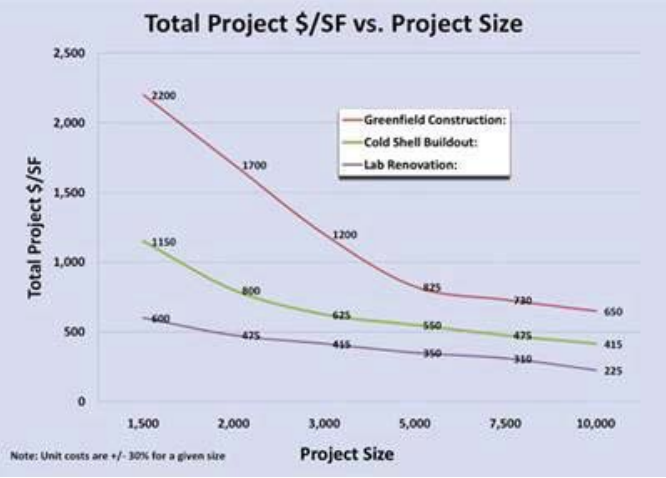
LAB-BASED COMPANIES CAN BENEFIT FROM COMMERCIAL REAL ESTATE DOWNTURN

By Melody Spradlin | Director, South Bay

The abundance of available commercial property, coupled with the relatively higher cost of new construction and much lengthier permitting and design processes, is creating dramatic opportunities for the conversion of office space and former lab space into new laboratories.

The numbers dramatize the story. For instance, San Francisco-headquartered Dome Construction Corp. estimates that for projects as small as 1,500 ft^2, the cost of construction on undeveloped land is \$2,200/ft^2, vs. \$1,150 for cold-shell buildout, and only \$600/ft^2 for lab renovation. The cost spread narrows for projects as large as 10,000 ft^2, but office-to-lab conversations are still about one-third of the cost of new facility construction (chart, right).

A typical schedule for design, permitting and build-out of 100,000 ft^2 of lab in an existing structure is six to eight months, whereas a ground-up lab facility of comparable size could take from 14 to 18 months to design, permit and build.



In the Bay Area, where science-based real estate activity is intense, Dome has built biotech, biofuels, computer technology and medical laboratories, quite often in spaces originally intended for commercial purposes. We see this trend continuing as science-oriented companies mushroom, creating a need for lab facilities ranging from green technology to healthcare—frequently as the result of long-term federal spending objectives to bolster alternative fuels and better medical care.

The real estate advantages of retrofits are great, and are further discussed later in the article. However, repurposing facilities can be challenging for architects, engineers, builders and tenants. It's not a job for unqualified professionals. Conversions of office campuses into lab facilities must be carefully redesigned to prevent MEP issues, as you reconfigure and augment infrastructure intended originally for much simpler operations or single-tenant requirements.

At other times, you must accommodate the concerns of strictly commercial tenants in an office environment that is being partly converted to intense laboratory operations. The additional resources required may involve increased water usage, structural improvements to accommodate mechanical upgrades, electrical and power infrastructure upgrades, accommodating chemical handling with waste streams (flammables, toxics, corrosives and acids) and other related activities. Some clients even hope to make room for manufacturing or live animal testing.

Challenges of repurposing office space to labs

Once companies decide to build lab focused facilities in existing space, a whole range of issues must be confronted. They are daunting, but less so than beginning from scratch. And renovation usually means labs can be brought online much faster than new buildings—an important factor in breakthrough industries where months can sometimes make the difference between business success and failure.

Here are some issues your design and building team is likely to encounter:

- *Floor-to-floor heights.* Preferred floor-to-floor height for labs is typically 15 to 16 ft, which is not necessarily going to be available in existing office/warehouse space. However Flad Architects principal Irene Lo explains that a 14-ft floor-to-floor height can be workable with careful planning of lab layout and utility design. Although a finished lab ceiling height at 10 ft is ideal, 9 ft is not bad. But 8 ft is too low for most uses. Height considerations include intended lab use (wet or dry lab) and required duct work clearances, as well as possible equipment alternatives such as ductless or low-flow fume hoods and chilled beams.
- *Lab bay width.* Optimal ranges fall between 10 ft, 6 in. to 11 ft, with typical bay depths ranging from 22 to 36 ft. During site selection, the team should consider the bay spacing and limitations imposed from differing conditions against the intended use of the lab. For start-ups, the process flow and lab layout can often be manipulated to fit around existing column spacing that was not originally designed for lab use.
- *Co-location issues.* Large tech campuses that originally were built for one occupant must be carefully repurposed to prevent mechanical, electrical and plumbing issues as you untangle infrastructure associated with a single-occupant campus to create a multi-tenant campus. Often a the central plant utility approach can be modified to create individually monitored utilities through the use of advanced BMS controls systems. The hidden benefit of colocation is often a synergy of various tech and bio/pharma companies.
- *Vibration criteria.* Today's labs often use robotic and other vibration-sensitive equipment. Ranges can vary greatly with different structural systems, from 8,000 mm/s (adequate for most computer equipment) up to the 100 to 200 mm/s demanded for uninterrupted use of laser-based systems, microinjection labs and electron microscopes. In existing facilities these obstacles can often be worked around without a complete overhaul of structural system by placing sensitive equipment near columns, away from walkways, on the ground floor, and/or providing base isolation. Being aware of equipment vibration criteria during site selection will save many headaches later.
- *Power.* Analyze back-up and emergency power capability and the basic electrical loads the building can handle by preparing a detailed matrix of all lab equipment requirements. Dome has specialists that track equipment needs throughout a project, from preconstruction to commissioning, to ensure all equipment requirements are accounted for throughout the process. Robotics and other equipment requires clean power as well; methods for providing it should be investigated before selecting a site.
- *Code and hazmat issues.* Many of the sites now being evaluated for potential lab use were built under old building, fire and ADA codes and for different occupancies. Careful consideration of intended use must be made during site selection and preconstruction planning. In particular, the alignment of intended utilization of hazardous materials with the existing building and external bulk storage systems, if any, can have a significant impact on the site-selection process. Partner with a code consultant, general contractor and design team to compare as-built drawings with permitted chemical inventories, taking into account permitted wall and utility construction, against the actual chemical inventories and in-place construction. Take the time to look above ceilings and in crawl spaces during due diligence. The general contractor can identify key information regarding MEP systems, structural systems and hazardous control areas during this phase.
- *MEP/infrastructure repurposing.* Regulatory reporting requirements require thoughtful consideration of how information from MEP systems will be segregated to collect data for individual occupants' required reporting on topics like Hazardous Waste Inventory Management and air emissions. Skilled and trained MEP staffers are needed to undertake complex projects involving equipment with unique vibration characteristics, ventilation requirements and clean-power needs. A skilled integrated team can also guide the company through decisions about point-of-use systems for water and specialty gases vs. distributed systems.
- *People, process and waste flow.* Visualizing people, material, lab sample, waste and equipment flow through the facility, especially moving from a single occupant to multiple occupancy use, is key. Systems for contained waste collection and disposal are paramount when removing a lab or introducing one into a commercial structure where some existing tenants operate non-lab businesses. Animal use requires focused attention on the travel path of the animals.
- *Modeling capabilities.* Construction renovators should extensively use building information modeling (BIM) software to preplan, especially in tight spaces originally designed for other uses. More usable research space can be reaped with careful planning of utility routing and designing as many systems as possible as closed vs. open systems to fall within code considerations. BIM and other computer-modeling technologies can also ease analysis of regulatory implications regarding traffic flow, congestion and code issues. This will allow the team to see how you can fit more into a space.
- *Sustainability.* Cash-strapped companies can help secure funding by using sustainable practices that cut costs while protecting the environment. Thoughtful consideration can uncover alternatives that save money and still meet LEED requirements. Life-cycle cost analysis is typically required for complete understanding of the price of any sustainability investment.
- *Future expandability.* Before settling on a site, investigate local zoning regulations with an eye not just to the current operations of your lab but also future stages of the company's growth into animal research or manufacturing, including required hazardous storage and disposal.

Lab-to-lab renovations

Repurposing and adapting former R&D spaces, as opposed to office/warehouse space, can be a very good move. Sandra Jamme, principal facilities project manager, SLJ Business Services LLC, Redwood City, Calif., says, "Targeted existing buildings are typically fitted-out with lab requirements such as air handling systems, chemical fume hoods, cold rooms, DI water systems, etcetera, so it is a cost effective way, with minor tenant improvements, to swiftly begin operations. In addition, these facilities are generally located in jurisdictions that have knowledge of the science requirements, so that process flows, waste streams and life-safety requirements are understood, which improves the occupancy permit lead-time."

For example, at Artemis Health Inc., a prenatal diagnostics company in San Carlos, Calif., the team chose to renovate and move equipment into an existing lab building that serves life-science and administration requirements, without the expense of new construction, says Jamme, the company's facility manager. "Key benefits to this approach included securing optimal location to local talent and resources, utilizing the building fit-out with an existing air-handling system, chemical fume hood, cold-room, air compressor, DI water system, and so on to swiftly and cost effectively begin laboratory operations."

She notes that the choice expedited her client's corporate goals. "We still have the building obligations in terms of maintenance, repairs, common area charges, etcetera, and the property owner provided tenant improvement allowances, which have enabled us to do renovations and add emergency power capabilities."

Speed to market is another critical factor in site selection. Some of the alternative choices considered by Artemis had more curb appeal; however, the selected site allowed scientists to commence work with minimal down-time. Upgrades such as emergency power enhancements, electrical modifications for unique equipment requirements and seismic reinforcement activities were completed and conducted in a timely manner.

In conclusion, there is still a powerful lifecycle argument to be made for undergoing the greater front-end expense of building lab facilities from the ground up. If the costs are amortized over many years, savings can be accrued from structures that are erected using the most modern sustainable technologies. However, with capital scarce and business demands intense on fast-paced industries, the delays in raising money and getting myriad authorizations can be daunting.

Reusing existing commercial and former lab facilities is the most viable choice for many lifescience and technology firms. An experienced, integrated AEC team is required to explore all of the code and process implications of converting these facilities to their new purpose.

Melody Spradlin is the South Bay leader of the San Jose, Calif., office of Dome Construction (www.domeconst.com). Economic situation offers real estate choices In the recession-hit Silicon Valley, office vacancy rates at the end of the third quarter of 2009 had reached almost 17.8% and 15.4% for research and development space, according to Grubb & Ellis. A further inducement to lab location in the area was the annualized asking rents for office space of $32.95/ft^2 , and $14.63 for R&D space, Grubb and Ellis also reported.

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