

Name: GREG L. OWEN, P.E.

Title: Cleanroom Design Principal

Education: B.S., 1974, Mechanical Engineering, Purdue University

Registration: Professional Engineer, Pennsylvania, Maryland, Colorado
Professional Mechanical Engineer, Idaho, Oregon

Affiliations: American Society of Mechanical Engineers
National Society of Professional Engineers



I have over 40 years' experience in project management, engineering management, design and construction of facilities in the semiconductor, food, pharmaceutical, industrial, and advanced technology areas. I have held design and construction positions as a Cleanroom Planning and Design Consultant, Project Engineer, Project Manager, and Engineering Manager.

Representative assignments include:

- University of Texas at Austin Montopolis Cleanroom Project, Technical Consultant to the Universities Planning, Design and Construction Group addressing cleanroom design and construction issues related to the Montopolis Project.
- University of Texas at Austin Montopolis Cleanroom Project, Technical Consultant to the Universities Planning, Design and Construction Group addressing cleanroom design and construction issues related to the Microelectronics & Engineering Research Center Cleanroom Expansion Project
- University of Texas, Arlington Montopolis Cleanroom Project, Cleanroom Consultant responsible for the development of a basis of design document for upgrading the existing 1988 Cleanroom (originally built for Sematech) for use by the University for research in advanced packaging technologies.
- Penn State University, State Collage, Pennsylvania, Cleanroom consultant for the CHIMES project Programming, Schematic Design, Design Development, and providing technical guidance Construction Documentation Preparation. Provide Cleanroom related Bid evaluation and Services During Construction addressing cleanroom related issues. Project involved the addition of 2300 sf of class 10, 100 and 10,000 cleanroom space to the existing Millennium Science Center Cleanroom and the renovation of 4300sf of abandoned research laboratories in the West Electrical Engineering building into a class 100/1000 bay and chase cleanroom.
- University of Colorado, Anschutz Health Sciences Building, Colorado Center for Personalized Medicine & Behavioral Health: Cleanroom Consultant for the Compounding Pharmacy Cleanroom Suite (ISO Class 5 or Better) designed and constructed to meet the requirements of USP General Chapter 800, Hazardous Drugs – Handling in Health Care Settings.
- Carnegie Mellon University (CMU), Scott Hall Nano-Bio-Energy-Technologies Building, Pittsburgh, Pennsylvania. Cleanroom Consultant for tool support systems and tool engineering services for the Claire and John Bertucci Nanotechnology Laboratory. The energy efficient facility contains Class 10 and 100 Cleanroom environments and is LEED Gold certified. Provide industrial interior design for the cleanroom and chemical and gas storage and dispensing rooms with incidental engineering. This included cleanroom Architectural concept, recirculation air system – ceiling plenum and recirculation fans; gas distribution devices (gas cabinets, VMBs, gas panels, and cylinder restraints); ultrapure stainless-steel

pipework specification and line sizing – cleanroom cylinder gases only. Provide design support for the development of the shell and allocation of footprint during programming and schematic design, moving to more detailed work products in design development and then to detailed construction documents. Support during the bidding phase of the project and during execution of construction.

- University of Chicago Pritzker Nanofabrication Facility, part of WERC Institute of Molecular Engineering, Chicago, Illinois. Project Engineer. A design-build research cleanroom project with a local contractor. We provided full tenant improvement design for a 10,000SF cleanroom with 6,000SF of support area within a multi-story research facility being designed concurrently by others. A BIM based design was developed over a five-month period in close cooperation with the user group and base building design team. Responsible for providing design guidance for Jacobs' design leads as well as the client user group from experience on many other similar projects. Overall responsibility for including contract scope into the design, coordinating design between disciplines and quality control. This Design-Build Project included a bay-and-chase, low wall return design cleanroom with over 12,000 GSF in area and ranging from class 1,000 to class 100 performance
- University of Glasgow, Glasgow, Scotland: Cleanroom Consultant for Programming and Schematic design (UK Stage 1) for the new James Watt Nanofabrication Center to be constructed at the new Clyde Waterfront Innovation Campus (CWIC). With 40,300 sf of class 10 through Class 100,000 clean space spread over four cleanrooms the facility is designed to support industry collaboration, nano-science research, and University academic programs while providing a world class environment like those found in industry and peer University facilities globally.
- University of California, Los Angeles, California Nanosystems Institute, Court of Sciences, Los Angeles, California. Cleanroom Consultant with the Lab Planner, Project Architect and Mechanical Engineer in the design and construction of the facilities Material Science and Biological cleanrooms (Class 10 / 100). Activities included Resolution of HPM Storage concerns, Development of cleanroom concepts and air management systems, Tool Utility Matrix development, draft HMMP Preparation and development of design approaches to address HPM delivery, storage and dispense within the confines of the UCLA Campus setting.
- University of Houston, Science and Engineering Classroom Building, Nanotech Research Cleanroom. Cleanroom Consultant with the Lab Planner, Project Architect and Mechanical Engineer in the design and construction of the facilities Material Science cleanrooms (Class 1000 / 100). Activities included Development of cleanroom concepts and air management systems, Tool Utility Matrix development, Conceptual development of Process Support systems and development of design approaches to address HPM delivery, storage and dispense within the confines of the U of H Campus setting. Site observations during construction and cleanroom specific contractor submittals were reviewed and final facility acceptance recommendations were provided.
- University of Texas – Austin, Engineering Education and Research Center. Cleanroom Consultant providing full, all discipline schematic design and design review for the 1400sf class 1000 and 10,000 Instructional Cleanroom.
- University of KwaZulu – Natal, Durban, South Africa. Cleanroom consultant providing full, all discipline schematic design, design development and design review for a 700sf class 10,000 Soft Litho / Microfluidics cleanroom located in the K-Rith Medical Research Building. The construction documents were completed by an in-country AE firm. Also provided were construction specifications-based materials easily obtainable in South Africa