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Professor Frances Hellman
DEPARTMENT OF PHYSICS, MATERIALS SCIENCE AND ENGINEERING
366 Le Conte Hall #7300
BERKELEY, CALIFORNIA 94720-7300

TEL: 510/642-6135
FAX: 510/643-8497
E-MAIL: fhellman@berkeley.edu

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To whom it may concern:

I am writing this letter to attest to my extraordinarily high regard for the work of Bonnie Blake-Drucker, the architect with whom I worked (extensively) in designing and building my research laboratory in Birge Hall at the University of California, Berkeley in 2004-2005. I am a Professor of Physics and of Materials Science, formerly at the University of California, San Diego (for 17 years) and now at Berkeley. My research is in the area of condensed matter experiment, specifically materials physics, and my laboratory contains a large number of pieces of expensive, high tech equipment, almost all of which require sophisticated infrastructural support (high pressure regulated water flow, high pressure clean compressed air, high vacuum lines, liquid Helium return lines, N₂ and He gas supply lines), many of which require very clean isolated power, others of which require high power and careful attention to safe electrical grounding, and most of which are either vibration sensitive or are capable of producing vibrations which must be eliminated so they don't affect other pieces of equipment. In addition, the space into which we were putting my laboratory is both relatively old and with poor infrastructure (it is nearly a 50 year old building) and the space itself is not large. The university completely ripped out and stripped the space of all previous infrastructure and walls, to allow Bonnie and me to design the lab space we needed.

Because of the severely limited space, in order to accommodate all the equipment, it was imperative to centralize infrastructural needs like vacuum and water pumps and N₂ and He gas supplies rather than having a local version of each. It was in addition necessary to separate the vibration-producing items (pumps) from vibration-sensitive equipment (scanning tunneling microscopes).

Thus, the design of my laboratory space, while only 2000 sqft, required and received an attention to detail that was incredible. Bonnie assembled an extraordinary team of experts in mechanical, vibrational, and electrical engineering. The whole team came down to see my previous laboratories in San Diego in order to really have an understanding of the equipment space and infrastructure requirements. Bonnie then quite literally spent days working one-on-one with me to lay out the position for each piece of equipment, where the walls would go, and how big each room had to be within this space. She designed an absolutely extraordinary lab, with creative solutions to problems (e.g. a separate vacuum pump room with vibration isolation platforms). She listened when I pinpointed problems (e.g. the first design had pumping lines that were too small for the vacuum I need) and worked with me to resolve all the many issues of this construction.

As an example, one of the more demanding parts of my lab is a clean room space for my ultra-high vacuum deposition chambers. This room is fantastically demanding of all the infrastructure, with 3 separate deposition chambers, requiring very high electrical power (~100 kW), high pressure and flow regulated water supplies, liquid helium return lines, various gas supply lines, and ceiling clearances of nearly 12' to accommodate the chambers. All while working within a 700 sqft space and in a HEPA air-filtered clean room environment.

The bottom line is that Bonnie was phenomenal. Her attention to detail and her willingness to work one-on-one with me has resulted in a laboratory that works better than I really thought possible. The ceiling is covered with the various supply and return lines, but every piece of equipment has a home and every piece has all the infrastructure it requires. Every component of the lab (mechanical, electrical and vibrational) works just as we envisioned, attesting to the quality of the people she brought into this project. She and the team she assembled planned enough capability into the design that even future requirements are taken care of.

Perhaps even more remarkably, as the building infrastructure to which my lab must couple has proven even less functional than we had thought, her design has had the flexibility built into it that we have been able to accommodate changes without huge added costs. I will give three examples of this: 1) the building water proved to be much dirtier than anyone had anticipated (my requirements are apparently greater than other users in this building), but her team's design of water filtering easily allowed us to add more filters. 2) the building's house vacuum proved to be far worse than I could use, but the design of the vacuum lines in my lab and the pump room and vibrational platform allowed me to replace that entire system with my own vacuum pump at the cost only of a vacuum pump. 3) The building's house compressed air system has proven to occasionally fill with water, due to an inadequate drier system, but again we were easily able to convert over to our own compressed air.

Bonnie's attention to detail and vision of the lab was not limited to the design phase of the construction. Once construction started, she supervised the construction crew, both through weekly construction team meetings and her regular on-site visits. This supervision was absolutely essential - I can state with complete confidence that without this, there would have been many many oversights and incomplete parts of the lab.

Overall, my experience working with Bonnie has been extraordinary. She designed and oversaw the construction of a sophisticated and complicated laboratory space that is now totally functional, beyond anything I have previously had access to. I am happy to recommend her in the strongest possible terms to anyone interested in designing and building a lab space.

Sincerely,

A handwritten signature in black ink that reads "Frances Hellman". The signature is written in a cursive, flowing style with a long horizontal line extending to the right.

Frances Hellman