Interpretation IC 170-2013-6 of
ANSI/ASHRAE/ASHE Standard 170-2013
Ventilation of Health Care Facilities

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Request from: Travis English, Kaiser Permanente, 1800 Harrision Street, Oakland, CA 94612.

Reference: This request for interpretation refers to the requirements in ANSI/ASHRAE/ASHE Standard 170-2013, Section 7.1.a.6.ii, regarding use of the multiple space calculation method.

Background: Standard 170-2013 §7.1.a.6.ii indicates designers may use “the Ventilation Rate Procedure (multiple zone formula) of ASHRAE Standard 62.1” (S62). And, in doing so, “The minimum outdoor air change rate listed in this standard shall be interpreted as \( V_{oz} \) (zone outdoor airflow) for purposes of this calculation.”

Thus,

\[ V_{170} = V_{oz} \]

Where \( V_{170} \) is the per space outdoor air flow derived from air change rate.

In ASHRAE Standard 62.1, \( V_{oz} \) is composed of an area-based component, \( (R_a \cdot A_z) \), and an occupant based component, \( (R_p \cdot P_z) \). In order to calculate the uncorrected outdoor air intake, \( V_{ou} \), in S62 Equation 6-6, it is necessary to separate \( V_{oz} \) into these two components. Equation 6-6 reads:

\[
V_{ou} = D \sum_{all\,zones} (R_a \cdot A_z) + \sum_{all\,zones} (R_p \cdot P_z)
\]

Where \( D \) is the occupant diversity, defined by S62 Equation 6-7, which reads: 

\[
D = \frac{P_s}{\sum_{all\,zones} P_z}
\]

To successfully complete the calculation, the following is proposed:

1. Assume a relatively high value of \( R_a \) to ensuring that each area receives minimum ventilation. \( R_a = 0.12 \) is here proposed, which is equal to the \( R_a \) in S62 used for spaces such as break rooms, photo studios, libraries, children’s museums, etc. See S62, Table 6-1.

2. Substitute \( V_{170} \) into S62 Equation 6-6, using \( R_a = 0.12 \). S62 Equation 6-6 is currently written as:

\[
V_{ou} = D \sum_{all\,zones} (R_p \cdot P_z) + \sum_{all\,zones} (R_a \cdot A_z)
\]

It would be re-written as follows

\[
V_{ou} = D \sum_{all\,zones} (V_{170} - R_a \cdot A_z) + \sum_{all\,zones} (R_a \cdot A_z)
\]

Which, using \( R_a = 0.12 \), simplifies to the following:
\[ V_{ou} = D \sum_{all\text{zones}} V_{170} + (1-D) \sum_{all\text{zones}} 0.12 A_z \]

Using this, the remaining calculations in S62 Equations 6-6 through 6-8, may be completed.

**Interpretation:** Is it acceptable to assume a value of \( R_a \) for the calculation of \( V_{ou} \) (S62, Equation 6-6).

**Question:** Is this interpretation correct?

**Answer:** Yes.

**Comments:** Values for \( R_p \) and \( R_a \) have not yet been identified for health care spaces.