

EXETER

Project: Exeter Schools
Multipurpose Space

Client: Exeter R-VI School District

Location: Exeter, Mo.

Architect: Dake Wells Architecture

Structural Engineer:

Jones & Assocs.

MEP Engineer: Genesis Design
Group

Lighting Design: Andrew Wells;
Kevin Conway (Genesis Design
Group)

Acoustician: Bruce E. Moore

Daylighting Consultant: Jason
Hainline (Environmental Market
Solutions)

General Contractor: Springfield
Builders, Inc.

Challenge:

► The 350 students grades K-12 attending the Exeter School were attending classes in five disconnected buildings surrounding a courtyard in a small rural farming community (pop. 707) located 60 miles southwest of Springfield, Mo. School superintendent Tina Nolan challenged the design team to devise a solution that would unify the buildings and become a much-needed social center and symbol of pride for the community at large, and stay within a tight \$2.2 million budget. Primary activities for which space was needed were a gymnasium, cafeteria, and performance space.

Solution:

► The architects created an 11,600-sq.-ft. multipurpose structure that occupies the former interstitial space between the existing buildings, plus adapting 5,400 sq. ft. from an existing building. Flooded with light from clerestory windows and skylights, the space makes a strong visual statement by means of a suspended red oak folded wood ceiling that integrates sound-absorbing Tectum and T8 lighting fixtures.

THE SCHOOL DISTRICT OF

Exeter, Mo., pop. 707, needed to provide a new gymnasium, cafeteria, and performance space for its 320 students, grades K-12. A \$2.2 million budget was allocated to cover the structure and the interior, including lighting and mechanical systems.

Ideally, the design solution needed to be functional, cost-efficient, and make a unique architectural statement. “All for \$2.2 million,” points out architect Brandon Dake of Dake Wells Architecture, Springfield, Mo. “Three separate buildings would have cost upwards of \$5 million to \$6 million,” he estimates. So Dake and partner Andrew Wells collaborated with electrical engineer Kevin Conway, acoustician Bruce Moore, and daylighting advisor Jason Hainline to make their solution work: a single 11,600-sq.-ft. structure plus an additional 5,400 sq. ft. in an existing building to achieve both operational and aesthetic goals.

Their final product’s central design statement is a dropped ceiling that can be compared to an oversize origami that extends the width of the new building, or, with further explanation, a piece of sushi. This interior structure, erected on a former central court between five separate buildings housing classrooms and extra-curricular activities, has already garnered four major awards.

Exeter is located in a rural farming region 65 miles southwest of Springfield and 20 miles north of the Arkansas border. Exeter’s multi-grade school building is also the surrounding community’s entertainment and meeting center. Says architect Wells, “Our brief from school superintendent Tina Nolan was that the facility would be in use for sports practice from 5:30 a.m. until 8:30 p.m., and later if community events were scheduled. Artificial illumination would

LIGHT + SOUND

THE EXETER SCHOOL’S MULTIPURPOSE SPACE IS A STRUCTURE-WITHIN-A-STRUCTURE THAT CAN BE COMPARED TO A PIECE OF UNFURLED ARCHITECTURAL ORIGAMI OR A PIECE OF SUSHI.

Story: Vilma Barr, contributing writer

Photography: Gayle Babcock, Architectural Imageworks



SUSHI ANYBODY?

According to architect Brandon Dake, the complete system, which maximizes daylight while abating sound, is kind of like a sushi roll—the wood wrapper helps reflect sound, while the acoustic panels act as “rice” absorbing the sound. Recessed luminaires from Prudential augment natural light. T8s from GE were also placed along structural beams for additional, but out of the way, ambient light.

be required in the early morning, evenings, and periods during the day when daylighting required boosting,” he explains.

Two major hurdles—sound control and lighting—were approached concurrently. “A typical gymnasium has terrible acoustics,” says Dake. “You can’t hear anything because of the reverberation. So we had to capture the sound and focus it into a ‘sweet spot’ in front of the stage,” he says. “Any sound that escapes this area would be absorbed and disappear. The concept is like a sushi roll. Here, its outer layer is made of sound-absorbing panels from Tectum, much like rice absorbs soy sauce. The wood wrapper is reflective of sound, keeping all the good stuff in like the seaweed which holds the whole roll together,” Dake explains. With reverberation times in the new building calibrated at 0.9 seconds, “the space performs acoustically like a small theater rather than a gymnasium,” he reports.

Tectum’s roof deck planks, are composed of a cementitious acoustical material comprised of aspen wood fibers, was fabricated into 4 ft. × 8 ft. light-reflecting folded panels in combination with red oak panels to create the dropped ceiling. It extends from 22 ft. to 25 ft. above the athletic floor, folding down to 8 ft. to 9 ft. at the perimeter walls.

Our basic approach to lighting the space,” says architect Wells, was how to make the most effective use of daylight. “The basketball court is oriented in an east-west direction, with the performance platform on the north side. We opened the east and west ends with large expanses of frosted glass,” he says. Four 32-in. × 96-in. skylights were added on the recommendation of consultant Hainline.

Electric lighting for the space,

planned by Conway, exclusively employed 32-watt T8 fluorescent lamps from GE, rated at 3,500K, to match lamps already in use by the school. Conway located the fixtures on either side of the exposed steel beam roof structure to protect them and minimize exposed conduit runs. “The white tectum deck acts as a reflector to disperse the light over the court,” Conway states. “Fixtures within the wood ceiling are high-impact fluorescents with a protective lens,” he points out. “Around the main space 2 × 4 fluorescents are grouped into bands of light.

For the indirect lighting, basic fluorescent strips from Metalux are equipped with wire guards. Slim 4 ft. × 6 ft. dimmable recessed fixtures from Prudential for direct lighting were randomly placed within the wood ceiling.

Fixtures in both lighting schemes are equipped with emergency ballasts.

On overcast days, Conway recorded 55 fc in the main assembly space, rising to 120 on bright days. Conway points out that the space has achieved its designed power density of 1.1 watts per sq. ft. A photocell was installed for overall control of the indirect lighting based on natural light available in the space.

The design team is pleased with the recognition they have received on their solution to benefit the school and the community. “We understand that great design doesn’t have to be expensive. It means you have to be smart and deliberate about how you spend your money. The final per sq. ft. cost came in at \$129,” Dake concludes. ❏

PRODUCTS USED:

1 GE (T8 Fluorescents) www.gelighting.com. Circle 209.

2 Prudential (recessed fluorescents) www.prulite.com. Circle 208.