BUTTERFLY CONSERVATORY • PRODUCTION GREENHOUSES

BUILDING:	**Butterfly Conservatory** **Niagara Falls, ON, Canada**
OWNER:	Niagara Parks Commission Niagara Falls, ON, Canada
CLIENT:	Baird Sampson Neuert Toronto, ON, Canada Mr. Barry Sampson
AREA:	30,700 sf
COMPLETION:	1997

This 30,700 sf project forms an essential element in the strategy of the Niagara Parks Commission to further develop the tourist attractions available at Niagara Falls. It incorporates a massive 11,200 sf tropical house opened year-round for the sole purpose of displaying butterflies from all over the world. Accompanying this facility is approximately 2,000 sf of lab, research and support space, and 17,500 sf of general and butterfly production greenhouses. Design critical decisions were made after visiting existing butterfly conservatories and studying their design.

Agritechnove was responsible for the HVAC and electrical concepts for the Butterfly Conservatory and responsible for the complete design (structural, mechanical, electrical/control) of the production greenhouses as well as the control system for the Conservatory.

SPECIAL FEATURES - The Butterfly Conservatory was designed to use natural ventilation as much as possible to keep operating costs down. It is fitted with the equivalent of 40% of the floor area in operable windows. A shading system is subdivided in several zones to follow the sun's path thus avoiding undesired shading of indirect light. The whole interior environment it netted using a transparent material to avoid butterflies getting stuck on humid glass surfaces. High volume air handlers with cooling coil modulate to provide masses of cool air to be released rather than small volume of very cold air. All air return ports are at low velocities to avoid sucking in butterflies and air supply ports are designed and located to avoid stressing the tropical plants. Fogging system is designed for evaporative cooling at the upper part of the building and zone humidity control at several locations close to the floor. Humidity control includes water features of the display. Heating is designed on a multi-zone to avoid overheating parts of the building. Several temperature sensors at various elevations monitor temp. and RH and average values to modulate the systems properly. The production greenhouses are divided in butterfly production and plant production. The butterfly production has several netted cells for various species. Baffles were installed to force air through the cells to ensure proper ventilation. Services are brought to each individual cells.

TECHNICAL SYSTEMS - Full distributed computer control over the production greenhouses and Butterfly Conservatory, over 300 points of control. Special strategies were called for in the specifications. CO2 injection, HID lighting special rolling and roll-out benches, hot-water modulating heating systems, two-stage insect screening, exaust fans for greenhouses, air inlet through corridors, complete irrigation and fertigation systems, emergency power, high capacity air handlers with CC and HC, chillers.

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