

PLANT SCIENCE CENTER



BUILDING: Donald Danforth Plant Science Center

OWNER: Plant Science Institute
St. Louis, MO, USA

CLIENT: Mr. Tom Goulden, AIA
Hellmuth Obata + Kassabaum
Architects (HOK)
St. Louis, MO, USA

AREA: 13,020 sq. ft.

COMPLETION: 2001

The greenhouse complex is dedicated to research on plants to improve human nutrition & health, studies of root biology and root nutrient interactions, development of resistance to disease & pests, novel materials and bio-based products. The new complex is divided into 15 independent compartments and 2 corridors.

Agritechnove was responsible for facility programming, complete design, drawing and specification, bid documents, and non-resident construction supervision.

SPECIAL FEATURES - Two compartments are completely air-conditioned and heated through their own air-handling systems, independent from the other zones, with adjustable fresh air intake. A permanent monitoring of the greenhouse is tied to the general building control system to provide redundancy. Design to ensure reasonable temperature within the greenhouse in case of coolant system failure by switching to 100% fresh air, fog cooling and use of the horizontal shading system. Natural ventilation is used in four compartments in conjunction with automatic shading and fog system to minimize the use of forced air system. Fresh air is introduced through corridors and from there to each greenhouse compartment, as needed. Other features are: Special insect screening in natural ventilation openings and on positive pressure fans, vertically moving sash panels allowing fresh air in the greenhouse without obstructing corridors. Snow melt function with heat generated close to the roof to ensure structural integrity and snow melting to avoid long periods of time with light obstructed by snow on the roof.

TECHNICAL SYSTEMS - A-frame roof glass structural system with over 450 points of controls distributed DDC control system with greenhouse designed software tied to a weather station. All greenhouse functions are tied to this system: HID lighting, automatic irrigation/fertilization system, high pressure fog system, reverse osmosis water treatment system, pad cooling system, modulating hot-water heating system with fin tube radiators, 2 speed forced ventilation exhaust systems, HAF recirculation fans, positive pressure fans, vertical and horizontal shade/energy curtains, electrical outlets in some zones. Rolltop, fixed, ebb & flow and heated benches are also part of the equipment. Electrical main power, electrical distribution and emergency power that feeds all the mentioned above systems expected the HID lighting system.

