



BIOCONTAINMENT GREENHOUSE

BUILDING:	BL3-Ag Maximum Security Biocontainment Greenhouse and Laboratory
OWNER:	USDA, ARS, BARC-West Beltsville, MD, USA Mr Ray Carrion, P.M.
AREA:	2,500 sf
COMPLETION:	2004

This project was initiated by USDA to provide researchers with a totally contained place for research on exotic pests, biocontrol and creation of genetically modified organisms for special purposes. These organisms must be contained to prevent potentially serious damage to local and regional agriculture. The facility was designed based on the highest agricultural containment level for plants as defined by USDA (BL3-AG) and is a state of the art facility, the only one of its kind currently within the United States.

The facility includes 2,500 sf of research and laboratory and another 2,700 sf of support space. The greenhouse HVAC is designed to operate under a wide temperature range on a continuous basis. Structural rigidity and alignment are above standards, glass is tempered laminated IGU's, resulting in a very airtight research spaces. There are 4 independent greenhouse compartments, 1 laboratory section and a pair of dual-showers (in-out). The building is under several gradients of negative pressure, from the non-contained side to the dirtiest side. A specialized greenhouse computer control system is tied to a general building control system similar to that of other buildings on the campus. Both systems include over 300 points of control, an inordinate number for a building this size. Mechanical systems are almost all redundant. A dedicated biowaste treatment system handles the waste from the contained areas.



Greenhouse and Laboratory

The greenhouses are equipped with lighting system, shading system, benching, fogging, irrigation, deionized water and other necessary research tools. The laboratory has fume hoods, large steam autoclave, ethylene oxide sterilizer, biosafety cabinet, dew chamber, dishwashing and other amenities.

The facility has been solidly tested based on extremely stringent series of test (APHIS, ARS Design Manual, NIH and others) on building envelope, ducting, HEPA filters, biowaste treatment, control system and others.