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Earth Rangers Centre

Radiant heating and cooling systems benefit the environment and create a comfortable home for Earth Rangers Centre's wildlife refugees.

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Radiant heating and cooling system provides a comfortable environment for wildlife refuge occupants

As one of Canada's most innovative and energy-efficient buildings, the 60,000 ft² (5,574 m²) Earth Rangers Centre in Woodbridge, Ontario, functions as a wildlife refuge and hospital and as an education centre for children. The facility houses a world-class veterinarian research and training hospital, interactive educational displays for the public and one of Canada's only oil spill response units dedicated to wildlife.

Unique design elements were necessary to accommodate the building's unusual full-time occupants—beavers, deer, raptors and songbirds, to name a few. Treatment and rehabilitation rooms for these special residents also demanded durability, water-resistance and as few hiding and escape nooks as possible.

To meet these demands, the project's engineers specified hydronic radiant heating and cooling. "REHAU was chosen to supply the system based on their innovative technology and their ability to provide comprehensive on-site support throughout the project," said Richard Lay, senior design engineer at Enermodal Engineering Ltd., and engineer of record for the Earth Rangers project.

The Earth Rangers Centre is one of the first buildings of its kind in North America. "This technology offers a number of advantages over traditional forced air systems," said Mark Euteneier, president of Klimatrol Environmental Systems.

"A radiant system benefits the environment by using less fuel, plus it is less costly to maintain. The REHAU system benefits the Earth Rangers project in particular, as it eliminates ductwork in which animals can hide, and it utilizes a concrete floor surface that's easy to clean and maintain."

For the radiant heating and cooling system, 74,000 ft (22,555 m) of REHAU's RAUPEX O₂ Barrier crosslinked polyethylene (PEXa) pipe is installed in more than 36,000 ft² (3,345 m²) of exposed concrete slabs. RAUPEX was placed in both the floor and ceiling—as well as in the cast-in-place skylights—in order to collect, distribute and maximize solar gain. The combined ceiling and floor slab mounting design enables the system to provide both efficient heating and cooling.



The system's cooling function employs concrete slabs that are actively cooled to approximately 64° F (18° C) overnight using circulating water from a cooling tower or geothermal wells. The slabs warm up slightly during the day as they absorb heat from the space. This technique provides much of the building's cooling energy on an average day and significantly cuts electricity use.

As a complete system, the Earth Rangers Centre is proof that a building can be operated effectively and efficiently, while minimizing impact to the environment.

Project: Earth Rangers Centre in Woodbridge, ON

Construction type: Sustainability education and veterinary hospital, opened 2004

Project scope: 60,000 ft² (5,574 m²)

Engineer: Enermodal Engineering Ltd

Contractor: Klimatrol Environmental Systems, Ltd

Energy Consultant: TRANSSOLAR

REHAU systems used: Radiant heating and cooling (RAUPEX[®] pipe, compression-sleeve fitting system, PRO-BALANCE[®] manifolds)

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