Elements for "Healthy" School Design
In a Nutshell:

- *Indoor air quality*: look at new ventilation designs such as 100% outside air with recovered heat and moisture (see resource: Turner Group); allow for pollution generating activities and materials
- *Building and finish materials*: use least toxic materials; initial cost may be offset by longevity and fewer health complaints.
- *Thermal comfort and control*: consider human comfort range, microbial growth, "individual "zone"control, solar affects, energy efficiency
- *Lighting quality*: avoid harsh artificial lighting, uncontrolled daylight, solar effect
- *Acoustics*: avoid echoes and noisy equipment; look at ceiling materials and other surfaces instead of using carpet as a noise damper.
- *Ergonomic design for classroom*: proper design for computer stations for students and staff and other classroom seating or working plane heights.
- *Easier maintenance*: design for long-term maintenance; easy access to systems as well as cleaning procedures and daily operations to keep building and occupants safe and healthy (examples: plan for Integrated Pest Management, maintenance plan that includes minor repair schedule, filter changes, stripping/waxing scheduled when building is closed).

Goals for Building Healthy Schools:

- School buildings should be designed as safe and healthy learning and work environments for students and staff.
- School building sites should not have negative environmental impacts on the occupants or the neighborhood.
- School buildings should include a quality-control strategy for ensuring acceptable air quality in the design, contract documents, construction and long-term maintenance.
- School construction activities should be monitored, scheduled and carried out following all state and federal laws, as well as guidelines adopted by the City and/or School Department to reduce any negative health and safety impacts to the building occupants (if any) and the neighborhood.

School buildings should be designed to be safe and healthy learning and work environments for students and staff.

- ✓ Include building occupant participation and community representation in the design and construction process.
- ✓ Understand the full community use of the building (before, during, after school and evening use)

Building sites should not have negative environmental health impacts on the occupants or the neighborhood.

- ✓ Use an environmental consultant to review plans and test results, materials selection, and to troubleshoot problems. (include Radon protection design)
- ✓ Conduct a complete site history, survey of surrounding potential sources of contamination and testing and evaluation of potential health risks to children. (ex. former factory, brown field, hazardous waste site or other sources of neighborhood pollution)
- ✓ Know the scope of hazardous material abatement to ensure health and safety controls in clean up (ex. Lead, asbestos).

Buildings should include a quality-control strategy for ensuring acceptable indoor air quality in the design, contract documents, construction. and long-term maintenance.

- ✓ Make acceptable indoor air quality everyone's goal (school and community, architects, engineers, contractors, trades people, city agencies etc.)
- ✓ Provide education and communication procedures between the project, the occupants and neighbors
- ✓ Select materials and systems that are non-toxic, low in pollutant emission levels and ones that don't require cleaning/ maintaining with toxic products (odors, irritants, toxins, carcinogens, asthmagens) Examples: tiles vs. carpet, adhesives, paints, finishes.
- ✓ Design spaces that provide adequate ventilation for certain equipment or rooms (examples: copying, and laminating machines, science labs, art rooms, computer labs).
- ✓ Allow for off-gassing/ airing-out of materials, proper storage of furnishings/equipment and proper clean up
- ✓ Use energy efficiency measures such as electronic lighting ballasts to eliminate flicker, design HVAC systems with easy access for maintenance, energy performance contracts that avoids multiple contracts and vendors (see resource list for NAESCO/EPA booklet).

Construction activities should be monitored, scheduled and carried out following all state and federal laws, as well as guidelines adopted by the City/and or School Department to reduce any negative health and safety impacts to the building occupants (if any) and the neighborhood.

- ✓ Require that contractors use methods, techniques, sequences (schedule) and procedures that will ensure good IAQ. (See resource list for SMACNA Guidelines).
- ✓ Establish a committee and/or system to monitor compliance with these procedures (some jobs may need to be shut down until the problem is identified and resolved).
- ✓ School building projects should include "commissioning" in the contract; the process that ensures that systems are designed, installed, functionally tested and operated according to the design intent. (ex. need to allow time for airing-out building, final clean-up, HVAC system balanced and tested, dirty filters changed, training of operations and maintenance staff.)

Resources and References used for this document:

MassCOSH: Mass Healthy Schools Network library of information on school environmental safety and health

US EPA IAQ Tools for Schools Kit; contact Eugene Benoit, EPA Region1 (CPT) 1 Congress St., Boston MA 02114, (617) 918-1639

Indoor Air Quality, a design guide; Wagdy Anis AIA, Indoor Air Quality Committee, subcommittee on Design, Boston Society of Architects, BSA Publication #190

Indoor Air Quality School Construction and Renovation Manual for Building Occupants and Building Committees1st Edition, produced by the Indoor Quality Institutes, Boston Society of Architects' Indoor Air Quality Subcommittee on Schools, 52 Broad St. Boston, MA 02109-4301.

Technical Bulletin, Building Ecology and School Design; Maryland State Dept. of Education Division of Business Services School Facilities Branch; 200 West Baltimore St., Baltimore, MD 21201

School Solutions, How to Save Money and Improve Indoor Air Quality Using Energy Performance Controls, National Association of Energy Service Companies (NAESCO), Environmental Protection Agency; NAESCO 1615 M. Street NW, Suite 800, Washington, DC 20036.

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