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MEMORANDUM

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FROM: Gray Robertson

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SUBJECT: Ventilation in Restaurants and the Hospitality Industry

Within the last few weeks, I've been asked by several sources about ventilation requirements in restaurants, hotels, casinos, etc. The issue that precipitates all these requests is how can existing restaurants accommodate the ASHRAE 62-1989 "Ventilation for Acceptable Air Quality" standards.

As we all have long realized, the ASHRAE standards tend to be the foundation on which most building codes are based for ventilation rates. Furthermore, since minimum ventilation rates for offices in the 62-1989 Standard moved from 5 cfm per person to 20 cfm per person, two major concerns about existing buildings were:

- 1 Could the existing ventilation system deliver the extra air?
- 2 Wouldn't a fourfold increase in ventilation rate lead to a fourfold increase in operating costs?

Let us first understand why most of these fears are groundless in offices and then look at the real situation in restaurants. I see nothing but good news for the hospitality industry!

- 1 Can the existing ventilation system handle the extra air volume?

Consider a typical ventilation system for an office housing say 100 people.

Pre-ASHRAE Std 62-1989 Outside air minimum would have been 5 cfm x 100 = 500 cfm
 Post-ASHRAE Std 62-1989 Outside air minimum would be 20 cfm x 100 = 2000 cfm

However, this is only the outside air fraction. The volume of supply air (supply air = total of outside air + return air) would typically have been 9000 cfm.

It would take 9000 cfm of supply air at the correct supply air temperature to provide cooling for the 100 people at the design load condition, i.e., the ventilation system must have been sized for handling 9000 cfm. The fans and ductwork have the capacity to handle 9000 cfm. Thus, changing from 500 to 2000 cfm of outside air simply changes the percent of outdoor air in the supply air from 5.6% to 22%. The ventilation system fans and ductwork etc. still move around the same volume of total air.



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The only limiting factor is whether or not the existing chill coils have the capacity to cope with the extra percentage of outdoor air. In most office environments, the coils can accommodate the change for most of the year. Perhaps in extremes of temperature we can have undercapacity, but this does not apply to most restaurants (see below).

2 Will a fourfold increase in minimum ventilation rates mean a fourfold increase in costs?

This is partly answered in the prior explanation. We do not increase the total ventilation air four-fold. We only change the outside air content from 5.6% to 22%.

Understanding this basic fact can help us appreciate why every credible study made to date shows that the real cost increase from switching from 5 to 20 cfm minimum outdoor air raises ventilation costs by no more than 5-10% total. Again, even this does not apply in most restaurants.

Restaurants and the Hospitality Industry

If we compare the minimum outdoor air ventilation rates for areas relevant to this industry between old ASHRAE standards and new or current standards, here is what we see:

Location	Minimum outdoor air for ventilation in cfm/person				
	Standard 62-1973		Standard 62-1981		Standard 62-1989
	Minimum	Recommended	Smoking	Non-smoking	Minimum
Food and Beverage Industry					
Dining rooms	10	15-20	35	7	20
Cafeterias and Fast food facilities	30	35	35	7	20
Bars and cocktail lounges	30	35-50	50	10	30
Hotels					
Lobbies	7	10-15	15	5	15
Conference rooms	20	25-30	35	7	20
Assembly rooms	15	20-25	35	7	15
Casinos			35	7	30
Offices					
Office spaces	15	15-25	20	5	20
Smoking lounges	n/a	n/a	50	n/a	60
Others					
Bowling alleys	15	20-25	35	7	25
Ballrooms	15	20-25	35	7	25

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Observations

- 1) Any restaurant, hotel, ballroom, bowling alley, etc. that allowed smoking in the past built or remodelled since 1981 and meeting the then current ASHRAE standards has more ventilation capacity than ASHRAE 62-1989 requirements.
- 2) Any bar, cafeteria, hotel conference and/or assembly room built between 1973 and 1981 meeting the then current ASHRAE standard has as much or more ventilation capacity than ASHRAE 62-1989 requirements.
- 3) Only the following areas built between 1973 and 1981 that applied the then current ASHRAE standards may have difficulty meeting 62-1989 levels:

Dining rooms built between 1973 and 1981
Hotel lobbies built between 1973 and 1981
Bowling alleys and ballrooms built between 1973 and 1981

However, there would only be a problem if the then minimum ventilation rates were used. If the recommended rates were chosen, every facility that ever allowed smoking in the past has the installed capacity to meet ASHRAE 62-1989 today.

4) Offices

In the past, we have all been concerned for too long with the burden existing offices have in complying with ASHRAE 62-1989. Everyone automatically presumed major ventilation upgrades despite the fact that HBI research showed most offices, new and old, could accommodate moderate smoking if operate correctly.

Now we see clearly why and how this is:

- a) Any office built between 1973 and 1981 that used minimum ventilation rates had 15 cfm/person of outdoor air. If they used recommended rates, they had 15-25 cfm/person and therefore even exceeded ASHRAE 62-1989.
- b) Any office built between 1981 and 1989 that assumed some degree of smoking should have specified the 20 cfm ventilation rate, not the 5 cfm figure assumed by many, i.e., the vast majority of existing offices did have designs meeting ASHRAE 62-1989 standards.

Recommendation

In view of this review, every hotel, restaurant, bowling alley or their respective hospitality associations when informed on these issues should willingly embrace ASHRAE 62-1989 and help its adoption at every city, state and national level.

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