National TAB

Project Summary

The summary below provides a quick understanding of our scope of work and general testing procedures. Enclosed in the report are further details about your building performance including recommendations, asset data, and pictures. Our focus is to work with the trades to remedy any issues or deficiencies during the actual field balancing and not after the balancing has occurred to achieve a positive environment and outcome. The level of success is determined by the availability of the trades, possible parts needed, or time constraints.

RTU's (Roof Top Units) w/ Diffusers
Each of the RTU's were measured at their terminal devices or via traverse to establish a total flow for that unit. Each RTU was adjusted to within tolerance of the engineer's design flow. Outside air was measured by reading the intake air opening with a velocity grid and multiplying by the free area. The outside air damper was adjusted until the airflow was within the design requirements. Any equipment that fell outside of that tolerance is noted throughout the report.

Kitchen Exhaust Hood & Associated Fans
Each kitchen exhaust fan was measured at the hood filter bay utilizing a velocity matrix and a manufacturer's correction factor. Each filter velocity is multiplied by the manufacturer's corrected area. The sum of these readings equals the total flow of the exhaust fans. The total flow of the exhaust was then adjusted to within tolerance of the design flow. Any EF's that fell outside of this tolerance is noted throughout the report.

General Exhaust Fans w/ Grilles
The general exhaust fans were measured by reading each air device with a flow hood. The total airflow for each fan is equivalent to the sum of these readings. Fan speed was then adjusted so that the airflow was within tolerance of design. Each terminal device was balanced to within tolerance of the design volume using the installed volume dampers. Any equipment that fell outside of this tolerance is noted throughout the report.

Final Building Tests
After completing the test and balance the final building pressure was measured. It was confirmed that the building pressure fell within acceptable tolerances of -0.02" wc to +0.02" wc and that the pressure measurement coincides with the actual and design net airflow. Any deviations from these standards are noted throughout the report.
The hood capture was tested at the perimeter of the hood and the cook top level with the equipment heat on to ensure satisfactory hood capture and containment.

Technical Summary

The purpose of this visit was to balance two exhaust hoods that were replaced, as well as provide a total flow TAB for the store to help identify any issues and improve the overall comfort and efficiency of the system.

On arrival at the store, both exhaust fans were set to max speed (10.0v). The building pressure was measured negative, at around –0.022". Acceptable building pressure falls within –0.02" to 0.02" W.C.. While negative pressure is acceptable, we want slightly positive pressurization for the store. This makes it so the system has control over any air entering the building, filtering contaminants, and provides a more comfortable and efficient space.

HD-1 was exhausting within design airflow (1500 cfm), while HD-2 was measured above 2300 cfm. It appears the filters for HD-1 are completely clogged. The hoods are designed to exhaust 1500 cfm each for this application, but we do not typically need them set to max speed. Smoke capture for both exhaust hoods is being interrupted by the cookline diffusers. 4-way diffusers are installed. On a culvers cookline, perforated diffusers with rigid vertical duct are typically installed to help direct air straight down, and not at the exhaust hoods. As installed, the 4-way diffusers are creating a turbulent environment along the cookline. To make

matters worse, the diffuser in front of the griddle supplies almost 1000 cfm and does not have a damper installed. This is causing extreme disruption to smoke capture. We would like to reduce the volume of air to this diffuser but will need a damper to do so. We slowed HD-2 to design airflow (around 7.0v for 1630 cfm) but smoke capture was extremely poor. As a result, we had to leave the hood exhaust fans at max speed. Otherwise, the kitchen would fill with smoke.

In addition to the cookline issue, there is also an issue with the wiring to both exhaust fans. Electrical conduit and the control wire were drilled through the grease duct. This allows grease to leak into interior space creating a fire hazard. This also holds the fans up, so they are not flush with the curb and are leaking. The jagged hole drilled for the control wire will certainly cut through the wire eventually, disabling the exhaust fan. This installation does not allow for effective cleaning and needs to be corrected.

We Highly recommend installing perforated cookline diffusers with dampers and rigid 90s installed, as well as
correcting the exhaust fan wiring. This should reduce the disruption being caused by the cookline diffusers and allow the hoods to be slowed into design.

Please take note of the additional issues described in the report below. Two issues we would also like to highlight include:

1. The RTU outside air filters are completely clogged and need to be cleaned.
2. The kitchen RTU is capable of humidity control, but it does not appear a sensor is wired in. The unit also has an alarm to do with humidity control. Recommend this is investigated and humidity control enabled as this will lead to a much more comfortable space and allow more fresh “makeup” air to be brought in through the unit.

Issues are listed in the issues section, as well as noted on each individual asset. We believe by addressing the issues with the exhaust fans / hoods as well as the other issues listed throughout this report, the restaurant HVAC system will be greatly improved. Please do not hesitate to reach out with any concerns or questions.