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Although Capitol Hill Montessori has resided at the former Logan Elementary School for only 5 years, the building itself is far from new. I urge the committee to support funding for modernization – specifically to replace the HVAC system, windows, and potable water piping – to address the human health and environmental hazards that our children and teachers are exposed to daily.

Our children at Capitol Hill Montessori are exposed to poor indoor air quality, high ambient air temperatures and other environmental hazards that affect their health, safety and academic performance. I would like to highlight four of the problems -

- Windows and doors have paint that is peeling and, due to their age, likely have lead¹, which is a poison with especially high consequences for children;
- Windows are painted shut which causes fumes from cleaning chemicals, radon and other gasses to build up in high concentration².
- The heating system is not controllable - ambient temperatures are high, frequently exceeding 80°F, even in winter (see figure 1)
- Several lead tests of the potable water supply came back positive.

My wife and I chose Capitol Hill Montessori because of the excellent teachers, the Montessori Method and the diversity of the students and the staff. However, the physical structure is in abject disrepair. It reflects a lack of commitment from the City to the health and safety of its children and employees.

The physical structure poses many health challenges not unlike what we see in the news in other areas recently such as Flint, Michigan. Briefly, I would like to bring your attention to a few of the problems:

¹ The presence of a lead-based paint hazard is a violation of the law. (See §8-231.02(a)). The District’s law establishes that any paint in or on a pre-1978 residential property or “child-occupied facility” (including daycares, kindergarten classrooms, or preschools, provided they host children under six years of age on a regular basis) is presumed to be lead-based paint. This means that **any paint in or on such a property that is not in intact condition is automatically considered to be a lead-based paint hazard.** <http://doee.dc.gov/service/lead-related-regulatory-and-legislative-affairs>

² Mists, vapors and/or gases from cleaning chemicals can irritate the eyes, nose, throat and lungs. Symptoms may include burning eyes, sore throat, coughing, trouble breathing and wheezing. Chemicals in some cleaning products can cause asthma or trigger asthma attacks. Some cleaning products contain hazardous chemicals that can enter the body through skin contact or from breathing gases into the lungs.
<https://www.osha.gov/Publications/OSHA3512.pdf>

Lead Paint

Paint is peeling from all of the windows and fall on the ground where our children play. They invariably put their hands in their mouth and slowly get poisoned by it. We ask that you please replace the windows over the summer when school is not in session. Do not do it while school is in session as it will present an unnecessary increased risk of lead poisoning to our children.



Peeling paint on front of house windows at Capitol Hill Montessori at Logan

Lead in Potable Water

Because of the age of the building, there's a high likelihood of the use of lead in the piping system. I fear that the test results and the City's past performance do not convince me that the potable water supply is safe. Furthermore, lead in water can spike for different reasons and periodic testing alone cannot detect them. The responsible thing to do is to remove the lead from the water supply.

High Ambient Air Temperatures

Because of the high temperatures in the classrooms, students are not able focus on their work and do not perform as well as their peers in schools with better temperature controls³. Studies have found that reading speed, reading comprehension, and multiplication performance of school children is poorer as large as 30% in classrooms with temperatures of 81 to 86 °F, relative to 68 °F. As a matter of fact, the District's public library closes their doors if temperatures exceed 82F in keeping with OSHA recommendations. Between January and March 2016 there were at least 32 days where the temperature was 75 °F or higher including 12 days that the temperature was between 80°F and 84°F. There are 56 window units in the school that constantly run even in winter because of the heating system. The temperatures remain uncomfortably high even with the window a/c units running in the winter.

Poor ventilation causes buildup of harmful vapors

Almost all the windows are painted shut. Studies show that incidences of asthma ⁴and cancer ⁵increase when students breathe stale air containing harmful fumes such as harsh cleaning chemicals. Most days when you first enter the school, you will experience a suffocating feeling from the heat and the stale air. We are setting our children up for asthma, cancer and other diseases.

Concerns with the Indoor Air Quality Test conducted on January 12, 2016

The sampling was sufficient for the purpose of determining whether the oil leak contributed to any indoor air quality issues. However, the sampling should not be used to draw conclusions about the daily indoor air quality that our children experience due to many shortcomings. While we have no reason to believe that the carbon monoxide and lower explosive limit is inaccurate, the study was limited in scope, and extrapolating the findings as "typical" air quality during normal school hours would be inappropriate and could lead to bad decision-making.

The major issues with each section are as follows:

- Study period
 - The study was done over a short period of time that does not reflect the conditions of the building when it is in use. Sampling occurred over a three-hour period on a day when the school was closed. Many metrics such as temperature and carbon dioxide levels will vary significantly throughout the school day and week. Because ventilation practices and activities will differ during the school day from off hours, sampling should take place time during the school day when school is in session.

³ <https://www.epa.gov/schools/impact-performance-and-health-schools>

⁴ <https://www.epa.gov/iaq-schools/managing-asthma-school-environment>

⁵ <https://www.epa.gov/iaq-schools/managing-radon-schools>

- Temperature (Page 3)
 - The report provides average temperatures that are within recommended ranges. However, if the study period was longer, they would have seen that the students experience temperatures well above the recommended ranges. See Figure 1 below where you will see that temperatures frequently exceed this range above 80F in Ms. Steven's classroom. Students in the school have also reported temperatures well into the 90F range.
- Relative Humidity (RH) (Page 3)
 - While the relative humidity is well below the recommended range to prevent mold growth per The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), it is so low that it is in a range that presents health issues to occupants. Small children, in particular, experience increased eczema, dry skin and other adverse reactions when they spend time in environments with very low humidity. As a matter of fact, doctors always recommend humidifiers in the house especially with small children. People are generally comfortable in humidity in the range of 30% to 60%. Many readings were below 20%. NIH recommends a range of 40% to 60%.
- Carbon Dioxide (Page 3)
 - The number of occupants, access to open windows and doors significantly affect CO₂ levels. The study was conducted on a day when the building was unoccupied, which renders the results and analysis unactionable.
- Total Volatile Organic Chemicals (TVOC) (Page 4)
 - TVOC varies widely when a building is occupied vs when it is not. The study was conducted when the building was unoccupied and not subject to many of the factors that contribute to elevated TVOC. For example, the school was not cleaned that day by the janitor and teachers had not done their classroom cleaning, which can be major contributors. There were two non-adjacent classrooms with elevated levels. Levels above 666 $\mu\text{g}/\text{m}^3$ in offices have been associated with 50-90% increases in rates of eye, skin, nose, throat, and mouth irritation.⁶ Both classrooms exceeded this level toward the end of a day even though the building was unoccupied.
 - Classroom windows do not open and there are limited air exchanges to mitigate air quality problems.

⁶ Brasche, S., et al. *Factors determining different symptom patterns of sick building syndrome—results from a multivariate analysis*. in *Indoor Air '99: Proceedings of the 8th International Conference on Indoor Air Quality and Climate*. 1999. Edinburgh, Scotland: Research Communications Ltd.

Brasche, S., et al., *Self-reported eye symptoms and related diagnostic findings—comparison of risk factor profiles*. *Indoor Air*, 2005. **15 Suppl 10**: p. 56-64.

Brasche, S., et al., *Comparison of risk factor profiles concerning self-reported skin complaints and objectively determined skin symptoms in German office workers*. *Indoor Air*, 2004. **14(2)**: p. 137-143.

- Conclusions (Page 6)
 - The results of the study should have been highly qualified. The numerous factors that provide misleading results should have been reported to DGS and a recommendation should have been made to undertake further studies.
 - There is no recommendation regarding elevated levels of TVOC, especially considering it was done when school was not in session and can perhaps be easily remedied depending on the source.

Concerns with the Water Tests Done on April 14, 2016

I looked at the report and found several major issues with it that would cause higher readings to be evident if the study was done properly.

- Samples were collected on Thursday April 14. They should have done it on a Monday and ideally after a long weekend or holiday just before the building will be used.
- They did not specify the time of day that the sample was collected.
- They did not cite any sources that uses water continuously that might affect the readings.
- They did not provide any sort of recommendations.
- They did not provide the possible source of the contamination or make any recommendations to DGS to investigate.

Conclusion

We are not asking for a beautification project. We are asking you to safeguard the health and safety of our children. Please put our children's health first and fund Capitol Hill Montessori at Logan capital improvement projects. We are looking for a sense of urgency from you our leaders to protect our children. We need you to act swiftly and decisively to address the issues at Capitol Hill Montessori:

1. Replace all windows in the school over the summer and perform lead abatement in other areas.
2. Install a centralized HVAC.
3. Replace all potable water pipes including all fountains, sinks, and outdoor water sources.

Classroom Temperature during School Hours

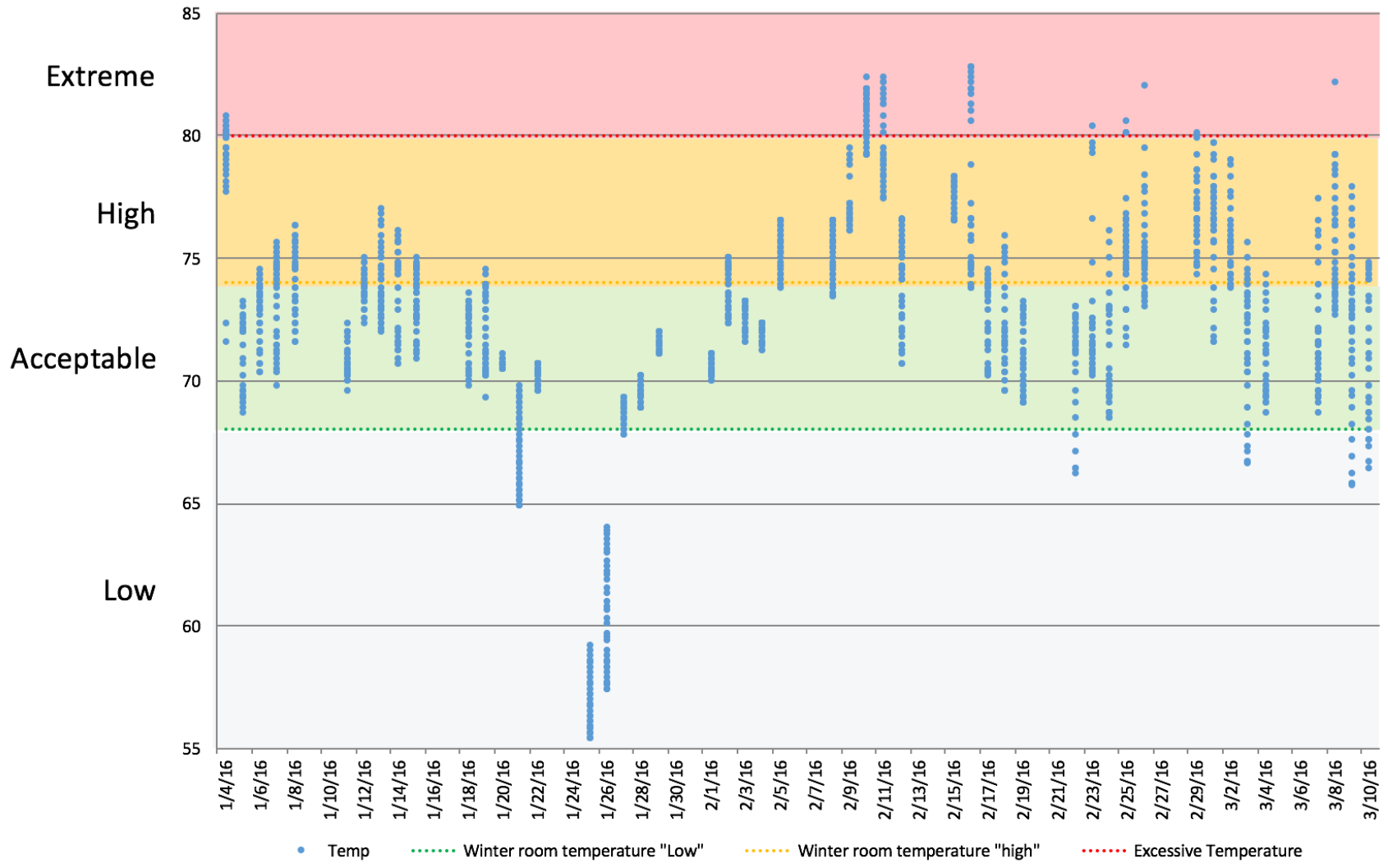


Figure 1. Recorded classroom temperatures during school hours from January through March 2016.

Additional Reading

- <https://www.epa.gov/criteria-air-pollutants/naaqs-table>
- The majority of adverse health effects caused by relative humidity would be minimized by maintaining indoor levels between 40 and 60%
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1474709/>
- Associations of Cognitive Function Scores with Carbon Dioxide, Ventilation, and Volatile Organic Compound Exposures in Office Workers:<http://ehp.niehs.nih.gov/15-10037/>