

Harvard University

Laboratory for Interface Science and Engineering (LISE)

Project Description

Location: Oxford Street, Cambridge, MA

- Academic/Research application
- New Construction/Urban Campus, Challenging Site
- Cleanroom/Imaging/Material Synthesis areas
- Includes **Nanotechnology** and Characterization
- 300 Process/Characterization/Support Tools
 - MOCVD, MBE
 - eBeam Lithography
- Includes a **BioTech** area
- Teaching/Learning Opportunities
- Safety/Code Compliance Achieved with “Moat”, Creative Design
- Connectedness to Campus
- Flexibility – Need to Attract Senior Staff
- “Name” Architect – Rafael Moneo
- Under construction 2003
- AGI providing consulting and design programming through design



University of California at Berkeley

Microfab

Project Description

Location: Hearst Avenue, Berkeley, CA

- Project Budget: \$70M
- Demo/Replace Existing Building Davis Hall North
- 2 cleanroom levels plus Basement and Penthouse
- Varied Substrate Types, 200mm capability, Full CMOS and other processes
- 270 Process/Support Tools
- Urban campus, steep grade, adjacent buildings
- Vibration/Seismic issues – structure modeling
 - Optimized HPM Transport and Storage, “H” occupancy areas
 - Optimized Wet Benches for minimum chem usage
 - Donated, relocated and new tools
 - MOCVD, CMP, other process challenges
 - Design 2001, Construction 2004
 - AGI providing consulting and design services – programming through construction support



MIT, Massachusetts Institute of Technology

Microphotonics Lab

Project Description

Location: Cambridge, MA

- Academic/Research application
- Cleanroom and Characterization areas
- Varied substrate size/types
- Brown site, partial new construction
- Urban campus
- Vibration issues
- Safety/Code/HPM issues
- Budget/Donated tools
- Flexibility
- Donated Tools (200mm scale)
- Possible backfill into existing lab space.
- AGI provided consulting and programming design services



Design

Interface with A/E design team

- Insure design meets owner's needs
- Insure tools will operate within designed facilities
- Value engineering/difficult designs

• Interface with owner - ongoing

- Discuss tool changes
- Discuss process changes
- Impact on design
- Discuss Student, Researcher and Facilities Changes.

• Design Services provided by AGI

- Specialty systems (Gas cabinets, specialty gases, abatement)
- DI Water, Waste Treatment, Specialty Liquid/Drain Systems
- Laboratory Design
- Cleanroom MEP support
- Fixtures, furnishings, wet process stations



AGI's Unique Design Tools

- **FabTech 5.0™ Utility Matrix Database**

- Develops utility demands based on a specific tool list.
- Calculates total loads for entire facility and a room by room comparison.
- Use diversification factors to determine the average usages by area.
- The database currently contains well over 2000 tools.
- Diversification factors can accommodate future expansions (to 200mm or 300mm tools).

- **AutoCAD 2000**

- Used to generate the layout of the facility
- An extensive database of existing equipment footprints.
- Clearance/Maintenance space included

- **Other AGI Standard Design Documents**

- Basis of Design
- Tool list
- Room Conditions Spreadsheets
- Gas Cabinet/VMB matrices
- Gas/Chemical Usages matrices/code comparison/emission analysis



Other Services Provided by AGI

- **R&D Cleanroom Operations Consulting**

- MES – “Manufacturing” Execution Systems
- EHS – Environmental, Health and Safety – Haz Mat Management
- Improve Productivity of Research
- Use of Shared Systems
- Cost Accounting
- Technology Transfer

- **Tool Relocation, Installation, and Start-up**

- De-install, Pack, Ship, Organize
- Evaluate Tool Procurement Alternatives
- Perform Source Inspections
- Install/ hookup Design, Supervision
- Tool Sign Off (Safety/Operations)
- Tool Qualifications
- Process Qualifications
- Operational Specifications
- SPC, Cpk

