

Bay

Consulting Engineers

Engineering • Project Management

**Statement of Qualifications
For
Bay Consulting Engineers**

“From Concept to Completion”

Top Clients

get

Top Services

from

Top Professionals

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Consulting Engineers

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Company Profile

Bay Consulting Engineers is a multidiscipline engineering and project management firm that serves industrial, institutional, governmental, and commercial clients. Our team has worked together for over fifteen years in Silicon Valley. Based on our proven, cohesive and successful work experience we offer our clients quality professional engineering and project management services.

We perform with a highly skilled professional team working together, using common sense, practical experience, and best in kind methods and practices. We are guided by the following principles:

- Responsiveness to customer needs.
- Provide professional quality services on time and on budget.
- Develop a follow-up strategy to gauge performance with all customers.
- Provide a service-oriented approach to support our customers.

As a full service multidiscipline organization, Bay Consulting Engineers controls budget, schedule and quality with effective management of all projects. This service, traditionally offered by large organizations with correspondingly large overheads, is sorely missing in the Silicon Valley. Projects can be delegated to Bay Consulting Engineers directly or arrangements can be made to supplement and assist our clients' in-house staff.



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Professional

- LEED Certified – Sustainable and Green Designs.
- Close Collaboration with Academia – Stanford, Berkeley and Arizona State.
- Professional Organizations Membership– ISPE, ASHRAE, IEEE, ASME, AIChE, SEMI.

Sample Projects Performed:

Bay Consulting Engineers has performed projects in Santa Clara, Alameda, San Mateo, and Sonoma Counties.

Bay Consulting Engineers is the engineer of record for the mechanical systems design of multiple projects for the Mask Operation site renovations for a confidential client in the South Bay. This is the largest construction project for an industrial facility at present in Santa Clara County. The exact construction value has not been disclosed, but we estimate it to be in excess of \$50 million.

Bay Consulting Engineers is performing engineering services for multiple projects for Alza Corporation in Mountain View. These projects include the following:

- Development of air flow diagrams for existing laboratories and the HVAC equipment; analyze and resolve lab pressurization concerns.
- Design solutions for laboratory hood exhaust systems for multiple buildings.
- Design conversion of Building PA-11 chiller plant to primary/secondary pumping.

Bay Consulting Engineers has performed evaluations for air handling units for Genentech in South San Francisco to resolve temperature distribution concerns.



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Bay Consulting Engineers has completed designs for multiple projects for Hitachi Global Storage Technology in San Jose.

Bay Consulting Engineers is the architect and engineer of record for the detail design of the 96 unit Apton Apartment Complex in Milpitas that is now in design phase. The value of the construction will exceed \$12 million.

Client References

Mr. Eric Haraga, Managing Partner, Ei8ht Entertainment Group, 408-757-7447

Ms. Natalie Thomas, Project Manager, HMC Architects, 408-977-9160

Ms. Melinda Lum, Project Leader, HMC Architects, 408-977-9160

Mr. Donovan A. Dolojan, Project Manager, HMC Architects, 408-977-916

Mr. Jose Yow, Project Engineering Manager, Intel, 408-765-9471

Mr. Hugo Ojeda, Facilities Program Manager, Hitachi, 408-717-6412

Mr. Rod Mahdavi, Sr. Facilities Engineer, Alza-Mountain View, 650-564-3026

Mission Statement

Bay Consulting Engineers strives to deliver to our clients outstanding engineering and project management services; to provide fulfilling careers and professional satisfaction for our people; and to achieve financial success so that we can reward ourselves and grow.



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Why Bay Consulting Engineers is the Right Choice?

Proactive Help for You

- Principals active in all projects
- Fresh ideas that will make a difference
- Clear and concise communication during the project
- Big firm experience, small firm attention
- Direct service approach – no extra layers or extra costs
- Local decisions and direction, national and international resources

Timely, Reliable Responses to Your Needs

- Four hour response to phone calls
- We meet deadlines
- Voice mail and email to all principals and employees
- We can meet you today or tomorrow

People Who Know your Business

- Your information is confidential and secure
- We hire only experienced engineers and designers
- You do not pay for training or startup costs
- We work closely with your team to leverage their abilities



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General Services

Bay Consulting Engineers offers complete design and project management services to clients. These services can be any or all of the following:

- Project definition, programming, planning, and organization.
- Site Master planning.
- Rezoning and obtaining of building permits.
- Managing the design process through construction documents.
- Expedite plan checking through authorities having jurisdiction.
- Preparation of bid documents.
- Managing startup and commissioning process.
- Preparing as-built record drawings and assembling owner's manuals.



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Discipline Services

Bay Consulting Engineers offers clients multidiscipline engineering capabilities in the following areas:

- Project Management
- Mechanical/HVAC
- Plumbing
- Chemical / Process Systems and Piping
- Electrical
- Telecommunication
- Life Safety
- Site Security and Safety
- Instrumentation and Controls
- Automation and Systems Integration
- Process Optimization; and Sustainable and Green Design
- Risk Assessment and Minimization



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Partial List of Successful Projects Performed

Offices, Commercial and Institutional

Lead Mechanical and Lead Electrical - **Ei8ht Entertainment Group, San Jose, California:** Engineering services for a new 4000 square-foot lounge restaurant and bar in downtown San Jose, California

Lead Mechanical and Lead Electrical - **HMC Architects, San Jose, California:** Renovations of 9 San Jose Unified School District Schools.

Lead Mechanical and Lead Electrical - **Badru Valani Developer, Milpitas, California:** Engineering services for a new 98 unit apartment complex in Downtown Milpitas, California

Lead Mechanical and Lead Electrical – **John Alkis, Phoenix, AZ :** Engineering services for a new 392 unit apartment towers in Downtown Phoenix, Arizona

Lead Electrical – **James A Guthrie Architects, Moulton Plaza, Sunnyvale, California:** Electrical Engineering services for a 128 unit apartment complex.

Lead Mechanical and Lead Electrical – **Reid Lerner Architect, Gilroy, California:** Engineering services for a new 10,000 square-foot supermarket in Los Banos, California

Lead Electrical - **Reid Lerner Architect, Gilroy, California:** Electrical engineering services for various solar panel projects for residential and commercial spaces and interconnection to the power utility company.

Project Manager - **Virginia Terrace, San Jose, California:** Entitlement, permitting, schematic design, design development, establishing project budget and financial projections for a 170 units, for-sale town homes project to be constructed over a 2-level podium on 2.2-acre site.

Project Manager - **Millbrae Station, Millbrae, California:** Entitlement, permitting, schematic design, establishing project budget and financial projections for a 120 units, for-sale, town homes and flat condominiums project to be constructed over a podium on a 2-acre site.

Mechanical Engineer - **Sandhill Office Building, Palo Alto, California:** Design of mechanical systems for a 20,000 square-foot two story office building.

Mechanical Engineer - **Hotel Versailles Restaurant, San Jose, California:** Design of HVAC and plumbing systems for a 95-seat restaurant, kitchen and laundry facility.

Mechanical Engineer - **Interland Building 12, Hayward, California:** Design of mechanical systems for a 25,000 square-foot, three story office building.



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Partial List of Successful Projects Performed by Principals

Offices, Commercial and Institutional (Continued)

Lead Electrical Engineer - **Remax Professional Plaza Building, Fremont, California:** Electrical, mechanical and plumbing design of new 2-storey, 20,000 square foot office building.

Lead Electrical Engineer - **Mount Calvary Lutheran School, San Jose, California:** Complete electrical, mechanical and plumbing design for new classrooms and gymnasium facilities.

Lead Electrical Engineer - **Fremont Christian School, Fremont, California:** Complete electrical, mechanical and plumbing design for new administration and classroom buildings.

Lead Electrical Engineer - **Fremont Middle School, Stockton, California:** Complete electrical, mechanical and plumbing design, including electrical systems analysis, upgrade and modification.

Lead Electrical Engineer - **Fremont Christian School, Day Care Facilities, Fremont, California:** Complete electrical, mechanical and plumbing engineering and design for new daycare facilities.

Lead Electrical Engineer - **Sleep Inn Hotel, San Jose, California:** Electrical, mechanical and plumbing design for a new hotel.

Lead Electrical Engineer - **Holiday Inn Express, Hollister, California:** Electrical, mechanical and plumbing design for a new hotel.

Lead Electrical Engineer - **County of Santa Clara, Parks and Recreations Department, Santa Clara, California:** Electrical and mechanical systems renovation of various parks.

Lead Electrical Engineer - **Billy De Frank Community Center, San Jose, California:** Complete electrical, mechanical and plumbing design for the renovation of existing community center facility.

Lead Electrical Engineer - **San Jose Redevelopment Agency, San Jose, California:** Complete electrical engineering design for City of San Jose's various streetscape, parks, and public areas lighting system projects.



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Partial List of Successful Projects Performed by Principals

Data Centers

Project Manager - **US DataPort, San Jose, California:** Entitlement, Permitting, schematic design, design development, establishing project budget and financial projections for 2.5 million square feet of data center campus on 174-acre site. Project included 250 MW cogeneration power plant and 60,000 tons capacity chiller plant.

Project Manager - **US DataPort, Prince William County, Virginia:** Entitlement, Permitting, schematic design, design development, establishing project budget and financial projections for 3.4 million square feet of data center campus on 186-acre site. Project included 250 MW cogeneration power plant and 80,000 tons capacity chiller plant.

Project Manager - **US DataPort, Bayonne & Irvington (2 sites), New Jersey:** Site evaluations, infrastructure investigations, County and City negotiations for the development of 2.5 million square foot data center campus on approximately 120-acre sites with 250 MW cogeneration power plants, and 80,000 tons capacity chiller plants.

Project Manager - **US DataPort, Guam:** Site search, site evaluations, infrastructure investigations and local government contacts for the development of 100,000 square foot data center facility.

Development Manager – **Digiplex, Europe:** Turnkey design and construction of over 1.0 million square feet of data centers throughout Europe.

Development Manager - **I-Asiaworks, Asia:** Turnkey design and construction of over 0.5 million square feet of data centers throughout Asia.

Project Manager - **Confidential Client, Kiryat Gat, Israel:** Design and construction of a 20,000 square-foot corporate data center.

Project Manger and Lead Mechanical Engineer - **Confidential Client, Santa Clara, California:** retrofit of existing 15,000 square-foot building into computer data center.

Lead Mechanical Engineer - **Silicon Systems, Santa Cruz, California:** Retrofit of existing 5000 square-foot area into a corporate data center.

Lead Mechanical Engineer - **Amdahl M-4, Santa Clara, California:** Design of mechanical systems for 10,000 square-foot data center facility.

Lead Mechanical Engineer - **Sentinel Data Center, Santa Cruz, California:** Design of mechanical systems for a 3000 square-foot data center to support a newspaper publishing plant.



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Partial List of Successful Projects Performed

Specialty Facilities

Lead Mechanical Engineer - **Schilling Foods, Salinas, California:** Design of a specialty process exhaust system from the spice milling line.

Lead Mechanical Engineer – **Ito-Cariani (Takenaka International), Hayward, California:** Design of 85,000 square-foot specialty cut meat and processed meat facility. Plant included two-stage ammonia refrigeration system.

Lead Mechanical Engineer - **United Technologies, San Jose, California:** Remodel of a building to accommodate the new Therm-X™ process line.

Project Manager and Lead Mechanical Engineer - **Space Systems/Loral, Palo Alto, California:** Retrofit design of existing energy center and humidity control upgrade for a 30,000 square-foot high-bay, Class 10,000 cleanroom which houses satellite thermal test chamber.

Project Manager and Lead Mechanical Engineer - **Space Systems/Loral, Palo Alto, California:** Design of 5,000 square-foot Class 100,000 link building which houses satellite during transfer between process buildings.

Project Manager and Lead Mechanical Engineer - **Space Systems/Loral, Palo Alto, California:** Complete design for the construction of 85,000 square-foot building, including Class 100,000 high-bay satellite assembly and test facility (Building 6).

Lead Mechanical Engineer - **United Technologies, San Jose, California:** Design of 30,000 square-foot Class 100,000 high bay (Titan missile manufacturing building).

Project Manager and Lead Chemical Engineer - **JDS Uniphase Flex Products, Santa Rosa, California:** Design and construction management of a 80,000 square-foot greenfield thin film deposition facility for the manufacture of optically variable pigments for printing US and other currencies.

Project Manager and Lead Chemical Engineer - **JDS Uniphase OCLI, Santa Rosa, California:** Design and construction management of a 70,000 square-foot facility for the manufacture of coated glass and optical components.

Project Manager and Lead Chemical Engineer - **Neovac, Santa Rosa, California:** Design and construction management of a 25,000 square-foot facility for the coating of reel-to-reel high performance materials.

Lead Electrical Engineer - **AT&T Wireless, Northern California:** Electrical and mechanical design of multiple new cell sites.



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Partial List of Successful Projects Performed

Life Sciences

Lead Mechanical Engineer, Lead Electrical Engineer – **Alza Corporation Mountain View, California:** Design for converting Building PA-11 chiller plant to primary/secondary pumping scheme.

Lead Mechanical Engineer, Lead Electrical Engineer – **Alza Corporation Mountain View, California:** Development of air flow diagrams for existing laboratories and the HVAC equipment; analyze and resolve lab pressurization concerns.

Lead Mechanical Engineer, Lead Electrical Engineer – **Alza Corporation Mountain View, California:** Design solutions for laboratory hood exhaust systems for multiple buildings.

Lead Electrical Engineer - **Alza Corporation, Mountain View, California:** As-built and tenant improvement designs for buildings M3, M4, MP1, MP5 and RC11.

Lead Electrical Engineer, Lead Mechanical Engineer – **Alza Corporation, Mountain View, California:** Design of mechanical and electrical systems for various labs and office remodels.

Lead Mechanical Engineer, Lead Electrical Engineer – **Alza Corporation, Vacaville, California:** Engineering consulting and evaluations for the SAC-5 Coater Process Installation design package.

Lead Mechanical Engineer, Lead Electrical Engineer – **Alza Corporation, Vacaville, California:** Engineering consulting and evaluations for the Acetone Waste Collection System design package.

Lead Mechanical Engineer, Lead Electrical Engineer – **Alza Corporation, Vacaville, California:** Engineering consulting and evaluations for the Thermal Oxidizer Installation design package.

Lead Electrical Engineer, Lead Mechanical Engineer – **Genentech Corporation, South San Francisco, California:** Design of mechanical and electrical systems for various cleanrooms and labs.

Lead Electrical Engineer, Lead Mechanical Engineer – **Genentech Corporation, South San Francisco, California:** Design of HVAC systems and associated electrical systems for various labs and manufacturing spaces in Building 8.



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Partial List of Successful Projects Performed

Life Sciences (Continued)

Lead Electrical Engineer, Lead Mechanical Engineer – **Genentech Corporation, South San Francisco, California:** Design of HVAC systems and electrical systems for installation of vile washers and stoppers.

Project Manager, Lead Mechanical Engineer - **Syntex Corporation, Palo Alto, California:** Retrofit design for 10,000 square-foot research and development biotechnology facility.

Project Manager, Lead Mechanical Engineer - **Syntex Corporation, Palo Alto, California:** Design of Building P3 tableting suite.

Project Manager, Lead Mechanical Engineer - **Syntex Corporation, Palo Alto, California:** Design and upgrades to a WFI system at Building P3.

Project Manager, Lead Mechanical Engineer - **Syntex Corporation, Palo Alto, California:** Suite upgrade and design for the installation of lyophilizers in a Class 100 environment.

Lead Mechanical Engineer - **Biosis, Palo Alto, California:** Design of mechanical systems for a 20,000 square-foot biotechnology facility.

Lead Electrical Engineer, Lead Mechanical Engineer – **Bayer Laboratories, Emeryville, California:** Design of mechanical and electrical systems for various labs and office remodels.

Lead Electrical Engineer, Lead Mechanical Engineer – **Sugen Corporation, South San Francisco, California:** Design of mechanical and electrical systems for various labs and office remodels.

Lead Electrical Engineer, Lead Mechanical Engineer – **Alexian Brothers Hospital, San Jose, California:** Electrical and mechanical design of nursery and administration offices.

Lead Electrical Engineer, Lead Mechanical Engineer – **Coalinga Hospital, Coalinga, California:** Electrical and mechanical design of new hospital building.

Lead Electrical Engineer – **Crystal Springs Rehabilitation Center, San Mateo, California:** Electrical, design of system to upgrade emergency power.

Lead Electrical Engineer, Lead Mechanical Engineering – **Delta Memorial Hospital, Antioch California:** Electrical and mechanical design of catheter lab.

Lead Electrical Engineer, Lead Mechanical Engineer – **John Muir Hospital, Walnut Creek, California:** Complete electrical, mechanical and plumbing design for new angiography lab.



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Life Sciences (Continued)

Lead Electrical Engineer – **Kaiser Gateway, Oakland, California:** Complete electrical, including electrical systems analysis, upgrade and modification for various departmental projects.

Lead Electrical Engineer – **Kaiser Permanente Hospital, Hayward, California:** Complete electrical engineering design for renovation of emergency room and pulmonary facilities.

Lead Electrical Engineer, Lead Mechanical Engineer - **Kaiser Permanente Hospital, San Rafael, California:** Design for renovation of radiology lab.

Lead Electrical Engineer, Lead Mechanical Engineer - **Kaiser Permanente Hospital, Redwood City, California:** Design for new eye lab.

Lead Electrical Engineer - **Kaiser Permanente Hospital, Roseville, California:** Design for power distribution system for central plant and signal system.

Lead Electrical Engineer, Lead Mechanical Engineer – **Santa Clara Valley Medical Center, San Jose, California:** Complete electrical and mechanical engineering design for emergency room remodel.

Lead Electrical Engineer – **Chandler Medical Center, Chandler, Arizona:** Complete design from concept to completion of hospital power system with N+1 reliability.

Lead Electrical Engineer – **Scottsdale North Hospital, Scottsdale, Arizona:** Electrical engineer design for central chiller plant and hospital HVAC installation.



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Microelectronics

Project Manager and Lead Mechanical Engineer - **ST Microelectronics, Phoenix, Arizona**: Design of a 2400-ton variable flow chiller plant to replace an existing chiller plant at Building 1100. New chiller plant incorporates energy efficiency features such as variable speed drives, single loop chilled water pumping, and waterside economizers.

Project Manager and Lead Mechanical Engineer - **ST Microelectronics, Phoenix, Arizona**: Design of a 7000 square-foot, Class 1 cleanroom expansion for the EPI process. Expansion included adding flammable and corrosive gas storage areas.

Project Manager and Lead Mechanical Engineer - **Seagate, Milpitas, California**: Design for retrofit of 5000 square-foot building for the installation of a plating line. The retrofit included adding a Class 1000 cleanroom around the plating line.

Project Manager, Lead Mechanical Engineer, and Lead Architect - **National Semiconductor, Santa Clara, California**: Design for the retrofit of 14,000 square-foot conversion of an existing fab to a copper process fab. Project included upgrading the existing fab to Class 1 cleanrooms.

Project Manager, Lead Mechanical Engineer, and Lead Architect - **National Semiconductor, Santa Clara, California**: Retrofit design for replacing two 45,000 CFM air-handling units for fab in Building E.

Project Manager, Lead Mechanical Engineer, and Lead Architect - **IBM, Guadalajara, Mexico**: Design of a new 17,000-square-foot chemical storage and distribution facility. Facility included flammable and general storage of virgin and used chemicals for IBM's disk drive assembly factory in Mexico.

Project manager - **Confidential Client, Kiryat-Gat, Israel**: Complete design and construction of 1,260,000 square-foot greenfield semiconductor manufacturing facility, including an 85,000 square-foot Class 1 cleanroom, a 75,000 square-foot central utility building, 400,000 square-foot, four-story office building, 80,000 square-foot office/warehouse, and 30,000 square-foot hazardous material storage building (Fab 18).

Lead Electrical Engineer and Lead Architect- **Episil, Tai Nan, Taiwan**: Electrical engineering design of one 161 KV GIS, transmission substation with multiple 22.8 KV supporting substations for a large Episil cleanroom facility. Design included N+1 redundancy and emergency power requirement.



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Microelectronics (Continued)

Lead Electrical Engineer – **Novellus, San Jose, California:** Design of a 100,000 square-foot cleanroom facility for training purposes. Completed the design of a 90,000 square-foot, Class 1 cleanroom facility, including tool fit-up and tool hook-up. Complete design of power distribution system, calculations of power distribution cable, lighting and grounding systems and California Title 24 Energy Code study.

Lead Electrical Engineer – **Confidential Client, Chandler, Arizona:** Design and construction services for upgrades of power distribution system and a substation with tiebreaker. Electrical design and calculations of power cable, lighting and grounding, life safety and special systems for buildings C3, C4, C10, C1 1, and Fab 6. Provided short circuit analysis and breaker coordination study for site engineering department. Responsibility for Migrating controls devices for 21 HVAC, VFD/AFD and exhaust fan units from Johnson Control to NCU/NEU FMS system, including preparation of P&IDs, point-to-point control diagrams, and riser diagrams.

Lead Electrical Engineer – **Confidential Client, Santa Clara, California:** Lead a team of 10 employees to provide tool hook-up and fit-up service for 300 tools for D2 fab, phases 1, 2, 3 & 4.

Lead Electrical Engineer and Lead Architect- **Confidential Client, Santa Clara, California:** Feasibility study for a proposed new Building 5 to provide additional power and secondary substations.

Lead Electrical Engineer – **Motorola, Scottsdale, Arizona:** Design for the addition of a new substation, cleanroom and motor control center, including lighting, power, special systems design and construction administration for facility system upgrades.

Lead Mechanical Engineer - **Confidential Client, Chandler, Arizona:** Master planning, design, and construction services for a 1,300,000-square-foot sub-micron microelectronics manufacturing facility with Class 1 cleanrooms (Fab 12). Responsibilities included feasibility analysis for a 75 MW cogeneration plant.

Project Manager - **Applied Materials, Santa Clara, California:** Maydan technology center design and construction administration services.

Life Safety Engineer - **Applied Materials, Santa Clara, California:** Turnkey design and construction of the life safety system for the Santa Clara campus site.



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Microelectronics (Continued)

Project Manager, Lead Architect and Lead Mechanical Engineer - **Applied Materials, Japan**: Feasibility analysis for upgrade of 20,000 square-foot applications laboratory.

Project Manager, Lead Architect and Lead Mechanical Engineer - **Applied Materials, Korea**: Multidisciplinary schematic design services for a new applications laboratory.

Project Manager and Lead Life Safety Engineer - **Applied Materials, Taiwan**: Design and construction administration services for the life safety systems for a new applications laboratory.

Project Manager, Lead Mechanical Engineer, and Lead Architect - **VLSI Technology, Inc., San Jose, California**: Complete design and construction administration services for a new 3,600 square-foot Class 1,000 product development laboratory.

Project Manager, and Lead Mechanical Engineer- **Nikon Precision, Belmont, California**: Complete design and construction administration for a new 5,000 square-foot Class 10,000 product development and testing cleanroom.

Lead Mechanical Engineer - **SEEQ Technology, Milpitas, California**: Complete design for retrofit of an existing cleanroom and hookup design for installation of Nikon steppers.

Project Manager and Lead Mechanical Engineer - **Bell Communications Research, Red Bank, New Jersey**: Complete design for a humidity control system upgrade of 200,000 square-foot research and development facility.

Lead Mechanical Engineer - **Confidential Client, Rio Rancho, New Mexico**: 233,000-square-foot expansion of sub micron microelectronics manufacturing facility with 43,000 square feet of Class 1 cleanroom and expansion of existing support facilities (Fab 11P1).

Lead Mechanical Engineer - **Confidential Client, Jerusalem, Israel**: Site analysis for a new 120,000-square-foot semiconductor fab (Fab 8).

Lead Mechanical Engineer - **Confidential Client, Rio Rancho, New Mexico**: Programming for a 1,300,000-square-foot sub micron microelectronics manufacturing facility with 105,000 square-feet of Class 1 cleanroom (Fab 11P2).

Lead Mechanical Engineer - **Confidential Client, Chandler, Arizona**: Master planning, design, and construction services for a 1,300,000-square-foot sub micron microelectronics manufacturing facility with Class 1 cleanrooms (Fab 12).



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Microelectronics (Continued)

Project Manager - **Lam Research, Inc., Fremont, CA**: Multidiscipline design for Class 10 cleanrooms and Fab.

Project Manager, Lead Mechanical Engineer, and Lead Architect - **Confidential Client, Santa Clara, California**: Retrofit design of 7,000 square-foot, Class 100 tab process room in D2 building.

Project Manager, Lead Mechanical Engineer, and Lead Architect - **Confidential Client, Santa Clara, California**: Retrofit design of 15,000 square-foot Class 1 area and multiple Class 100 and Class 1,000 areas (Building D2).

Project Manager, Lead Mechanical Engineer, and Lead Architect - **Confidential Client, Santa Clara, California**: Retrofit of existing 60,000 square-foot building to test area (SC-7).

Project Manager, Lead Mechanical Engineer, and Lead Architect - **Confidential Client, Santa Clara, California**: Retrofit of existing 20,000 square-foot building into research and development and test labs (SC-9).

Project Manager, Lead Mechanical Engineer, and Lead Architect - **VLSI Technology, Inc., San Jose, California**: Design for the addition of a thermal oxidizer unit for solvent exhaust abatement from existing semiconductor fab.

Project Manager, Lead Mechanical Engineer, and Lead Architect - **Xerox Corporation, El Segundo, California**: Silicon sub micron prototyping facility, including 16,500 square-feet of cleanroom space.

Project Manager, Lead Mechanical Engineer, and Lead Architect - **Confidential Client, Santa Clara, California**: Retrofit design of 3,000 square-foot Class 1 cleanroom in Fab 1.

Project Manager, Lead Mechanical Engineer, and Lead Architect - **Confidential Client, Santa Clara, California**: Design for hookup of various process tools.

Lead Mechanical Engineer - **National Semiconductor, Puyallup, Washington**: Programming for remodel of 14,000 square-foot wafer fab.

Lead Mechanical Engineer - **Tower Semiconductor Ltd., Haifa, Israel**: Design for the upgrade of 5,000 square-foot of Class 1 cleanroom. Responsibilities included programming and conceptual design.



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Partial List of Successful Projects Performed

Microelectronics (Continued)

Project Manager, Lead Mechanical Engineer - **Orbit Semiconductor, Jerusalem, Israel:** Design of a new 20,000 square-foot new wafer fabrication facility. Responsibilities included programming and conceptual design.

Project Manager, Lead Mechanical Engineer and Lead Architect - **Confidential Client, Santa Clara, California:** Design for a 160,000-square-foot expansion of an existing facility (D2P3). The expansion included a 31,500-square-foot Class 1, sub micron cleanroom and associated fab support functions. Responsibilities included programming, conceptual design, contract documents, and construction support.

Lead Mechanical Engineer - **Silicon Systems, Santa Cruz, California:** Onsite design and construction management for the renovation of 18,000 square-feet of cleanroom including upgrade of existing services and process equipment installation.

Lead Mechanical Engineer - **Silicon Systems, Santa Cruz, California:** Fit-up and hook-up design of process equipment services for relocation and consolidation of 4-inch wafer process line in 15,000-square-foot cleanroom.

Lead Mechanical Engineer - **Hewlett-Packard, Santa Rosa, California:** Design for the retrofit of 5,000 square-foot, Class 1 cleanroom in an existing facility.

Project Manager, Lead Mechanical Engineer - **VLSI Technology, Inc., Tempe, Arizona:** Engineering analysis and criteria development for retrofitting existing energy center to support up to 150,000-square-foot light manufacturing facility.

Project Manager, Lead Mechanical Engineer - **Confidential Client, Santa Clara, California:** Construction management for 1,000 square-foot Class 1 HTO furnace area in Fab 1.

Lead Mechanical Engineer - **Wacker Siltronic, Portland, Oregon:** Design of direct expansion dehumidification and heat recovery system for EPI remodel project.

Lead Mechanical Engineer - **Boeing Electronics, Renton, Washington:** Design of a direct expansion dehumidification system.

Project Manager, Lead Mechanical Engineer - **Apple Computers, Fremont, California:** Retrofit design of multiple projects, including fit-up design of flexible manufacturing system (FMS).



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Partial List of Successful Projects Performed

Microelectronics (Continued)

Lead Mechanical Engineer - **Akashic Memories, Santa Clara, California:** Design of HVAC and process piping systems for a 10,000 square-foot, Class 1000 manufacturing facility.

Lead Mechanical Engineer - **Monolithic Memories, Santa Clara California:** Design of HVAC and process piping systems for a 7000 square-foot fab remodel.

Lead Mechanical Engineer - **Integrated Device Technology, Salinas, California:** Design of HVAC and process piping systems for a new 20,000 square-foot fab.

Lead Mechanical Engineer - **Chino-Excel Technology, Taiwan:** Design of mechanical systems for a new 20,000 square-foot wafer fab.

Lead Mechanical Engineer- **Signetics, Santa Clara, California:** Decommissioning design of an existing 10,000 square foot fab and converting the building to an office space.

Lead Electrical Engineer and Lead Architect – **Opsys, Fremont, California:** Design and construction for a new 12000 S.F. facility, which consisted of 400-square feet of class 100 optical cleanroom and several class 10,000 R&D laboratories. Responsibilities included pre-design collaboration with manufacturing engineers from Japan and value engineering the project.

Lead Electrical Engineer and Lead Architect – **CIENA, Cupertino, California:** Design and construction support for a state-of-the-art audiovisual conference room with multi projection capability and teleconferencing.

Lead Electrical Engineer and Lead Architect – **CIENA, Cupertino, California:** Design for converting an existing 9000 square-foot of warehouse space into offices and a new 3500 square-foot cafeteria.

Quality Assurance - **Motorola, Tenjin, China:** Design and construction review for the construction of a 200,000 square-foot, 200mm, Class 1 wafer fabrication facility.

Quality Assurance – **Hewlett-Packard, Shanghai, China:** Design and construction review for the construction of a 400,000 square-foot assembly facility for printer heads.

Quality Assurance - **IBM, Shanghai, China:** Design and construction review for the construction of a 300,000 square-foot facility for fabrication and assembly of multi-chip modules.



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Partial List of Successful Projects Performed

Microelectronics (Continued)

Quality Assurance – **Nanya, Taiwan**: Design and construction review for the construction of a 200,000 square-foot fab for 200 mm wafer fabrication.

Quality Assurance- **Toppoly Optoelectronics Corp., Hsin-Chu, Taiwan**: Design and construction review for the construction of a 400,000 square-foot fab for low temperature polysilicon display fabrication.

Expert Witness- **AIU/Lloyds of London**: Expert witness for the insurance industry on the fire that destroyed a 120,000 square-foot fab (Fab D) owned by UMC in Hsin-Chu, Taiwan.