

Structures Unlimited, Inc.

Energy-Efficient Skylights & Pool Enclosures

The Ultimate Daylighting Building Technology

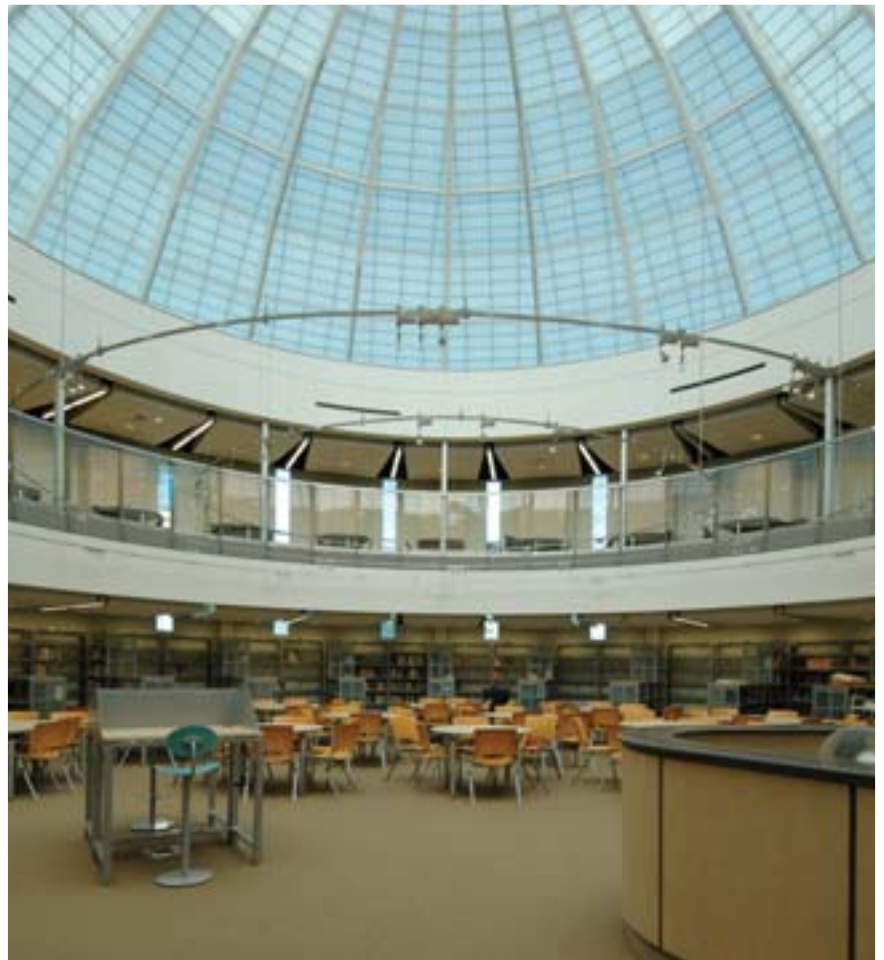
Pre-engineered, aluminum space-frame technology and Kalwall® translucent panels combine to create ultra energy-efficient, large Clearspan™ composite structures.

Project Profiles: Academy of Information Technology and Engineering, Stamford, CT

Many of today's high school students will be the information technology, networking, computer science, engineering, and architecture leaders of tomorrow. And the Academy of Information Technology and Engineering (AITE) is the sort of 21st century school they need to learn to compete successfully in a global marketplace. This magnet school in Stamford, Connecticut, also strives to inspire and excite students with dynamic design elements, including a striking, 60-foot, Structures Unlimited dome skylight that crowns and daylights a circular, two-level, galleried and futuristic-looking library.

Designed by Fuller and D'Angelo, P.C., of Elmsford, New York, the \$42 million, 123,000-square-foot AITE starts with the classrooms, labs, gymnasium and cafeteria you'd expect at a high school, then adds a media center, dance studio, atrium, and open amphitheater. Not surprisingly, this technology-oriented school also offers zoned wireless access for laptops, but that's just the beginning. Inside AITE, the building's very structure is left visible for study by architecture and engineering students. The school's central computer core, a vivid display of lights, servers and wiring, can be seen by all from the main lobby. (The core not only supports the school's computers, it provides backup for every aspect of the City of Stamford's computer network.)

Fuller and D'Angelo's design also incorporates green technology. During low-demand time periods, a thermal storage system banks energy for use during the school day. Coupled with a complete light sensor system, the



introduction of natural daylight into the building cuts down on the use and cost of artificial lighting. The enormous, 60-foot Structures Unlimited skylight showers the library in Museum-quality Daylight™. An aluminum box beam superstructure provides the basis for this energy-efficient, pre-engineered, self-supporting skylight system; 3,500 square feet of Kalwall translucent panels, secured to the box beam rafters, form a rigid, cohesive structure. (Additionally, a Kalwall

Curtainwall System daylights the school's gymnasium.) The skylight's unique overlap system provides a "shingle effect", virtually eliminating leaks, while the fully thermally broken system improves the building envelope's energy performance. Kalwall, a strategic partner of Structures Unlimited, is a world leader in advanced daylighting technologies. The latest iteration, Kalwall+ Nanogel®, achieves insulation of up to R-20.



"The dome structure was designed by Fuller and D'Angelo with technical aspects, economics and aesthetics in mind," says principal Joseph Fuller, Jr., in describing the Structures Unlimited skylight. "It was the most viable solution for this project. Well-designed, light and structurally capable. The dome rests over two interior spaces, namely the main library/reading room floor and also an upper, second floor ring, which houses teacher work areas. Natural light, distributed evenly across the spaces below, supplies correct light levels for learning." Under controlled, natural daylight, shadows and glare are eliminated; in a library setting, reduced eyestrain makes reading books and working with computer screens much easier. And for years, studies have pointed out the mental and physical health benefits of a daylighted building. Daylighted schools also report better behavior, higher test scores, and more regular attendance by students.

The dome "supplements an enormous electrical lighting requirement, which was consequently reduced to an acceptable level," Fuller continues. "The vast amount of area enclosed by the dome structure, with its dynamic shape as a half-circle, is cost-beneficial, energy-efficient, and provides an optimum interior atmosphere. The dome crowns the library space and creates an external focal form and accent. Further, at night, the dome glows with light and resonates from the building's exterior as a beacon reflecting this important building's signature outline."

AITE principle Paul Gross also offers "glowing" praise. "The Structures Unlimited 60-foot dome skylight is the 'crown' of our impressive and functional building. As a STEM (Science, Technology, Engineering and Math) school, the dome is a learning opportunity as well as a compelling visual structure. Our pre-engineering students have used the dome and the skylights to analyze and discuss the design, composition, structure, and ecological benefits. It is

the dome, however, that receives the greatest attention by students and their teachers. In addition, first-time visitors to the building consistently remark about the effect of the dome, first from outside and then from underneath it. AITE's library/media center enjoys the attention and rewards that the dome provides."

Before AITE was even built, its design merited *American School & University's* Education Design Excellence Work in Progress Award; after construction, accolades continued with the 2008 Design Collobetition BEST Bronze Award and 2008 Design Collobetition High Tech Silver Award. "The dome creates a soaring, invigorating sense of space and light, drawing you upwards to the sky," said judge Scott Goldman. "The stacks and mezzanine retain a warm, cozy feel ... a very comfortable place to research and study." Susan Cohoon also praised the space, adding, "It is difficult to find a design that would appeal to high school students and encourage them to utilize the media/library center." Kristine Mower called it "a beautiful design;" Jonathan Estrin said it was "compelling and well-articulated." From the computers at its core, to the visible structure of its interior walls, to its stunning Structures Unlimited dome skylight, AITE both teaches and inspires students who will develop tomorrow's technological wonders.

Specifications:

Skylight: 3,500 square feet
Light Transmission: 14%
Solar Heat Gain Coefficient: 0.18
U-Value: .23 Btu/hr/ft²/°F, or 1.30 W/m²K
Exterior: Greenish Blue
Interior: White

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