Introduction

PURPOSE OF THE GUIDELINES

The purpose of NY-CHPS is to provide a framework that helps districts and their design teams design and build sustainable school buildings that enhance the educational environment and facilitate learning. High performance schools optimize resources over the life of the facility, are less expensive to operate than standard buildings, and help to ensure healthy, safe, and high quality learning environments.

These Guidelines were developed as part of a collaborative effort between the New York State Education Department and the New York State Energy Research and Development Authority. An Advisory Council was created to inform and guide the process consisting of members of the following groups: Superintendents of Buildings and Grounds Association, Association of Educational Safety and Health Professionals, Association of School Business Officials, Council of School Superintendents, New York State Department of Health, a Teacher, the Healthy Schools Network, ASHRAE, Association of Energy Engineers, and the American Institute of Architects. The Guidelines themselves are built from a Massachusetts version of the Guidelines of the Collaborative for High Performance Schools, Inc. (CHPS). CHPS was originally developed as a collaborative effort in California. New York is grateful for all those involved in the California and Massachusetts development processes. In recognition of the development process, New York has named these Guidelines, NY-CHPS.

PROVIDE AN OUTSTANDING LEARNING ENVIRONMENT

Schools designed to meet NY-CHPS will improve the learning environment while providing a healthy learning environment, saving energy, resources, and money. NY-CHPS buildings are durable, easy to maintain, healthy, energy efficient, and comfortable. ***Most important, high performance schools provide students and teachers with an outstanding learning environment.***

SCHOOL FACILITIES MUST BE DURABLE

NY-CHPS helps designers and districts understand the true life-cycle cost of a school, focusing not just on construction costs, but also including energy, maintenance and replacement costs. School construction bonds are typically over long financing periods, up to 30 years. New school buildings must employ construction technology and building materials that outlast the bonds that pay for them. NY-CHPS helps designers and school officials select building materials and

technologies based on total, life-cycle cost of ownership and the best interests of the building's occupants.

School Facilities Must Be Easy to Maintain

Schools must be properly maintained to be energy efficient, healthy, and durable. Maintenance expenses must be considered during design as they represent a significant expense to districts and tax payers. High performance schools recognize the vital role of maintenance staff in keeping buildings healthy and safe. Healthy and safe buildings contribute to lower absenteeism rates and more productive occupants.

Buildings Should Be Designed to Utilize Natural Resources

Schools buildings should be designed with special attention to overall site orientation to capture natural lighting, passive solar heating, and natural cooling effects. Designers must pay special attention to room location, equipment sizing, window placements, and glazing selection. Sites should be selected to preserve natural resources and to minimize adverse impacts on the environment.

Renovation Projects Are an Opportunity for High Performance Design

The average school building in New York is over 50 years old as of 2005. Many of New York's school buildings are aging, and many will undergo significant renovation in the coming years. The renovation of school buildings provides districts with an opportunity to increase energy efficiency and indoor environmental quality while maintaining and promoting building durability. Healthy and environmentally-friendly schools can contribute substantially to achievement of educational goals. High performance renovation can help New York's older school buildings to continue to cost-effectively serve districts for many years to come.

Provide Long-Term Benefits to Students, Teachers and Taxpayers

High performance schools provide direct benefits to teachers and students by improving the educational environment, including spaces that are well lit, have good acoustics and indoor air quality, and are designed to optimize learning. Districts that build high performance schools provide savings through reduced energy, maintenance, and replacement costs. High performance schools take steps to be the next generation of schools that provide lasting benefits to the community.

General Notes

NY-CHPS is written as an Appendix to the NYSED Manual of Planning Standards (MPS). All school construction projects that fall under the auspices of NYSED and requiring a building permit must meet all local (where applicable), state and federal codes, as well as all requirements in the MPS, including the New York Uniform Fire Prevention and Building Code and the State Energy Conservation Construction Code. To maintain consistency among the various NYSED documents, various sections of NY-CHPS reference specific New York State Codes, regulations

of the NYS Department of Environmental Conservation, and federal requirements. In addition, some sections that deal with building operations include a requirement that "the school shall develop a formal policy to …" These kinds of requirements are intended to involve the district superintendent and the school board to formalize policies that will benefit the school for years to come.

WHAT IS A HIGH PERFORMANCE SCHOOL?

A high performance school has three distinct attributes: it is designed to enhance the learning and working environment; it is less costly to operate than a conventional school over the life of the building; and it conserves important resources such as energy and water.

A high performance school is designed to optimize the materials durability of the facility and to utilize high efficiency, "correctly-sized" heating, ventilating, and air conditioning equipment and lighting systems. Wherever possible, appropriate amounts of glare-free daylight should be brought into the school to enhance the learning environment. The building shell should integrate the most effective combination of insulation, glazing, and thermal mass to ensure energy efficiency. Plumbing fixtures are specified to reduce water consumption. Together, these measures can significantly reduce the operational costs of running the school building. Based upon recent research completed around the country on the benefits of high performance schools, it is reasonable to estimate that 20% - 40% cost savings in utility bills versus a non-green building of the same size and shape are possible.

A high performance school is also thermally, visually, and acoustically comfortable. Thermal comfort means that teachers, students and administrators should be neither hot nor cold as they teach and learn. Visual comfort means that the quality of lighting makes visual tasks, such as reading and following classroom presentations, easier. Acoustic comfort is achieved when students and teachers can easily hear and comprehend each other, and are not impeded by loud ventilation systems or noise from adjoining spaces or the outdoors.

High quality indoor air is another important feature of a high performance school. Air intakes should be located away from potential sources of contamination and ventilation systems should be designed to optimize fresh air. Architects and engineers should incorporate best design practices to prevent water intrusion into wall and roof assemblies. This, in turn, reduces the potential for the accumulation of moisture in materials that could support mold growth or lead to premature replacement of indoor finishes and even structural elements.

A high performance school should also be built on an environmentally responsible site**.** To the extent possible, the school's site should conserve existing natural areas and incorporate them into the curriculum. Stormwater runoff is minimized or captured on site for irrigation or flushing water closets. The site should be accessible to bicycle and pedestrian traffic and be conveniently located for community activities.

While operational savings, environmental stewardship, and community-building are attractive benefits, it is important to emphasize that, above all, a high performance school should provide an environment that enhances the primary mission of the New York State Education Department: to raise the knowledge, skill, and opportunity of all the people of New York.

How Much More Will It Cost?

It is usually assumed that building high performance schools is more costly, but that is not always the case. By using an integrated design process from the start, better buildings can usually be built at little — and sometimes no — additional construction cost. Higher design costs will usually be incurred, but this is usually only a small fraction of overall project costs and many times incremental design costs can be offset by savings in other areas. For example, if an architect proposes the possibility of saving energy by changing the windows from double glazing to triple glazing, this will save energy but will cost more money for the windows. But then the engineers might find that they can eliminate the perimeter hot water radiation system because the perimeter heat loss is reduced, and heating can be done with just heat from the air system. A designer might also determine that air duct sizes for heating and cooling can also be reduced, or the boiler may be downsized. In the final analysis, the reductions in HVAC equipment could more than pay for the added cost for the triple glazing. In the traditional, non-integrated process — in which designers primarily sit in their separate offices and use a standard, "worst case design" sheet method — such integrated savings and advantages are often not possible, and systems can be needlessly over designed and inefficient.

Most architectural and engineering firms involved in school design have already developed at least some expertise in sustainable design and high performance schools. However, there are a number of new skills and processes involved that deserve additional fees. A commissioning authority and an energy analysis firm may need to be added to the design team at additional cost. These are usually contracted directly by the owner. The architect is usually in charge of the HPS design process and will have a number of additional tasks to perform in executing and documenting the process. The engineers, who in the past were usually paid on a percentage of the cost of the equipment in their work, may also have additional HPS tasks and may be asked to reduce the size and cost of their equipment to more closely match the reduced building loads. Districts are encouraged to openly discuss these potential costs with their design professionals at the interview stage.

Despite the efforts of skilled professionals using an integrated design process, a high performance school's first cost may be slightly more than that of a conventional design. But the cost/benefit analysis of the project as a whole (as in past projects) will show substantial savings. A MTC report published in December, 2005, indicated that for 30 HPS schools nationwide and an analysis of available research, HPS schools cost 1.5% to 2.5% more than conventional schools, but the HPS schools provide financial benefits that are 10 to 20 times as large. Savings can accrue from reduced energy use, reduced water and sewer use, reduced equipment maintenance and replacement costs (by using life cycle costing of materials for example), reduced site maintenance, reduced liability costs and even possibly reduced sick-time losses from student and teacher absences by eliminating out gassing of volatile organic compounds from the building materials.

Using NY-CHPS High Performance Schools Guidelines

The NY-CHPS Guidelines are provided by NYSED as a benchmark for high performance school buildings.

The Guidelines are divided into seven sections: site; water; energy; materials; indoor environmental quality (IEQ); operations and maintenance; and extra credit. Each section has prerequisites that must be achieved, with the remainder of the Guidelines consisting of optional credits. These prerequisites and credits allow the district to show that their completed school meets the criteria for a New York High Performance School. To obtain this standing, a minimum of all prerequisites and 65 credits must be achieved. The district must maintain documentation proving that the prerequisites and claimed credits have been met so that the public can review the documentation. Furthermore, for the credits that include Post-Construction documentation, that documentation must be gathered after the school is completed to demonstrate that the building is performing as predicted. All documentation must be maintained where it can be accessed for a period of five years.

NYSED provides these Guidelines to help designers produce better high performance schools, but the use of the Guidelines is voluntary. Following these Guidelines is not required — as following NYSED's Manual of Planning Standards is — in order to receive a construction permit from NYSED.

NY-CHPS SCORESHEET

The following table can serve as a worksheet for totaling your points.

NY-CHPS Guidelines Scoring			
		Total Points	**133**
Section	**1. SITE**	**Group Points**	**15**
		Group %	**11%**
1.1.1	Code Compliance	---	Prereq
1.1.2	Joint Use of Facilities	---	Prereq
1.1.3	No Development Near Wetlands	---	Prereq
1.1.4	No Development on Parklands	1	Credit
1.1.5	No Buildings on Floodplains	1-2	Credit
1.1.6	Reduced Building Footprint	2	Credit
1.1.7	Sustainable Site and Building Layout	2	Credit
1.2.1	Construction Erosion/Sedimentation Control	---	Prereq
1.2.2	Post-Construction Stormwater Management	1	Credit
1.3.1	Design to Reduce Heat Islands	2	Credit
1.4.1	Exterior Light Pollution	2	Credit
1.5.1	Transportation, Locate Near Public Transit	1	Credit
1.5.2	Transportation, Pedestrian/Bike Access	1	Credit
1.5.3	Transportation, Minimize Parking	1	Credit
	2. WATER	**Group Points**	**3**
		Group %	**2%**
2.1.1	No Irrigation for Landscaping	1	Credit
2.1.2	Reduce Potable Water for Landscaping	1	Credit
2.2.1	Indoor Water Use Reduction	1	Credit
	3. ENERGY	**Group Points**	**26**
		Group %	**20%**
3.1.1	Exceed Code by 20%	---	Prereq
3.1.2	HVAC System Sizing	---	Prereq
3.1.3	Superior Energy Performance	1-10	Credit
3.2.1	On-Site Electricity Generating Renewables	2-5	Credit
3.2.2	On-Site Thermal Energy Renewables	1-4	Credit
3.3.1	Third-party Commissioning	---	Prereq
3.3.2	Third-party Training	---	Prereq
3.3.3	Identify an Energy Manager	---	Prereq
3.3.4	Track Energy Costs	---	Prereq
3.3.5	Energy Management System Controls	---	Prereq
3.3.6	Additional Commissioning	3	Credit
3.3.7	Energy Management System Monitoring	2	Credit
3.3.8	Submetering	2	Credit
	4. MATERIALS	**Group Points**	**26**
		Group %	**20%**
4.1.1	Wallboard and Roof Deck Products	---	Prereq
4.1.2	Floor Systems Based on LCC	1-4	Credit
4.1.3	Interior Wall Systems Based on LCC	1-4	Credit
4.1.4	Exterior Wall Systems Based on LCC	2	Credit
4.1.5	Roof Systems Based on LCC	2	Credit
4.1.6	Other System Based on LCC	2-6	Credit
4.2.1	Storage & Collection of Recyclables	---	Prereq
4.2.2	Site Construction Waste Management	1-2	Credit
4.3.1	Building Reuse 75%	1	Credit
4.3.2	Combined Materials Attributes	1-5	Credit

NY-CHPS Guidelines Scoring			
	5. IEQ	**Group Points**	**32**
		Group %	**24%**
5.1.1	Access to Views 70%	---	Prereq
5.1.2	Access to Views 90%	2	Credit
5.1.3	Daylighting in Classrooms	5	Credit
5.2.1	Visual Performance	2	Credit
5.3.1	Walk-Off Grills/Mats	---	Prereq
5.3.2	Filter Efficiency	---	Prereq
5.3.3	Drainage	---	Prereq
5.3.4	Irrigation Design	---	Prereq
5.3.5	Electric Ignition Stoves	---	Prereq
5.3.6	Air Intake Location	---	Prereq
5.3.7	Duct Insulation	---	Prereq
5.3.8	Pollutant Source Control, Ducted HVAC Returns	---	Prereq
5.3.9	Air Intake Location: 50 Feet	---	Prereq
5.3.10	Low-Emitting Materials	1-5	Credit
5.3.11	Pollutant Source Control, Off-Gassing	2	Credit
5.3.12	Pollutant Source Control, High Efficiency Filters	3	Credit
5.4.1	Construction IAQ Plan	---	Prereq
5.4.2	Mold Protection	---	Prereq
5.4.3	Filters During Construction	---	Prereq
5.4.4	Construction IAQ, Ventilation of VOCs	---	Prereq
5.4.5	Construction IAQ, HEPA Vacuuming	---	Prereq
5.4.6	Construction IAQ, Duct Protection	---	Prereq
5.4.7	Construction IAQ, Building Flushout	2	Credit
5.4.8	Air Flow Stations	2	Credit
5.4.9	Continuous Air Monitoring	2	Credit
5.4.10	Interior Air Handling Units	2	Credit
5.5.1	Minimum Acoustical Performance	---	Prereq
5.5.2	Sound Isolation	2	Credit
5.5.3	Improved Acoustical Performance	2	Credit
5.6.1	ASHRAE 55-2004	---	Prereq
5.6.2	Controllability of Systems	---	Prereq
5.6.3	Thermal Control	1	Credit
	6. OPERATIONS AND MAINTENANCE	**Group Points**	**15**
		Group %	**11%**
6.1.1	Energy Plan	---	Prereq
6.1.2	No Fossil-Fuel-Powered Equipment Indoors	---	Prereq
6.1.3	Energy Benchmarking	2	Credit
6.1.4	Indoor Environmental Management Plan	2	Credit
6.1.5	U.S. Green Building Council LEED EB Updates	2	Credit
6.1.6	BOC Training	2	Credit
6.1.7	Certified Superintendent of Buildings and Grounds	2	Credit
6.1.8	Continuous Commissioning	2	Credit
6.2.1	Maintenance Plan	---	Prereq
6.2.2	Green Cleaning	---	Prereq
6.2.3	Integrated Pest Management Plan	---	Prereq
6.2.4	Purchase HEPA Vacuums	---	Prereq
6.2.5	Computerized O&M Plan, CMMS	3	Credit
	7. EXTRA CREDIT	**Group Points**	**16**
		Group %	**12%**
7.1.1	Performance Monitoring	1	Credit
7.2.1	Energy Star New Equipment	1	Credit
7.2.2	Prohibition of Personal Electrical Devices	1	Credit
7.2.3	Purchase Low-Mercury Lighting	1	Credit
7.3.1	Clean Energy	1	Credit
7.3.2	Landfill Gas	1-2	Credit
7.4.1	Alternate Fuels Buses	1	Credit
7.4.2	Alternate Fueled Maintenance Vehicles & Equipment	1	Credit
7.4.3	Anti-Idling Measures	1	Credit
7.4.4	Install Diesel Oxidation Catalysts on All Buses	1	Credit
7.5.1	Design to Use Components of the Building as a Laboratory	1	Credit
7.5.2	Design to Use as a Red Cross/Community Shelter	1	Credit
.6.1	Innovation Credits	1-3	Credit