This is a Modular Green School Building

A **HEALTHY INDOOR ENVIRONMENT** is provided by carefully selecting materials, equipment and construction methods. **Air quality** is maintained with non-toxic construction materials, finish surfaces and paints containing low levels or no volatile organic compounds (VOCs). Factory construction in a weather-protected facility avoided exposure of materials and systems to rain and mildew during the construction process, minimizing the long-term potential for mildew or indoor air-quality degeneration. **Natural ventilation** is provided with monitored fresh air intake in the mechanical system and with operable windows for fresh air in nice weather, while high insulation values, quality windows and careful weatherization eliminate drafts and minimize mechanical conditioning in hot or cold weather. **Generous windows** and **solar tube skylights** provide **daylight** in all rooms. To optimize day light levels, the windows are shaded from direct sun with exterior **aluminum sunshade louvers** and solar tubes are fitted with operable shades. **Acoustical dampening** is essential to interior experience, and children's ability to learn and distinguish spoken language is especially affected by background sound levels and surface echo. This building has **advanced mechanical systems** that have been tested as 20 to 35 times quieter than traditional systems. Floor, wall and ceiling systems are designed to limit sound transfer from the exterior and between rooms and to significantly dampen sound reverberation within rooms. Surfaces, materials and colors throughout the space are selected not only for health, sustainability, functionality and **hygienic ease of maintenance**, but also to provide **vibrancy, fun** and **creative inspiration**.

ENERGY EFFICIENCY has been a major focus of design and construction for this building. First of all, factory built modular buildings are not only equal to or superior to traditional buildings in quality, but the **controlled manufacturing process greatly minimizes energy and material waste** typical to site construction. Modularity of the construction system allows relocation and **future re-use** of the building without typical demolition and disposal waste of materials and embedded energy. **High quality windows, high-performance GreenGuard insulation and high-grade sealants** reduce heat loss, which reduces energy waste, pollution and release of greenhouse gasses. A high-quality white rubber roof and solar-shaded, low-emissivity glazing **reflect solar heat gain** away from the building to keep it comfortable in hot weather, reduce air conditioning loads inside the building, and reduce heat-island warming of adjacent buildings and outdoor spaces. The **high-efficiency Bard heating, ventilating and air-conditioning** (HVAC) mechanical systems use sensors and electronic controls to minimize energy use while optimizing temperature and fresh outside air as the number of people and activity increase in a room. These **carbon dioxide monitors** and other occupancy sensors "learn" patterns of activity and optimize air conditioning settings to conserve energy and maintain comfortable levels appropriate to daily cycles of use. **Coordinated sensors and**

electronic control of the lighting system turn off lights when there is no activity in a room. The electronic control system is designed for future implementation of light dimmers controlled by actual daylight levels in the room, so that when the sun brightens, lights will automatically dim. Planning for increased future affordability of on-site power generation, the building is also designed and structured to accommodate a future rooftop photovoltaic (PV) array capable of fully powering the building with zero energy from the power grid.

SUSTAINABLE MATERIALS AND CONSTRUCTION SYSTEMS are employed throughout the building. Wherever possible, **high-recycled content materials** are used, including gypsum wallboard, cabinet systems, acoustical ceiling tile, and linoleum floor tile; and carpet tile made from recycled plastics and designed for return to its factory for 100% future recycling. Wood structural and finish components are either engineered composite wood from rapidly renewable sources, or **Forest Stewardship Council (FSC) certified products** grown in sustainable forests. Microstrand Wheat Board, a material that contains no toxins and is made from agricultural waste products left over from the harvesting of edible grains is used as a special wall-surfacing panel. Finally, factory-built modular, re-locatable construction, with its inherently low waste and reduced embodied energy, is itself a major contribution to sustainable building practice. This **green, modular school building** was built sustainably and economically to serve its current Harvard users well, and in the future, this will be relocated to another site with minimal transfer waste, to be enjoyed again by future users. **Re-Use, Reduce, Recycle.**