

## **John S. Nelson, PE**

Consultant & Adjunct Professor

### **Education**

Bachelor of Science - Mechanical Engineering, Magna Cum Laude  
Bradley University (1975)

Master of Science  
Mechanical Engineering  
University of Wisconsin (1976)

### **Registration/Certification**

Registered Professional Engineer  
Various States and National Council  
of Engineering Examiners (NCEE)

### **Professional Societies and Activities**

Member –  
University of Wisconsin-Madison  
College of Engineering  
Industrial Advisory Board  
2001 – 2006  
Chair, 2003 – 2004

Member –  
University of Wisconsin – Madison  
Nelson Institute for  
Environmental Studies  
Advisory Board  
2006 – Present

Member-  
Sustainability Subcommittee  
ASCE BOK 2

Former Member –  
National Science Foundation  
Undergraduate Engineering  
Foundation Coalition Board

Former Appointed Member –  
Committee on Prudent Practices for  
Handling, Storage and Disposal of  
Chemicals in Laboratories:  
Subcommittee on Laboratory  
Space and Equipment

Member –  
Green Lake Association Board  
Of Directors

Faculty Advisor –  
UW Madison Emerging Green  
Builders

### **Summary**

Mr. Nelson is a consultant to the design and construction industry, and an adjunct professor in the Department of Civil and Environmental Engineering, College of Engineering at the University of Wisconsin – Madison.

John consults with organizations, both public & private, who view Lean Practices and Sustainable Development as essential strategies. His specific activities include critical analysis, strategy, market development, mentoring, & project participation – including closing & planning.

John seeks to help organizations transform & realize their highest potential by aligning their marketplace opportunities with organizational abilities – and by developing people and competencies through projects.

Examples of recent assignments include:

- Supporting the US General Service Administration Design Excellence Program as an appointed Construction Peer
- Advising a Regional Medical Center on Professional Selection & Project Delivery
- Advising a Major Healthcare System on Capital Strategies
- Supporting WARF on the Wisconsin Institutes of Discovery
- Advising a National A/E on Engineering Strategies
- Advising an Environmental Consultancy on Business Strategies

Academic interests center on Sustainability and Lean Design. Recent conference presentations include:

- “Sustainability & Transportation” keynote speech at Midwest Transportation Forum - Madison Wi. – August 2008
- “Para Professionals in Leadership Constrained Engineering Organizations” discussion with Norman Doll, Executive Leadership Conference – UW Madison – December 2007
- “Sustainable Development in Real Estate” keynote speech – Grasskamp School of Real Estate – UW Madison – October 2008
- Rethinking Sustainable Construction – University of Florida – October 2006
- Lean Management Models for FM and Capital Projects – Rethinking Risk, Long Term Facilities Management Sustainability - Tradeline Inc, April 2007 & 2008

Duties as adjunct professor include lectures in courses such as:

- CEE 498 – Construction Project Management

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Participant –  
LEAD Conference 2008  
Co Sponsored by Stanford  
University and the University  
Of Colorado  
Engineering: Stewardship of the  
Earth  
Sponsored by the National  
Science Foundation  
Summer 2003

Recipient –  
University of Wisconsin  
College of Engineering  
“Distinguished Service Award”

Recipient –  
University of Wisconsin  
Construction Club  
“Lifetime Achievement Award”

Instructor –  
Harvard Graduate School of Design  
2001

Instructor –  
University of Wisconsin Extension  
“Laboratory M/E System Design”

Speaker on energy-related topics  
for:  
The League of Women Voters  
ASHRAE  
The AEE World Energy Congress

Speaker at numerous *Tradeline, Inc.* conferences

Author –  
“Leadership in the Construction  
Industry – The Challenge of the  
Brutal Facts”, With JS Russell, AS  
Hanna, ML Hendrickson. LEAD  
2008 Conference.

“One Big Idea for the Construction

- CEE 578 – Capstone
- EPD 612 - MEPP Technical Project Management
- Inter Engineering 101 – Energy and Sustainability
- RE 365 & 765 – Sustainable Real Estate Development
- CEE 698 – Sustainable Development for Construction
- Business 356/765/601 – Business Sustainability; People, Planet and Profit

Academic duties also include participation in:

- “What would Aldo Leopold Think About Corn Ethanol?”, a seminar series with CoE and Ag
- AEC Project Based Learning Course, with Stanford University and Others
- Energy Institute, CoE
- Weston Lecture Series, CEE and Nelson Institute
- High School Student on Campus Career Days

During his tenure in industry, he served as Project Engineer, Department Head, Project Manager, Vice President and Chief Executive Officer at Affiliated Engineers. His background includes design, applications and research experience with dynamic building systems, along with business and project management.

Selected project experience includes:

**Science and Technology**

**Wisconsin Institutes for Discovery – UW Madison, Madison Wi.**  
Consultant to Wisconsin Alumni Research Foundation for this 300,000 ft<sup>2</sup> facility, whose functions include nanotechnology, biotechnology, and information technology. Planned and designed for changeability – to accommodate regular occupancy change – and sustainability – with resource footprints 50-80% below current campus practice. Implemented with BIM technology and Integrated Delivery techniques. See <http://www.discovery.wisc.edu/>

**Indiana University – Simon Hall – Bloomington, Indiana:** Principal-in-Charge for the mechanical, electrical and piping (MEP) systems design of this new facility which includes space for biochemistry, biophysics and proteomics, genomics and bioinformatics, atmospheric, biogeo and environmental chemistry, protein crystallization and neuroscience and a plant growth facility. Sixty-four percent of the facility will be dedicated to laboratories, a portion of which will be a BSL3 designated space. (2008 Lab of the Year High Honors Recipient)

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Industry – Risk Realignment”,  
Tradeline April 2008

Contributing Author –  
“Design & Delivery of a Graduate  
Level Project Management Course  
For Experienced Professionals”,  
with WP Pfeidehirt, JS Russell, A  
Shenot at 2008 AEEE Conference

“Building Type Basics for Research  
Laboratories” by Daniel D. Watch  
Published by John Wiley & Sons,  
Inc. 2001

Author –  
“Renovation of Research and  
Development Facilities” with Ralph  
Jackson, Jr. and James Miller  
*Industrial Development*  
July/August 1988

Author –  
“Planning Functional R&D  
Facilities,” with Ralph Jackson, Jr.,  
Published by Flad & Associates  
1985

Author –  
"The Practical Application of Heat  
Recovery Concepts,"  
*WEEC* October 1981

Author –  
"Northern Tri-Load Solar Energy  
System"  
*ASHRAE Journal* September 1980

Author –  
"Performance of Open Cycle Air  
Conditioning Systems,"  
*Solar Energy Journal* 1978

**Employment History**

Present - Consultant,  
Adjunct Professor

**University of Illinois at Chicago - College of Medicine Research Building - Chicago, Illinois:** Principal-in-Charge of MEP systems design and planning services for a new 330,000 sf research facility. The project also included a renovation of the adjacent facilities for existing research operations. The new research facility will contain physiology and biophysics, biochemistry, microbiology and immunology, pharmacology and pathology. The building will house clinical researchers working with funded researchers in those departments, providing for on-going interdisciplinary research.

**University of Wisconsin - Engineering Centers - Madison, Wisconsin:** Principal-in-Charge for programming, site and building concept analysis, as well as subsequent MEP/IT/Lighting systems design and construction administration services for this state-of-the-art facility. The 204,000 sf Engineering Centers is a progressive teaching/learning environment that supports the College of Engineering's vision for the integration of education and research. The building allows students to learn in an innovative environment that incorporates different engineering disciplines into one space and allows students to begin to utilize hands-on skills beginning in their freshman year. This facility houses space for both student and research centers including, nano material, nano fabrication, plasma manufacturing, common labs, biomedical research, Class 10, 100, 1,000 and 10,000 clean rooms, trace centers and an automotive and engine dyno room.

**University of Wisconsin - Biochemistry/Nuclear Magnetic Resonance (NMR) Building - Madison, Wisconsin:** Principal-in-Charge of MEP design services for a new 186,400 sf facility providing 166,400 sf of biochemistry research and support space and 20,000 sf for an NMR center. The biochemistry area houses research laboratories, an animal facility, plant growth chambers, a library, administrative offices and conference rooms. The building includes 20 twelve-person labs and eight six-person labs. The National Institutes of Health - funded NMR center houses four spectrometers consisting of a 500-, 600- and 750-MHz magnet, as well as a new high-field 1 GHz spectrometer.

**University of Oklahoma - Biomedical Research Center - Oklahoma City, Oklahoma:** Principal-in-Charge of MEP design and construction of an 187,000 sf biomedical research center (BRC) adjacent to the existing biomedical sciences building. The BRC houses research groups working in biomedical science (i.e., molecular medicine, neuro-biology, invasive cardiology, structural biology, human genetics, thrombosis, toxicology, drug abuse and population-based

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– CEE, UW  
Madison  
1977 – 2004 Affiliated  
Engineers, Inc.  
1975 – 1977 University of  
Wisconsin -  
Department of  
Mechanical  
Engineering  
Specialist and  
Research Assistant  
1972 – 1975 Caterpillar Tractor  
Co. (Co-Op)

epidemiological studies). The facility includes 64,000 sf of bench labs, a biocontainment suite, an immuno-efficient and transgenic species suite, an infectious disease suite, 4,000 sf of animal holding rooms and 6,000 sf of shared core laboratories.

**North Carolina State University - College of Engineering - Raleigh, North Carolina:** Principal-in-Charge of MEP and master planning for a new campus to house teaching and research facilities including classrooms, laboratories, administrative offices and seminar spaces. Phases I and II are under design and construction, as is the campus central plant and infrastructure.

**Northwestern University - Basic Industry Research Laboratory - Evanston, Illinois:** Principal-in-Charge and Project Manager for programming and MEP design services for a 130,000 sf industrial research facility in Evanston University Research Park. The facility houses a two-story vibration generating, high-bay laboratory and a six-story tower containing generic physical chemistry and physical properties laboratories and office space. Research conducted on-site ranges from metal processing and materials manufacturing, biocatalysts, geology and geophysics, environmental technology, chemical synthesis, electrochemistry, chemical analysis, electron microscopy and spectroscopy.

The following represent additional Science and Technology projects Mr. Nelson has served on:

- **University of California – Geology and Marine Biology Building – Santa Cruz, California**
- **University of Wisconsin – School of Veterinary Medicine – Madison, Wisconsin**
- **University of Florida – School of Veterinary Medicine – Gainesville, Florida**

### **Healthcare**

**Columbia St. Mary's - Facilities Integration and Expansion – Milwaukee, Wisconsin:** Principal-in-Charge for this multi-campus project that will consolidate two existing hospitals into one new hospital in an urban setting; expand an existing, suburban hospital; and create several new outpatient facilities in outlying community areas. The new hospital campus will consist of world-class facilities that combine strong clinical programs and the latest technology in an innovative healthcare delivery system that is designed around patient needs.

**Lutheran General Hospital - Park Ridge, Illinois:** Principal-in-Charge

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for master planning of an expansion of a 1.3 million sf complex with a 712-bed acute care general hospital on a 64-acre campus.

### **Medical Science**

**National Institutes of Health - Clinical Research Center - Bethesda, Maryland:** Principal-in-Charge of programming and design of a 1.3 million sf world-class, flexible and adaptable facility that is a full replacement of the existing Clinical Center. The facility will have 850,000 sf of core program functions and include 250,000 sf of laboratories, an imaging center including PET, 200 inpatient beds, several day-hospital stations and a vivarium. The complex includes an interstitial above each occupied floor with a full, walkable deck.

**University of Texas - M.D. Anderson Cancer Center - Houston, Texas:** Principal-in-Charge of the development of a 15-year master plan to guide functional and cost-effective physical renovation and development of this three million sf cancer center. The project included a two-phased existing facilities assessment and development of a facility database management system. The master plan provided strategies and data for both long-term functional changes and ongoing facility capital renewal and improvement projects. Project elements included:

- Electrical system upgrade and essential electrical system contingency plan
- New research facility planning & concepts
- Nuclear medicine renovation
- Development of MEP standards
- Reuse optimization
- Replacement research facility
- Commissioning of patient care and research buildings

**University of Texas – M.D. Anderson Cancer Center – Basic Science Research Building – Houston, Texas:** Principal-in-Charge for this new, 520,000 sf multidisciplinary research building designed to further MDACC's transition from separate discipline research to multidiscipline research. The project includes BSL2 and 3 research spaces, a 125,000 sf animal vivarium and fully walkable interstitial space for utility distribution.

**Fred Hutchinson Cancer Research Center - Seattle, Washington:** Principal-in-Charge of master planning and subsequent MEP design

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services for Phase I, II and III for this five-phase, one million-plus sf cancer research campus. Basic and clinical research, patient treatment and the study of cancer prevention all take place under the roof of this world-class facility. Phase I was a 305,000 sf laboratory facility and associated 25,000 sf vivarium and health resources center; Phase II was a 210,000 sf laboratory facility; and Phase III was a 130,000 sf outpatient facility.

**BJC Health System/Washington University Medical Center – Campus Integration Plan – St. Louis, Missouri:** Principal-in-Charge for the multi-million dollar campus integration project launched by Washington University, home of Barnes-Jewish Hospital and St. Louis Children’s Hospital (BJC Health System). The project consolidates and relocates medical services, create new treatment facilities, add amenities and improve the medical center grounds. Most outpatient, diagnostic and testing services, as well as cancer services, are now located on the north side of the campus, and all high-intensity, complex surgical cases and related care are delivered on its south end, including the new emergency and trauma center.

In addition to the original master planning project, Mr. Nelson also was responsible for the following design project:

- Center for Advanced Medicine – 650,000 sf facility includes ambulatory care, cancer center and diagnostic and treatment services
- Charles F. Knight Emergency and Trauma Center – 250,000 sf provides emergency and urgent care and trauma area in one well-marked, accessible center
- Parking facilities
- New operating rooms (28) and the renovation of existing Ors

**University of Florida - Shands Teaching Hospital - Gainesville, Florida:** Project Engineer for MEP design of the renovation, expansion and construction of a \$100 million research and teaching hospital.

**University of Wisconsin - Clinical Science Center - Madison, Wisconsin:** Principal-in-Charge and Engineer for numerous expansion and remodeling projects.

**Research**

**Pfizer, Inc. (formerly Pharmacia) - Building Q - Skokie, Illinois:** Principal-In-Charge of this 176,000 sf building that includes offices,

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chemistry and biological science laboratories, a vivarium and production pilot operations. AEI incorporated sustainable site planning, energy efficiency, material and resource conservation, indoor environmental quality and water safeguarding into the green design. This project achieved a Gold LEED™ rating from the U.S. Green Building Council.

**Allergan, Inc. - Irvine, California:** Principal-in-Charge of MEP design of a 150,000 sf research and development facility that includes a 40,000 sf vivarium, a 7,000 sf central plant and chemical and biology labs.

**Bausch and Lomb Pharmaceuticals - Optics Center Laboratory - Rochester, New York:** Project Manager for all programming and design services, including architectural and engineering, for 100,000 sf of laboratories for the personal and professional products division. The project was selected as a high honors winner in the “1989 Lab of the Year” competition sponsored by *R&D Magazine*.

**Boehringer Ingelheim Pharmaceuticals, Inc. – Research Facility Expansion – Ridgefield, Connecticut:** Principal-in-Charge of planning, programming and MEP design services for a pharmaceutical research facility expansion, which included 114,000 sf of animal research space, 93,000 sf of laboratories and office space.

**Genentech, Inc. – South San Francisco, California:** Principal-in-Charge of MEP design services for multiple research and development facilities. The Founders Research Center contains biological, analytical and organic laboratories, offices and major mechanical and building support spaces. Building 3D is a 45,000 sf cell culture and fermentation facility. The Process Science Center is a 165,000 sf laboratory and development facility.

**Texaco, Inc. - Beacon, New York and Port Arthur, Texas:** Principal-in-Charge for master planning of a 600,000 sf of petroleum and process research facilities.

**Glidden Research Center - Strongsville, Ohio:** Principal-in-Charge and Project Manager for a detailed analysis of the laboratory supply and exhaust air systems serving one wing of a major paint and coatings research facility. Following the study, final construction documents were completed for renovating the HVAC systems serving the wing.

**Amgen (formerly Immunex) - Helix Project - Seattle, Washington:** Principal-in-Charge for all dynamic utility systems master planning for a new research campus totaling over two million sf. Mr. Nelson also served as Principal-in-Charge for the implementation of the MEP design for Phase I, 750,000 sf of space including four laboratory buildings, two adjoining office buildings, a commons building (cafeteria, auditorium,

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library and executive offices), a central utility plant, and renovation of an existing warehouse.

### **BP Research (formally SOHIO) - Warrensville Heights, Ohio:**

Principal-in-Charge and Project Manager for the development of a master plan for a research campus, the design of utility infrastructure upgrades and pilot plant expansions, the preliminary design of new central utility plant and the preliminary design of a laboratory expansion.

The following represent additional research projects Mr. Nelson has worked on:

- **United States Department of Agriculture (USDA) – Dairy Forage Research Center – Madison and Baraboo, Wisconsin**
- **U.S. Geological Survey – Doraville, Georgia and Arvada, Colorado**
- **Honeywell - Sensor & System Development Center – Bloomington, Minnesota**
- **Amoco Corporation – Building 200 – Naperville, Illinois**
- **James River Corporation – Neenah, Wisconsin**

### **Infrastructure**

#### **University of Wisconsin – Campus Master Plan – Madison,**

**Wisconsin:** Principal-in-Charge for the study that analyzed existing utility distribution systems, quantified present demand on utility systems and established specific utility corridors for future campus expansion.

#### **University of Illinois at Urbana-Champaign - Chilled Water System**

**Upgrade - Champaign, Illinois:** Principal-in-Charge for a new chilled water plant with an initial cooling capacity of 15,000 tons and a future capacity of 30,000 tons. The scope of work also included installation of a distribution piping system and connection to the new distribution system.

#### **University of North Carolina - South Chiller Plant Expansion -**

**Chapel Hill, North Carolina:** Principal-in-Charge of Phase I of a five-phase project, which involved the expansion of the existing 4,000-ton south chiller plant to an eventual 19,000 tons. A new satellite plant was constructed. All phases have now been implemented.

#### **Oklahoma State University - Chilled Water System Study and**

**Implementation - Stillwater, Oklahoma:** Principal-in-Charge for a study of long-term chilled water expansion needs which included load projections, distribution system analysis, thermal storage analysis and

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options for expansion. The chilled water system had a capacity of 12,600 tons with a future capacity of 28,000 tons. The study consisted of a computer simulated hydraulic system analysis and a schematic layout of a new 16,000 ton chilled water plant. The study was followed by in the complete design and implementation of the west side chilled water plant and distribution system, for which Mr. Nelson was the Engineer of Record.

### **Loctite Corporation - Central Plant - Rocky Hill, Connecticut:**

Principal-in-Charge for the design of a central plant capable of cogenerating 1200kW of electrical power via two engine-generator sets, which are paralleled with a 23kV primary feeder from the local utility. The cogeneration system is expandable to 1800kW. Waste heat energy is reclaimed off of the engine-generator sets and is used to produce either chilled water at a single-stage steam absorption chiller or for building heating and domestic hot water production. The central plant is currently capable of producing 1,300 tons of chilled water for cooling and 19,000 MBH of hot water for heating/reheat. Both systems are expandable to 2,030 tons and 26,500 MBH respectively. The project was delivered with third party financing.

**Repsol Petroleo - Madrid, Spain:** Principal-in-Charge and Project Manager for the master planning of the MEP infrastructure for a new research site for the National Oil Company of Spain, as well as preparation of a basis of design document. Also provided assistance to the chosen design team in Spain for the master plan and detailed design.

**Boehringer Ingelheim Pharmaceuticals, Inc. – Utility Extensions - Ridgefield, Connecticut:** Principal-in-Charge and Project Manager for this high temperature hot and chilled water extension.

The following represent additional Infrastructure projects Mr. Nelson has worked on:

- **Amoco Corporation – Chilled Water Improvements – Naperville, Illinois**
- **United States Air Force Reserve – Minneapolis, Minnesota**
- **BP Research (formally SOHIO) - Warrensville Heights, Ohio:**

### **Office Buildings**

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**Lands' End – Office Building - Dodgeville, Wisconsin:** Principal-in-Charge of MEP engineering design services for a new two-story, 100,000 sf office building utilizing an open floor plan configuration and a new central utility plant.

**Modern Woodmen of America - Home Office Building Expansion - Rock Island, Illinois:** Principal-in-Charge for a 90,000 sf, stand-alone addition connected to the existing headquarters via an enclosed bridge. The building includes 70,000 sf of new office space, all of which incorporates a six-inch raised floor, a 5,000 sf data center, multiple training rooms and parking on the lower two levels.

**Northwestern Mutual - Corporate Office Expansion - Milwaukee, Wisconsin:** Principal-in-Charge and Project Manager for programming, analysis and design services for this 18-story, 565,000 sf corporate office expansion and data center. The project employed raised floors in offices for flexibility and a high degree of modularity to accommodate “briefcase moves.”

**Wisconsin Electric (WEPCO) - Corporate Headquarters Addition - Milwaukee, Wisconsin:** Project Engineer for programming and MEP systems planning and design for WEPCO's new 420,000 sf corporate building. This facility houses 1,100 employees and six major areas including a data center, administration, quality testing laboratories and research and development.

**American Family Insurance Company - National Headquarters - Madison, Wisconsin:** Principal-in-Charge for facilities master planning and MEP design of a 1.3 million sf national headquarters facility. This facility was the first to be constructed on this site, necessitating the coordination and planning for the extension of gas, electric and phone services into the area. This first phase of construction included more than 540,000 sf of office space; 64,000 sf of education/training space; and more than 220,000 sf of support space, including a 64,000 sf data center and a disaster recovery computer room.

**Bayer, Inc. - Divisional Headquarters - West Haven, Connecticut:** Mechanical Specialist for the design of a 250,000 sf divisional office which is connected to the existing utility infrastructure system. The total area is divided between two low-rise buildings. Air-handling equipment is located in penthouses allowing for intake air to be taken above the level of the adjacent freeway. The integrated interior design accommodates indirect lighting, flexible air distribution and a light shelf bringing daylight into the perimeter office zone. Voice and data systems

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are supported through a main telecommunications room and local LAN satellite rooms. The scope of services included design services for site storm water abatement calculations and design.

**J. I. Case - Corporate Headquarters - Racine, Wisconsin:** Principal-in-Charge of engineering design services for a 120,000 sf corporate headquarters facility, which includes a cafeteria, a large open atrium and a combination of enclosed/open office and conference space. The building is four stories in height with a mechanical penthouse for HVAC equipment and has a fully engineered smoke control system due to the atrium design.

### **Public Buildings**

**Midwest Express Center - Milwaukee, Wisconsin:** Principal-in-Charge of engineering design services for the design of the 676,000 sf state-of-the-art convention center. This facility incorporates a central utility plant, telecommunications infrastructure and automatic lighting controls for meeting rooms and the ballroom.

**Overture Center for the Arts - Madison, Wisconsin:** Principal-in-Charge for this 400,000 sf visual and performing arts center located in the center of downtown Madison. A 2,400-seat multi-purpose performance hall/theatre is being designed and built during Phase I, as well as a striking new entrance to the center. Renovating Madison's historic Oscar Mayer Theatre occurred in Phase II, improving acoustics and sight lines while retaining the beauty of the existing space.

### **Industrial**

**Bausch and Lomb Pharmaceuticals - World Headquarters - Tampa, Florida:** Principal-in-Charge for a 154,000 sf headquarters facility. This facility included pharmaceutical manufacturing areas (sterile/nonsterile ophthalmic products), warehousing space, quality control testing laboratories, research laboratories, pilot plant laboratories and administrative office spaces. Class 100 clean rooms are the nucleus of the aseptic areas where the product is exposed. Main fill and packaging rooms are Class 1,000. Buffer zones are Class 10,000 and 100,000, meeting Good Manufacturing Practice (cGMP) requirements.

**The Boeing Company - Boeing Materials Technology (BMT) Complex - Seattle, Washington:** Principal-in-Charge for preliminary design of the 340,000 sf complex consisting of laboratories for materials

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research in the areas of composites, chemistry, flammability, corrosion, textiles, metals and ceramics. The complex also includes offices for the development of documents, standards and specifications to control the properties of products purchased from suppliers. Mr. Nelson worked with users, the owner and the owner's planning consultant to identify characteristics of, and requirements for, mechanical and electrical systems to support the project.

**Lifescan, Inc. - A Division of Johnson & Johnson - Milpitas, California:** Principal-in-Charge for the design of a 140,000 sf medical device manufacturing facility that includes offices, research and development labs and low humidity rooms and environmental control of exhaust stacks using oxidation equipment. This was a fast track project designed and built in 12 months.

**Boehringer Ingelheim Pharmaceuticals, Inc., - HVAC Analysis – Ridgefield, Connecticut:** Principal-in-Charge for the evaluation of the HVAC systems serving the clinical pharmaceutical manufacturing and testing areas of BIPI's research facilities. The purpose of the evaluation was to determine modifications necessary to achieve cGMP conditions for this production facility. This analysis began with a clarification of the Basis of Design criteria, including temperatures, humidity, pressure relationships, etc. It was then followed by a detailed on-site evaluation of existing conditions, including measurements. The measurements served as the database for subsequent analyses and revealed many system deficiencies. Some of these deficiencies were remedied quickly, while others required substantial system modification in order to allow cGMP conditions to be met.

### **Higher Education**

**University of Wisconsin - Weidner Center for the Performing Arts - Green Bay, Wisconsin:** Principal-in-Charge for MEP, fire protection, security and communications programming analysis and design for this arts facility. This center is a multi-purpose performing arts facility that includes a 2,000-seat auditorium with two balconies, a 200-seat ensemble hall for symphony rehearsals and music recitals and a dance studio.