



Residence at Thoreau

Zoning Sustainability Narrative

March 11, 2025

This project will be pursuing the Specialized Stretch Code and phius+2021 building program (often referred to as passive house).

Passive house projects play a critical role in supporting decarbonization efforts in the construction and housing sectors. By prioritizing energy efficiency, these homes dramatically reduce the need for heating and cooling, which are among the largest contributors to carbon emissions in buildings. As more Passive Houses are built, the overall carbon footprint of the housing sector decreases, aligning with local goals for carbon reduction and environmental sustainability.

Below are key concepts of this program:

The phius program builds on the best practices of other national green building programs, which the project will also comply including:

- EPA ENERGY STAR Multifamily New Construction program
- EPA Indoor airPLUS program
- Department of Energy Zero Energy Ready Home program

Energy Efficiency and Reduced Environmental Impact: Passive houses use 50%-70% less energy for heating and cooling compared to standard homes, significantly reducing energy bills. This project requires extremely low loads, so this project has a much smaller impact on the local utility grid compared to other buildings.

The team intends to pursue an all electric building design, minus backup generator and some outdoor amenities. This will include specifying heat pumps and heat pump water heaters which are significantly more efficient to operate than gas based appliances or conventional electric options. Other features include: all low flow plumbing fixtures meet WaterSense EPA standards, European tilt turn windows with U Value of 0.17, LED lighting, PV ready design (structural load, conduit, inverter)

EV Parking: The project team intends to meet the EV charging station criteria within the Specialized Code by providing power to 20% of the total parking spaces and installing 10% of the total parking

spaces with EV chargers at occupancy. The remaining 10% EV charging stations will be installed as the demand increases on the site.

Superior Envelope: The team intends to install high-performance windows, insulation in walls, floors, and roofs minimizes heat loss or gain, maintaining a consistent indoor temperature. The team will also complete various envelope analysis' to ensure the project meets the best practices in building durability, water management and minimizing thermal bridging and associated heat losses. We know this will lead to a longer-lasting, more resilient structure in this community. Envelope highlights include installation high performance:

- European tilt turn windows which bring higher performance for insulating and air leakage (U value of 0.17),
- insulation in walls, floors, and roofs minimizes heat loss or gain, maintaining a consistent indoor temperature.
- Building Envelope testing and verification

Airtight Construction & Rigorous Performance testing : Passive houses are built with high levels of airtightness, preventing drafts and reducing the infiltration of outdoor air and pollutants. This often results in less leakage of hot or cool air in a property and can also mitigate transmission of smell, sound and noise from unit to unit.

Our sustainability consultant will not only be involved during the design process to help us meet the plus+2021 requirements, but will also be engaged in the field to help ensure all the design intents are being met in the field. They will be responsible for helping access envelope performance, unit compartmentalization testing, kitchen and bathroom exhaust ventilation and much more.

Enhanced Indoor Air Quality: We intend to follow best practices under the EPA Indoor airPLUS program to promote exceptional IAQ. The team will accomplish this using a three-prong strategy:

1. The team will specify building materials with low/no VOC to minimize exposure to toxins in the property.
2. The team will lean on best practices in mechanical ventilation to ensure units are ventilated appropriately and providing fresh air to occupants in the spaces.
3. The team will follow best practices in moisture management ensuring long term durability of the property and mitigate moisture related health risks for occupants.

Reduced Environmental Impact: Lower energy consumption means fewer greenhouse gas emissions, making Passive Houses more environmentally sustainable.

Resilience to Climate Change: Enhanced insulation and airtightness protect Passive Houses from extreme weather conditions, contributing to resilience in a changing climate.