Biomedical Research Building

Coordination and Mock-Ups Key in Lab Construction

by Elaine Schmidt

The sleek $94 million Biomedical Research Building at the Medical College of Wisconsin/Children's Research Institute conceals the complexities of the interior. In addition to the usual medical research systems, the facility needed the components for a vivarium. Mock-ups of rooms were done to ensure they will satisfy users' needs.

ABOVE: The $94 million, 320,000-sq.-ft. Biomedical Research Building in Wauwatosa is expected to be finished in December. (Photos courtesy of Grunau Co.)

The sleek exterior of the Biomedical Research Building in Wauwatosa hides the complexity of the interior space where multiple mechanical systems are being knitted together to serve labs and a vivarium.

"The mechanical coordination has been very critical," said Mike McNamee, senior project executive in Milwaukee for general contractor Gilbane Building Co. of Providence, R.I.

The $94 million, 320,000-sq.-ft., four story project broke ground in March 2005 and is slated for completion in December.

The Medical College of Wisconsin and the Children's Research Institute, >>

The building has a glass facade to give it a sleek, cutting-edge look.

also based in Wauwatosa, own the building.

Lab construction is always complex, but this structure contains a vivarium, a holding area for live research animals, which has added significantly to the complexity of the MEP systems.

"This job is taking layers and layers of ductwork and piping," said Ron Kwiatkowski, vice president of design/build for the Grunau Co. of Milwaukee, the project's HVAC and plumbing contractor and project manager on the new facility. "It surpasses anything I have ever seen."

McNamee added that even though there is interstitial space to work with, working with the minimum headroom requirements and the enormous amount of ductwork has made the project difficult.

Kwiatkowski said that the vivarium space requires stainless steel piping for an animal watering system; complex exhaust and decontamination systems; and finely tuned systems to control temperatures, humidity and air changes, all of which are critical to the animals in the vivarium.

Coordination was such an essential element of getting the systems in place that Gilbane required coordination personnel on site.

"We insisted that the MEP and fire-protection contractors all have one onsite representative doing coordination so that you are not running from office to office to coordinate work," McNamee said. "They are all here onsite so you just walk next door to get what you need."

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Noting that the mechanical contractor will usually take the lead in such coordination efforts, he said Grunau has six or seven coordination and fabrication people onsite.

Fitting in the Crews With approximately 60 paired animal-holding rooms and procedure rooms to build, and all the intricate systems to knit into the interstitial spaces, the physical requirements of getting crews into the various spaces when they needed to be there were also a large concern.

"We broke down the job into pods of animal holding and procedure rooms," Kwiatkowski said. "A pod is maybe eight or 10 rooms and we need roughly 500 hours to do a pod of maybe 60 ft. by 60 ft. So how many people can you put in there?"

The original plan was to put four people in each pod, but they had to work on lifts to get into the interstitial space. When it turned out that only three people would fit comfortably in the pods, it became clear that it would take four to five weeks to complete each pod.

Kwiatkowski added that he is planning to keep the same personnel on all of the pod work, hoping to pick up some time once the learning curve is out of the way.

'Critical' Mock-ups Although mock-ups are commonly done of highly specialized spaces such as surgical suites, laboratories and hospital patient rooms, the ones done on this project were critical. Users of the new facility needed to try a room on for size and make any necessary alterations before construction began.

"We did mock-ups of one animal-holding room and one procedure room," Kwiatkowski said. In early De-

cember, departments were still evaluating the elements of the rooms' design and layout, tweaking details to make the rooms suit their needs.

Kwiatkowski said that a few changes have been made, including moving air-distribution devices to allow sprinkler heads to be placed in certain locations. "That's the point of building the mock-up, to get these changes made before you start constructing the rooms," he said.

The structure's fourth floor is being shelled for future use as lab space, which has required additional coordination and planning.

"We are putting in under-floor piping for plumbing and waste systems, both sanitary and acid waste, and stubbing it off on the fourth floor so that when that floor is built out, we don't have to go into the third-floor ceilings and disrupt activities down there," Kwiatkowski said. He added that the fourth floor is also getting exhaust systems that anticipate possible use of that space for radiology.

Busy Campus The small site, which is bordered by existing buildings and one of the busy medical campus' main thoroughfares, has presented its own set of construction issues.

"We have had to coordinate deliveries closely because we have hardly any laydown or storage area," McNamee said. "Deliveries have to be times so that materials go straight from the trucks into the building."

He said that the presence of an existing vivarium in one of the nearby buildings has brought up issues of noise control because sudden noises and-or vibrations can bother the animals. "We can make some noise, just not vibrations," he added.

Coordination was a key issue for contractors on the Biomedical Research Building project in part because of the extreme amount of piping runs in the facility.

Key Players

Owners: Medical College of Wisconsin and the Children's Research Institute, Wauwatosa

General Contractor: Gilbane Building Co., Providence, R.I.

Owner's Representative: Hammes Co., Madison, Wis.

Architect: Hammel, Green and Abrahamson, Milwaukee

HVAC and Plumbing: Grunau Co., Milwaukee

The vibration concerns had an impact on material handling, the demolition of an existing parking garage and particularly in the construction of the foundation for the new building. Drilling rather than driving piles solved the foundation issue, and in other areas treading lightly with materials and demolitions has done the trick.

Even the process of bidding this job was out of the ordinary.

"This was not a traditional bid process," Kwiatkowski said. He said that an extensive interview process was used, which resulted in Grunau being brought on early in the planning stages of the project.

"We said; don't just bring us on as an installer. Make us part of the decision-making team," Kwiatkowski added. "We did a lot of legwork up front to sell this to Gilbane and they saw that the drawings were not going to be ready to bid on their schedule." <<

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