



BIM, bam, boom

Every now and then new technology comes along that is worth its weight in gold and changes the way projects are managed, as Alan T Swaby learns

Visualize for a moment the Windows screen saver where a million tubes writhe around the screen like a basket of snakes, twisting and turning out of the path of their neighbors. Thomas Thomsen, project manager of the New Mexico Tri-Service Laboratory project, is right in the middle of just such an installation.

"From a utilities point of view," he says, "this is a very complex building, but so far we've put about

\$40 million of work in place and not had a single change order caused by conflicts between any of the many different services in the building."

Thomsen works for the Jaynes Corporation in Albuquerque, itself part of the Jaynes Companies, an employee-owned company and general building contractor servicing the southwestern US. Nationally, it ranks midway in the *Engineering News-Record* Top 400 listings, with revenues last year of \$340 million. In New Mexico, it has held first place for a number



of years. Jaynes dates back to the 1940s, when it started life as a small concrete contractor.

The Tri-Services Laboratory in Albuquerque is a \$72 million project to provide administration

moment, routine blood tests could be happening on one floor while human autopsies take place on another and contagious animal carcasses are being diagnosed elsewhere. The building will provide a shared central atrium lobby and training space for staff and law enforcement personnel, as well as unique laboratory utilities that will be shared by the State agencies to further provide economies of scale within the building.

The laboratory is being built on a sloping five-acre site and will have three separate entrances for the three different uses. Its facades also vary, with a mixture of glass, pre-cast panels and cast-in-situ techniques both for aesthetic value and in order to meet the requirements for the LEED Silver certification they are targeting.

“We’re pleased the client has this objective,” says Thomsen, “as it fits well with the Jaynes corporate

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offices and essential diagnostic facilities that are to be shared by state health laboratories, veterinary diagnostic services and the medical examiner. In other words, it’s a highly sensitive location where, despite the work being somewhat similar in nature, it needs completely different faces for its three completely different types of customer. At any one

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objective of sustainability. Even when LEED is not on the agenda, we try to influence the way a building is planned and constructed so that we minimize the environmental impact of our work while at the same time encouraging total life-cycle costings that lead to more efficient heating and cooling systems or environmentally friendly waste management systems.”

Due to the complexity and size, some of the equipment needed has to be built in as the floors rise. Thus, the planning and scheduling needs to be very carefully considered. For example, the building has three BSL3 (bio-safety level 3) suites totalling 20,000 square feet, or a tenth of the total floor space (it’s thought that the Office of the Medical Investigator suite may be the largest contiguous BSL-3 area in North America).



BSL rooms are the exact opposite of cleanrooms. Instead of ensuring that all dirty particles are extracted, BSL aims to ensure that nothing is removed inadvertently. Every possible way that deadly bacteria in the rooms could find a way out has to be stopped. As well as HEPA filtration on the HVAC system (some of the best HEPA units deliver 99.995 percent clean air, providing extremely high levels of protection against airborne disease transmission), everything coming into or out of the rooms must be sealed, from light switches to the floor material. Concrete, being porous, is not an option in a BSL room.

In addition to the BSL ventilation, the normal air conditioning ducting, power conduits and water piping, the building has other needs such as various ultra-pure industrial gases, all of which have to be accommodated in a restricted and finite area. To coordinate everything, Jaynes is using Building

Information Modeling (BIM), which enables detailed drawings from a half dozen different suppliers to be integrated and potential areas of conflict highlighted. Prior to this software being available, a project such as this would require schematics to be put onto film, superimposed and read over a light box. However, this primitive technique could never spot every point of conflict.

Without BIM, Thomsen acknowledges there would have been conflicts on every floor of the building. But with it, every problem area has been identified before construction began, requiring zero remedial work being necessary. It does require patience, though.

“It’s a very powerful tool,” says Thomsen, “and on this project we’re utilizing it to the fullest for the first time. It has meant that we have to work in a



different way, allowing more time at the front end of the job to ensure that the planning is spot-on. Our site superintendents were skeptical at first, thinking that precious time was being wasted, but without exception, they’ve all been converted.”

In the past, “as built” drawings could be flawed, but thanks to BIM, maintenance engineers for the new building will have the most accurate 3-D record possible of absolutely everything within the structure.

Thomsen feels that BIM has delivered other benefits as well. “The RFP [request for proposal] basis on which contractors for this project were evaluated and the conflict-reducing qualities of BIM have led to very harmonious working conditions among the three parties—owner, architect and contractor. There has been no feeling that one side can only benefit at the expense of another. Instead, it has been pure teamwork and a highly satisfying atmosphere all around.” – *Editorial research by Dan Finn* ■