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Height Matters: New Calif. Regs Will Allow
Life-Science Shops to Construct Taller Labs

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By [Alex Philippidis](#)

California regulators are close to adopting changes to the state's new building code that will enable life-science companies and lab developers to construct laboratory buildings four or more stories tall — something all but impossible under the new state building code that took effect on Jan. 1.

The changes, under review by the state's Office of the State Fire Marshal, would finalize the creation of a second "L" occupancy classification for industrial laboratories. California life-sci leaders and state fire officials have worked on the measure for more than a year, and debuted it on a trial basis earlier this year [[BRN, Oct. 1, 2007](#)].

With space growing scarce and more costly to develop — especially in San Francisco and other cities that have hopped on the biotech bandwagon — life-sci leaders have looked to emulate commercial office towers by expanding vertically.

"The L should help the industry because right now the levels of chemistry that are allowed in controlled areas is below the level necessary to operate a biotech laboratory," Reinhard Hanselka, president and principal chemical engineer of consultancy Integrated Engineering Services, told *BioRegion News* last week. The firm has offices in Santa Clara, Calif., and Panama City Beach, Fla.

"Many people now are on the edge of compliance. The L allows them some discretion — allows them to multiply using passive fire controls — [in how they regulate] the chemical usage in a building," Hanselka added. "The regulators enforce the codes religiously. They will do inspections, so people will have to comply."

L occupancy users can also expect to pay "approximately 5 to 10 percent more" in construction costs compared to a "B" occupancy of less-intensive university research and testing labs, not counting chemicals, based on the experience of builders during this past year's trial period, Hanselka added.

An architect familiar with the design of laboratories had a different take: "It really depends on the size of your building," said Greg Muth, a laboratory architect with

Perkins+Will, which has an office in San Francisco. “If you have a relatively small building, there’s really a very limited cost impact. But then, there’s probably a very limited reason to go to an L occupancy.”

Muth, whose firm has designed numerous lab buildings for biotech companies nationwide, said builders will most likely employ the L occupancy classification when constructing, and especially renovating, lab buildings in urban settings.

“Generally, in new construction, you look at avoid using the L occupancy,” Muth added. “Primarily its use is for renovating existing buildings, or on sites where you are looking for the sort of density that forces you to build higher, which primarily occurs on university sites.”

California’s fire marshal has agreed with life-sci leaders that a permanent industrial L category is needed, and is in the late-review phase of amending the code. Formal changes would not go into effect until 2010, Hanselka said.

Among changes under review is limiting the number of lab suites capable of storing hazardous materials. The industrial L allows an unlimited number of suites on a given floor as long as they contain the maximum percentage of flammable liquid allowed on that floor.

The code allows for 100 percent of the maximum allowable quantity of these materials per laboratory suite to be stored on floors 1-3 and the first below-grade level; 75 percent for floors 4-6 and the second below-grade level; 50 percent on floors 7 and above; and nothing for the third and lower below-grade levels. Percentages of above-ground floors can be doubled if the material is stored in fire-rated cabinets.

Unlike with other zones, the L occupancy will not allow occupants to make percentage changes even if the building is equipped throughout with an automatic sprinkler system.

The fire marshal’s office has also proposed tightening the standard for interior wall and ceiling finishes required in sprinklered buildings for corridors (from C to B), rooms and enclosed spaces in buildings of three or more stories (from C to B, but shorter buildings would remain at C). In non-sprinklered buildings, corridor finishes would also be changed from B to A, and rooms and enclosed spaces from C to B.

Officials are also considering whether to allow lab suites on more than one floor, subject to the lower percentage of hazardous material permissible. The 2007 building code limited lab suites to a single floor.

Lab suites are defined to include ancillary support areas, including offices and storage areas. They require material capable of resisting fire for one hour within the vertical and horizontal separations between suites up to the fourth floor, and two-hour separation between two or more suites on the fifth and higher floors, versus the two-hour category

for all floors called for under the 2007 California Building Code, which took effect Jan. 1.

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However, the amendments would add a two-hour separation requirement between lab suites and group “B” control areas, which can include offices not linked to a lab, and assembly areas of fewer than 50 people.

“An L occupancy can [contain] 120 gallons of [hazardous] liquid,” Hanselka said. “If I had 20 L occupancies on a floor, that’s 20 times 120, or

2,400 gallons, which is inappropriate. The controversy is, how many L occupancies do we allow per floor?”

The answer, he said, could come as soon as Oct. 17, which is when state fire officials are expected to meet next to discuss the changes. However, any change to the “L” occupancy approved then or soon after would not go into effect until 2010.

Even with no legal limit on the number of lab suites they can construct, builders and developers face a practical challenge to building more than a handful of L occupancies per floor: Each L occupancy requires distinct exhaust systems that are separated from the others.

Other amendments to the 2007 regulations under review include raising from 100 feet to between 200 and 500 feet the required distance between two exits; requiring only a two-hour resistance barrier rather than two-hour resistance horizontal exits with separate elevators on each side of the fourth or higher floors of lab buildings; and substituting the lower fire-resistance Type IB for lab buildings of all heights, compared with the option of types IA or IIA for lab buildings of four or more stories outlined in the 2007 code.

Hanselka made his comments Oct. 1, six days after the new L occupancy code changes were publicly discussed by panelists during the GeneAcre 16 conference, presented in South San Francisco by BayBio, the life-sci industry group for the Bay Area and northern California.

During the discussion, Irene Lo, a principal of FLAD Architects, and Gale Bate, owner of the building code consultancy Code Resource, detailed the process of planning, then winning approvals for the state’s first L-occupancy life-sci building. It is a six-story, 260,000-square-foot lab building in San Francisco’s Mission Bay section owned by Shorenstein Properties and expected to be completed in November.

The core shell was built to California’s 2001 building code, but improvements for the anchor tenant, FibroGen, which leases 239,000 square feet, were designed to conform to the industrial L occupancy. That process was approved Feb. 29 following city reviews that began the previous November.

The GeneAcres 16 conference, during which the L occupancy code changes were publicly discussed, took place 13 days after California's Building Standards Commission, which oversees the state's building code, approved making the industrial "L" designation permanent. It also took place three days before Gov. Arnold Schwarzenegger signed into law a bill that formalizes SFM's right to craft and approve fire-prevention standards for laboratories.

[Senate Bill 1668](#), *An Act to Amend Section 13143 of the Health and Safety Code, Relating to the State Fire Marshal*, was introduced by state Sen. Carole Migden (D-San Francisco). The law allows the fire marshal's office to prepare and adopt rules establishing minimum fire-prevention requirements "for any laboratory or research and development facility that stores, handles, or uses regulated hazardous materials."

SB 1668 codifies what state fire officials and lab builders have understood to be the case, Hanselka and Muth agreed in separate interviews.

The Senate bill was written after several local municipalities questioned whether the state fire marshal's office had the authority to establish minimum statewide standards for labs. Those standards existed in California's H-8 hazardous occupancy category governing laboratories and similar areas used for scientific experimentation or research" under the 2001 building code.

That code was superseded Jan. 1 by the *2007 California Building Code*. It is based on a 2006 set of revisions to the international building code — the template for the codes of California and most states — that forced the state to revise its previous 2001 building code.

The changes reflect a consensus by fire officials that the 2001 code's regulations were superseded by the ability of sprinkler systems to contain damage wrought by fires. To that end, for example, partial sprinkling of buildings was allowed as long as the buildings used fire barriers or fire walls.

But those and other changes all but precluded the ability of life-sci shops and other labs to build lab space above the third floors of commercial buildings. Exempt were universities, which were already covered by the current "L" classification when the new regs took effect.

One example of the 2007 code is that it limits the ability of labs to store more than 7.5 gallons of Class 1B flammable liquids above the third floors of lab buildings, and 30 gallons total within a control area. The higher standard is meant for buildings in which flammable liquid is stored in a fire-rated cabinet.

Using the assumption that each principal investigator uses an average 8 gallons of flammable liquid annually, the 2007 code had the effect of limiting the number of PIs per

control area to between two and four, with no more than two control areas allowed per floor, according to Hanselka.

Such limits would hurt development of new life-sciences campuses — especially urban ones like the Alexandria Science & Technology Center at Mission Bay, the approximately 2.7-million-square-foot, 13-building campus being developed in the namesake San Francisco section by Alexandria Real Estate Equities.

Alexandria joined with life-sci businesses and industry groups like BayBio and San Diego-based BIOCOM in pressing for the new L occupancy.

“We seem to have fallen through the cracks before this was developed. So [these proposed changes to the 2007 code are], I think, very helpful,” Matthew Gardner, BayBio’s president and CEO, told *BRN* in an interview.

The lobbying effort showed results by the time the state bill went before lawmakers this past summer.

“The needs of the biotech industry in places like San Francisco, where there is a scarcity of land, require multi-story buildings. The restrictions existing in the currently adopted code based on the ICC make it virtually impossible to build in the biotech hub of Mission Bay,” the state Assembly Committee on Government Organization wrote in a June 24 analysis of SB 1668 after the bill was rewritten.

The rewrite changed the bill’s purpose from its original one, which was to develop a program to stamp out the tree disease sudden oak death syndrome in Marin and Sonoma counties.

Two months later, 72 life-sci executives, lab builders, and industry advocates expressed support for the L occupancy and for amendments that the state fire marshal’s office sought during a public comment period in May.

Opposing several of the changes were Morgana Yahnke and Ken Krouse, the northern and southern California presidents, respectively, of the California Fire Chiefs Association, Fire Prevention Officers Section. They contend that the amendments would weaken fire resistance and controls needed to stop fires since they allow labs to store flammable liquids at greater building heights than allowed for under the B classification in the 2007 code.

The fire marshal’s office rejected that argument, noting that while its amendments would allow flammable liquids beyond third floors, the quantity would be limited to buildings with more rigorous controls than those of B occupancies, such as offices, professional or service businesses, and restaurants with seating for fewer than 50 occupants.

“The base model code (2006 International Building Code) adopted by reference into the California Building Code does not adequately support the facility demands of a growing

biotech/life science industry in California, as well as educational facilities,” the state fire marshal’s office wrote.