## **Section 3 – Ventilation Rate**

## Ventilation Verification and Energy Optimization Assessment

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|  | **Determine Minimum Required Outside Air (OSA)** | | | | | |
|  | * If available, obtain the design documents and obtain the minimum required OSA. | | | | CFM | |
|  | * Determine if the zones actual use and occupancy matches the designs expected use and occupancy. | | | | Y/N | |
| Original Occupancy (Design) | | Occupancy Category (Use): | | Occupancy: | | |
| How was original occupancy determined? | | |  | | | |
| Actual Occupancy | | Occupancy Category (Use): | | Occupancy: | | |
| How was actual occupancy determined? | | |  | | | |
|  | * If Yes, proceed to outside air measurements. | | | |  | |
|  | * If No, calculate the new minimum outside air rate based on ASHRAE 62.1 or Table 120.1-A of the 2019 Title 24 California Building Energy Efficiency Standards, as required by your local jurisdiction. * See Example at end of document. | | | | | CFM |

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|  | **Verify Minimum Required Outside Air (OSA)** |

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| **Steps** |  | | **CAV** | | | **VAV** |
| 1 | Disable demand control ventilation (if applicable) | Check if NA |  | | |  |
| 2 | Verify unit is not in economizer mode during test (economizer disabled) | |  | | |  |
| 3 | CAV and VAV testing at full supply airflow | |  | | |  |
| a. | Adjust supply air to achieve design airflow or maximum airflow at full cooling. | |  | |  | |
| b. | Measured outdoor airflow reading (cfm) | | cfm | | cfm | |
| c. | Required outdoor airflow (cfm) | | cfm | | cfm | |
| d. | Time for outside air damper to stabilize after full supply airflow is achieved (minutes): | |  | | min | |
| 4 | VAV testing at reduced supply airflow | | | | | |
| a. | Adjust supply airflow to either the sum of the minimum zone airflows, full heating, or 30% of the total design airflow. | |  | |  | |
| b. | Measured outdoor airflow reading (cfm). | |  | | cfm | |
| c. | Required outdoor airflow (cfm) | |  | | cfm | |
| d. | Time for outside air damper to stabilize after reduced supply airflow is achieved (minutes): | |  | | min | |
| 5 | Return to initial conditions | |  | | |  |
| 6 | Calculations | | | | | |
| Determine Percent Outside Air at full supply airflow (%OAFA) for Step 3. | | | | | | |
| a. | %OAFA = Measured outdoor airflow reading /Required outdoor airflow.  100 x (Step3b/Step3c) | | | % | | % |
| b. | %OAFA is within 10% of design Outside Air. (90% ≤ %OAFA ≤ 110%) | | | P / F | | P / F |
| c. | Outside air damper position stabilizes within 5 minutes. (Step 3d < 5 minutes) | | |  | | P / F |
| VAV only: Determine Percent Outside Air at reduced supply airflow (%OARA) for Step 4. | | | | | | |
| a. | %OARA = Measured outdoor airflow reading /Required outdoor airflow reading.  100 x (Step4b/Step4c) | | |  | | % |
| b. | %OARA is within 10% of design Outside Air. (90% ≤ OARA ≤ 110%) | | |  | | P / F |
| c. | Outside air damper position stabilizes within 5 minutes. (Step 4d < 5 minutes) | | |  | | P / F |

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|  | **Increased Outside Air** | | |
|  | * Document if the ventilation components can provide increased outside air if recommended. |  |  |
|  | * Document unit model and serial number |  |  |
|  | * Provide documentation, including relevant photographic documentation, in the assessment report so a licensed professional can determine if the minimum outside air can should be increased and can be without compromising the system’s ability to maintain space conditions and pressurization. | |  |

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Sample calculation of a new minimum outside air rate based on ASHRAE 62.1 or Table 120.1-A of the 2019 Title 24 California Building Energy Efficiency Standards, as required by your local jurisdiction.

* Sample requirement for a 900 square foot meeting room or assembly area.

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| **Standard** | **Method** | **15 People** | **25 People** | **35 People** |
| ASHRAE 62.1 2019 |  | 258 CFM | 358 CFM | 458 CFM |
| California T24 (2019) |  | 225 CFM  **Use Larger** | 375 CFM | 525 CFM |
| California Title 24 (2019) |  | 342 CFM | 342 CFM | 342 CFM |

*This document is intended to be used solely as an aide when developing the methods, procedures, and forms used in the Ventilation Verification and Energy Optimization Assessment.  It is the responsibility of each contractor, supervisor, and technician to ensure that the methods, procedures, and forms used meet the requirements of the local mechanical codes.  The National Energy Management Institute Committee makes no representations, whatsoever, that drafting procedures or forms based on this document will meet that requirement of local mechanical codes and expressly disclaims any liability or responsibility regarding the use of this document.*