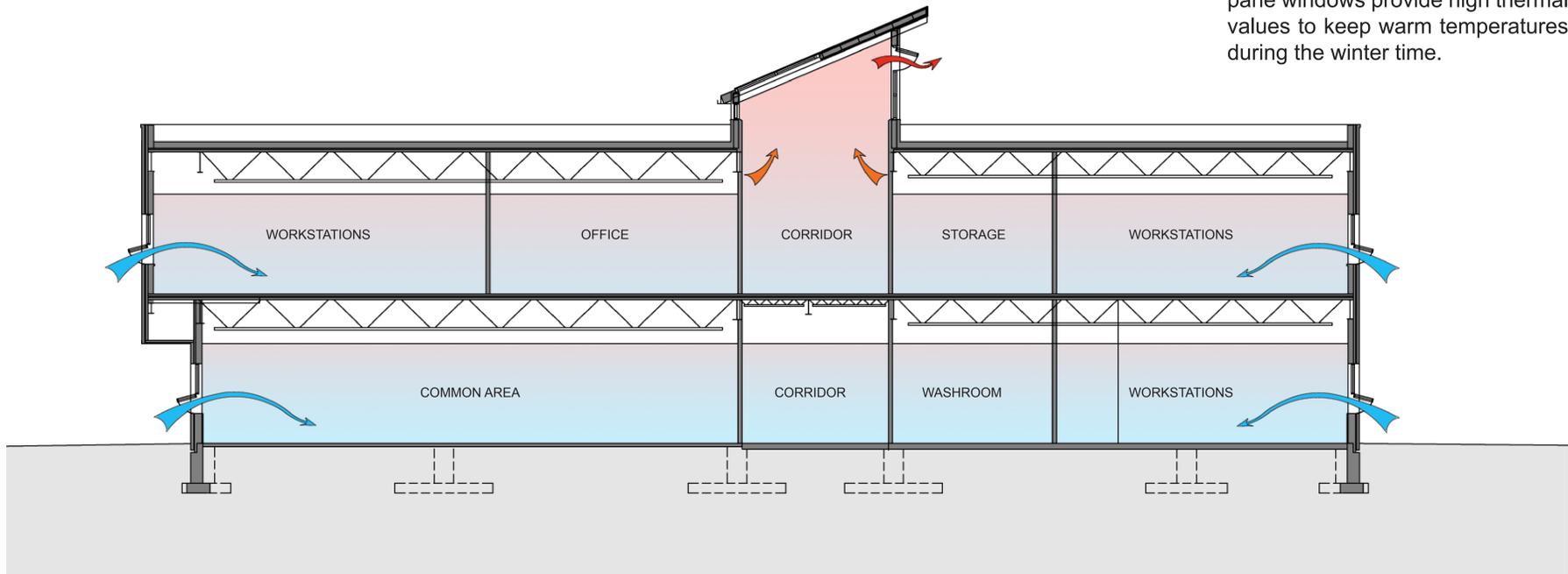


Several energy saving strategies were employed at the Waterloo North Hydro building. The offices employ conventional HVAC systems with the heating component fed from a geothermal field. The garage, storage and repair components utilize in-floor hydronic heating also connected to the geothermal field. The geothermal system provides 50% of the required heat, and the remainder is supplied by natural gas. Preliminary figures include projected energy savings of over 60% relative to the Model National Energy Code for Buildings (MNECB) standard – an annual cost savings of over \$65,000. This equates to an annual consumption of only 3,172,000 Megajoules (MJ) compared with 8,161,000 MJ for a similar building designed to the MNECB. 359 tons of carbon dioxide CO₂ (green house gas) are saved from being emitted each year, which is equivalent to taking 57 cars off of the road.

CONSIDERATIONS

Buildings consume approximately 37% of Canada's primary energy. Production of electricity through the use of fossil fuels such as oil and coal requires extraction, transportation, refining, power generation and distribution. These processes significantly impact the environment in a myriad of adverse ways. For example, conventional fossil-based generation of electricity releases carbon dioxide, which contributes to global climate change.

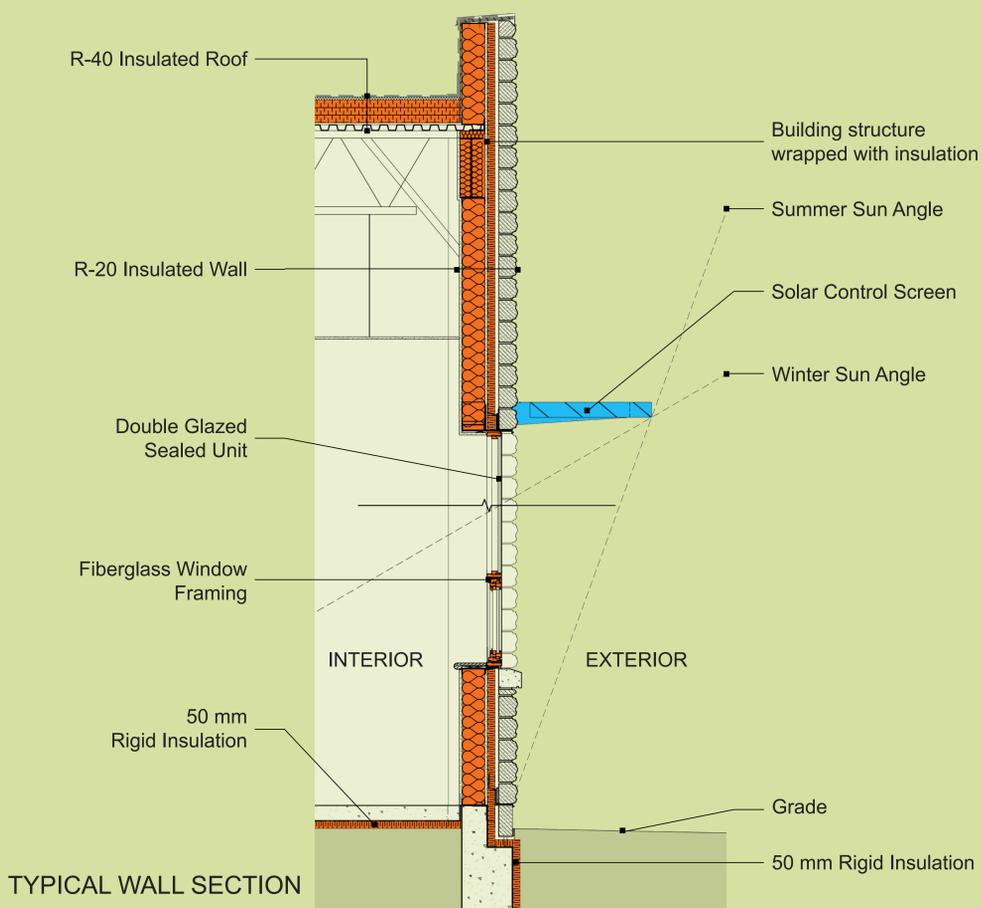
Operable windows along the perimeter are installed to cool down the building during spring and fall. The walls, roofs and the double-pane windows provide high thermal values to keep warm temperatures during the winter time.



BUILDING CROSS SECTION

BUILDING SYSTEMS COMMISSIONING

In order to ensure that heating, ventilating, and air conditioning (HVAC) systems perform as intended to achieve energy efficiency goals, the building systems were thoroughly commissioned at the end of construction before the facility was opened. The commissioning process included the demonstration of all equipment and systems to those that run the building and required that the equipment suppliers be present and participate in the training sessions.



TYPICAL WALL SECTION

GREEN MEASURES

- An HRV (Heat recovery ventilator) is used to pre-heat incoming fresh air using from mechanical exhaust air.
- Increased levels of building insulation - R20 walls and R40 roof.
- High-performance windows (argon filled with low-E coating specific to the window's orientation) decrease the overall energy demand.
- Window orientation, together with exterior solar control screening, captures abundant natural light, reducing the electric lighting demand within the building.
- Occupancy and daylight sensors add an additional level of control to the already high-efficiency light fixtures throughout.
- High efficiency tankless hot water heaters are installed for domestic water use.
- None of the building equipment contains CFCs (chlorofluorocarbons) or ozone depleting gases.