Let's Build Smarter.

With your expertise and our experience, we can build smarter together.

Canadian winters aren't for the faint of heart. McDonald Brothers Construction (MBC) and their staff worked through the cold winter months to complete the Multifaith Housing Initiative (MHI) Veterans' House in Ottawa, Ontario, in partnership with 3M The MHI Veterans' House is a healthy living space focused on building a positive community for homeless veterans.

McDonald Brothers Construction

Founded in 1988 by brothers Paul and Patrick McDonald, MBC is a family-owned, Ottawa-based, general contracting company. They believe the most effective way to grow a business to new heights is to secure lasting relationships with their clients. MBC's outstanding construction project management experience encourages repeat clients and word-of-mouth recommendations from their strong network of architects, consultants and building owners.

Over the past 30 years, MBC's passion for building set them apart from other contractors. Not only did they develop strong technical knowledge, but their above-and-beyond creative abilities allow sincere enthusiasm for every project. MBC focused their efforts on non-residential markets and are known for their success within the Institutional, Commercial and Industrial (ICI) sectors. This is measured not only by the achievements of the past, but also the progress they are making towards the future.

MBC's innovations put them at the forefront of change as it relates to technological advances, construction methods and materials, as well as sustainable building practices. The industry's move towards sustainable building design was the biggest catalyst of change in the past several years. As active members of the Canadian Green Building Council, MBC advocates for sustainability and green building designs, acting as consultants to further initiatives such as LEED Canada, Green Globes, Zero Carbon Building, Passive Housing and more.

The MHI Veterans' House was built with one of these sustainable initiatives: Passive House design concepts. These concepts revolve around the idea of reusing heat in buildings, with a goal of minimizing and eventually phasing out the excessive usage of fossil fuels.

Passive House Standards

The intent of Passive House design is to construct a building that won't require heavy-duty heating and air conditioning appliances. The goal is to rely mostly on thick walls with an airtight envelope to keep tenants warm in the winters and cool in the summers. Passive House designs use up to 90% less energy for heating and cooling than similar sized building with a traditional design.

Buildings have extensive direct and indirect impacts on the environment. During construction, occupancy, renovation, repurposing and demolition, buildings use large amounts of energy, water and raw materials while generating waste and emitting potentially harmful atmospheric emissions. In response, green building standards, certifications and rating systems were created to lessen the impact buildings have on the environment.

Passive Housing Building Certification is just one of the internationally recognized building certification systems. In 1990, Building Research Establishment's Environmental Assessment Method (BREEAM) was established. The U.S. Green Building Council (USGBC) followed in 2000, creating the Leadership in Energy and Environmental Design (LEED) rating system for new construction. Other sustainable design certifications include Green Building Initiative (GBI) known as Green Globes in the US, Energy Star, Living Building Challenge, and a plethora of others.

Passive House designs distinguish themselves from other certification options by using exceptionally high levels of insulation paired with an airtight building envelope, well insulated window frames, glazings, thermal bridge free design and construction. Any potential leakage through windows will not achieve the required energy efficiency.

Quality control and monitoring is crucial to meeting the Passive House standards. Much more care and integrity than is typically used for a regular building of the same size is needed. After the building is complete, pressurization and depressurization tests are run to check if the building meets Passive House air leakage standards.

To live up to Passive House rigorous standards, MBC needed a product for the Veteran's House that was excellent at preventing air leakage, weather resistant and easy to install in cold weather.

3M™ Air and Vapor Barrier products are specially formulated to be applied at temperatures ranging from 0°F to 150°F (-18°C to 66°C) – meaning the cold weather wouldn't hinder the building process. In addition, 3M was available to provide technical expertise and experience to support the customer over the course of the project.

3M and MBC

MHI Veteran's House is essential to veterans who are homeless or at risk of homelessness in Ottawa. It combines safe and sustainable housing with essential on-site rehabilitation services to give veterans an opportunity to recover from both physical and mental health and addiction-related issues. The supported housing model allows for veterans to form a community and move on to the next stage of their life.

"Being able to provide these resources for veterans who need it is an amazing feeling, and I am proud that we were able to do it in a sustainable way," said Pat McDonald, Secretary and Treasurer for MBC.

In addition to the invaluable impact the MHI Veteran's House has on veteran's lives, it was also the first Passive House project that MBC completed using 3M solutions.

"You get one shot at properly achieving the Passive House Standards, and if you don't do your due diligence, it's very easy to fail," McDonald said. "We knew the product we chose to utilize for this project needed to be reliable enough to help us reach the Passive House requirements."

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>
> **- McDonald**

3M's Air Barrier with Permeable Backing 3015VP was the selected product, due to its ability to meet required standards and its proven success in cold weather environments. In addition, no primer is needed, which allows for a more efficient installation process, even in the face of difficult project complexities. Construction continues to become ever-more complex as architectural programs, local codes, and the day-to-day job site become more sophisticated and technically rigorous.

The architect for the project, Stephen Pope of CSV Architects, reviewed and approved the product because of its ease of installation, as well as the known features and benefits of the material. Along with being rain and water resistant and permeable to water vapor, the ability to be installed with no primer is one of the 3M™ Air Barrier with Permeable Backing3015VP's key benefits.

"3015VP is definitely easier to manipulate and work with in cold weather than some of the other products that have been used," McDonald said.

3M and MBC's longstanding partnership allowed for a seamless installation. The installation took place in January and February 2020, which tend to be Ottawa's most frigid months . 3M technical experts assisted on-site to help the installers become comfortable with the product and understand the level of care needed to ensure Passive House requirements were met. 3M's expertise and technical skillset also allowed MBC to reduce development and installation time.

"The installation ended up being very uneventful," McDonald said. "This is high praise for any project because you don't want anything out of the ordinary to happen."

Standards Met, Standards Kept

The uneventful installation process was essential, especially because MHI paid a premium to ensure that the Passive House standards of achieving an extremely tight building envelope were met.

"It is even more critical that there are no issues that arise later on," McDonald said. "The 3015VP product ensured that the application process was smooth and error-free."

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The pressurization and depressurization test results came back better than normal, meaning the MHI Veteran's House usage of 3M 3015VP allowed less air leakage than when other products were used.

With MBC's expertise and 3M's experience, McDonald Brothers Construction look forward to continuing their partnership and building smarter together.

Credits
General Contractor: McDonald Brothers Construction
Architect: CSV Architects
Distributor: HD BRAFASCO

To learn more about how 3M can help you build smarter, please visit **www.3M.com/BuildSmarter.**

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