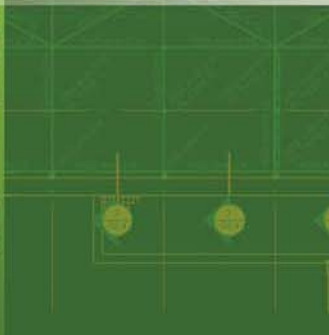
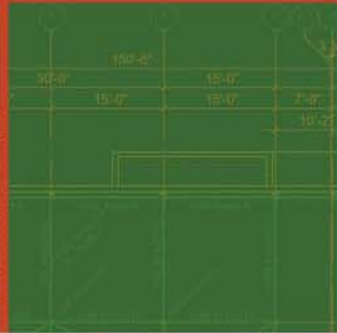
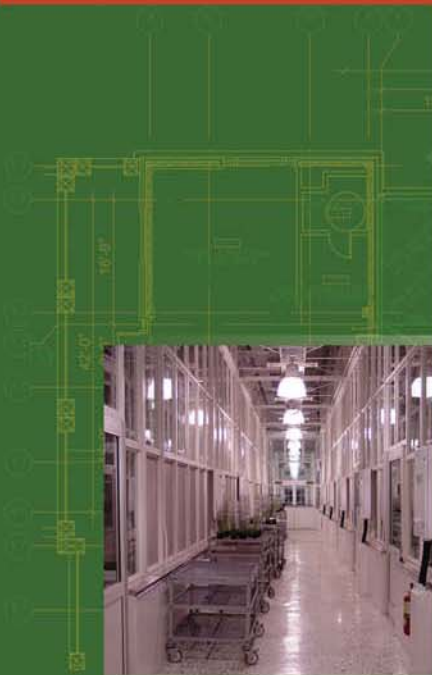


The Growth Professionals

A «GROWING» TEAM OF SPECIALISTS IN PLANT GROWTH FACILITIES



WHY SPECIALIZED DESIGN SERVICES ?

Numerous types of construction today warrant specialized consulting services. As an example, laboratory consultants are routinely hired for the planning of science buildings. Consultants are hired for special projects requiring specialized engineering services and a comprehensive knowledge of the industry standards. Research greenhouses are specialized facilities calling for systems and equipment not found in any other types of construction.

Specialized design services such as Agritechnove's provide a thorough perspective, an ability to plan for longer term and a careful attention to details. The result is a new facility, bid competitively and built on budget with minimal change orders – a facility which offers a high degree of flexibility and versatility – a research tool that easily adapts to the changing requirements of research, with mechanical systems that perform over time with minimal maintenance – and most importantly, a facility controlled and monitored based on specified requirements for additional adaptability.

Agritechnove offers complete A/E services for the design or upgrade of a greenhouse facility. The firm is hired directly by the Client or is integrated to the A/E team of a larger project to take care of the planning and coordination of the greenhouse part of the Works. From technical and functional programming to complete bid documents, the services extend also to the construction phase and, ultimately, to the commissioning of the facility.



PROFESSIONAL SERVICES

Agritechnove's professional services encompass a wide variety of projects, all related to the propagation, growth and study of plant material and insects. Facilities include agricultural and biological research facilities, botanical gardens and flower exhibits, commercial production greenhouse ranges and specialized enclosures, such as custom growth chambers and root study rhizotrons.

The corporation offers a full range of services from the preparation of programmatic requirements through all design stages of drawings and specifications to construction supervision.

A multi-disciplinary professional team with specialists in the fields of biological sciences, as well as electrical, mechanical and civil engineering. For highly specialized problems, leading researchers are contracted, thanks to a wide range of contacts developed over the years.

Work is done in English, French or Spanish, in inch/pound or metric systems.



FACILITIES

BIO-CONTAINMENT GREENHOUSES

Controlled environment research facilities with bio-containment levels from BL-1 to BL-3 (Ag), designed to prevent the escape of undesirable biological agents into the environment. Facilities must comply with standards from different regulatory Agencies.

MOLECULAR FARMING

Larger greenhouse facilities for industrial molecular farming. Standards of construction, flexibility, containment and control requirements are higher than normally used for production greenhouses.

CONSERVATORIES AND ATRIUMS

Glass structures or skylights of various shapes and sizes, typically designed for the conservation or exhibit of various plants, insects or animal species.

INSTITUTIONAL GREENHOUSES FOR RESEARCH AND EDUCATION

A variety of facilities ranging from semi-commercial greenhouses to precise air-conditioned controlled environments, designed according to requirements and budget and based on commercially available structures or special architectural requirements.

OTHER FACILITIES AND SYSTEMS

Agritechnove has extensive experience in the design of highly specialized and precise experimental equipment for plants, insects and animals, such as custom large size growth chambers, rhyzotrons, hydroponic set-ups, mesocosm benches and others. Our team has completed numerous projects for underground growth facilities (mines), mushroom production, forest nurseries, field irrigation systems, etc.

TECHNOLOGICAL EXPERTISE

Agritechnove's professional personnel and technical staff cumulates over 50 years of daily experience in the fields of greenhouses, plant environment and plant growth processes in general. This sector of activity represents over 90% of the corporation's past and current projects. This expertise is backed up by fully computerized operations.

- An impressive data bank holds the most recent technical information on products of over 1200 companies worldwide, all related to plant growth equipment, structures, systems and materials.
- All Agritechnove's drawings are produced on CAD system. The CAD library has expanded over the years to include most greenhouse standards as well as all our specialized designs, many of which have become manufacturer's standards.
- Computers are used for climate modelization, which allows our engineers to forecast energy consumption, usage of water, CO₂ and other services on any given time basis. These tools are most helpful in performing operating costs analyses for a planned or existing facility.
- Computer assisted shade studies are carried out to assess shade cast by surrounding buildings, trees or equipment on the greenhouse.
- Computerized simulations of structures are performed for dimensioning calculations of structural components and foundation.



PHILOSOPHY

The firm's mission is to supply its clients with complete and varied services in the fields of greenhouse design, biological and agricultural research facilities, irrigation and related technologies. The firm targets two major market segments composed, on the one hand, by academic, public or private research complexes and, on the other hand, by commercial and industrial growers.

Our mission is motivated by our belief that the agricultural industry will experience sustained and vigorous growth to meet the ever increasing world demand. Modern production techniques increasingly require precisely engineered facilities. Today's research involves biotechnology, transgenics and environmental impact considerations, which demand sophisticated infrastructures. This is our challenge.



PROFILE

Agritechnove Inc. is recognized for design excellence in agricultural and biological greenhouse facilities. The corporation experienced a rapid expansion since its creation in 1983. In recent years, its multi-disciplinary team has designed several research facilities for USDA, Agriculture Canada, Universities and private corporations. The firm also reached the international market with projects in Algeria, Kuwait, Benin (Africa) and Australia.

Agritechnove's full range of professional engineering services is continually upgraded and enhanced by sophisticated communications and computer systems to anticipate future technological needs in design and production.

Agritechnove is known for the competence, flexibility and dependability of its personnel. In most of its projects, the firm works jointly with larger project A/E teams. Agritechnove takes pride in its ability to integrate smoothly and efficiently with any project team.



STRUCTURAL DESIGN

Through Agritechnove's experience with all major North American greenhouse manufacturers, our design team is keenly aware of standard greenhouse structures and how they can be cost effectively modified to accommodate the client's requirements while staying closer to the standards of the greenhouse industry. Over time, greenhouse manufacturers have become aware of the modifications we impose on their standards, through repeated exposure, and this eases the bid process.

This experience allows our professional engineers to efficiently and consistently take into consideration seemingly «minor details» such as airtightness, efficiency and modular design, and incorporate special architectural constraints in the design. Our structural designers always keep in mind that the structure must allow maximal light within and facilitate the installation of the specialized mechanical systems that will follow. Consequently, the selection of structural members is based on considerations that differ from more regular types of buildings.

MECHANICAL, ELECTRICAL AND CONTROL DESIGN

Agritechnove makes a solid difference when it comes to greenhouse MEP systems. Greenhouses are designed for plants or insects, not for humans. Proprietary software is used for cooling, heating and plumbing calculations. Loads are verified with source systems to ensure required capacities are delivered to the greenhouse. Air conditioning calculations are based on sensible and cooling loads typical of greenhouse environments. Special care is given to supply/return temperatures to avoid blasting cold air on delicate plants. Air distribution within the space is also critical to ensure uniformity of climate within the greenhouse.

Specialized greenhouse systems are typically grouped under division 13 of a project specifications. They include systems such as natural and mechanical summer/winter ventilation, shading/blackout, supplemental lighting, photoperiod control, movable canopies, growing benches of all kinds, fertilizer injection and filtration systems, CO2 control, propagation

systems and many others. All systems are coordinated carefully with mechanical and electrical systems down to their exact location within the space.

Greenhouses are damp environments that corrode electrical material. Our electrical engineers are highly trained in industrial processes and tough environmental conditions. A great deal of care is brought to hide or judiciously locate all electrical equipment and conduits to avoid casting shade in the greenhouse. Most of the conduits are embedded in concrete floors and kneewalls, and are precisely coordinated with the mechanical systems to pop out where required. Computer control is based on available specialized greenhouse systems with all necessary tie-ins to commercial campus-wide building automation and security/alarm systems. Systems can be upgraded and are very flexible with respect to the changing requirements of research.



PROJECT TYPES

Research / Education Greenhouses | Containment & Quarantine Facilities

Insect Rearing Facilities | Conservatories

Commercial Greenhouse Ranges | Reforestation Nurseries | Atriums & Hobby Houses

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