

Project Summary

Purpose of the visit is to evaluate complaints from the client of hot conditions on the cooklines and a pressure issue at the private dining room. A balance was previously completed in 2021 during construction. NOTE: original data from that visit was used in majority of the report for reference. Only the values retested were changed.

The scope of work is to balance the outside air for all units, supply air for RTU-1 and RTU-6, and airflows for exhaust fans for the best outcome of the space. The strategy was to reduce the MUA as much as possible on the cookline without causing the building to be neutral.

Arrived on site and discussed with operations about their observations and was told the following:

- Main cookline with the solid fuel cooking gets unbearably hot. The cooks also stated that when they are in busy periods, the hoods do not capture well and smoke rolls out.
- The prep cookline also gets very hot.
- Area in front of the dish hood gets hot but talking to the dish washer he said it was not too bad. Although he was relatively new. There is a switch on the hood he noted has to be manually turned on.
- The hoods were found to be in modulation mode and the cooks said they have to manually but them into max air.
- Under 90 degrees outside and the RTU's seem to keep up OK.
- Dining room was getting to 76 degrees with a setpoint of 70 degrees.
- Private dining room has pressurization and doors are hard to open/sucking shut. They also have comfort issues there.

Initial air flows and data were gathered. The initial flows are noted in the Initial Data checklist. The major findings and adjustments are as follows:

1. All thermostats set to 66 degrees by staff to try and pre-cool the space. They are programmed for fan on.
2. Initial temperatures measured as (approximately 11am)
 - a. Dining - 70.5 F / 58.7% RH
 - b. Main Cookline – 73.5 F / 60.3% RH
 - c. Prep – 75.2 F / 62%
 - d. Outside – 76.4 / 64.5%
3. Some multispeed RTU's were found to be running in low speed. Locked the RTU's into high speed for the duration of testing.
4. Main cookline and smoker hoods found to be modulating to low speed even during high periods of cooking. The airflow was running low all day and was resulting in smoke capture issues. The cooks were having to manual press the max air button multiple times a day. Took temperatures at the hoods to determine appropriate modulation and then changed the settings inside the hood. Hoods starting capturing better and the cooks noted a difference.
5. The building net airflow with all fans in high speed was +3111 CFM (very positive). However the initial building pressure was -0.019" wc which was taken when fans were modulating in low speed. Airflows for the multi speed RTU's were balanced for both low and high speed to maintain building pressurization.
6. Restroom exhaust fan was not running. This was fixed as the technician was leaving site and it was confirmed it was running, but unable to measure the final flow.
7. Main cookline exhaust fan serving the solid fuel was found low (2142 CFM out of design of 3150) which was known prior to the visit. The MUA for this hood was also found proportionally low.
8. Reduced MUA4 on the main cookline from 3891 CFM to 3304 CFM.
9. MUA2 was found to be high on flow at 3208 CFM and was reduced to 2710 CFM.
10. RTU-4 (Kitchen) outside air was above design and ratio was 42%. This high of ratio can cause humidity and temperature issues.
11. RTU-1 (Private dining) airflow was found as 1755 CFM (designed for 1200 CFM). Reduced as much as possible to 1593 CFM.

12. The pressure at the private dining door was found to be very positive (in reference to main dining area). There is a side door that opens up to the outside that was negative. The building was balanced slightly negative to ensure the MUA could be reduced as far as possible. The final building pressure was measured as $-0.008''$ wc.

Final findings and Recommendations:

1. Main strategy for improving comfort was to reduce the MUA as much as possible and also reduce the outside air on the RTU's. The main cookline hoods were also found to be modulating causing smoke and heat loss. This was resolved. RTU-4 serving the kitchen had a very high outside air ratio which can present issues with the RTU keeping up during cooling. Comfort should be monitored to see if there is any improvement. Based on final temperatures taken in the space it appears that a conditioned MUA may be required to drastically improve the conditions.
2. RTU-5 (Dining) discharge air temperatures were taken and was high. It was confirmed that the thermostat was in cooling mode. Appears that possibly the unit is not cooling properly. Recommend this unit be serviced.
Entering air = $69.0\text{F} / 60.7\% \text{RH}$
leaving air = $67.0 \text{F} / 86.6\% \text{RH}$
3. The private dining area has a positive pressure of $+0.0434''$ wc relative to the main part of the building. The reason for this pressure is due to the return for the RTU being installed outside of the private dining room. To reduce the pressurization of this room a return will need to be added to the room. The RTU is also high on airflow. Changing pulleys to reduce airflow would help with the pressurization. However, unit appeared to be cooling OK and if there are no complaints with comfort in the room it is not recommended to reduce airflow. The room is tall and has large windows so reducing airflow too much could cause comfort issues.
4. Other items were found during the TAB process but are not necessarily having a significant impact on overall performance of the space. Those items are included in the following pages for the owners review.