

<b>DOCKETED</b>	
<b>Docket Number:</b>	20-RENEW-01
<b>Project Title:</b>	School Energy Efficiency Stimulus Program
<b>TN #:</b>	237745
<b>Document Title:</b>	National Energy Management Institute (NEMI) Comments - Recommended Clarification to Revised Staff Draft Guidelines SRVEVR_210507
<b>Description:</b>	N/A
<b>Filer:</b>	System
<b>Organization:</b>	National Energy Management Institute (NEMI)
<b>Submitter Role:</b>	Public
<b>Submission Date:</b>	5/7/2021 3:47:59 PM
<b>Docketed Date:</b>	5/7/2021

*Comment Received From: National Energy Management Institute (NEMI)*  
*Submitted On: 5/7/2021*  
*Docket Number: 20-RENEW-01*

## **Recommended Clarification to Revised Staff Draft Guidelines SRVEVR\_210507**

NEMI supports adopting the attached modifications to Chapter 2: Project Requirements of the School Reopening Ventilation and Energy Efficiency Verification and Repair Program Guideline. Contractors commonly develop and provide customers with estimates containing detailed site-specific budget, timeline, and accurate description of scope of work. However, if that scope is not clearly defined, contractors must bid high to account for unknowns. The following recommend changes reduce the unknowns. Limited unknowns, or risk, will result in a more uniform estimation process.

*Additional submitted attachment is included below.*



Docket No. 20-RENEW-01

California Energy Commission

Docket Unit, MS-4

1516 Ninth Street Sacramento, CA 95814-5512

School Energy Efficiency Stimulus (SEES) Program

Re: Recommended Clarification to Staff Draft Guidelines School Reopening Ventilation and Energy

Chapter 2: Project Requirements

A. HVAC Assessment and Maintenance Grants

An LEA may apply for a SRVEVR grant to fund HVAC assessment, completion of an HVAC Assessment Report, HVAC general maintenance, adjustment of ventilation rates, filter replacement, and carbon dioxide monitor installation, as well as limited contingency funding for repairs, upgrades, or replacements necessary to make the system functional or more energy efficient.

Grant applications must specify the details of each site and provide contractor estimates for costs specific to each site. Awards will be made based on contractor estimates. Additional details on application requirements are provided in Chapter 3.

Pursuant to PUC Section 1623 and these guidelines, system assessment and maintenance must follow a prescriptive process and meet certain requirements as specified. An LEA receiving a SRVEVR grant must ensure that Qualified Personnel or Licensed Professionals, as required below and defined in Table 1, perform all required project work. Additionally, the results and findings from assessments must be recorded in the HVAC Assessment Report as described in this chapter.

**The contractor estimate shall be the primary substance of the application thus reducing the need for further consultation. A contractor estimate, for the HVAC Assessment and Maintenance shall provide a detailed site-specific budget, timeline, and accurate description of the following tasks:**

- **Assessments and general maintenance as designated in Section B - HVAC Assessment and Maintenance Requirements.**
- **Carbon Dioxide monitor installation or replacement as designated in Section C – Carbon Dioxide Monitoring.**
- **HVAC Assessment reports as designated in Section D – HVAC Assessment Report.**
- **Review of HVAC Assessment Report as designated in Section D – HVAC Assessment Report.**
- **HVAC Verification Report as designated in Section E – HVAC Verification Report.**



**The HVAC Assessment and Maintenance Grants shall include an additional 20 percent of the requested amount for repairs, upgrades, or replacements necessary to make the HVAC systems functional or more energy efficient. Repairs, upgrades, or replacements beyond the 20 percent shall be noted in the HVAC Assessment Report and the HVAC Verification Report. Grants for work in excess of the 20 percent contingency will be referred to as HVAC Upgrade and Repair Grants and may be addressed in future editions of the guidelines.**

## B. HVAC Assessment and Maintenance Requirements

### 1. Filtration

The LEA receiving a SRVEVR grant shall install filtration with a minimum efficiency reporting value (MERV) of 13 or better in the HVAC system where feasible. **While not all systems can operate with a MERV 13, the highest MERV filtration shall installed without adversely impacting equipment.**

- a. Qualified Testing Personnel shall ~~test~~ review system capacity and airflow to determine the highest MERV filtration that can be installed without adversely impacting equipment, shall replace or upgrade filters where needed, and shall verify that those filters are installed correctly. **The expected cost of the filters shall be included in the HVAC Assessment and Maintenance Grant estimate. Adjustments or repairs to increase fan capacity shall be limited to the 20 percent contingency. Required adjustments or repairs beyond the 20 percent contingency shall be considered for future HVAC Upgrade and Repair Grants.**
- b. If a system uses ultraviolet germicidal irradiation (UVGI) to disinfect the air, the UVGI lamp shall be checked for proper operation, replacing bulbs as needed and verifying that the ultraviolet light does not shine on filters. **Repairs and replacements shall be limited to the 20 percent contingency. Required Repairs beyond the 20 percent contingency shall be considered for future HVAC Upgrade and Repair Grants.**
- c. For systems with economizers, Qualified Testing Personnel shall test system economizer dampers pursuant to Section B of CEC form CEC-NRCA-MCH-05-A–Air Economizer Controls (<https://energycodeace.com/NonresidentialForms/2019>).
  1. Economizer dampers and controls that are not properly functioning shall be repaired by a Skilled and Trained Workforce. **Repairs shall be limited to the 20 percent contingency. Required Repairs beyond the 20 percent contingency shall be considered for future HVAC Upgrade and Repair Grants.**
- d. **Deficiencies not repaired with the 20 percent contingency and r**Recommendations for additional maintenance, replacement, or upgrades to the above shall be recorded in the HVAC Assessment Report required under PUC Section 1626 and these guidelines.

### 2. Ventilation

After completing the filtration requirements described above, a Qualified Testing Personnel shall verify the ventilation rates in the facility classrooms, auditoriums, gymnasiums, nurses' offices, restrooms, and other occupied areas to assess whether they meet the minimum ventilation rate requirements set forth in Table 120.1-A of Part 6 (commencing with Section 100.0) of Title 24 California Code of Regulations. The assessment shall include all of the following:

- a. Calculation of the required minimum outside air ventilation rates for each occupied area based on the anticipated occupancy and the minimum required ventilation rate per



occupant set forth in Table 120.1-A. Calculations shall be based on maximum anticipated classroom or other occupied area occupancy rates and determined by the performing technician. Natural ventilation shall be designed in accordance with Section 402.2 of the California Mechanical Code (Part 4 [commencing with Section 1.1.0] of Title 24 of the California Code of Regulations) and shall include mechanical ventilation systems designed in accordance with Section 403.0, Section 404.0, or both sections, of the California Mechanical Code.

- b. Measurement of outside air under Section B of CEC form CEC-NRCA-MCH-02-A–Outdoor Air Acceptance (<https://energycodeace.com/NonresidentialForms/2019>) and verification of whether the system provides the minimum outside air ventilation rates calculated in subparagraph a) directly above.
- c. Survey readings of inlets and outlets to verify all ventilation is reaching the served zone and there is adequate distribution. Verify if inlets and outlets are balanced within tolerance of the system design. Document **measured read** values and deficiencies. If the original system design values are not available, document available information and note unavailability of system design values in the assessment report.
- d. Verification **that design building/space pressure is achieved.** ~~of building pressure relative to the outdoors to ensure positive pressure differential and ensure the building is not over-pressurized.~~
- e. **If applicable, verify the drive assembly condition.**
- f. Verification of coil velocities and coil and unit discharge air temperatures required to maintain desired indoor conditions and avoid moisture carryover from cooling coils.
- g. Verification that separation between outdoor air intakes and exhaust discharge outlets meet requirements of the California Building Code, including Section 120.1.
- h. Confirmation that the air-handling unit is bringing in outdoor air and removing exhaust air as intended by the system design.
- i. Measurement of all exhaust air volume for exhaust fans, including restrooms. Document any discrepancies from system design.
- j. If the system does not meet the minimum ventilation rate requirements set forth in Table 120.1-A, **the system shall be adjusted to the highest minimum ventilation allowable without adversely impacting equipment performance and building indoor environmental quality. In their review of the HVAC Assessment Report** a Licensed Professional ~~or Qualified Adjusting Personnel~~, as defined in Table 1, shall review the system airflow and capacity to determine if additional ventilation can be provided ~~without adversely impacting equipment performance and building indoor environmental quality.~~ **If the system does not meet the minimum ventilation rate for the expected occupancy, a Licensed Professional shall clarify the actual ventilation rate and the occupancy it should serve.**

1. If additional ventilation can be provided, a Qualified Adjusting Personnel must adjust ventilation rates to meet the minimum ventilation rate requirements set forth in Table 120.1-A to the extent feasible. After the adjustment, the measurement and verifications required by b), d), and e), directly above must be repeated. **Adjustment of the ventilation rates to meet the minimum**



**ventilation rate requirements with existing equipment shall be included in the HVAC Assessment and Maintenance Grant estimate.**

2. If minimum ventilation rate requirements set forth in Table 120.1-A cannot be met, this deficiency shall be reported in the HVAC Assessment Report, the HVAC Verification Report (outlined in Section E below), and addressed by a Licensed Professional as required by this chapter.

3. Demand Control Ventilation

a. If a demand control ventilation is installed, it must be adjusted to a carbon dioxide set point of 800 ppm or less and tested by Qualified Testing Personnel pursuant to Section B of CEC-NRCA-MCH-06-A–Demand Control Ventilation Systems Acceptance (<https://energycodeace.com/NonresidentialForms/2019>).

1. If the demand control ventilation system does not maintain average daily maximum carbon dioxide levels below 1,100 ppm, it must be disabled until such time as the LEA determines that the COVID-19 crisis has passed, unless disabling the control would adversely affect operation of the overall system.

2. When disabling a demand control ventilation system, the system must be configured to meet the minimum ventilation rate requirements and tested and adjusted to provide a notification through a visual indicator on the monitor, such as an indicator light or other alert system, such as an electronic mail, text, or cellular telephone application, when the carbon dioxide levels in the classroom have exceeded 1,100 ppm.

b. Recommendations for additional maintenance, replacement, or upgrades for the demand control ventilation **that cannot be completed with the 20 percent contingency** shall be recorded in the HVAC Assessment Report, described in Section D.

4. Coil Condition

a. A Qualified Testing Personnel or a Skilled and Trained Workforce shall verify:

1. Coil condition.

2. Condensate drainage.

3. Cooling coil air temperature differentials (entering and leaving dry bulb).

4. Heat exchanger operation.

~~5. Drive assembly.~~

b. If repairs, replacement, or upgrades are necessary **that cannot be completed with the 20 percent contingency** these deficiencies shall be reported in the HVAC Assessment Report and the HVAC Verification Report and addressed by the Licensed Professional pursuant to PUC Sections 1626–1627, as described in Section D.

5. Additional Requirements

a. A Qualified Testing or Adjusting Personnel shall review control sequences to verify systems will maintain intended ventilation, temperature, and humidity conditions during school operation.



1. For previously unoccupied buildings, perform the recommended practices of reopening a building as covered in the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Building Readiness document — Restarting a Building. Additional information can be found on ASHRAE’s webpage for Building Readiness (<https://www.ashrae.org/technical-resources/building-readiness>)
  2. Verify a daily flush is scheduled ~~for two hours before and after scheduled occupancy or demonstrate calculation of flush times~~ per ASHRAE Guidance for Reopening and Operating Schools and Buildings or otherwise applicable local or state guidance. Additional information can be found on ASHRAE’s webpage for Reopening of Schools and Universities (<https://www.ashrae.org/technical-resources/reopening-of-schools-and-universities>).
  3. Verify that HVAC system operational times, exhaust fans operation times, setpoints, and enabled features meet ASHRAE Guidance for Reopening and Operating Schools and Buildings or otherwise applicable local or state guidance.
- b. If installed HVAC systems or system components are broken, fail to meet minimum ventilation requirements, or are unable to operate to the original design and **intent and cannot be repaired with the 20 percent contingency**, this information will be included in the HVAC Assessment Report prepared pursuant to PUC Section 1626, and described in Section D, which will be provided to a Licensed Professional for determination of appropriate corrective measures pursuant to PUC Section 1626. Repairs, upgrades, or replacements shall be performed by a Skilled and Trained Workforce.
- c. Requirements for filtration levels, ventilation rates, and ventilation schedules may be amended by the CEC based on the latest COVID-19 or other applicable guidance.
6. Carbon Dioxide Monitoring
- a. Installation

To ensure proper ventilation is maintained throughout the school year, all classrooms in schools receiving a SRVEVR grant shall be equipped with a carbon dioxide monitor that meets all the following. **The cost of the monitor, installation, and initial adjustment shall be included in the HVAC Assessment and Maintenance Grant estimate.**

1. The monitor is hard-wired or plugged-in and mounted to the wall between three and six feet above the floor and at least five feet away from the door and operable windows.
2. The monitor displays the carbon dioxide readings to the teacher through a display on the device or other means such as a web-based application or cellular phone application.
3. The monitor provides a notification through a visual indicator on the monitor, such as an indicator light or other alert system, such as an electronic mail, text, or cellular telephone application, when the carbon dioxide levels in the classroom have exceeded 1,100 ppm.
4. The monitor maintains a record of previous data that includes at least the maximum carbon dioxide concentration measured.



5. The monitor has a range of 400 ppm to 2,000 ppm or greater.

6. The monitor is certified by the manufacturer to be accurate within 75 ppm at 1,000 ppm carbon dioxide concentration and is certified by the manufacturer to require calibration no more frequently than once every five years.

b. Continued Monitoring of Classroom Carbon Dioxide Level

If a classroom carbon dioxide concentration exceeds 1,100 ppm more than once a week as observed by the teacher or the facility's staff, the classroom ventilation rates shall be adjusted by Qualified Testing or Adjusting Personnel, as defined in Table 1, to ensure that peak carbon dioxide concentrations in the classroom remain below the maximum allowable carbon dioxide ppm setpoint. Verification of the installation of carbon dioxide monitors in all classrooms shall be included in the HVAC Assessment Report, described below. **The requirement for future adjustments by a Qualified Testing or Adjusting Personnel shall not be included in the HVAC Assessment and Maintenance Grant estimate. The LEA is responsible for continued monitoring.**

---

Christopher Ruch

*Director of Training*

National Energy Management Institute

3180 Fairview Park Drive, Suite 400

Falls Church, VA 22042

(C) 916-280-6281