



Mill Brook Primary School

Concord, NH

GENERAL INFORMATION

Location: 53 South Curtisville Road,
Concord, NH

Project Cost: \$16,087,285

Scope: 64,580 ft²

Cost Per Square Foot: \$210/ft²

Enrollment: 476 students

Architect: HMFH Architects, Inc.

Engineers: Rist-Frost-Shumway

Estimated Energy Cost Savings: \$51,507

EUI (kBtu/ft²): 38.5

PROJECT OVERVIEW

Mill Brook Primary School is one of a trio of high-performance schools that opened in September 2012 in Concord, NH, along with Abbot-Downing and Christa McAuliffe elementary schools. The new building replaced two schools, the Dame School and Eastman School.

Mill Brook features a learning corridor that facilitates different methods of teaching and learning. The exposed HVAC, lighting, and structural components are used as teaching tools to inform both students and the community about energy efficiency. The new school is designed to maximize its situation adjoining an existing elementary school, the Broken Ground School, by sharing facilities; Mill Brook students use Broken Ground's gymnasium, while Broken Ground students use Mill Brook's auditorium. In addition to saving on construction costs and cutting back on energy usage, this relationship has the added benefit of exposing both schools to greater resources for its students.

Student wellness was an ongoing priority throughout the design process. Skylights and clerestory windows illuminate the building with natural daylight, exposing students to blue light, which promotes a healthy circadian rhythm, while also reducing the building's overall energy usage. High-reflectance white paint on interior walls, along with colored panels that diffuse sunlight, also increase lighting efficiency.

LED exterior lighting features full-cutoff—light only seen from below the fixture—preserving the darkness of the 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 minimize the amount of airborne dust particles and improve air quality for students and educators.

The school is 43 percent more efficient than the ASHRAE 90.1 baseline. To further reduce the school's environmental impact, sustainable materials were used throughout. Local forest certified wood was used for casework, reclaimed granite from the demolished building formed the new outdoor amphitheater, and the exterior features durable, low-maintenance masonry. Low-flow water fixtures reduce estimated potable water use by 53 percent, and drought-tolerant plants reduce irrigation demand. Outside, pervious paving reduces stormwater runoff. Mechanical systems were housed indoors rather than on the roof to increase their lifespans while making regular maintenance easier.

The newly constructed features were largely informed by the community members, who were involved throughout the process. The community wanted to preserve the site's surrounding forests; design of the building in turn minimized impact on the surrounding landscape and even situated the school to have easy access to natural resources including woodland trails.

SUSTAINABLE DESIGN ELEMENTS

Site

- Nearby access to nature and fitness trails
- Shared facilities with existing neighboring Broken Ground Elementary School
- Sited to preserve open space and minimize disturbance of surrounding natural area
- Use of pervious paving to reduce stormwater runoff
- LED exterior site lighting with full cutoff, preserving night skies

Acoustics

- Acoustic treatments reduce background noise and reverberation, and exceed ANSI 12.60
- Low-noise classrooms

Water

- Low flow fixtures reduce potable water usage by 53%
- Drought tolerant plants eliminate need for irrigation

Energy

- Mechanical systems housed indoors rather than on roof for longer lifecycle
- Highly efficient thermal envelope with fiberglass windows, double insulated walls, R-30 roof



This case study was prepared by NEEP. For more information about High Performance Schools, please contact John Balfe, NEEP's Senior Buildings & Communities Solutions Associate at jbalfe@neep.org or 781-860-9177 x109.