

# Adsum Sunflower

Design team delivers Net-Zero community in 18 months

By Molly Merriman and Natalie Leonard

**The Sunflower is a 25-unit long-term rental housing development and community centre for Adsum for Women and Children, a local not-for-profit based in Halifax. The project was one of the recipients of the first round of Federal Rapid Housing Initiative funding in 2020.**



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1. The new building footprints were designed to make use of the existing site and driveway of a former school to minimize disturbance. The buildings were oriented for solar south to maximize solar gains and natural daylight.

Adsum is an organization leading change in housing through advocacy, support, and services to end homelessness. The goal of the Sunflower was to create 25 new units of rental housing for Adsum clients who were experiencing housing insecurity and need a safe, affordable and permanent place to call home.

The Sunflower was built on the site of a former school donated by Halifax Regional Municipality that Adsum had converted into transitional housing. The building was outdated and its layout far from ideal. Although initial explorations were made to save the existing building, the project team ultimately decided to demolish and make way for new housing.

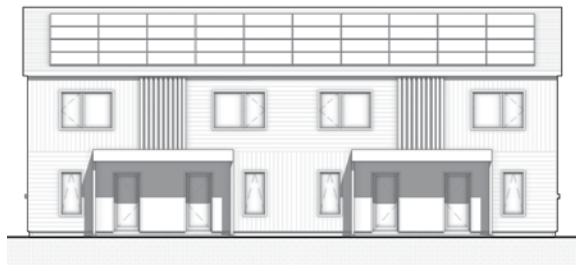


**Site plan**

- 1. Building A
- 2. Building B
- 3. Building C
- 4. Building D
- 5. Building E



Building B north elevation

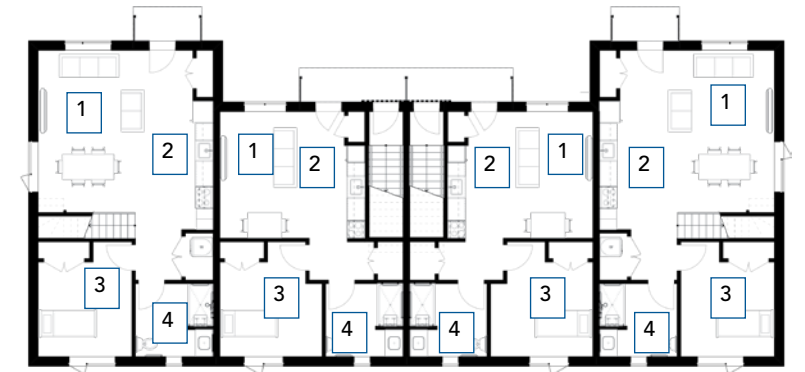


Building D south elevation

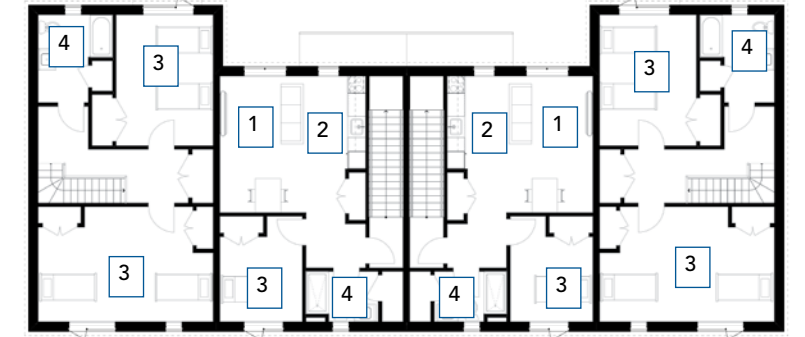


**Building A**

- 1. Program room
- 2. Kitchen
- 3. Electrical room
- 4. Mechanical room
- 5. Patio
- 6. Laundry
- 7. Resource room
- 8. Bathroom
- 9. Property manager
- 10. Manager
- 11. Corridor
- 12. Social work
- 13. Admin



Building B - Ground floor



Building B - Second floor

- 1. Living/dining room
- 2. Kitchen
- 3. Bedroom
- 4. Bathroom



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The new building footprints were designed to make use of the existing brown site and driveway to minimize disturbance. The buildings were oriented for solar south to maximize solar gains and natural daylight, and their positioning close to Greenhead Road also allows for future expansion should Adsum opt to build more units.

The site design was based on the vision of creating a small pocket neighbourhood, and each unit entrance was designed to face onto a central courtyard to foster a sense of community and safety for the tenants, many of whom have experienced domestic violence.

- 2. A view to Building E and Building A on the left.
- 3. High-performance windows and doors contribute to the efficiency of the building envelope.
- 4. Wood-frame wall, fall and roof components were factory prefabricated and assembled on site.



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## PROJECT CREDITS

**CLIENT** Adsum for Women and Children

**PROJECT COORDINATION** Affordable Housing Association of Nova Scotia (AHANS)

**ARCHITECTURAL DESIGN AND ENERGY CONSULTING** Passive Design Solutions

**ELECTRICAL ENGINEERING** Equilibrium Engineering

**STRUCTURAL ENGINEERING** Andrea Doncaster Engineering

**CIVIL ENGINEERING** Servant Dunbrack McKenzie & MacDonald (SDMM) Ltd.

**LANDSCAPE ARCHITECTURE** Clinton Pinks Landscape Architect

**GENERAL CONTRACTOR** Dora Construction

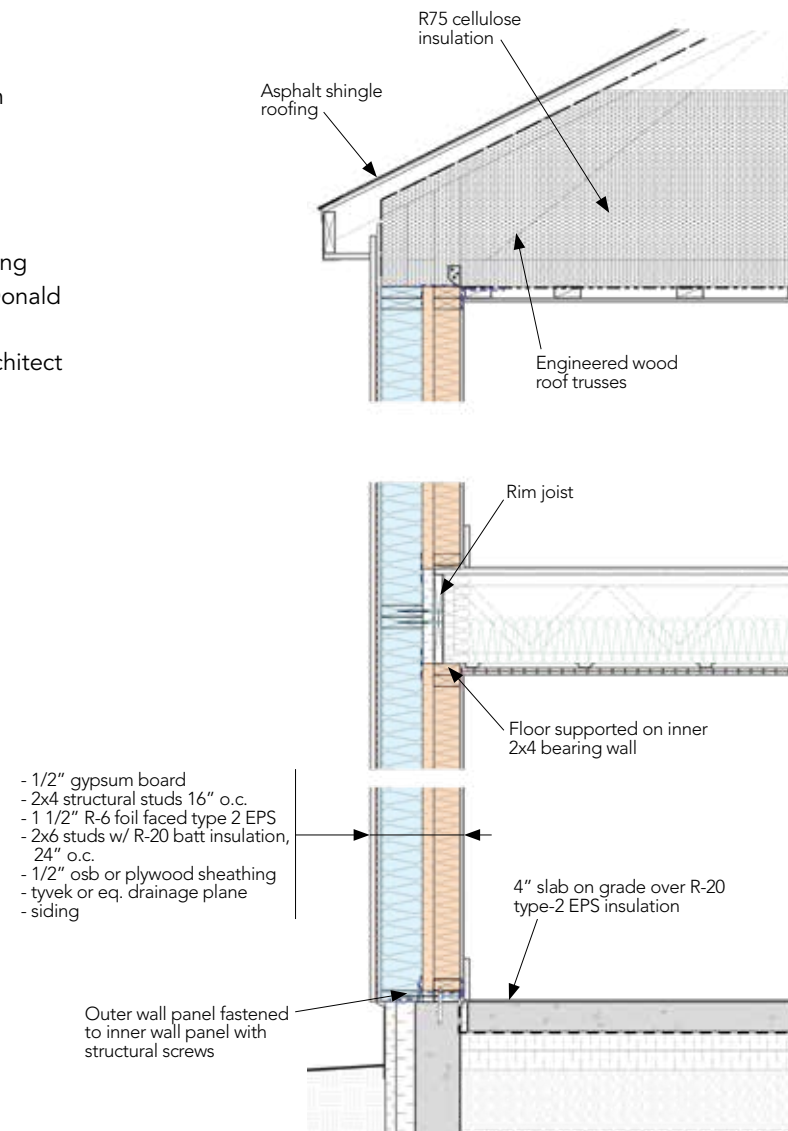
**PHOTOS** Julian Parkinson

**LANDSCAPE PLAN DRAWING COURTESY** Clinton Pinks Landscape Architect

**ALL OTHER DRAWINGS** by Passive Design Solution

The community centre—outfitted with offices, program space, accessible washrooms and laundry, and a communal kitchen—was placed closest to the road, providing a buffer for the private dwelling units while acting as a connection point for the staff and tenants.

The two-storey housing units are distributed among four separate buildings, creating a sense of openness and respecting the existing density and fabric of the neighbourhood. The unit mix consists of one, two and three-bedroom units in stacked and townhouse configurations, with four fully barrier-free units placed closest to the community centre and parking.



A key design focus was to incorporate Passive House principles and to achieve Net-Zero—a must for the long-term financial sustainability of project given the below-market rents that were required through the funding model. By increasing the efficiency up-front through thoughtful design, reaching Net-Zero site energy became an attainable goal, and the resulting architectural design was able to address other vital client needs such as the creation of spaces that are light-filled, comfortable, buffered from outside noise, and resilient to storms.

The building envelope was designed for Passive House airtightness targets and detailed for elimination of thermal bridging. The energy modelling work was done iteratively throughout the design phases to achieve Net-Zero energy using only the available roof space for future PV modules, which informed the window layouts, insulation levels, and overhang shading.

The durability of exterior and interior finishes was critical to ensure that ongoing maintenance costs and efforts would be minimized, since Adsum operates on a tight budget focused on serving the needs of their tenants. Vinyl siding was used in varying orientations, along with thermally modified wood accents to add warmth and visual interest.

The environmental impact of material choices was considered in the specifications. Locally available building materials were prioritized, and high embodied carbon materials were used only as necessary. The structural design eliminated bearing in the demising walls and reduced frost wall thickness from 8" to 6" resulting in a 25% reduction in concrete use.

A simple roof structure was designed to bear the added weight of the planned PV system. No structural steel was used, the amount of glazing was balanced for egress, daylighting, ventilation, energy performance and embodied carbon, and no formaldehydes were permitted in any interior finishes.

Locally manufactured triple-glazed vinyl windows were used throughout the project. Casement and awning sizes were kept compact to extend the lifespan of the operable windows. Window sizes were balanced in the energy model and low solar heat gain glass was strategically used to reduce the cooling loads to a level where air conditioning was not required.

The heating system decision was complex—a ducted heat pump was cost-prohibitive, and single ductless mini splits in each unit were deemed too complicated to operate and maintain, so electric baseboards were chosen as the main heat source. Efficiencies were found by sharing heat pump hot water heating between one-bedroom units, and all appliances and plumbing fixtures were chosen based on a combination of energy efficiency, ease of use, and local availability. Centralized plumbing layouts, insulated water lines, and hot water heat pumps reduced hot water use by 75%, and low flow fixtures were specified to reduce overall water use.

Time was a critical factor throughout the project as the main federal funding source required that the project be substantially completed within a year of its inception. A collaborative and decisive design team was essential to bring the drawings from concept to construction documentation within six months. The Sunflower is now fully occupied and forms a key part of Adsum's ongoing operations and long-term housing strategy.

Working under an integrated team model, the project was successfully delivered during the coronavirus pandemic within just eighteen months—an achievement that we hope can help demonstrate what is possible in addressing both the current housing and climate crises.

**MOLLY MERRIMAN NSAA, OAA, MARCH, PROJECT ARCHITECT, PARTNER AND NATALIE LEONARD P. ENG., CONSULTANT AND ENGINEER, FOUNDING PARTNER ARE WITH PASSIVE DESIGN SOLUTIONS.**

5. and 6. Thoughtful design made reaching Net-Zero site energy an attainable goal while creating spaces that are light-filled, comfortable and buffered from outside noise.

