



Bldg. N-01

QUARANTINE GREENHOUSE

BUILDING:	Facilities Modernization for the Subtropical Agricultural Research Laboratory
OWNER:	USDA/ARS/SARL Weslaco, TX, USA
CLIENT:	Marmon Mok San Antonio, TX, USA Mr Herb Denny, AIA
AREA:	16,780 sf
COMPLETION:	2001

The project started early 1995 and includes new buildings, modernization of several other buildings, existing greenhouse upgrade, design and construction of new research greenhouses and design and construction of a quarantine greenhouse for insect rearing. Each phase required the redaction of a detailed Program of Requirements followed by basic A & E design services. Phases I to IV included the upgrade of one greenhouse (Bldg. 223), the design of 3 new greenhouses (Bldgs. 222, N03-A, N03-B) and the design of 1 rooftop contained greenhouse (per APHIS guidelines) (Bldg. N-01). The next phases included the design of 2 new greenhouses (Bldgs. N03-C and N-03D) and the upgrade of 2 existing greenhouses (Bldgs. 209 & 210). The total area of greenhouses for the project was 16,780 sf.

For each greenhouse, Agritechnove was responsible for the Program of Requirement, the design, drawings and specifications and non-resident construction supervision. Agritechnove was part of a larger design team for this project.

SPECIAL FEATURES - Addition of vestibule to each greenhouse, one BSL-2 greenhouse constantly kept under positive pressure to avoid insect penetration (N-03A). This greenhouse has special air distribution to ensure low-velocity positive air displacement within the shell. Special double limit-switch vent motors allowing for proper positive pressure inside. Piped services and electrical/control conduits mostly embedded in concrete to provide as much light as possible inside the greenhouses. No penetration through glass anywhere. High clearance under the trusses to allow for longer plants.

The APHIS certified greenhouse (rooftop N-01) is completely air conditioned with adjustable fresh air intake. That greenhouse is under negative pressure with permanent monitoring tied to the general building control system and system's 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 an exterior shading system. Structural system designed to withstand 100 miles per hour wind, structural silicone glazing system with sealed units. Special architecturally integrated exterior shading system incorporating three levels of safety against strong winds. Fully dedicated computer control system with all necessary ties for alarms to the general building control system and monitoring and storage of greenhouse parameters. Dedicated waste water treatment.

TECHNICAL SYSTEMS - All greenhouses provided with fog cooling to replace old pad systems. Natural ventilation, shading system, movable benches, insect screened ridge and side vents, new RO systems. Natural gas heating system. HID lighting with movable fixtures. Provisions made for installation of HEPA filtration in N-01 to allow for BSL-3 upgrade in the future.

Non-contained greenhouses under programmable DDC automates tied to weather station. Trellice system incorporated to the structure.