



## Case Study

### Multi-Family Residential Building

Seattle, WA



#### Application

60-unit low-rise multi-family residential building

#### Location

Seattle, WA

#### Project Completion

2018. (The development was built in 1968. The hot water system was overhauled in 2018.)

#### Overview

Elizabeth James House is a 4-story apartment building subsidized by HUD which provides low cost housing to eligible seniors in Seattle, WA. The all-electric building was constructed in 1968 and offers 60 apartments, all 1-bedroom with single occupancy. The building underwent a redesign of its hot water system in 2018.

#### Original Equipment Replaced

The existing system that was replaced was not original. It was comprised of three relatively new 39 kW instantaneous electric resistance water heaters, three 120-gallon hot water storage tanks, a primary water heater pump, a building hot water circulation pump, and an expansion tank. The three electric water heaters were piped in parallel to three storage tanks piped in series.

## New Equipment Installed

The new system included four 15,000 BtuH Sanden Heat Pump Water Heaters (3<sup>rd</sup> Generation Model GUS-A45HPA) and re-used the three existing storage tanks and main hot water pump and circulation pump. The existing electric water heaters were left in place as a backup. A new 175-gallon storage tank and a thermostatic tempering valve were added.



## Result

The HPWH System produced sufficient hot water to meet the daily demand of 20 gallons/day/apartment (single occupant per apartment) with a total electricity usage of 68 kWh/day for all 4 heat pumps. The referenced report cites a Coefficient of Performance (COP) for the new system of 3.3, three times more efficient than the previous ERWH boiler system which it replaced.

## Reference

See "[CO2 Heat Pump Water Heater Multifamily Retrofit: Elizabeth James House](#)" by Adria Banks, Colin Grist and Jon Heller of Ecotope Inc.

## Disclaimer

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