

## CONTAINED RESEARCH FACILITY



<b>BUILDING:</b>	<b>Contained Research Facility</b>
<b>OWNER:</b>	University of California / Davis Davis, CA, USA
<b>CLIENT:</b>	Anshen + Allen San Francisco, CA, USA Ms Marissa Tweedie, AIA
<b>AREA:</b>	2,480 sf
<b>COMPLETION:</b>	2003

This project was put forward to answer the increasing problems with the multitude of pest and disease problems caused by harmful non-indigenous (exotic) organisms and their also increasing resistance to chemical pesticides. The "Contained Research Facility" is designed to accommodate BSL-3 programs to develop specific chemical, biological and/or physical control measures not currently possible anywhere in the nation. It is a 2480 sf facility incorporating 6 individual greenhouse zones, totally independent from each other and divided in 2 suites: Entomology, Plant Pathology/Nematology and Bioengineering suites. The design process included very frequent meetings with users to discuss at length all possible alternatives to ensure this facility is among, the top ones in the United States. Total BSL-3 greenhouse space is 2480 sf.

Agritechnove was responsible for the complete design of the 6 greenhouse compartments with anterooms, vestibules, storage and other facilities. Agritech also helped in the design of the BSL-3 support space, including soil media handling, potting room, insect rearing rooms and other features.

**SPECIAL FEATURES** - Unique air induction units used in each greenhouse to allow cutting in half the air volumes treated in the AHU's. Special architectural structure, exterior shading system (1 zone for each of 3 suites). Design exceeds NIH BSL-3 requirements. Highly defined and fully detailed airtightness requirements. Full computer control, possibility of adding analog or digital equipment in any zone. Signals used to control other equipment brought in by users. Computer controlled power outlets assignable to any input (digital or analog). Over 250 points of control. Special soil media carts designed for BSL-3 requirements of sterilization, mobile dispensers. Complete communications facilities between BSL-3 and exterior. Humidification and dehumidification equipment, sterilization procedure and equipment for all zones and anterooms. All greenhouse equipment removable, special waste treatment, design incorporates systems for future aquaculture research (high gpm and water treatment). Sophisticated building protocol documents. Inside finish avoiding nesting places for insects and impervious to chemicals. Each insectary suite zone can be transformed in one large cage by installing netting on existing extrusions incorporated in basic design without disrupting HVAC control.

**TECHNICAL SYSTEMS** - Induction units allowing mix of cold air from AC system with same volume of greenhouse air. Negative pressures by rooms, monitored and tied to emergency alarms. Full redundancy of critical systems. Emergency power and UPS to control system. Special control algorithms created for the project. CO2 injection, piped services include DI water, fertilized DI water, cold and hot water, steam, compressed air, vacuum, lab gas. Assignable inputs and outputs at each zone in addition to modulating control of all permanent systems. HEPA filtration of fresh air and exhaust air. HID (HPS & MH) movable lighting system. Planned flexibility throughout to accommodate future research programs and varying needs in terms of equipment and crops.