North Commons at Village Hill, a new community built to the Passive House Standard, delivers a comfortable living experience for residents and provides The Community Builders with a property where energy and comfort results exceed expectations. Integrated design and construction processes deepen The Community Builders' expertise, charting its path to a sustainable future.

The Community Builders (TCB), a nonprofit affordable housing provider, is known for implementing neighborhood-based models that drive opportunity for residents and the surrounding community. At North Commons at Village Hill, TCB created Passive House (Phius) certified homes that deliver measurable benefits to residents, maximize energy and water savings, can be maintained without significant changes to TCB's infrastructure or business models, and blend seamlessly into the surrounding community. The resulting affordable housing development is the first Phius certified multifamily property in Western Massachusetts.

**Challenge: Assembling an Experienced Team**
Phius requires forethought very early in the design process. There are a number of ways that certification can be achieved, making the selection of knowledgeable team members critical. Ideally, a design team will have Phius experience, but these professionals are not always available. For North Commons, TCB had to select a team without that experience. To counterbalance, TCB included Phius-certified staff on the development team and they engaged an experienced Phius consultant very early to establish and properly communicate Phius-related expectations.

**Challenge: Hot Water Heating & Electrification**
TCB’s typical practice is to install centralized hot water heating to maximize energy and water efficiency, save space in residents’ units, and simplify property maintenance. In design, TCB explored a range of hot water heating systems, considering system location, local regulations, and energy model impacts. Given the push toward electrification and the benefits offered, TCB carefully explored this option. However, given high installation costs, unfamiliar and untested equipment, and significant energy modeling penalties, an electric system was not a viable choice. Since the local jurisdiction issued a moratorium on new natural gas hookups, TCB elected to install a centralized propane boiler.

**About Passive House**
Passive House (Phius) is a building standard that requires strategies to lower energy use, maintain consistent indoor temperatures, and reduce weather impacts, leading to improved resident comfort. It benefits property owners by increasing durability and reducing operating costs. Phius requires integrated design and construction practices and extensive third-party verification to ensure building compliance and performance.
This efficient system takes up little space and is directly vented to the exterior, preventing any potential exposure to toxic chemicals. While this means North Commons at Village Hill is not fully electrified, the experience of the residents and affordability can be better assured.

**Challenge: Phius-Compliant Windows & Installation**

Windows are an important visual feature of a home but are the least insulated portion of the building envelope. While the Phius standard does not speak to views and natural light, TCB’s own standards prioritize quality environments for residents and harmonize design with surrounding communities. To meet both criteria, TCB identified and installed large, energy-efficient triple-paned European windows. This solution required changes to typical processes, including additional installation equipment, mock ups and contractor and subcontractor training. TCB will implement these lessons learned on future projects to avoid rework, cost increases and construction delays.

**Lesson Learned: Triple-paned windows require a different installation process and equipment.** Residential windows, especially in low-rise construction, are typically light enough to be lifted into place without extra equipment. The large triple-paned windows were too heavy to be lifted, and the team had to plan for a crane to be on-site.

**Lesson Learned: On-site mock-ups are useful to ensure proper installation.** Construction mock-ups (full-size representations of proposed details) are standard for large commercial projects but less typical in low-rise construction. In this case, TCB recognized that mock-ups were essential to ensure that window design details were properly installed to pass Phius envelope testing.

**Lesson Learned: On-going training for construction staff is critical.** TCB worked with the construction team to lead trainings at the beginning of the project and also quickly discovered that on-going training was needed for all new construction staff to prevent rework.

**Successful Results: Energy & Cost Savings**

In Massachusetts, code requires new homes to meet HERS ratings of 65 or less; North Commons successfully exceeded this benchmark by achieving a HERS rating of 33. According to the U.S. Department of Energy, an existing home would score 130 on the HERS Index. North Commons uses approximately 50% of the energy of a code-built home, and only 25% of an existing home.

This energy savings translates to significant cost savings; energy modeling predicted property-wide annual costs savings of $25,000 compared to code, and TCB is already exceeding this prediction. Currently, TCB pays for all resident utilities, and will be able to apply these additional savings to continue its mission of providing high-quality affordable housing.

1 https://www.hersindex.com/hers-index/understanding-hers-index/

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**Key Takeaway: Phius benefits are greater than the challenges.** Phius-certified affordable housing has a learning curve and processes cannot simply be duplicated. However, TCB’s deepening expertise and early consultation with Phius experts ensures lessons learned are integrated smoothly into future projects. Additionally, the benefits are clear; high-performing housing improves resident experience, provides energy and cost savings, and demonstrates environmental stewardship to the community, all valuable for long-term affordable housing owners. As TCB continues to implement neighborhood-based solutions, these sustainable strategies support increased impact.

“The Community Builders is committed to sustainability in housing, advancing clean energy and reducing our carbon footprint," said Rachana Crowley, senior director of real estate development at TCB. “We’re proud of our work at North Commons and look forward to creating housing that is more efficient and communities that are more sustainable in New England and beyond.”