

Grafton Middle/High School

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The Grafton Middle School/High School is a 285,000 GSF facility in Virginia Beach, VA. By combining a middle school and high school, its design takes advantage of economies of scale and shared facilities to increase the value received for dollars spent.

The school was conceived and designed as an energy efficient building, located on the site to take maximum advantage of natural heating and cooling. It also features extensive use of daylighting.

Its HVAC system is flexible and energy efficient, allowing the school to heat or cool only a few classrooms instead of entire building wings during off-hours. The owner's building committee asked for classroom watersource heat pumps, a system they had used successfully in the past—though with access and maintenance difficulties because of the heat pumps' location. The Grafton school's design team solved the maintenance problem by locating the heat pumps in a small mezzanine space under the sloped roof and above the second floor corridors—an inexpensive and secure space that is

easily accessed for such routine chores as filter replacements.

Grafton achieved additional energy efficiency through a DDC energy management system and an advanced central ventilation system. The ventilation system uses desiccant wheel heat recovery to reduce electric refrigeration loads and precondition outside air.

In addition to saving money through energy efficiency measures, the district saved money by sharing facilities—the auditorium, gymnasiums, a media center, kitchen, and music rooms are located in the center of the two schools and can be isolated from classroom wings for after-hours community functions. The Grafton facility is used by community and extracurricular groups both before and after school hours, as well as on weekends and over the summer. Despite the extended hours of operation, the most recent 12-month utility records indicate a highly energy-efficient operation, as shown in the following table:

Grafton Middle/High School	Norfolk, VA SMSA Building Energy Performance Standards Goal	US EIA Building Energy Use Survey of average energy use	
		<i>Existing education facilities, South region</i>	<i>All educational buildings > 100,000 GSF floor area</i>
43,000 Btu/GSF-year	46,000 Btu/GSF-year	62,900 Btu/GSF-year average energy use,	77,700 Btu/GSF-year average energy use