Shunya Power
ASHRAE LowDown Showdown

2021 Building Performance Analysis Conference

Building Type: Residential Care Center
Total Floor Area: 75,000 ft²
Location: Puerto Rico

Total Site Energy Usage
2003800 kBtu

Site EUI
28 kBtu/ft²

Source EUI
82.6 kBtu/ft²

Total Operational Carbon
0 kgCO2e/ft²

Total Energy Storage Capacity
000 kBtu

Annual Water Usage
1022000 Gallons

Annual Energy Costs
1.9 $/ft²

Annual Water Costs
1.6 $/ft²

Total Annual Costs
3.6 $/ft²

Total Energy Generation
2422000 kBtu

Design Description
The 3-story residential care building is located in San Juan, Puerto Rico. The building is divided into four wings with a central connector between the four wings. Active and passive energy saving measures were utilized to achieve a net zero energy building while ensuring occupant comfort levels were attained. The building was designed to provide a comfortable living space with library, media, tech rooms, restaurant, and PT spaces in the building.

Energy Savings Strategies
Passive energy saving strategies are employed such as: improved envelope construction, double roof to provide building shading; partial green roof and window shading to reduce loads; Biochromatic windows for improved daylighting and insulation; Solar panel fins provide shade and generate electricity. Provisions for natural ventilation with open corridors; skylights for corridors to reduce lighting loads.

Active energy saving measures such as: DOAS Air Handling Units with Total Energy Recovery Wheels to pre-condition outside air; Heat Recovery chillers to heat domestic water along with heat pump water heater as an auxiliary heater; Chilled water reset; Cooling systems designed for high part load efficiency. High Efficiency fan coil units for apartments; Lobby with elevated temperature setpoints and high-volume ceiling fans for expanded comfort region. High efficiency solar panels on the roof and parking lot provide all the onsite power.

Team
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