

NEW ECOLOGY

808-812 Memorial Drive: Energy & Water Savings through the Auditing Process

Location: Cambridge, MA • *Units:* 300 (212 affordable) • *Construction Completed:* estimated 2023 • *Audit funded by* Massachusetts Clean Energy Center • *Project expected to be incentivized from* LEAN and MassSave program

PROJECT BACKGROUND

808-812 Memorial Drive, owned by Homeowner's Rehab Inc. (HRI) and located along the Charles River in Cambridge, provides affordable housing to over 450 low income residents. The building is aged and in need of significant capital upgrades to ensure its physical and financial viability in the years to come. A sustainability and energy efficiency leader, HRI committed to comprehensively evaluating the energy and water savings opportunities at the building ahead of their planned rehabilitation. This enabled HRI to leverage resources invested into the building to reduce energy and water use and operating expenses, and to provide residents a comfortable and healthy living environment. With support and funding from Local Initiatives Support Corporation (LISC Boston) and the Massachusetts Clean Energy Center (MassCEC), HRI engaged New Ecology, Inc. to conduct a comprehensive ASHRAE Level II Audit through which a number of important energy and water conservation measures were identified.

Deterioration of the building's exterior façade required new cladding, which provided a strategic opportunity to improve the air barrier and insulation levels. Improvements to the performance of the building's mechanical systems, lighting, and water fixtures paired well with proposed envelope upgrades. The design team utilized the technical and financial information provided in the ASHRAE II report to create the case and develop a plan for the deep energy retrofit of the building that is currently in design.

Energy Savings

HRI plans to implement the following energy conservation measures in the rehabilitation scope of work:

- Exterior façade replacement with integration of air sealing and increased levels of insulation.
- Replacement of central heating and domestic hot water systems with high efficiency condensing boilers and efficient fan coil units in apartments.
- New cogeneration plant providing efficient heating and low cost electrical power to the site.
- Replacement of apartment CFL lighting with LED fixtures.
- New central ventilation system and cleaning and sealing of the existing distribution ductwork.
- Replacement of unit appliances including dishwasher, refrigerator, and stove with efficient models.



ESTIMATED SAVINGS

The total estimated annual savings for the implemented energy conservation solutions are:

- 2,973,120 gallons of water
- 141,659 kWh of electricity
- 7,053 therms of natural gas
- \$92,500 of annual utility savings

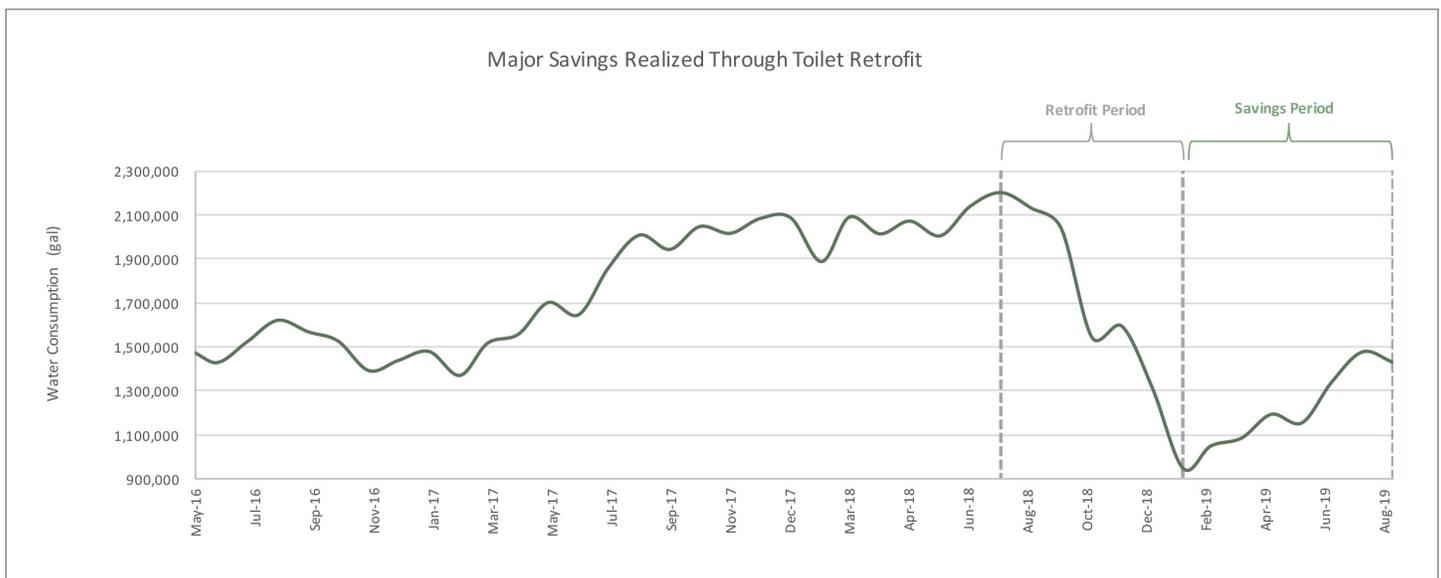
*values from 2017 audit report

Water Savings

Refurbishment of bathrooms and kitchens in the units includes replacement of all toilets, faucet aerators, showerheads and dishwashers. Replacing these fixtures and appliances with high efficiency models, will result in a projected water use reduction of almost 3,000,000 gallons per year.

IMMEDIATE WATER REDUCTION IMPROVEMENTS

As part of the ASHRAE Level II audit, NEI recommended installing an abatement meter on the cooling tower make-up water line to offset the sewer charges associated with the cooling tower. After the abatement meter was installed the realized savings was only \$16, far below the estimated amount. NEI performed an analysis of projected cooling tower water usage and confirmed via a site visit that the abatement meter was installed in the wrong location. The abatement meter was relocated and approximately \$3,700 over a 12-month period was recovered.



Replacing the toilets reduced water consumption by 33% or \$445/day as seen in the graph.

In addition to the ASHRAE Level II audit, HRI engaged New Ecology to conduct a targeted water audit in March of 2018 to provide more detailed information regarding the cause of sudden excessive consumption at the building. Through analysis of historical usage data and further site investigations, NEI identified that leaking and inefficient toilets were the major source of that excessive water usage. As a result of this investigation, HRI immediately replaced all of the leaking toilets at the site with new, low-flow models. Water consumption at 808-812 Memorial Drive has since decreased by 33% resulting in a savings of approximately \$445/day, as seen in the chart above.

Using the ASHRAE II audit as a baseline for understanding the conservation and cost saving opportunities at the building, HRI is on the path to ensuring that 808 Memorial Drive will perform efficiently in the future as it provides a critical affordable housing resource.