

Case Study

Smooth Moves

A sandless acrylic plaster helps provide a California middle school with a classic look.

In designing the 2013 Science and Technology Building for Helen Stacey Middle School in Huntington Beach, Calif., architectural firm LPA Inc., Irvine, responded to the client's "Exploration" theme with some exploring of its own.

The firm's design looks at novel ways of configuring educational spaces to let teachers and classes collaborate. Its construction seeks to blur boundaries between classrooms and between indoors and out, says LPA's Samuel Lim, project manager.

The two-story "L"-shaped structure's exterior uses a combination of light-colored structural brick, aluminum trim and an ultra-smooth finish coat over gypsum-board sheathing. This creates an effect reminiscent of the International Style, Lim says, an architectural style popularized in the 1920s and '30s.

"We don't start with any preconceived notions of 'style' when we design our

buildings," Lim says, "but if I had to categorize this particular design, it would be in the vein of the International Style."

The Science and Technology Building resembles the International Style with its rectilinear forms and light, taut exterior plane surfaces without ornamentation.

(Bottom) Bold lines and strong volumes on the Science and Technology Building's west elevation are intended to create a unique and inviting structure within the Helen Stacey Middle School campus.

(Right) The Science and Technology Building's first floor is clad in glass to maximize views into and out of the building, while large clerestory windows let natural light into the second-floor science classrooms. Photos courtesy of Sto Corp.

By Gary Henry





The southeast corner of the addition features a stair and elevated walkway, as well as a first-floor masonry wall, lower left.

The exterior finish, plaster-like yet 100-percent acrylic, achieves its sleek, smooth texture by leaving out the sand aggregate common to such finish coats. Such sandless plasters are sometimes referred to as “Venetian” plasters, due to their Italian origins.

The result is a crisp, sharp-edged appearance complemented with aluminum trim and window reveals.

“We just wanted to be honest with the use of materials, and plaster has a simple elegance and beauty to it if installed well,” Lim says. “We specified a smooth texture, coupled with a simple palette of materials, to create a modern aesthetic that we hoped could fit into the context of the existing campus.”

The building’s open interior spaces are another feature shared with the International Style, although LPA’s building also has intimate spaces, such as digital and recording studios.

It’s not the middle school of generations past, Lim says.

Vertical folding operable walls on the first floor, similar to garage doors, roll up into the overhead to open interior rooms to one another, creating larger areas. Overhead sectional doors in the first floor’s exterior glass walls also operate to open the interior to the usually pleasant Southern California climate and give students easy access to the outdoors.

The design minimizes the plentiful, though sometimes harsh sunlight with a second-floor footprint that is larger than the first floor, Lim says. The overhang keeps the first-floor glass walls shaded. A generous array of second-floor windows on the north elevation help daylight the interior, while minimizing harmful effects of direct sunlight.

Construction began in March 2012 as general contractor DCK Worldwide, Pittsburgh, Pa., broke ground. By December, subcontractor Platinum Construction Inc., Anaheim, was erecting a mix of earthquake-resistant 6-inch steel-braced-frame connections and moment frames.

The subcontractor also installed the building envelope, including drywall, fiberglass insulation and five-eighths-inch gypsum-board sheathing. The Platinum Construction crew covered the sheathing with a Grade D 60-minute paper weather barrier, topping it with metal lath and control joints for the plaster system to come.

They also installed the aluminum reveals and trim around the building’s numerous windows, says Darrin Streilein, president, Platinum Construction.

With the structural walls and scaffolds up, Platinum Construction began the application of the exterior coating. Though the final coating, a type of “Venetian” acrylic plaster with no aggregate, is a product new to the market, application followed traditional scratch coat, brown coat and finish coat plastering procedures, according to Streilein.

The crew began on the north elevation, coating east, south and west elevations in turn. Their procedures started with troweling a sand-and-cement scratch coat onto the metal lath, three-eighths of

an inch thick, using chrome trowels for their lower coefficient of friction than traditional stainless steel trowels.

After drying, they followed with the second or “brown” coat, also three-eighths of an inch thick.

“With this particular system, we then used an acrylic base and fiberglass mesh prior to the finish coat,” Streilein says. The acrylic base makes the surface more acceptable to the finish coat, he adds, and the mesh, embedded into the base, helps prevent cracking.

The last step before applying the finish-coat, Streilein says, is sanding the wall to make sure the ultra-smooth finish coat goes on a wall that is already somewhat smooth. They sanded by hand, using 80- and 150-grit sandpapers.

“You have to make sure that the base is prepped properly,” he says, “just as in any other phase of the plaster system.”

The crew applied the pre-mixed finish coat an eighth-inch thick from 5-gallon buckets. “We just needed to ‘fluff it up’ a little with drill and paddle before applying it to the wall,” Streilein says.

Since this was the first time the crew had used this finish coat, Streilein says, there was some minor experimentation to find the best ways to achieve the specified texture, including how long to let the application set before troweling it to the required ultra-smooth finish.

“It took a little figuring out,” he says. “The lack of aggregate makes it less forgiving than more traditional plasters. It takes some finesse.



This detail of the ground-floor science classroom on the building's southwest corner shows the materials and color palette chosen to respect the vernacular of the existing campus.

“We got it down pretty quickly, though, and have used it on other projects since.”

On the other hand, Streilein says, it’s the finish coat’s lack of aggregate that helped the crew to achieve such a high smoothness level, an aspect of the project of which Streilein says he is particularly proud.

By December 2013, the Platinum Construction crew had completed their part in the project, having built and plastered about 7,500 square feet (697 square meters) of exterior building envelope. Then the exterior painting subcontractor took over, covering the plaster finish in white elastomeric paint for aesthetics — much of the rest of the campus is similarly painted — and weather-resistance.

It wasn’t just one product that produced the smooth surfaces and crisp clean lines of the Science and Technology Building, Streilein points out.

“It all starts with the framing,” he says. “You have to make sure that’s done properly. Then the lath and trim; it all works from the framing on out. Each step has to be done properly. Then, when you do get to the finish, it’s that much easier to achieve that kind of quality.”

In addition to its white walls, the Science and Technology Building has a white, reflective “cool” PVC roof, one of several energy-saving features its designers and owners hope will garner a LEED Silver certification.

Other LEED features include a high-efficiency water system, daylight sensors in the windows that automatically dim lights on bright days, and use of recycled and local building materials.

From the design standpoint, Lim says the minimum standard for a school facility is one that’s durable, cost-efficient and easy to maintain; one that is functional and meets the expectations of the users — teachers, students and the school district.

“But we want to take it farther than that,” says the architect. “It’s part of our responsibility to help show our clients new innovations in design and products. It’s exciting to see our collaborative efforts with our clients come to fruition.”

And feedback from the school’s end-users?

“Our new science exploratory building provides the latest technology and workplace for students and staff learning at Stacey Middle School,” says Principal Heidi DeBritton. She cites the ample windows and collaborative spaces, as well as the wireless connections, smart boards and other technology.

“We are thoroughly enjoying our new building,” she says. **D+D**