Toronto Military Family Resource Centre

LOCATION: 5 Yukon Lane, Toronto, Ontario
FLOOR SPACE: 19,800 ft^2 (1,840 m^2)
CONSTRUCTION DATES: 2002–2004
OWNER: Public Works and Government Services Canada
ARCHITECT: J Richard Doucette
STRUCTRUAL ENGINEER: Anna Kisilewicz, TSH
MECHANICAL ENGINEER: Richard Morris
ELECTRICAL ENGINEER: Judi Gregg

Rated Four Globes
Out of Five

*Please note that Green Globes™ uses a four globe scale in the U.S.
Four Globes in Canada is the same as 3 in the U.S.

PROJECT NOTES

PROJECT MANAGEMENT

Integrated Design Process (IDP)

- A team approach used throughout the design process involving collaboration between architect, engineers, consultants, and occupants
- Evidence of environmental goals established the early stages of the design process

Environmental Purchasing

- Public Works and Government Services Canada (PWGSC) Ontario Region green procurement standards that exceed National Master Specifications (NMS) guidelines
- Energy-saving high-efficiency equipment and appliances
- Emergency Response Plan to mitigate the likelihood and effects of environmental emergencies such as spilling of hazardous materials during site preparation or construction

SITE

Development Area

- Site which includes remediated brownfield
- Minimal disturbance to existing site topography

Minimization of Ecological Impact

- Silt fences erected during construction
- Excavated materials used in the playground and landscaping
- Minimal external lighting, with exception of security lighting at the parking lot that uses "down-lighting" fixtures

Enhancement of Watershed Features

- At least 30% of impervious surfaces shaded to avoid the heat island effect
- Water from roof routed into gutters and directed to pervious areas to percolate into soil
- 25% decrease in storm water run-off

Enhancement of Site Ecology

- Development located on a remediated brownfield site
- Naturalized landscape using native trees, shrubs and ground cover
- Minimal lawn area – limited to functional uses

MICROCLIMATE DESIGN

The Military Family Resource Centre is located at the highest elevation in Toronto with extreme exposure to wind. The roof structure is designed to take advantage of its location, using the wind as a natural cooling device in the summer. As wind passes over the building operable upper windows located near the roof create negative pressure facilitating the stack effect, and drawing cool air into the base of the building. In the winter, the large roof acts as a shield, deflecting air over and around the Resource Centre. Its slope helps to reduce snow deposition.

ENERGY

Energy Demand Minimization

- Curvilinear design with sloped roof at least 50% more energy efficient than the MNECB reference building
- Optimized floor area to efficiently fulfill the building's functional and spatial requirements while minimizing the amount of space that needs to be heated and cooled

Response to Microclimate and Topography

- Optimized effect of microclimatic conditions for heating or cooling due to location and orientation on the site
- Office areas facing north
- Play areas exposed to afternoon sun
- Sloped roof to provide shelter against wind and snow deposition
- Natural ventilation due to stack effect and differential pressure created by incoming air through operable windows at the lower levels

Integration of Daylighting

- Optimized daylighting through building orientation, window position and window-to-wall size ratios
- Double-glazed, clear window glazing with visible transmittance (VT) of 0.57
- Electric lighting integrated with daylighting, taking into account daily and seasonal variations
- Localized lighting controls for lights near windows and those away from windows

Building Envelope

- Doubled glazed windows with a U value of 3.0
- Heat retention due to insulation of the roof exterior
- Building integrity using best air/vapour barrier practices (Section 07195)
- Insulation value of ICF wall of R-32, which exceeds MNECB levels for Ontario region A

Energy-Efficient Systems

- Energy efficient equipment including lighting controls, HVAC equipment, radiant heating
- Night settings for temperature
- Direct Digital Controls (DDC) linked to the building automation system located in adjoining building

Energy-Efficient Transportation

- Public transport easily accessible within 500 yards, with service at least every 15 minutes
- Sheltered waiting areas

WATER

Water Conserving Features

- Water-saving devices including proximity detectors on urinals, low flush toilets (less than 1.5 gallon/flush), single level faucets, front loading washing machine, and water-conserving commercial dishwasher
- No irrigation systems due to hardy native plantings

RESOURCES

Materials that Minimize Consumption of Resources

- Durable, low maintenance building assemblies
- Renewable materials and locally manufactured materials including brick, cedar siding, pine and spruce wood products

Building Disassembly

- Materials and fastenings that allow for easy disassembly

Facilities for Recycling and Composting

- 172 ft^2 (16m^2) of space designated for storage of recyclable waste
- Composting on-site

EMISSIONS, EFFLUENTS

Minimization of Air Emissions

- Low-NOx boilers and furnaces

Minimization of Ozone-Depletion

- Ozone-depleting potential (ODP) of the refrigerant (HFC134) used in chillers of 0, with global warming potential (GWP) of 420

Pollution Minimization

- Old storage tanks removed
- No storage tanks on site
- Components and materials selected to avoid infestation of pests including Insulated Concrete Forms (ICF) Wall Construction that does not provide cavities for pests
- Structural openings protected to avoid infestation by pests

INDOOR ENVIRONMENT

Effective Ventilation System

- Air intakes upwind and at least 30 ft apart from outlets to avoid re-entrainment
- Main air intakes located more than 60 ft from major sources of pollution and at least the minimum recommended distances from lesser sources of pollution
- Ventilation in accordance with ANSI/ASHRAE 62 – 1999
- Reported design ventilation rate of 9 cfm/person
- Personal control over ventilation through operable windows
- Ventilation system that has capacity to flush out the building with 100% outside air at ambient temperatures above 32°F

Source Control of Indoor Pollutants

- ICF Wall Construction and other measures to minimize the accumulation of moisture and prevent the growth of fungus, mold, and bacteria on building surfaces
- Low VOC-emitting, non-toxic and chemically inert materials
- Easy access to air-handling units (AHUs) to facilitate maintenance and drainage
- Isolated and separately ventilated storage for cleaning and hazardous materials

Lighting

- Direct ambient daylighting to 80% of the primary spaces
- Daylight factor of 0.2 for areas requiring moderate daylighting, and 0.5 for well day lit daycare and work areas
- Solar shading devices to enable occupants to control brightness and glare from direct daylighting
- Local lighting controls, such as separate switches for perimeter and interior areas

Thermal Comfort

- ASHRAE 55–1992, Addenda 1995 for thermal comfort achieved

Acoustic Comfort

- Building siting and spaces within the building zoned for optimum protection from undesirable outside noise and acceptable noise criteria ranges
- Minimal negative acoustic effects from site circulation, drop-off and vehicular access
- Sound transmission class (STC) rating of the exterior walls of 48
- Acoustic controls to meet acoustic privacy requirements such as sleeping area separated from the play areas and noise-generating activities located in enclosed rooms
- Acceptable ambient sound levels in primary spaces

- Space relationships and circulation strategies that minimize the potential for occupancy-related acoustic problems such as stairways, and vertical transport systems designed and located to avoid acoustic problems in adjacent spaces

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