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Testimony of Martin L. Mador
Regarding the Adoption of Proposed Connecticut High
Performance Building Construction Standards

Office of Policy and Management
April 11, 2008

I am Martin L. Mador. I am submitting this testimony as the Legislative Chair for the Connecticut Sierra Club, as well as the Legislative Co-Chair for the Connecticut Foundation for Environmentally Safe Schools (ConnFESS). I join in all respects in the testimony submitted by my ConnFESS colleagues Joellen Lawson and Diane Ethier.

I hold a Masters Degree in Environmental Management from the Yale School of Forestry and Environmental Studies, where I studied land use and the built environment. I hold LEED accreditation from the US Green Building Council. I was the ConnFESS representative to the national Healthy Schools conference held in Washington, DC in December 2007. I am a co-editor and chapter author of Biophilic Design: The Theory, Science and Practice of Bringing Buildings to Life (Wiley. 2008), the first comprehensive book examining the relationship between the natural world and the built environment.

I have been working on green building legislation since 2002, testifying each year on proposed legislation encouraging green building in the state. In 2007,1 was invited by the chairs of both the Energy and Environment Committees to submit legislative language which would require green design for K-12 schools built with state funding. The result of these efforts was the passage of the sections of PA07-242 concerning green schools.

Requirements for green buildings were originally passed in 2006. They pertain to only to state buildings, with schools specifically exempted by amendment from the requirement. Regulations

were drafted to implement this legislation. However, with the passage of PA 07-242, the regulations needed to be extended to apply also to K-12 schools. My comments here will go mainly to the ways in which the draft regulations fail to address the specific needs of school construction. There is much to be praised in these draft regulations. However, there are many ways in which they are insufficient. I will touch on these shortcomings in broad strokes here. Much of the detail supporting this testimony will be found in submitted testimony from Joellen Lawson and Diane Ethier.

Contrary to the popular view held by many, green buildings are not simply about energy. This is true even though the legislation underlying these regulations, 16a-38k, is embedded in Chapter 298 of the CGS, entitled Energy Utilization and Conservation. A substantial part of the impact ol green buildings concerns the health, comfort, and productivity of the building's occupants. It is critically important that the Connecticut green building regulations contain strong indoor environmental quality (IEQ, also referred to as IAQ) provisions. This becomes even more important for a school setting, as a degraded indoor environment will have significant impacts on a child's health and academic performance.

Unfortunately the definition of LEED in!6a-38k-l Definitions mentions only environmental integrity, energy efficiency, and sustainable building practices. IEQ must be added to this definition.

LEED started a decade ago as a system for new construction of commercial and other large scale buildings (LEED-NC). Variants of LEED were then introduced for projects looking at a portion of the building. In the last two years, other buildings types were addressed by LEED for Residential and then LEED for Schools. In April 2007, the US Green Building Council declared that LEED-NC could no longer be used for K-12 schools. This was several months before PA 07-242 was passed, requiring LEED for school construction. That legislation simply required construction to LEED Silver or equivalent. Given this chronology, it is reasonable to conclude at the state regulations pertaining to school construction should be based on LEED for Schools

rather than LEED-NC. Unfortunately, these draft regulations do not.

Parallel to the development of LEED was the development of the Collaborative for High Performance Schools (CHPS) model. Originally designed for California, variants were subsequently constructed for Massachusetts, then the Northeast US, then New York. It is NY-CHPS which currently has the most robust set of requirements for designing and building K-12 schools. If Connecticut wishes to adopt the most effective and comprehensive regulations available, we should look to NY-CHPS for guidance. In fact, one alternative would explore licensing NY-CHPS for use in Connecticut. To do otherwise would be to set the bar fairly low, and unnecessarily so.

It could be effectively argued that, to design a truly effective green school, one must start with the impacts on the inhabitants of the school, the students. The environment created for them to study, socialize, and learn should be addressed first, followed by considerations of the environmental impact of the structure, material use, energy, water, etc. Unfortunately, this is not how we design our schools today.

I wish to point out that no state agency has taken ownership of the issue of the quality of K-12 school facilities, not the state Department of Education, not the Department of Environmental Protection, not the Department of Public Health, not the Department of Public Works. Similarly, no committee of the legislature has taken ownership of the quality of K-12 school facilities, not the Education Committee, not the Environment Committee, not the Public Health Committee, not the Energy Committee. This shortcoming cannot be remedied through this agency regulation writing process, but we need to be aware of this impediment to where we would all like to be.

It is clear that the authors of these regulations made little effort to tailor them specifically for Connecticut schools. For example, there are references in the regulations to municipalities, such as 16a-38k-6, which says "...by the agency/municipality that will be responsible for the ongoing

care, operation and maintenance of the building". In fact, 47 municipalities have schools which are managed, not by the towns, but by 17 regional school districts.

The legislation requires schools to be built to LEED Silver standards or equivalent. LEED requires third-party certification. This is the only way to ensure that a project has actually achieved its design goals. In this case, the design goals are actually legislative mandates, so it is necessary to make sure that the result conforms to the requirements. Third-party certification is thus part of the legislative mandate. Green Globes is specifically mentioned in the legislation. The Green Building Initiative, which owns the rights to market Green Globes in the US, has been developing adequate third-party certification for the past several years. As of today, there are three people who conduct such certification for them, through a one day site visit. The GBI is now working on an ANSI standard version of Green Globes, which they expect to be available in mid to late 2008. They anticipate that third-party certification will available through the Construction Specifications Institute. While this process is not nearly as rigorous (or expensive) as that of LEED, it may prove an acceptable alternative. However, this will not be known until the system starts operating. Green Globes should not be approved as an acceptable equivalent system until the state makes a determination that the third-party certification is rigorous and meaningful. It should be noted that Green Globes has not been developed with schools in mind, and therefore cannot be regarded as the equivalent of LEED for Schools or any version of CHPS.

Commissioning is a vital process for ensuring that a building is built as intended and as designed and that it actually functions as intended. The draft regulations call for mandatory commissioning, as they should. They also require that the commissioning agent(CA) not be an employee of any member of the design/construction team. The regulations require that reports will go to the project owner. This should be made even stronger by a requirement that the CA is contracted directly to the project owner. Otherwise, the CA would actually be paid by perhaps the architect whose work the CA is reviewing. The regulations should clearly require that the commissioning process examine building functioning in every season in which the building is occupied.

16a-38k-3 (c) calls for a mandatory IAQ plan during construction. This is important, as it has a direct bearing on post-occupancy IAQ. What is extraordinary is that there are no mandatory IAQ provisions which would apply during occupancy. This is perhaps one of the most significant shortcomings of the current draft. A number of the optional IAQ points, such as the requirements for use of low VOC materials, should be made mandatory in a school setting. Because all IAQ points are optional, it is possible to satisfy the draft requirements for a green school without earning a single IAQ point.

16a-38-3(I) requires that buildings and other impervious surfaces must not be built in a wildlife corridor. This is a mandatory provision. Unfortunately, there is no definitive map of wildlife corridors. Some towns may have made an effort to map them, perhaps by the town's Conservation Commission, but for the most part they probably do not exist. There is also no definition of a "wildlife corridor", according to the DEP. Therefore, although the intent is praiseworthy, it would be exceedingly difficult for a project to demonstrate compliance with this mandate.

This section also requires that the building be consistent with the state plan of conservation and development. Unfortunately, the state plan and its incorporated maps are not constructed with a fine enough resolution to determine consistency for a single parcel. It might be more appropriate instead to require that the building conform to the open space mandates of the applicable municipal Plan of Conservation and Development.

LEED for Schools contains an admirable catalog of concerns relating to site selection. It is recommended that these elements be incorporated into the state regulations.

16a-38k-7 allows the secretary of OPM to exempt a project from these regulations upon a written finding that the costs significantly outweigh the benefits. It is critically important that the regulations require explicitly that the costs to be examined in this analysis include the benefits to the occupants of the building, including their health, well-being, productivity, and academic

performance. The studies performed by Greg Kats demonstrate that many of the economic benefits of a green building accrue here, in addition to the savings in energy, water, and other expenses.

16a-38k-3(k) concerns the use of an integrated pest management plan. It is important that the regulations refer to state law regarding the use of pesticides in school settings, such as those found in PA 07-168.

A number of sections contain language applicable to perhaps an office building, but foreign to a school setting. For example 16a-38k-4 (e)(4) encourages bicycle transportation. Ironically, this may not be applicable to a school which busses all of its students. Other sections pertaining to location in a transit oriented area, such as 4(e)(l) and 4(e)(3) would not be applicable to schools.

Building a green school provides an excellent opportunity for education about environmental issues, including energy use, climate change/global warming, water consumption, recycling, habitat, stormwater infiltration, landfills, affect of materials on people, energy consumption of appliances, etc. The building itself becomes a teaching venue. Projects with a demonstrated plan to implement this through displays, posters, curriculum materials, etc. should earn a point towards qualification, such as is available in LEED for Schools ID credit 3.

There are a number of desirable environmental strategies which are not mentioned in these draft regulations. Green, or vegetated, roofs provide a number of benefits, such as storm water retention and cleansing. Pervious paving and parking areas very effectively promote infiltration of storm water rather than run off. These strategies should earn points towards compliance.

Notably missing from these regulations is any mention of acoustics. This is now regarded as a very significant element of a successful green school. The elements of NY-CHPS sections 5.5.1 and 5.5.2 should be incorporated here.

These regulations overlook a critical component or a green school, operations and maintenance. Only commissioning and a post-occupancy occupant of survey are mentioned. The elements of NY-CHPS in section 6 should be incorporated here. This is the only way to ensure that many of the IAQ elements incorporated in the design of the building do not deteriorate and become liabilities. Certainly, a periodic inspection of the entire building should be mandatory. The most effective way to accomplish this would be through requiring EPA's Tools for Schools.

Connecticut has had a continuous history of buildings highly contaminated with mold and pathogens, which has had devastating effects on students, teachers, and staff. This pattern continues today, with a number of schools in the state currently undergoing remediation efforts. Prevention of moisture incursion in the design and construction of the school should be a mandatory element of these regulations. The requirements of LEED for schools EQ credit 10-Mold Prevention should be incorporated here.

These regulations provide a solid and valuable foundation for ensuring that the schools Connecticut builds will have minimal impacts on the environment, will be cost-effective in their operation, and, certainly equally important, will provide healthy and productive environments for their occupants. Our children will have enhanced potential for learning, and their teachers will know that we have provided a safe and healthy place where they can spend their professional lives. However, the current draft only gets us to a baseline start. To make them truly effective, and to make them state of the art, a number of enhancements such as those suggested here, must be incorporated. Our goal must be to design and build the finest schools we can, using all of the knowledge about green building available to us.