Executive Summary

To an engineer specializing in building mechanical systems, a fundamental requirement of any design is the correct supply of ventilation air. However, the correct amount of ventilation air to be used in a system is a matter of much debate. A standard design practice is the solution to the debate, and the American Society of Heating, Refrigerating, and Air-conditioning Engineers publishes its Standard 62.1-2004 to guide the building industry in this issue. The standard is a key to a healthy, well ventilated mechanical system. With air quality excellence in mind, the Eberly Campus Community Center has been analyzed for compliance with the most recent ASHRAE Standard 62.1.

Because the Eberly Campus Community Center is a relatively small building, the entire building area is represented in the analysis. The building area encompasses a wide variety of spaces, creating the necessity for many small single zone systems (one air system per space), and several smaller multi-zone systems (several spaces attached to one air system). Systems evaluated in this analysis have been subjected to a pre-scripted calculation process involving a summary of spaces, a calculation of the outdoor ventilation air required per space, and the impact of combining the space or spaces into a single system. The results include the proper design amount of ventilation air for the building and the results are then compared with the original design airflows to discover compliance with the ASHRAE Standard 62.1-2004.

During the comparison of calculated and designed air flows, the analysis proves the required building outdoor airflow to be several thousand cubic feet per minute higher than the design values. While this is an interesting development, the results of the two would match closely if several of the large, infrequently used spaces are analyzed with a time averaged occupancy rate. Therefore, even though a straightforward analysis places the current outdoor air flow below standard, considering a diversity of occupancy over periods of time could prove the design to be adequate.