annually to reduce tenant utility costs (annual power demand: 21,544.53 kWh).



Solar Hot-Water Heating Systems: A solar hot-water heating system whereby using the sun to heat 30% of the domestic hot water has been specified in each home to reduce tenant utility costs.



2020 Guiding Principles (GP): Since 2002, the Federal Government has outlined its intent to advance sustainable building principles and practices throughout its portfolio established through a number of statutory and executive policies. The six **Guiding Principles for Sustainable Federal Buildings** were developed based on fundamental sustainable design practices and reflect progress in building design, construction, and operation best practices as well as ensuring efficient operations; protecting occupant health, wellness, and productivity; and promoting resilient buildings. The proposed design is in compliance with the GPs.

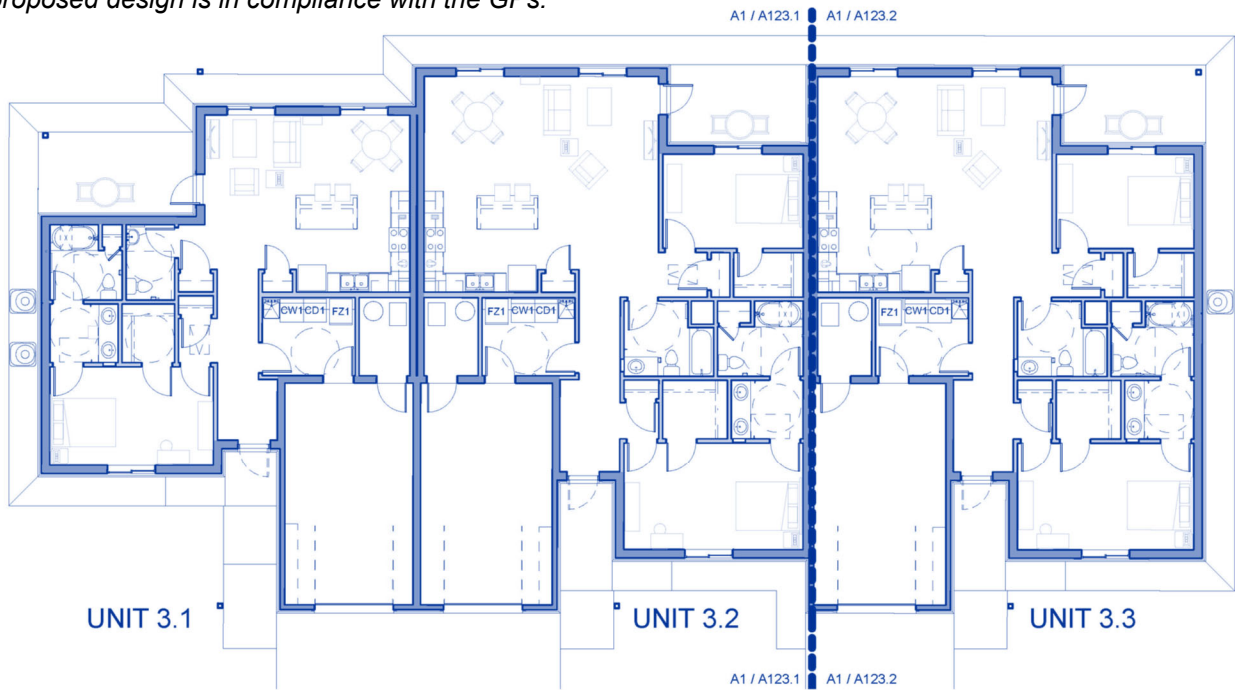


Key Sustainable Elements Captured in the Design of the Homes (3 Basic Unit Types):

- High efficiency air conditioning and heating reducing tenants heating/cooling bills.
- High insulation values for the building envelope, reducing heating/cooling demands.
- Low-E & insulated windows maximizing quality views of the surrounding bioregion, encircled by mountains on all sides, the **Colorado Plateau & Mountain Forests** consisting of desert shrublands and shrub steppes.

Design for Transient Living Patterns:

Floor plans for these homes are carefully organized to support transient staff and their families. The connected rooms provide space for ample seating for friends and family to gather. Ample storage spaces allows for stock piling supplies while living in this remote community.



Example of a Unit Type — Unit C— Attached Three Unit Triplex

2020 Guiding Principles

Peach Springs Staff Quarters
Peach Springs, AZ

2020 Guiding Principles Checklist NC
Compliance: Pending Construction Metrics

Compliance: 26*

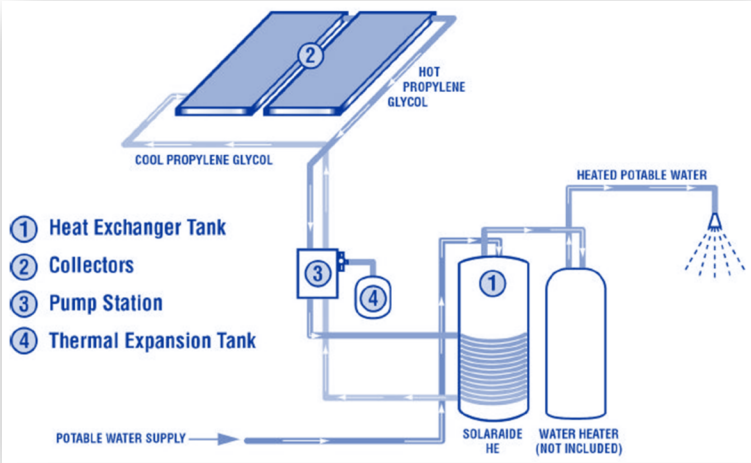
GP I. Employ Integrated Assessment	2 / 3
GP II. Optimize Energy Performance	5 / 5
GP III. Protect & Conserve Water	5 / 5
GP IV. Enhance Indoor Environmental Quality	9 / 9
GP V. Reduce the Environmental Impact of Materials	2 / 5
GP VI. Assess/Consider Climate Change	3 / 3

* Out of a possible 30 metrics

For new construction, 27 out of 30 metrics are required for compliance.
April 2023



Solar Hot Water Analysis Meeting 30% Hot Water Demand



Electric water heater thermal efficiency	87%	
System life expectancy	20	years
Solar WH system energy usage offset	4236	KWh
Cost of electricity	0.1	\$/KWh
Cost savings in a year - 1 Solar WH	\$423.57	
Simple payback	19	years

2019 IHS A/E Design Guide Requirements Advanced Meters to Track Energy/Water Use

A pulse signal is produced by a specialized IC, the signal is directly proportional to power consumption. The MCU records and stores the corresponding energy use. By way of a push system, submetering and monitoring of utility resources can be tracked.

EKM-Omnimeter II UL v.3

3/4" Vertical Water Meter

Water meters capable of measuring water flow in cubic feet. With pulse-output communication for remote reading, and is NSF/ANSI/CA 61 certified meeting strict standards for public health protection.