Assessing and Planning for Healthy American Schools:

Sample Language for an RFP Executive Summary

Infection Prevention and Control in Schools Task Force

Ventilation RFP Sample Language Working Group

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I. Context

The COVID-19 pandemic revealed a vast deficiency in our educational building infrastructure. Our schools were not designed to resist airborne disease transmission nor able to adequately respond to protect students and staff during the outbreak. To welcome children and staff back to our schools, we must improve our nation’s facilities’ ability to protect the health of its students and staff.

The subsequent federal relief legislation has presented an unprecedented opportunity to holistically re-examine, redesign, and reimagine the learning environments of our nation’s schools for physical health. There is also an opportunity to improve these spaces to address the mental and emotional health of students and staff in these learning environments. In addition, any reconsideration and redesign of a building’s engineering systems should not ignore the long-term operational costs of mechanical systems and their operational impacts on their local environment.

II. Overview of RFP

The following Request for Proposals is seeking bidders for professional services to assess, plan, and implement improvements to educational facilities in their district from a team of qualified firms able to support the planning and development of short-term modifications and renovations to school buildings, while capturing the complexity of designing for long-term healthy learning spaces.

This document is meant to provide sample language for an executive summary that defines a scope of work for:

1. building-by-building and room level assessments of air quality as it affects viral transmission,
2. development of a plan for addressing indoor air quality in the context of holistic and interdisciplinary considerations of health, education, and the environment,
3. serving as owner’s (district’s) representative for securing qualified and affordable firms to implement near term recommendations of the plan, and
4. alternatively, also providing implementation of district approved recommendations for near term work from the plan.

III. Qualifications

We seek proposals from qualified interdisciplinary teams with demonstrated expertise in the assessment, planning, design, maintenance and construction of educational facilities. Teams should include engineers, building scientists, commissioning agents, architects, educational facilities planners, project managers, designers, and engagement facilitators. Further contracting requirements will be pertinent in different states, for instance encouragement of RFPs from project teams including:

* Women and Minority owned businesses;
* Locally owned small businesses;
* Veteran-owned businesses; and
* Non-profit organization partners.

IV. Scope of Services

*I. Assessment*

We seek qualified individuals or teams of professionals to assess the current indoor air quality conditions of the typically occupied spaces in schools in the district. Items to be assessed on a per room, per school building, and school site basis are:

1.1 Provision of outdoor fresh air supply to each occupied space per healthy school ventilation guidelines

1.2 Adequate air filtration in air intakes per ASHRAE guidelines

1.3 Presence of demand-controlled ventilation to regulate supply of fresh air

1.4 Presence of visible metrics reflecting indoor air CO2 levels, temperature and humidity in all main teaching and gathering areas.

1.5 Presence of high efficiency exhaust air energy recovery

1.6 Viability of using air filtration technology to supplement outdoor fresh air supply

1.7 Viability of using natural ventilation to increase outdoor air

1.8 Level of intervention needed to upgrade system facilities

1.9 Presence of hazardous / harmful materials in most common touch surfaces

1.10 Presence of excessive air leakage through the envelope, leading to potential condensation problems or occupant discomfort

1.11 Availability and condition of outdoor learning environments.

1.12 Energy performance, lifecycle costs, and environmental impacts of mechanical systems.

Deliverable: Electronic database linked by district, school, building and room IDs, of the 12 data items, analysis of 12 data items by school characteristics and levels, web-based visualization of key data findings. Documentation and consistent application of data definitions, inspection protocols, and metrics for describing the condition or quality of the conditions.

*II. IAQ Plan*

As a part of the scope of work, bidders must propose a plan for how to modify current conditions found in the assessment to accomplish:

2.1 Fresh ventilated air of between 4 to 6 air changes per hour (ACH) or less than 1000 ppm of CO2 in all learning spaces to resist airborne disease transmission and to promote infection control (including COVID-19 and the annual flu virus);

2.2. Improved mechanical ventilation strategies to demand control strategies of ventilation, maximization of natural ventilation where viable, and use of high efficiency energy recovery systems that lower operational cost performance over the life span of building;

2.3 Devices to monitor indoor air quality (IAQ), such as in classroom CO2 monitors, to provide feedback to staff and teachers to make in time and on demand decisions to protect themselves and their students;

2.4 Facilities that reduce risk of exposure to environmental health hazards and support student health needs;

2.5 Learning spaces that are healthy and mitigate disease transmission without dramatically increasing the operational energy consumption of the HVAC systems; and

2.6 Lower life-cycle costs through improved HVAC design and building operations; and, in addition:

2.7 Engage stakeholders to set priorities for the plan for indoor air quality improvements based on the assessments—including technical, school staff, and community stakeholders; and

2.8 Incorporate spending deadlines for CARES Act, CRRSA Act, and American Rescue Plan Act into a schedule of priorities identified in the plan for air quality improvements.

Deliverable: Set of 4-5 meetings of stakeholders to 1) review findings; 2) review options for remedies; 3) review potential cost, schedule, and priorities for options; 4) revise options and priorities based on cost, schedule, and technical and stakeholder input; and 5) presentation and approvals of final scope, priorities, cost and schedule. Written and web-based plan including school specific scope, estimated cost, and schedule for Indoor Air Quality Improvements to mitigate viral transmission and support a health school environment.

*III. IAQ Plan in the Context of Comprehensive Plan of Improvements*

3.1 Engage stakeholders in developing a comprehensive plan framework to examine the systems and spaces holistically and with an expansive definition of human and environmental health that will address key areas for improvement, using a holistic definition of the needs, challenges, and opportunities of the school district in terms of educational vision and plan, population trends, facilities locations, designs, conditions, and utilization, and facilitate the development of guidance in terms of project prioritization, and design principles that will guide future decision-making.

Deliverable: A set of 3-4 meetings of stakeholders and educational facilities technical support to identify nexus of the IAQ plan with educational program priorities, equity, community concerns, and campus and district environmental priorities.

V. School District Information

[Insert information about individual school district here - location, size, number of students, number of buildings, etc]

VI. Supporting Materials

[Guidance](https://www.ashrae.org/file%20library/technical%20resources/covid-19/core-recommendations-for-reducing-airborne-infectious-aerosol-exposure.pdf) from the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) calls for effective operating of the HVAC system, by:

* Maintaining temperature and humidity design set points.
* Maintaining equivalent clean air supply required for design occupancy whenever anyone is present in the space served by a system.
* When necessary to flush spaces between occupied periods, operating systems for a time required to achieve three air changes of equivalent clean air supply.
* Limiting re-entry of contaminated air that may re-enter the building from energy recovery devices, outdoor air, and other sources to acceptable levels.
* Commissioning the HVAC system to ensure that it is functioning as designed.

In addition, a [report](https://www.usgbc.org/resources/five-guiding-principles) from the United States Green Building Council (USGBC) on upgrades for school buildings, which calls for investing in school infrastructure to improve learning outcomes while reducing operational costs in the long term.

Finally, [recommendations](https://schools.forhealth.org/) from the Healthy Buildings Program of the T.H. Chan School of Public Health at Harvard University define **healthy classrooms** as those in which the following rules (organized according to the hierarchy of controls) are adhered to:

*Engineering:*

* Ventilation rate has been maximized by increasing outdoor airflow
* Air filters have been upgraded to MERV13
* Supplemental air filtration has been provided by portable air cleaners.

*Administrative Controls:*

* W[ashing of hands frequently](https://schools.forhealth.org/risk-reduction-strategies-for-reopening-schools/healthy-classrooms/#wash-hands-frequently)
* Limited [sharing of objects](https://schools.forhealth.org/risk-reduction-strategies-for-reopening-schools/healthy-classrooms/#limit-sharing-of-objects)
* [Maximizing physical distancing to protect individuals](https://schools.forhealth.org/risk-reduction-strategies-for-reopening-schools/healthy-classrooms/#maximize-physical-distancing-to-protect-individuals)
* [Maximizing group distancing to slow transmission](https://schools.forhealth.org/risk-reduction-strategies-for-reopening-schools/healthy-classrooms/#maximize-group-distancing-to-slow-transmission-chains)
* Masking

The hierarchy of controls is a framework for thinking about infection prevention and control (IPC) strategies from those that are most effective to those that are least effective, layering in controls as needed, depending on context, to achieve needed IPC levels. The most effective strategy is elimination, for instance via vaccines. The next is engineering controls, for instance, with the recommendations on ventilation and filtration. The next strategy is administrative controls, and the final strategy is PPE.

The engineering controls should be in place at all times. Some administrative controls, including universal practices like handwashing, should also be encouraged at all times. Other administrative controls like limiting sharing of objects, maximizing physical distancing and group distancing, and masking may be activated or deactivated depending on the level of community spread of the pathogen of concern.

(For the hierarchy of controls, see: https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/FINAL-0321420\_B\_K-12\_Mitigation\_Toolkit508.pdf and adapted from<https://www.aaha.org/aaha-guidelines/infection-control-configuration/infection-control-strategies/>)

In the short term, achieve infection control upgrades of all learning spaces for improved health of learning environments. This should promote healthy air movement to protect against COVID-19 and annual flu transmission. Each indoor learning space should have at a minimum:

* Between 4-6 air changes per hour (ACH), and/or less than 1000 ppm of CO2. Healthy ventilation levels can be determined via the five step [guide](https://schools.forhealth.org/wp-content/uploads/sites/19/2021/01/Harvard-Healthy-Buildings-program-How-to-assess-classroom-ventilation-10-30-2020-EN_R1.8.pdf) to checking ventilation in classrooms from the Healthy Buildings Program at Harvard University.
* Windows that open to the exterior if possible;
* Mechanical ventilation with air filtration;
* A CO2 monitoring device to enable teachers and school staff to monitor their classrooms in real time.

Better than the minimum learning spaces would:

* Rely on windows open to the exterior rather than mechanical systems to achieve the target air change rate, with box fans to move air;
* Achieve cross ventilation with open windows on opposite sides of the room;
* Have open air classrooms and access to the outdoors.

Non-adherence:

When interior spaces cannot meet these minimum standards (i.e. no windows; no mechanical solution to deliver 4-6 air changes per hour), the first phase should include a temporary plan to take students out of unhealthy classrooms and provide improved learning environments through other means.

VII. Definitions of Terms Found in This Document

Airborne transmission: Airborne transmission is defined as the spread of an infectious agent caused by the dissemination of droplet nuclei (aerosols) that remain infectious when suspended in air over long distances and time. [[1]](#footnote-1)

HVAC systems: Heating, ventilation, and air conditioning (HVAC) is the technology of indoor and environmental comfort.[[2]](#footnote-2)

Life-cycle costs: Life Cycle Costing (LCC) is an economic analysis used in the selection of alternatives that impact both pending and future costs. It compares initial investment options and identifies the least cost alternatives for a longer period, typically 20 years or more. As applied to building design energy conservation measures, the process is mandated by law.[[3]](#footnote-3)

PPM: Parts per million. A unit often used to describe concentrations of **contaminants in air** (as a volume fraction).[[4]](#footnote-4)

Energy recovery systems: A system that integrates advanced energy recovery technologies and components into the HVAC system to capture the energy in the air stream — that would otherwise be exhausted to atmosphere — and use it to either pre-heat or pre-cool the outdoor airstream.[[5]](#footnote-5)

MERV13 Air Filter: Minimum Efficiency Reporting Values, or MERV, reports a filter's ability to capture particles. Filters with MERV-13 or higher ratings can trap smaller particles, including viruses.[[6]](#footnote-6)

ASHRAE Guidelines: American Society of Heating and Air-Conditioning Engineers (ASHRAE) standards and guidelines include uniform methods of testing for rating purposes, describe recommended practices in designing and installing equipment and provide other information to guide the industry.[[7]](#footnote-7)

Demand-controlled ventilation: A ventilation system capability that provides for the automatic reduction of outdoor air intake below design rates when the actual occupancy of spaces served by the system is less than design occupancy.[[8]](#footnote-8)

Building Envelope: The physical separator between the conditioned and unconditioned environment of a building including the resistance to air, water, heat, light, and noisetransfer.[[9]](#footnote-9)

Natural Cross Ventilation: When openings in a certain environment or construction are arranged on opposite or adjacent walls, allowing air to enter and exit.[[10]](#footnote-10)

1. <https://www.who.int/news-room/commentaries/detail/transmission-of-sars-cov-2-implications-for-infection-prevention-precautions> [↑](#footnote-ref-1)
2. <https://en.wikipedia.org/wiki/Heating,_ventilation,_and_air_conditioning> [↑](#footnote-ref-2)
3. <https://www.gsa.gov/node/81412> [↑](#footnote-ref-3)
4. <https://www.greenfacts.org/glossary/pqrs/parts-per-million-ppm.htm> [↑](#footnote-ref-4)
5. <https://www.nortekair.com/products/energy-recovery/> [↑](#footnote-ref-5)
6. <https://www.epa.gov/coronavirus/what-kind-filter-should-i-use-my-home-hvac-system-help-protect-my-family-covid-19> [↑](#footnote-ref-6)
7. <https://www.ashrae.org/technical-resources/standards-and-guidelines/general-information> [↑](#footnote-ref-7)
8. US Department of Energy <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjbksmWrZrxAhXeQzABHU9HDYIQFjAJegQIBBAD&url=https%3A%2F%2Fwww.energycodes.gov%2Fsites%2Fdefault%2Ffiles%2Fdocuments%2Fcn_demand_control_ventilation.pdf&usg=AOvVaw3n9gMqJHPxTZaW_PzdZCby> [↑](#footnote-ref-8)
9. <https://en.wikipedia.org/wiki/Building_envelope> [↑](#footnote-ref-9)
10. <https://www.archdaily.com/887460/cross-ventilation-the-chimney-effect-and-other-concepts-of-natural-ventilation> [↑](#footnote-ref-10)