EQuilibrium™
HEALTHY HOUSING
FOR A HEALTHY ENVIRONMENT

Project Overview:
Harmony House—Burnaby, British Columbia

This Project Overview highlights Harmony House, one of the winning entries in the Canada Mortgage and Housing Corporation (CMHC) EQuilibrium™ Sustainable Housing Demonstration Initiative – a national initiative to design, build and demonstrate sustainable homes throughout Canada.[1]

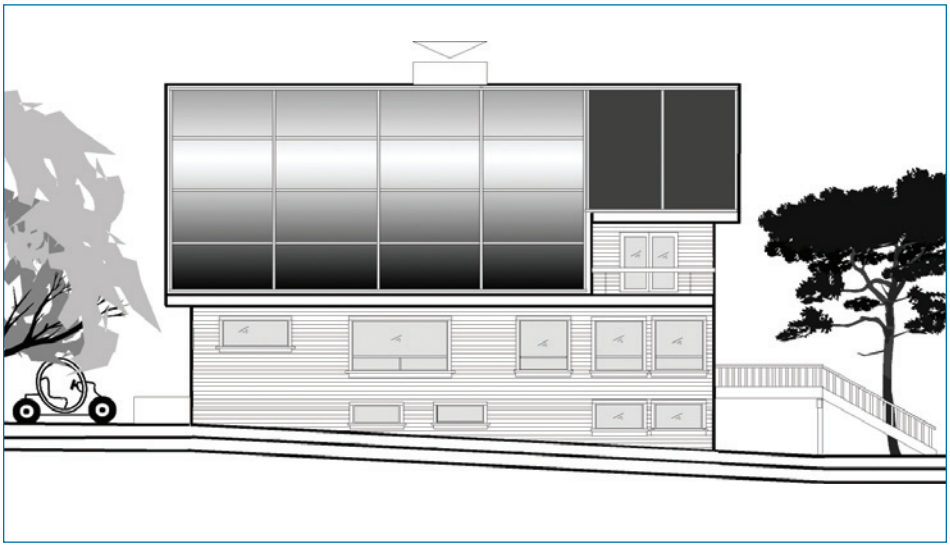

Figure 1—South elevation of Harmony House

Key Features

- Passive solar heating, grid-connected photovoltaic panels, solar hot water space and domestic hot water heating systems using seasonal heat storage
- Summer cooling will be provided by a wind and stack driven cooling tower
- Features such as highly efficient electrical appliance and lighting, and the use of smart metering and controls will allow occupants to minimize electrical energy consumption
- The project will be built in an established community, with many amenities within walking or cycling distance

Project Description

Harmony House will be a new, two storey, 325 m^2 (3500 sq. ft.) home with a basement and attached garage. Located in an established community in Burnaby, British Columbia, its flexible design enables 3 complementary functions – that of providing two housing units (a first and second floor unit and a basement in-law suite) and the capability for an in-home office.

The designer, Habitat Design + Consulting Ltd.(HDC), and the builder, Insightful Healthy Homes Inc., as well as other project team members have been involved in energy-efficient and sustainable building both locally and internationally for many years. For example, HDC has recently been involved in the design of a net zero energy housing project in Japan.

[1] For more information on this initiative and the various EQuilibrium™ projects, visit the CMHC website (www.cmhc.ca) and type the search keyword "EQuilibrium".

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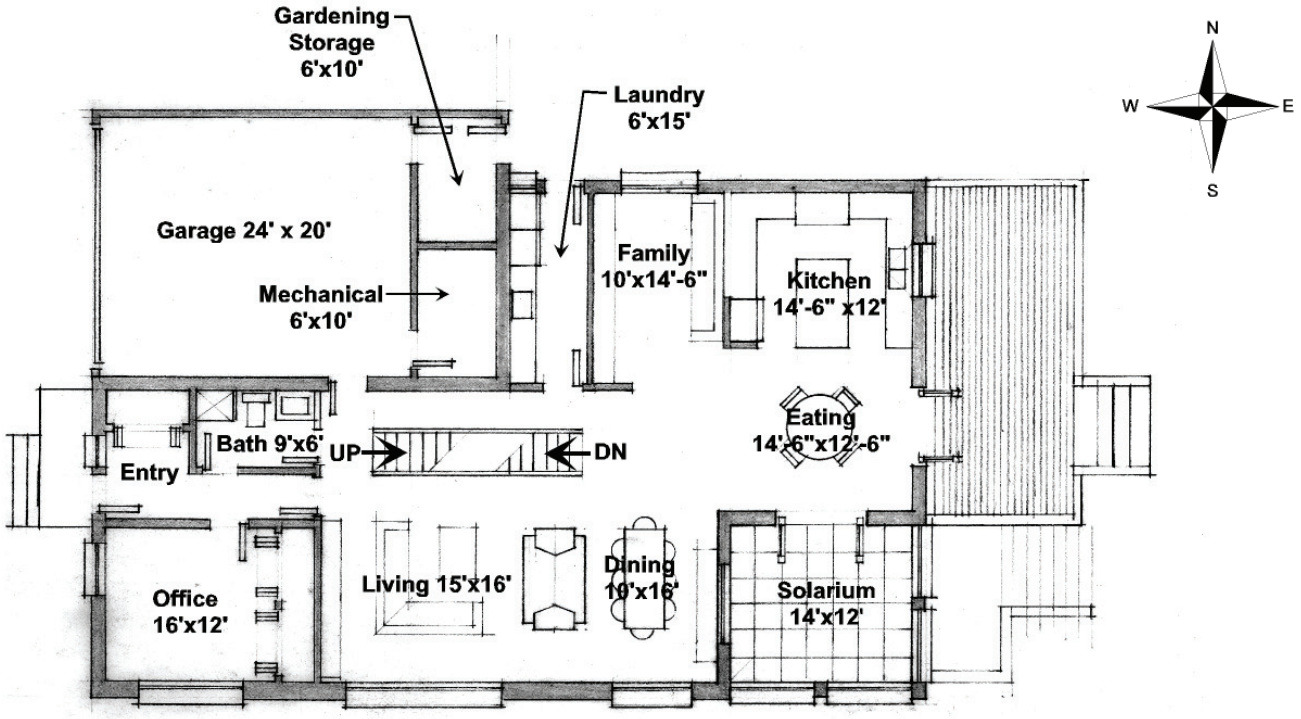

Figure 2—Main floor plan of Harmony House

The main floor of Harmony House will utilize an open-concept with living room, dining room, kitchen with adjacent eating area, family room, solarium, three piece bathroom, and office. The floor plan has been designed so that any clients visiting the house can access the office and bathroom without disturbing other occupants. The top floor includes the master bedroom with four piece ensuite and walk-in closet, two small bedrooms, a three-piece bath, and a large space open to the living and dining room area below. The basement in-law suite will have its own entrance, a combined kitchen, dining and living area, three-piece bath, and two bedrooms. The south sloping site allows for large windows and, with the open-plan design, will ensure good daylighting on all floors.

In keeping with the requirements of the CMHC EQuilibrium™ Sustainable Housing Demonstration Initiative, the key intent of the Harmony House team is to design and build a home that features a healthy indoor environment, energy efficiency, low environmental impact, significant resource conservation, affordability considerations, and production of as much energy as it consumes in a year (a net-zero energy home) from on-site renewable energy systems.

The design focuses on the entire home as an integrated system. It takes into account a variety of factors: the home's influence on, and interaction with, the surrounding environment; the environmental impacts related to the production, distribution, and utilization of various building materials; and building life-cycle analysis. The well insulated, air-tight building envelope and other energy efficiency features (energy-efficient mechanical systems, appliances, and lighting fixtures) will reduce the household energy requirements to a fraction of the energy requirements for a typical Canadian home. This minimal total annual energy requirement for the home is predicted to be nearly equal to the on-site annual production from renewable energy sources: active and passive solar space and water heating, seasonal heat storage, and photovoltaic (PV) electrical panels.

Additional features include design considerations to ensure a quiet home (such as triple glazed windows to reduce

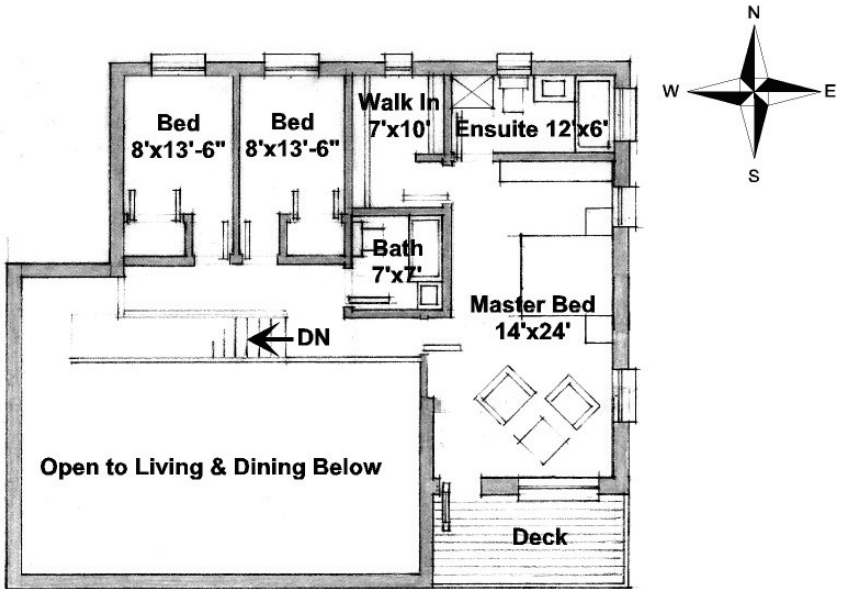

Figure 3—Second floor plan of Harmony House

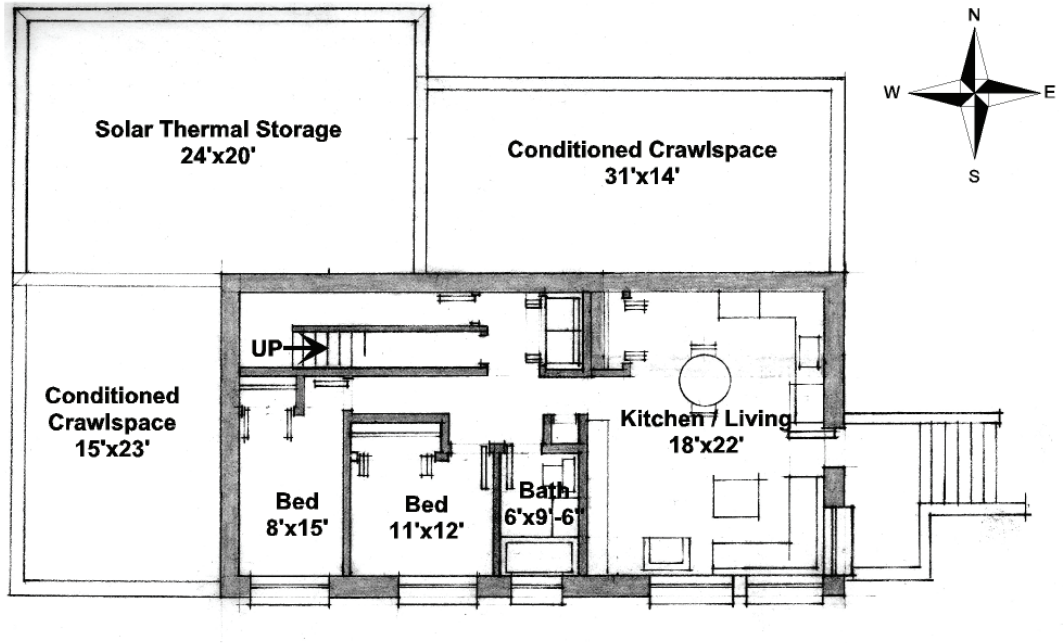

Figure 4—Basement floor plan of Harmony House

noise from the street), intelligent use of windows and skylights to provide natural lighting (daylighting), a heat recovery ventilator (HRV) as well as operable windows to ensure good ventilation and thermal comfort, the efficient use of locally produced environmentally appropriate building materials, the use of natural materials and finishes with low levels of volatile organic compounds (VOCs) to ensure good indoor air quality, and water conserving fixtures.

The design of the lot will employ rain water harvesting for irrigation as well as landscaping that minimizes irrigation requirements and promotes storm water drainage to the local aquifer rather than into the storm drains.

Project Team

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For more information on this project and on the CMHC EQuilibrium™ Sustainable Housing Demonstration Initiative, visit www.cmhc.ca

EQuilibrium™ Sustainable Housing Demonstration Initiative

What is EQuilibrium™ Housing?

EQuilibrium™ is a national sustainable housing demonstration initiative, created and led by Canada Mortgage and Housing Corporation (CMHC) that brings the private and public sectors together to develop homes, and eventually communities that address occupant health and comfort, energy efficiency, renewable energy production, resource conservation, reduced environmental impact and affordability.

CMHC's EQuilibrium™ housing initiative offers builders and developers across the country a powerful new approach to establish a reputation for building premium quality sustainable homes that will meet the needs of Canadians now and well into the future.

EQuilibrium™ housing combines a wide range of technologies, strategies, products and techniques designed to reduce a home's environmental impact to an absolute minimum. At the same time, EQuilibrium™ housing also features commercially available, on-site renewable energy systems to provide clean energy to help reduce annual consumption and costs.

The ultimate goal is a highly energy-efficient, low-environmental-impact house that provides healthy indoor living for its occupants and produces as much energy as it consumes on a yearly basis. As part of the initiative, all EQuilibrium™ projects will be open to the public for a minimum time period of six months and then monitored for performance with occupants for at least one year.

For more information on this project and on the CMHC EQuilibrium™ Sustainable Housing Demonstration Initiative, visit www.cmhc.ca

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