The Nonotuck Street apartment building houses 10 apartments and approximately 16 residents. The building was designed from the ground-up as a high-efficiency structure. The system was installed in July 2008 when the structure was built.

High-efficiency gas condensing boilers back up the solar system, and also provide radiant heat to the floors of the apartments. A large atmospheric tank serves as the store for the solar energy. As domestic hot water (DHW) is drawn, cold water is pre-heated through the solar tank, and piped into a Stiebel Eltron SBB 400 Plus storage tank.

If the water is up to temperature, the boiler doesn’t fire.

This setup ensures the residents always have hot water, even when the sun isn’t shining.

The DHW system is plumbed to recirculate once the temperature in the loop drops below a usable temperature. A 4-way valve regulates the recirculated water returning back into the DHW loop. A larger 3-way valve regulates water coming from the solar tank and the backup heater.

The ratio of gallons of storage to number of collectors is 93:1, which is much higher than in typical solar thermal systems. The large volume ensures that the tank temperature stays consistently low, and the collectors operate in their most efficient state.

The mechanical room houses 1500 gallons of thermal mass storage in a site-built tank and a Stiebel Eltron SBB 400 Plus 108 gallon backup storage tank.