How the Albert Sherman Center Exceeded its Sustainable Goal by Bryan Thorp

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Gathering Space photo by Vanderwarker

ARC/ Architectural Resources Cambridge (ARC) completed the $378 million Albert Sherman Center, a 512,000sf facility (with a 465,500sf adjacent parking garage) for biomedical research and education in December 2012. The Sherman Center contains 200,000 SF of educational space including a 350-seat auditorium, conference and seminar spaces, a cafeteria, a flexible function suite, campus support spaces, and a fitness center for faculty, students, and staff. It also includes 300,000sf of wet laboratory space, administrative spaces, and a vivarium for small animals.

A certified LEED Gold facility, the Sherman Center expands and unifies the campus, doubles its research capacity and supports the medical school's new learner-centered curriculum. The project was successfully built on-time and under budget, a tribute to the collaborative efforts of the entire design, engineering and construction team. The building design seeks to minimize the gulf between scientists doing laboratory bench work and doctors in clinical care, to encourage the cross-fertilization of ideas.

Throughout the design and construction of the Albert Sherman Center, the project team delivered on a pledge to provide both The University of Massachusetts Building

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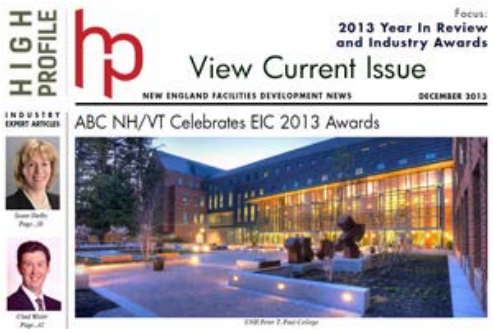

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Authority (UMBA) and UMass Medical School with sustainable and cost effective solutions for the new facility. From early energy modeling designed to explore optimal building orientation to enhanced commissioning to confirm energy savings, ARC's design team worked closely with the UMBA, UMass Medical School, Suffolk Construction, PMA Consultants, and our sustainable design consultant, Thornton Tomasetti, to ensure that sustainability goals were met.

The combination of efficient design, sustainable building practices and advanced technologies has resulted in an expectation that the new facility will operate 25 percent more efficiently than the code requirement baseline, consuming 4.1 million fewer kilowatt hours of electricity, using 30 percent less water, and reducing carbon dioxide emissions by 4.5 million pounds annually, compared to similar buildings of standard design. The predicted Energy Use Intensity (EUI) for this facility is 170 kBtu/sf/yr. Material choices were also carefully made to create a sustainable and healthy indoor environment for building users. The building has a core of recycled steel, a well-insulated building envelope, advanced heating and cooling systems, wood finishes harvested from sustainable forests, and carpets and other textiles woven with recycled fibers. Acoustic natural wood paneling on the interior walls imparts a sense of comfort and warmth to the public spaces. The north-facing, open lab modules were designed with high sloped ceilings and tall glazing to capture maximum indirect light and increase daylight penetration. South-facing glazing incorporates external sun shades and interior light shelves to decrease solar gain while directing daylight deep into interior spaces, creating a light and airy environment for building users. In collaboration with ARC's lighting design consultant, Lam Partners, we incorporated daylight- harvesting sensors to adjust lighting in offices, labs, and corridors to supplement the natural light only as needed. Rainwater from the roof and condensate water from the heating and cooling systems are captured and reused by the campus power plant, conserving 750,000 gallons of water each year.

The Sherman Center realized the greatest energy savings by effectively managing HVAC systems and implementing innovative technologies with the help of our mechanical, electrical and plumbing consultant, BR+A Consulting Engineers. Our team studied many options for reducing this energy usage. In developing the HVAC Basis of Design, we reviewed a series of Energy Reduction Measures (ERMs) and prepared life cycle cost information for the Owner to evaluate. Six major ERM's were implemented after considering energy cost savings, first costs, and annual maintenance costs:

1. Lab System Energy Recovery Wheels

2. Lab/ Office Active Chilled Beams

3. Lab System Reheat Recovery

4. Demand Control Ventilation

5. VAV Fume Hoods

6. Displacement Ventilation System

Our sustainable material approach resulted in 82.9% of the construction waste to be diverted from landfills, 22.5% of all building materials were made of recycled content and 14.53% of the materials selected were made from regional materials. The Albert Sherman Center exceeded the project's original sustainable goal of LEED Silver,

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and achieved LEED Gold Certification. In addition, the project has received numerous awards including the “Best Green Practices” award from The Boston Business Journal for its innovative sustainable design. We are thrilled with the results we have seen so far and are especially proud of the success from the collaborative project team approach.

Bryan Thorp, AIA, LEED AP, is an Associate Principal at ARC/Architectural Resources Cambridge in Cambridge, Mass.

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