ARLINGTON HIGH SCHOOL SUSTAINABILITY

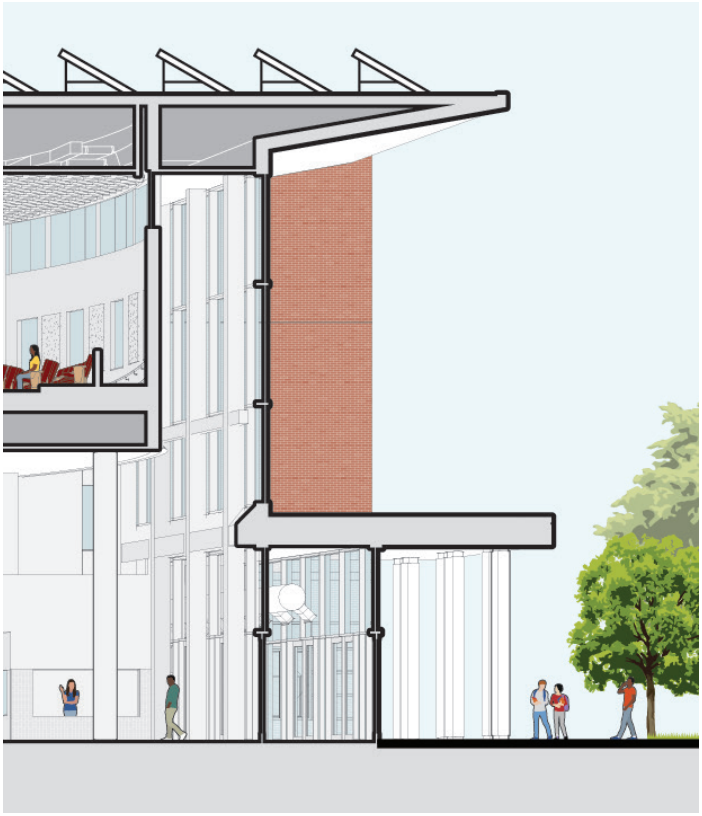
Energy

Limiting energy use to reduce operational carbon

Efficient systems, a well-insulated envelope, and daylighting strategies help lower AHS's **energy consumption.** Time-scheduled outlets reduce plug loads, limiting excess energy use.

- Efficient systems
- Passive design
- Plug load management
- Solar energy

A **solar array** produces **clean electricity** to offset a portion of the building's energy use, equivalent to the annual usage of about 170 Arlington households.



Building Facts

Daylight controls and **vacancy sensors** in classrooms and offices limit energy use by automatically dimming lights when there is sufficient daylight and turning lights off when a space is unoccupied.

Mechanical systems at AHS are **all electric.** No fossil fuels are burned on site to operate the building. The primary systems include centralized **Air-Cooled Heat Pumps (ACHP), Heat Recovery Air Handling Units (HRU),** and **Variable Refrigerant Flow (VRF) Systems.**

Plug loads are the largest contributor to AHS's energy use. To conserve energy, **programmed outlets** automatically switch off during non-peak hours.

Triple-pane glazing at the Mass Ave and north entrances ensures the lobby is light-filled and well-insulated to maximize **energy efficiency.**

The **north-south solar orientation** of the classroom wings reduces the energy used for heating/cooling, particularly in the spring and fall. The building's mechanical systems harness excess heat from the **direct southern exposure** to heat north-facing classrooms.

Carbon Reduction

Reducing carbon-intensive materials and the energy associated with construction, operation, and transportation

Supporting Arlington's goal of carbon neutrality by 2050, the building's design minimizes **operational carbon** and **embodied carbon.** The **all-electric** facility uses heating and cooling systems that rely on an increasingly clean electric grid and do not burn fossil fuels on site. Conscious material selection lowers the building's **global warming potential** (GWP), also known as its carbon footprint.

- Operational carbon
- Embodied carbon
- Transportation

Building Facts

Light-reflective roofing helps cool the area around the building, which keeps interior temperatures down and reduces the energy used for cooling.

AHS is one of the first municipal buildings in MA to utilize **low-carbon concrete.** In low-carbon concrete, alternative materials replace cement, which is known for its high carbon footprint, while maintaining the same structural strength.

Hot water for hand washing is preheated using excess waste heat from electrical rooms to save energy and **reduce the building's operational carbon.**

EV charging stations support environmentally friendly transportation and are open to the Arlington community when school is not in session.

Indoor Environmental Quality

Ensuring a healthy and comfortable interior environment

The new high school's interior environment promotes **mental and physical well-being** with optimal air quality, natural light, thermal comfort, and appropriate acoustics, allowing students and faculty to focus solely on education.

- Daylight
- Air quality
- Thermal comfort
- Acoustics
- Biophilic design

Building Facts

Materials with **recycled content** are used throughout AHS, including structural steel, concrete in the foundation, roofing, linoleum flooring, carpeting, and ceiling tiles. Linoleum flooring is also made from **rapidly renewable materials.**

AHS incorporates **Red List Free** materials, which do not contain any chemicals of concern identified by the **Living Building Challenge** (LBC).

Multi-level lightwells bring **daylight** deep within the building.

Air quality sensors throughout the school monitor CO_2 levels and ensure appropriate fresh air based on the number of occupants in a space.

Classrooms feature **sloped ceilings** to make room for mechanical systems while maximizing window height and **daylight.**

To ensure **appropriate acoustics,** the school utilizes sound-blocking strategies and highly absorptive materials, including ceiling tiles in classrooms, felt baffles in communal spaces, and texturized acoustic spray in lightwells.

Water

Reducing water consumption and managing rainwater on-site

Water is a **vital natural resource.** In the high school, it supports occupants, building functions, and natural site elements. The design employs **water management strategies** to help conserve this resource.

- Potable water conservation
- Rainwater management

Building Facts

Low-flow plumbing fixtures conserve over **660,000 gallons of water per year,** the equivalent of an Olympic-sized swimming pool!

Rainwater collection areas retain stormwater and allow it to percolate into the landscape over time. This prevents stormwater runoff, which adversely affects the quality of nearby waterways.

Native pollinator gardens on site collect rainwater from the building's roof and provide a habitat for local pollinator species.

Connections

Fostering meaningful connections between people and place

Through strategic planning, views between spaces, and access to the outdoors, the design cultivates connection on multiple levels: connections between students, connection to the greater Arlington community, and connection to the natural environment.

- Interpersonal connection
- Community connection
- Connection to nature

Building Facts

Direct outdoor access to facilitate expanded learning opportunities and a **connection to nature.**

Direct access to the **Minuteman Bikeway** and **bicycle parking** encourages cycling as an environmentally friendly means of transportation.

The **central spine** connects the upper Mass Ave lobby to the lower north entrance at the fields, connecting the school's departments and public-facing venues with a flexible **hub for student activity.**