BUILDING ENVELOPE SOLUTIONS Inc.

A High-Performance School for a Lower Overall Cost

Champlain Valley Union High School "New School" Makeover

Energy improvements can cost less than conventional building practices. Because the performance of the building envelope leads to a much lower design load, the mechanical systems can be downsized significantly, thus reducing the initial cost of construction. As a bonus, this saves energy for the life of the building.

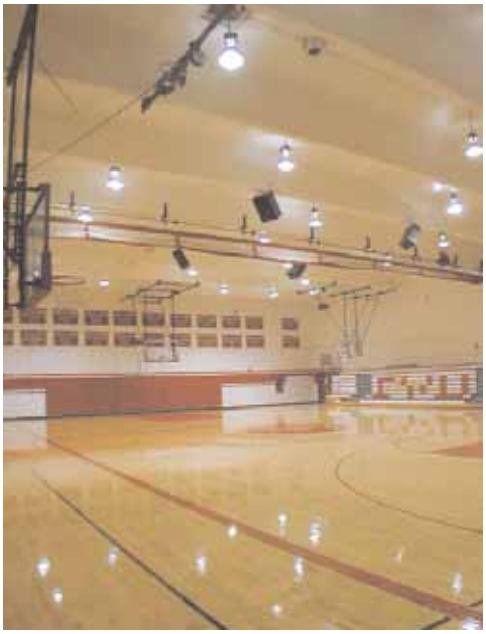
While long-term energy savings are important, a high-performance building envelope also saves during construction. By using the Cost Reduction Protocol (CRP) to guarantee the building's performance, the mechanical system can be "right-sized" to save a portion of the cost of construction. With a rigorous quality assurance program and compliance testing, the CRP assures the performance standard will be met.

Champlain Valley Union High School had a total building cost of $16 million with major additions of 63,000 square feet. A high-performance building envelope cost only $120,000 and saved six times this investment in HVAC systems. The innovative HVAC system, developed for the unusually low design load, cost at least 25% less than it would have with a conventional building envelope. This resulted in savings of $685,000, or about $10 per square foot according to data provided by Bill Root of GWR Engineering.

High-performance building envelope resulted in savings of $685,000 in the initial construction.

The CRP savings are not just realized during the construction process. These savings are ongoing for the life of the building in the form of lower operating and fuel costs, proving that building green can be a win-win proposition.

Summary	Estimated Standard Construction	Actual High-Performance Construction
Total HVAC system cost	$3,150,000	$2,362,500
Total shell	$30,014	$120,055
Total high-performance design and commissioning	$0	$1,500
Total additional work by building envelope-related trades	$0	$11,400
Total shell & HVAC system cost	**$3,180,014**	**$2,495,455**
Total net additional cost or savings		**$684,559**
Total building cost (excluding site development)	$16,684,559	$16,000,000
Square foot costs ($/sq. ft. of floor space)		
Building	$262.92	$253.97
HVAC	$42.33	$31.75
High-performance shell including all related costs	$0.48	$2.11
Subtotal	**$42.80**	**$33.86**
Savings ($/sq. ft. of floor space)		**$8.95**
Savings ($/sq. ft. of wall area)		**$24.57**



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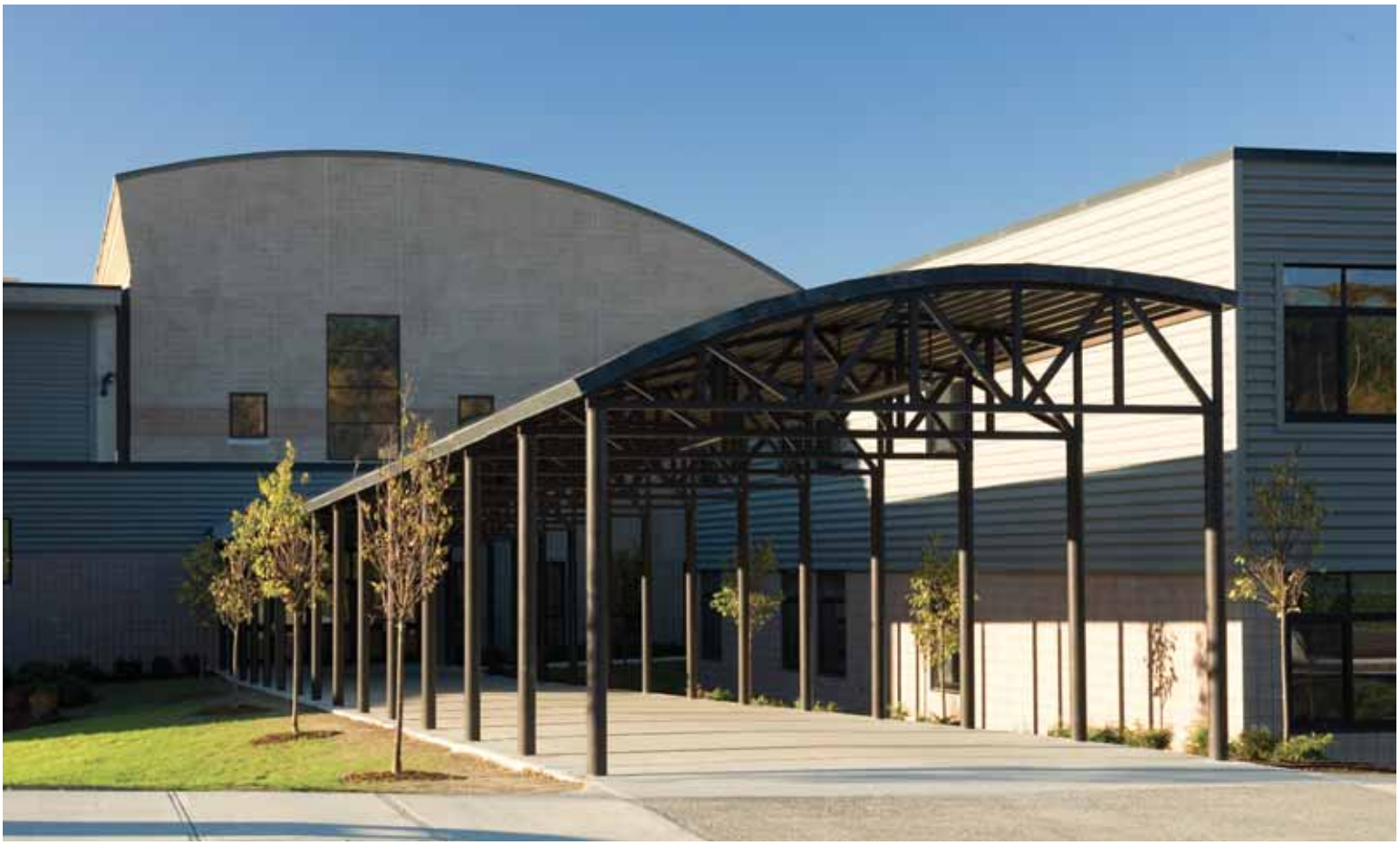
Champlain Valley Union High School



Performance Data	
Air Leakage Rates (in CFM50/Sq. Ft. of shell)	
Compliance Test Results	0.15
ASHRAE Recommended Max.	0.31
Conventional – U.S. Average	0.93
Air Leakage Rates (in ACH50/Hr)	
Compliance Test Results	0.04
ASHRAE Recommended Max.	0.08
Conventional –U.S. Average	0.23
Air Leakage Rates (in CFM50/Sq. Ft. of floor space)	
Compliance Test Results	0.23
ASHRAE Recommended Max.	0.47
Conventional – U.S. Average	1.40
Air Leakage Rate Comparisons	
Compliance Test Results	6.20
ASHRAE Recommended Max.	3.00
Conventional – U.S. Average	1.00

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