



Christa McAuliffe Elementary School

Concord, NH

GENERAL INFORMATION

Location: 17 North Spring Street, Concord, NH 03301

Project Cost: \$18,545,834

Scope: 71,485 ft²

Cost Per Square Foot: \$205/ft²

Completion: September 2012

Enrollment: 484 students grades K-5

Architect: HMFH Architects, Inc.

Engineers: Rist-Frost-Shumway Engineering

Funding/Grant: N/A
NE-CHPS

PROJECT OVERVIEW

Christa McAuliffe Elementary School is one of a trio of high performance schools that opened in September 2012 in Concord, NH. The other two are Abbot-Downing Elementary School and Mill Brook Primary School.

The new K-5 school honors its predecessor's character by reusing design element from the former school, like the ornate granite entryway. Inside, Christa McAuliffe's Learning Corridor functions as the heart of the school and supports various methods of teaching and learning. Throughout the interior, exposed HVAC, lighting, and structural components are used as teaching tools to bring energy efficiency and building structure into the curriculum.

Community members were involved throughout the planning and design process, and their input and goals led to the creation of a neighborhood school with accessible walking and bicycle paths leading to the welcoming façade.

Student health was also a priority and was reflected in a variety of design choices. To maximize student wellbeing, the design team ensured that interior spaces received natural light, which improves overall health and circadian rhythm. High-reflectance white paint on many of the walls increases the efficiency of lighting, while direct sunlight diffused with color panels and the school's north-south orientation minimizes glare. Exterior lighting features full cut-off ability, illuminating only the area below the fixture, which preserves the darkness of night sky.

The school's HVAC system also supports student health; the units use the same technology as units in medical operating rooms, featuring special diffusers that improve air quality and minimize the amount of airborne dust particles.

Acoustics were carefully incorporated into the new school, which fully meets ANSI Standard 12.60, the highest standard for classroom acoustics. Wall panels and ceiling tiles prevent background noise and reverberation and minimize noise and distractions. The impact of these changes shows through the new building's significant decline in absenteeism, which saw a 15-20 percent drop-off since McAuliffe's opening.



SUSTAINABLE DESIGN ELEMENTS

Acoustics

- Classroom spaces designed to meet or exceed ANSI 12.60 for background noise, reverberation time, and room to room sound isolation
- Acoustic wall panels line special areas, including the Learning Corridor and the gymnasium, for noise absorption

Community Involvement

- Community heavily involved in the planning process, and particularly active in establishing goals to maintain a neighborhood school

Daylighting

- High-reflectance white paint used on most walls and ceilings to increase lighting efficiency
- Carefully placed skylights and interior glazing make daylight a predominant light source in the Learning Corridor
- The gym is lit almost entirely by daylight

Energy Efficiency

- Energy modeling conducted to take into account local climate and building orientation
- The high-performance envelope (R 29.9) and mechanical systems exceed the requirements of ASHRAE 90.1
- HVAC systems housed in penthouse mechanical rooms for easy maintenance
- Dehumidification systems reduce the need for air conditioning
- Exterior lighting with full cut-off preserves the night sky

Health Impact on Students

- Natural lighting, improved wellbeing, and supportive of a healthy circadian rhythm
- Variety of spaces allow flexible movement

Indoor Environmental Quality

- All classrooms have operable windows
- Air delivery uses technology from operating rooms, minimizing airborne particles and improving air quality

Materials

- Elements from predecessor buildings were reused to honor the school's history and character
- Only products with little to no volatile organic compounds (VOC) were installed
- Gym floors made of rapidly renewing bamboo
- Steel, brick, and block were locally sourced

Occupant Behavior

- Constructed to expose HVAC, lighting, and structural components to be used as teaching tools

Site Selection

- Neighborhood school with accessible walking and bicycle paths
- Classrooms are north-south oriented to reduce glare

Water Efficiency

- Low-flow fixtures reduce overall potable water usage by 52 percent
- Native, drought-tolerant plants reduce irrigation demand