

FACILITIES

A Conversation about HIGH PERFORMANCE

ENERGY POSITIVE

school building design

HORRY COUNTY EDUCATION CENTER

Green Buildings

The terms, "High Performance", "Green", and "Sustainable Construction" are often used interchangeably.

Focus on ecological, social, and economic issues of a building.

Goal of sustainable construction is to create a healthy built environment based on efficient use of resources and smart ecological design.

High Performance

".... A building that integrates and optimizes on the life cycle basis all major high performance attributes, including energy conservation, environment, safety, durability, accessibility, cost-benefit, productivity, sustainability, functional, and operational considerations"

RFP 1415-91June 24, 2015 Appendix E: Energy Positive / High Performance requirements

Energy Positive

- "....means that the total amount of energy used by the building on an annual basis is less than the amount of renewable energy created on the site."
 - Measurement is consumption / production and NOT financial cost of the energy.
 - ASHRAE/USGB/IES Standard 189.1-2009 and ASHRAE62.1

Various building design / construction standards to measure "Green" aspects of the built environment.

- LEED
- Energy Star
- Energy Globe
- WELL Building

Must have extensive input from Owners on operational use and expectations for the finished project.

https://new.usgbc.org/leed

https://www.energystar.gov

https://www.energyglobe.info

https://www.wellcertified.com

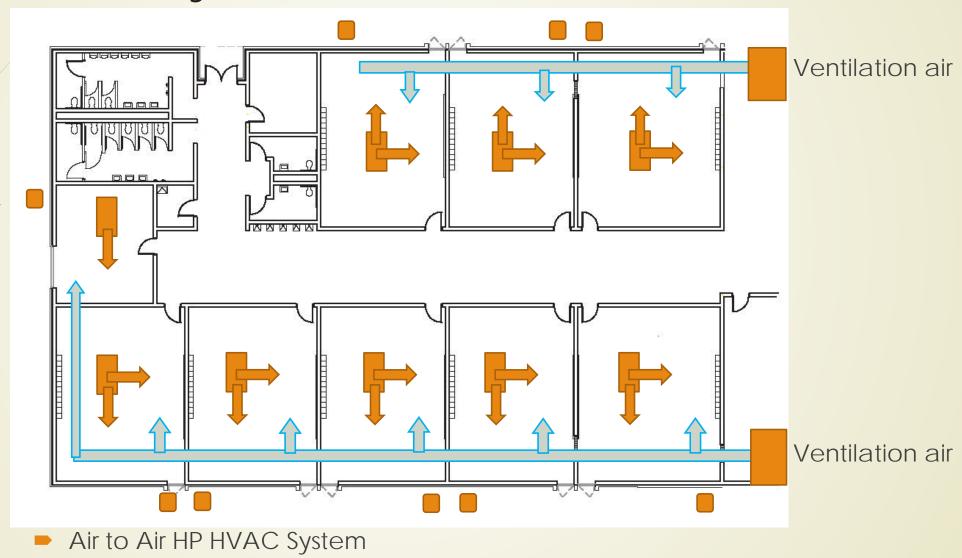
HCS history

- Water source heat pump systems
 - Proven systems which last 30+ years
 - Allow individual classroom control
 - Myrtle Beach Loris Green Sea & St James High Schools
 - 11+ other existing HCS schools
- Air to air heat pump systems
 - Lower first cost
 - Last 15 20 years
 - Allow individual classroom control
- Ice storage water source heat pumps
 - Reduce demand charges
 - Allow individual classroom control
 - ATA

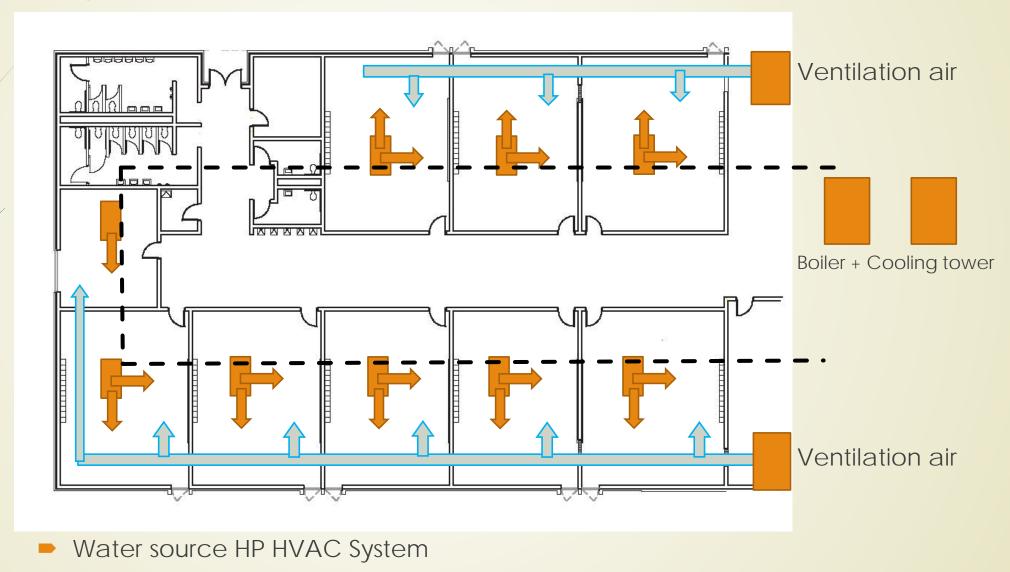
HCS history

- Five New Schools
 - Water source / geothermal / central energy plant / VAV systems / integrated OA.
 - Proven systems which last 30+ years
 - Allow individual classroom control.
- Recent HCS Renovations
 - Water source heat pump systems / dedicated outside air system.
 - Proven systems which last 30+ years
 - Allow individual classroom control
 - Midland Elementary
 - Myrtle Beach Middle School Conversion

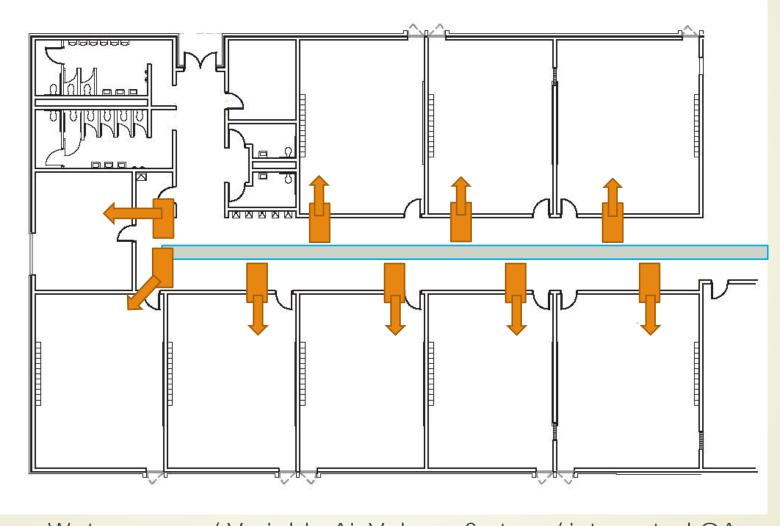
Basic System



High Performance System



High Performance System +

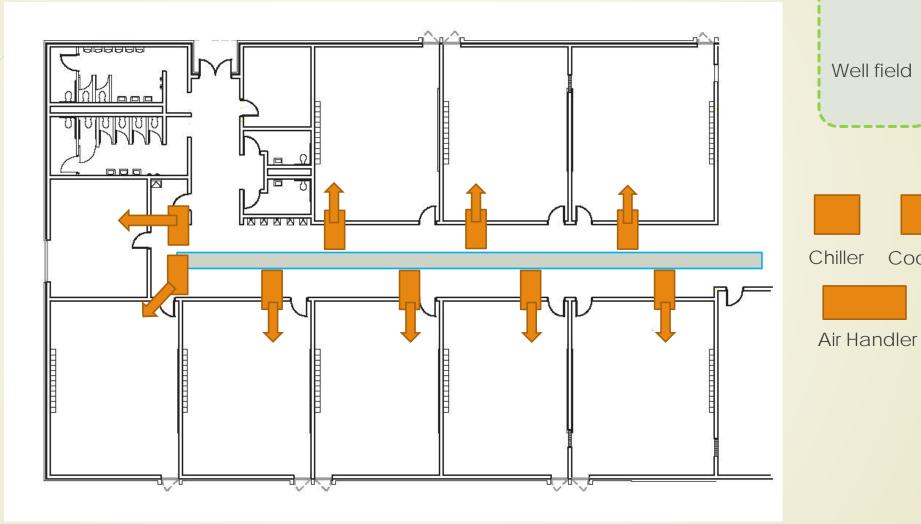


Chiller Cooling tower

Air Handler

Water source / Variable Air Volume System / integrated OA.

High Performance System + +



Water source / geothermal / central energy plant / VAV systems / integrated OA.

Cooling Tower

Energy Positive



Add PV panels to offset the energy consumption of the building.

Where do we go from here?

HIGH PERFORMANCE

YES

5-7 % cost increase

- Base system water sources heat pump systems
 - dedicated ventilation air system
- Some consideration for water source / geothermal / central energy plant / VAV systems with integrated ventilation air system based on Life Cycle Cost.

ENERGY POSITIVE

YES/NO

5-6 % cost increase

+ High Performance Cost

Based on life cycle cost / energy modeling and anticipated energy cost increases.

Horry County Education Center

Base System

PROGRAM BUDGET \$ 13m

- Air to Air heat pump system
- Dedicated ventilation air system
- High Performance

ADD

\$850,000

- Water source heat pump system
- Dedicated ventilation air system

Energy Positive

ADD

\$ 750,000

- PV panels on the roof
- Large enough system to offset energy consumption (+ 10%)

COST NUMBERS REFLECT HCS FACILITIES STATEMENT OF PROPABLE COST





Thoughts / Questions