

## The Science of School

# Innovative Bioscience Campus Breaks the Mold in Phoenix

By Scott Blair



The Bioscience High School's massive tilt-up panels feature unique fossil shapes recessed into the concrete. The shapes depict single-cell organisms, invertebrates and mammals, showing the evolution of life on Earth. Photos by Scott Blair

**This month**, the dreams of many students and educators in Phoenix will be realized with the opening of the Phoenix Union School District's Bioscience High School.

Located in downtown Phoenix, the school will provide students with math and science coursework normally found at advanced research universities.

"There are a few schools around the country that focus on math and science,

**The new \$11.2 million Phoenix Union Bioscience High School, located on a small, two-acre site in downtown Phoenix, is poised to reinvent the way students learn about math and science.**

but we are going to be very unique because of our proximity to the biomedical complex in downtown Phoenix," says Dr. Dave Silcox, principal of the school. The Translational Genomics Research Institute, University of Arizona's College

of Medicine, the Arizona Biomedical Collective and Arizona State University's School of Nursing are all located just a few blocks away.

The \$11.2 million project broke ground in August 2006 with Mesa-



A massive metal stairway leads from the main assembly area up to the second and third floors. The stairs are suspended from the ceiling using long metal rods, clevis pins and turnbuckles which will eventually all be painted red.

based Concord General Contracting as construction manager-at-risk. The three-story school will offer its 400 students a unique, high-tech setting to accompany their lessons.

studio space, a fitness room and an outdoor amphitheater, foregoes the dark hallways and doors that many older high schools have for an almost entirely open floor plan.

**“Concrete was poured on top of Styrofoam fossil forms that we created off of our CAD models...Then the forms were painstakingly removed from the concrete using several workers with cordless drills.”**

**Russ Sanders, Orcutt Winslow Partnership**

“All the systems are exposed inside,” says Russ Sanders, AIA, project architect with Phoenix-based architecture firm Orcutt Winslow Partnership. “Students might learn something about building structure, air conditioning systems, or they may learn about how data is brought from the street into the building and how it’s routed, because it’s all exposed and visible.”

The interior of the 52,000-sq-ft project, which contains 15 classrooms, labs,

“The classrooms don’t have four walls,” Sanders says. Rooms can be combined or walls can be moved to subdivide the open plan into various configurations to fit whatever lesson is planned, he says.

“It’s an interactive instructional model, where kids will be doing hands-on research together,” Silcox says. Teachers will be accessible and will co-mingle with students, rather than hav-

ing closed-off office spaces. “The openness is to facilitate a team approach in instructional activities.”

This meant that during construction, “the quality of workmanship had to be impeccable,” says Stephen Paine, Concord’s superintendent. “The subcontractors understood that their work was exposed and they had to do due diligence. They all stepped up to the plate.”

The building combines several different structural systems, including tilt-up concrete panels, masonry and pre-cast concrete with structural steel components, all atop concrete spread footings.

A significant change to the structure came during the design phase: the city of Phoenix required that the project provide some on-site parking due to future development plans for the surrounding area. With no room on the scant two-acre site for a garage, they chose to elevate the building from two stories to three, and place the 40-space garage on the first floor. >>



The \$11.2 million school's interior leaves much of the structural and mechanical systems exposed, so students can observe how it was constructed. This meant the quality of workmanship had to be very high, even for normally hidden components.

According to Concord project manager Tom Klinkert, Jr., this solution was less expensive than digging a basement garage. "Up until that point we were going to try to do the entire building out of tilt-up,

but that change necessitated the pre-cast concrete structure," Sanders says. Tpac performed the pre-cast beams and columns while L.R. Cowan Concrete Co. did the concrete foundation, both Phoenix-based. Gilbert-based Skyline Steel provid-

ed the structural steel components. The project prominently features tilt-up panels on the east and west-facing walls, the largest panel being 54-ft tall, 21-ft wide and 8-in. thick. Performed by Phoenix-based Jones Concrete Construction, the panels feature a unique relief design depicting large fossil shapes that trace the evolution of life from single-cell organisms to mammals, stretching from the bottom of the three-story panel to the top. To achieve the fossils, "concrete was poured on top of Styrofoam fossil forms that we created off of our CAD models," Sanders says. "A CNC router cut out the fossils off of our CAD-generated files and then we went out and hand-placed them in the formwork." Once the concrete set and the panels were lifted, "then the forms were painstakingly removed from the concrete by several workers using cordless drills. It was all a big experiment that worked out well." Since the east side will be more visible as

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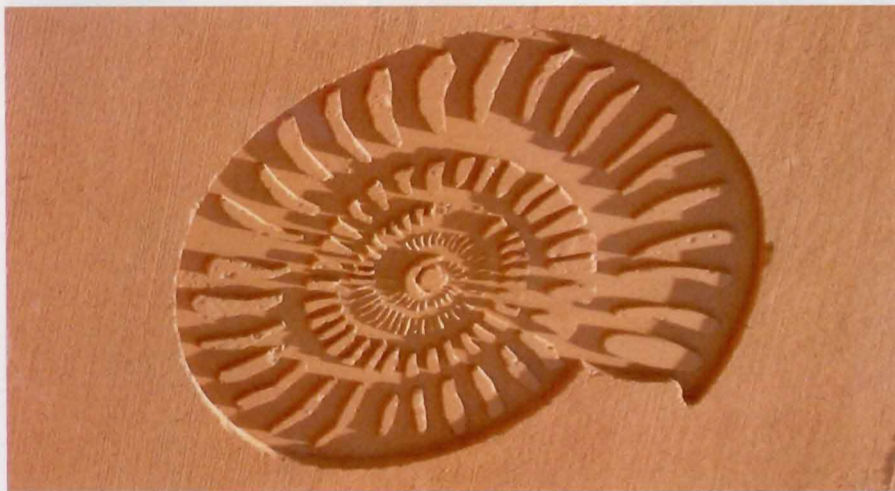
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Designers created a Styrofoam form of this fossil from CAD drawings. Once the concrete was poured and set, workers used drills to painstakingly remove the form, leaving this vivid design on the building's exterior.

the parent drop-off area, designers added visual interest through a large masonry and glass rectangle that pokes out from the middle of a tilt-up panel on the second and third stories. A large opening was cut into the 21-ft-wide panel, with the block masonry and deck jutting through it, creating more room for a large stairwell.

"It was part of the challenges on the project, but it adds some nice architectural detail," Klinkert says.

A three-story, light-filled atrium dubbed the 'Town Hall' graces the structure's south side and will serve as the school's cafeteria, commons and assembly area. "There are three large overhead garage doors which they can roll up during wintertime, that open out to the courtyard," Klinkert says.

The most striking feature in the atrium is a monolithic metal staircase that ascends all the way to the top floor.

"It is unique in that it hangs off the structural components on the ceiling and is suspended using long rods, clevis pins and turnbuckles," Paine says.

The interior color scheme calls for the entire stairway to be painted a rich red. "We wanted to show the structure in a way that people understand how it works," Sanders says. "Anything structural is painted red, while handrails will be a dark gray."

The project's seven labs feature case-work provided and installed by the Mesa office of ISEC Inc. Each lab includes its

own fume hood, and the building is served by 27 package HVAC units, Paine says.

Researchers from TGen and other nearby facilities were asked to provide input on the lab space layout. "They are the professionals in the arena and know

what our kids need and what would be most beneficial for them when they graduate," Silcox says. Students will be able to do internships and collaborations with the researchers as well.

"It's an amazing opportunity for urban Phoenix kids that those in other cities don't have," Silcox says. "The school board and the city were forward thinking in supporting it. Ten years from now this is going to be a prototype American high school." <<


### Key Players

**Owner:** Phoenix Union School District

**Architect:** Orcutt Winslow Partnership

**General Contractor:** Concord General Contracting

**Subcontractors:** Corbins Electric; IMCOR; ISEC; Jones Concrete Construction; L.R. Cowan Concrete Co.; Tpac; Skyline Steel; Progressive Roofing; Sun Valley Masonry




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