

Solana Beach School District Ventilation & Filtration Update

Special Board Meeting September 23, 2021



P2S EVALUATION TEAM



Kent Peterson, P.E.

Vice President / COO

ASHRAE - Former Society President and Fellow

ASHRAE - Decarbonization Task Force

ASHRAE - High Performance Sequences of Operation for HVAC Systems

U.S. Department of Energy, Definition of Zero Energy Buildings

California State University - Mechanical Review Board



James Del Monaco, P.E.

Associate Principal / Engineering Group Leader

ASHRAE - Current President-Elect San Diego Chapter

ASHRAE - Member of Guideline 13 - Specifying Building Automation Systems

ASHRAE - Former Chair of Technical Committee on Control Theory

ASHRAE - High Performance Sequences of Operation for HVAC Systems

U.S. Department of Energy, Better Buildings Initiative

ASHRAE

American Society of Heating Refrigeration and Air Conditioning Engineers

- International Organization in 130 Countries [51,000 Members]
- Mission: To serve humanity by advancing the arts and sciences of heating, ventilation, air conditioning and their allied fields.
- Epidemic Task Force Created in March 2020

P2S Involvement

- Former Society President - Kent Peterson
- Standard 62.1 - Ventilation for Acceptable Indoor Air Quality
- Standard 189.1 - Standard for Design of High-Performance Green Buildings
- Standard 170 - Ventilation of Health Care Facilities



PROJECT APPROACH

PHASE 1 - DATA ACQUISITION

- Review available As-Builts
- Review typical field conditions
- Interview Solana Beach SD Facilities Staff

PHASE 2 - PROJECT PLANNING

- Update Solana Beach SD on data acquisition findings
- Reconfirm project goals

PHASE 3 - ASSESSMENT

- Review available technologies for implementation
- Identify approach & potential phasing
- Collaboration with Solana Beach SD on implementation and impacts
- Provide written report of recommendations



DEFINITIONS

VENTILATION

The underlying principle for ventilation is to dilute and remove airborne pathogens as much as possible, exhausting them to the outside air and reducing the chance they can become deposited on surfaces or inhaled by room users.

FILTRATION

The principle for filtration is to trap very small virus containing particles in the return airstream and stop them from making it back to the room where they might be inhaled. Filters are rated according to a Minimum Efficiency Reporting Value (MERV), which identifies a filter's ability to capture particles in the following three ranges: 0.3-3.0 microns; 1.0-3.0 microns; and 3.0 to 10 microns.

1

CURRENT VENTILATION

“ *An air change rate of 6 room volumes/ hour or greater is desirable for reduction of the risk of transmission of COVID causing between people in the space.*

SBSD has undergone an assessment of the HVAC systems and are currently meeting these values.



RECOMMENDATIONS TO INCREASE VENTILATION

1. Continue to provide control strategies for pre-occupancy purge of air within the spaces (recommended by ASHRAE)
2. Continue to provide control strategies to increase outside air to meet ASHRAE Standard 62.1 (ventilation for acceptable indoor air quality)

2

CURRENT FILTRATION

“ *The recommendation for air handling systems that have return air is to use a MERV 13 filter rating*

SBSD has undergone an assessment of the HVAC systems and are utilizing MERV 13 filtration in all occupied spaces.



RECOMMENDATIONS FOR INCREASED FILTRATION

1. Provide in-room air cleaners, known as portable, stand-alone, plug-in, or air purifiers which include High Efficiency Particulate Air (HEPA) filters.

RECOMMENDATIONS for IN-ROOM AIR CLEANERS

1. Purchase and mount portable air purifier units which include HEPA filters for high priority areas until permanent fan filtered units are installed
2. Install fan filtered units into the ceiling grid in occupied spaces which include HEPA filters*



**Requires architectural drawings, engineering, and DSA approval*

PORTABLE UNITS

Pros

- HEPA Filtration (99% effective)
- Uses 120V outlets
- No DSA Submission
- Proven technology
- Portable options
- Provides a 3-5 year bridge to long-term system recommendation

Cons

- Consumes floor space if not mounted
- Acoustical considerations
- Additional ongoing filter change costs

FAN-FILTER UNITS (FFU)

Pros

- HEPA Filtration (99% effective)
- Does not use floor space
- <NC 35 sound levels (decibel level)
- Proven technology

Cons

- Requires DSA submission which will include:
 - a. Architectural drawings
 - b. Electrical engineering
 - c. Mechanical engineering
 - d. Structural engineering
- DSA may also include
 - a. Additional ADA requirements
 - b. Fire-life safety
- Ceiling changes and power run to FFU.



PRIORITY TIMELINE

first

- Purchase and mount portable units by priority area:
 - ▷ Special Day Classrooms
 - ▷ Speciality Classrooms
 - ▷ All Other Classrooms

second

- Develop a long-range indoor air quality recommendation to include fan filter systems
- Return for Board input, consideration, and possible approval

ESTIMATED COSTS

FILTRATION

- Continue with MERV 13 filtration (\$52,000)
- Mount classroom portable in-room cleaners (\$420,000)

TOTAL

\$472,000 (ESSER III)



DISCUSSION