

# High-Performance Building Envelope Reduces Construction Cost

## AVA Gallery and Art Center: A Work of Art and Historic Renovation

*A high-performance building can be built for less than a conventional building. While the envelope of a high-performance building may cost more, the performance leads to a significantly lowered energy load and a reduced mechanical systems cost. AVA Gallery reduced the cost of initial construction, gained long-term energy savings to keep operating costs in line and achieved LEED Gold certification.*

Contrary to common belief, the cost savings of a high-performance building envelope is not limited to long-term energy savings. A high-performance building envelope can reduce initial construction costs as well as long-term energy savings. In addition to the savings in the form of reduced energy costs spread over a number of years, the Cost Reduction Protocol (CRP) allows for significant savings in the form of reduced mechanical systems costs. To assure the lower energy load is met, the CRP requires rigorous quality assurance and compliance testing for meeting a performance standard throughout the construction process.

Because the CRP guarantees air tightness of 50% to 85% over typical construction methods, the mechanical engineer can safely design to a significantly lower energy load; this could not be done if using typical construction and building envelope methods. In the AVA Gallery project, using the CRP allowed the engineer to replace a large,

inefficient boiler with a staged environmental system consisting of three units. During the normal operation of the building, one unit is sufficient to maintain the environment of the entire building. Only during peak loads are the secondary and tertiary units needed.

Comparing an estimate of standard construction methods to the actual high-performance construction costs, there was a 1% savings in overall costs of the renovation of the building or about \$1 per square foot. The HVAC system dropped from an estimated 16% of the total building costs to 12% of the actual costs of a building with a high-performance envelope.

These saving are all in the initial construction costs. With the high-performance building envelope and significantly lowered energy load, these savings continue in the form of reduced energy costs throughout the life of the building, proving that building green is a win-win proposition.

The AVA Gallery and Art Center, established in 1973, is dedicated to the ongoing development of programs that nurture, promote, and challenge New Hampshire and Vermont artists, art students, and patrons of the visual arts. In September of 2003 the AVA Gallery acquired the H.W. Carter and Sons warehouse and factory as its new home. The 115-year-old New England mill building needed extensive renovations to make it safe and energy efficient. As an art gallery, climate control was crucial to protect the work housed in the building. The Board of Directors chose to "build green" and adhere to LEED (Leadership in Energy and Environmental Design) standards. Banwell Architects of Lebanon, N.H. consulted Building Envelope Solutions, Inc. to help create an integrated, energy-efficient design with a high-performance building envelope. The AVA Gallery earned a Gold LEED certification on this renovation.

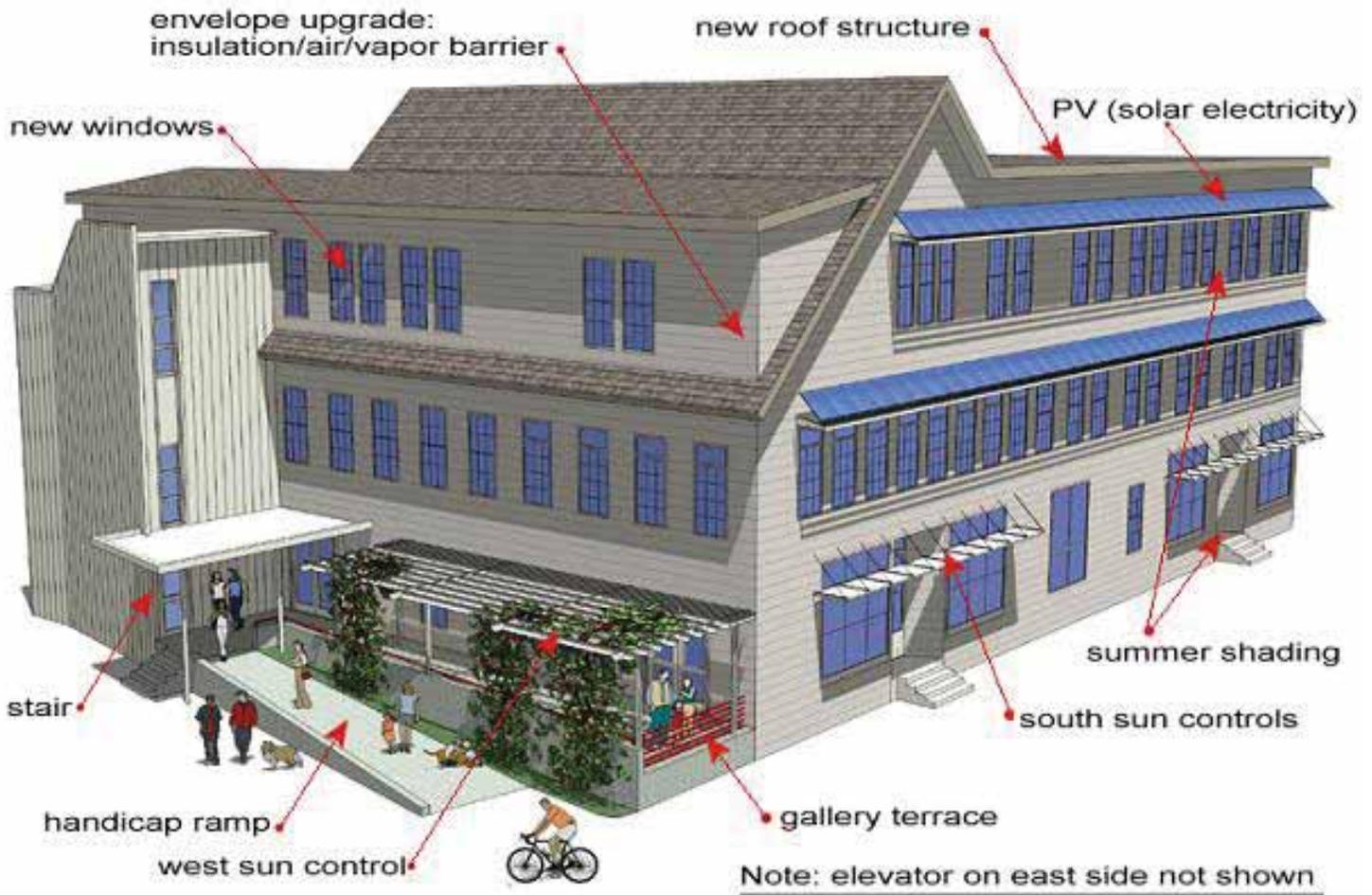


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Summary	Estimated Standard Construction	Actual High-Performance Construction
Total HVAC	\$533,333	\$400,000
Total Shell	\$44,067	\$132,200
Total High Performance design and commissioning	\$0	\$2,000
Total additional work by building envelope related trades	\$0	\$12,100
Total Shell & HVAC system cost	\$577,400	\$546,300
<b>Total net additional cost or savings</b>		<b>\$31,100</b>
<b>Square foot costs (\$/sq. ft. of floor space)</b>		
Building	\$98.75	\$97.99
HVAC	\$13.07	\$9.80
High Performance Shell including all related costs	\$1.08	\$3.58
Sub total	\$14.15	\$13.38
<b>Savings</b>		<b>\$0.76</b>

# AVA Gallery and Art Center

*Using a high-performance building envelope, the mechanical engineer can safely design to half the normal energy load.*



*The AVA Gallery wanted to create a building envelope that would be affordable and adhere to LEED specifications. It achieved this by passing the LEED requirements earning a Gold certification.*