



Abbot-Downing Elementary School

Concord, New Hampshire



General Information

Location: 152 South Street, Concord, NH

Scope: 73,446 ft²

Cost: ~\$17.5 Million

Completion: September 2012

Enrollment: 484 students (K-5)

Architect: HMFH Architects, Inc

Engineer: Rist-Frost-Shumway Engineering

Certification: NE- CHPS

Awards:

- 2013 Education Design Showcase Honorable Mention School Planning & Management
- 2013 Project of Distinction Council of Educational Facility Planners International (CEFPI)

**Estimated energy cost savings
of \$50,032 per year**

Project Overview

Abbot-Downing Elementary School is part of a trio of new high-performance schools in Concord, NH, that opened in September 2012 (Abbot-Downing, Mill Brook, and McAuliffe Elementary). The new school replaces the former Conant School, echoing design elements from the original school, including reuse of the signature cupola.

With an innovative Learning Corridor at the heart of the school, Abbot-Downing provides a learning environment that supports varied modes of teaching and learning. Importantly, construction was designed to reveal HVAC, lighting, and structural components to purposefully call student and staff attention to the systems integration on site. This facilitates using the school as a teaching tool to inform students and the community about energy efficiency. Scaled and sited to fit in with the residential neighborhood, the new school serves grades K-5 and provides a healthy, engaging learning environment enlivened with color, playful forms, and natural lighting.



Photo credit: Ed Wonsek/HMFH

To highlight the importance of efficient features, the HVAC system was made highly visible through use of a colorful paint scheme.

All mechanical systems exceed ASHRAE 90.1 and a combination of perimeter radiation heating with constant and variable air handlers is used to meet heating load.

To further reduce carbon footprint, locally sourced materials such as steel and brick were selected and products with little to no volatile organic compounds (VOC) were installed.

High-reflectance white paint is used on the majority of walls to increase the efficiency of lighting, including direct sunlight diffused with colored panels for natural lighting conditions that create a healthy learning environment for students. A north-south classroom orientation minimizes glare.

Low-flow water fixtures result in an estimated potable water use reduction of 52%, and native, drought tolerant plants reduce irrigation demand.

Dehumidification was chosen over full air conditioning to reduce energy cost. Diversity factor was used to further reduce the size of the chiller. The final chiller size is only 30% of a full building with A/C system, reducing the first cost as well as increase operating efficiency.



The community was heavily involved in the planning process, and as a result, emphasis was placed upon creating a neighborhood school. As such, the school is accessible by walking/bike paths that lead directly to the welcome area.

Sustainable Design Elements

Site

- Nearby access to walking and bike paths
- Classrooms oriented north-south to reduce glare and maximize daylighting

Acoustics

- Acoustic wall panels and ceiling tiles prevent background noise and reverberation

Materials

- Reuse of elements from old buildings
- Bamboo (rapidly renewable) gym floors
- Regionally sourced materials

Water

- Low flow fixtures reduce potable water usage by 52%
- Drought-tolerant plants reduce irrigation

Energy

- LED exterior site lighting with full cutoff to preserve night skies
- Mechanical Systems housed indoors rather than on roof for longer lifecycle
- Heat energy generated by wood-fired district heating plant

This case study was prepared by NEEP with information provided by HMFH Architects. To learn more about this project, please contact Susan Elmore at selmore@hmfh.com.

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