<div align="center">

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

</div>

<div align="center">

Date Approved: June 30, 2015

</div>

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:

$$V_{ou} = D\Sigma_{all\ zones}(R_a \cdot A_z) + \Sigma_{all\ zones}(R_p \cdot P_z)$$

Where D is the occupant diversity, defined by S62 Equation 6-7, which reads: $D = P_s / \Sigma_{all\ zones}P_z$

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:

    $$V_{ou} = D\ \Sigma_{allzones}(R_p \cdot P_z) + °_{allzones}(R_a \cdot A_z)$$

    It would be re-written as follows

    $$V_{ou} = D\ \Sigma_{allzones}[V_{170} - R_a \cdot A_z] + \Sigma_{allzones}(R_a \cdot A_z)$$

    Which, using R_a=0.12, simplifies to the following:

$$V_{ou} = D \, \Sigma_{allzones} V_{170} + (1-D)\Sigma_{allzones} \, 0.12 \, A_z$$

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.