

Report By:

National TAB
1329 E. KEMPER ROAD
SUITE 4210
CINCINNATI, OH 45246



Report: TAB REPORT
Function: Test, Adjust, & Balance
Date: 06/20/2024

PROJECT
06-17-24 CULVERS - STURTEVANT, WI
(REIMAGE)

722 S SYLVANIA AVE

STURTEVANT, WI 53177

Client

Accurex
PO Box 410
Schofield, WI 54476

National TAB

Project: 06-17-24 CULVERS - STURTEVANT, WI (REIMAGE)

Table Of Contents

Section	Page #
Summary	3
Technical Summary	4
Issue Data	7
Balance Schedule	19
Checklist Data	20
AHU/RTU	39
FAN - Exhaust	41
Kitchen Hood Type I	43

Project Summary

The summary below provides a quick understanding of our scope of work and general testing procedures. Enclosed in the report is further detail 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)

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 equipment'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.

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 new exhaust hoods installed at the store, as well as perform a total flow air balance and evaluation to seek out any opportunity to improve the comfort and performance of the HVAC system.

HOOD EXHAUST & ASSOCIATED FANS

Both the Griddle exhaust hood (HD-1) and the Fryer exhaust Hood (HD-2) are exhausting their design airflow of 1500 cfm. Their respective fans, PRV-2 (griddle) and PRV-3 (fryer), are misaligned on their curbs. It appears this misalignment is due to the original installation of the grease duct; the duct is not centered. As result, the hood exhaust fans had to be set at much higher than typical setpoints to achieve design airflow. This is causing unnecessary energy usage and strain on the exhaust fans. Recommend the fans are properly aligned with the duct. Once corrected, we anticipate the exhaust rates of both hoods to significantly increase. The PRV setpoints will need to be lowered and hoods rebalanced.

ROOF TOP UNITS (RTUs)

Two Lennox RTUs serve this Culvers location. A 12.5-ton unit serves the Dining space (RTU-1), and a 15-ton unit serves the Kitchen space (RTU-2). Both units have humidity control. Their sensors are wired, and dehumidification appears to be operating. RTU-1 was operating dehumidification during TAB. Both units are controlled via thermostat and are wired for occupancy, operating on a schedule. The occupancy scheduling is important to maintain building pressurization. When the hoods are powered on, both units need to be operating in occupied mode. This means their fans are running and outside air dampers are opening to their setpoints. In this system, the RTUs replace the air exhausted by the PRVs to “make-up” the difference and maintain building pressurization. A positively pressurized restaurant is important to keep out contaminants, force out smoke and odors, and prevent untreated, unwanted, or humid air from entering the space.

Upon arrival to this location, initial building pressure was measured around -0.029” W.C. which is outside of the standard tolerance of -0.02” to +0.02” W.C.. We measured the airflow of both RTUs to see what changes could be made to improve the building pressurization. For performance and efficiency, RTUs should operate at or around 350 Cubic Feet per Minute (CFM) of supply airflow.

RTU-1:

The dining room unit was measured to be supplying 4,427 cfm, or 354 cfm/ton. This is within design and no adjustments were made to the unit’s fan speed. The outside air was initially measured at 957 cfm. Because the unit has humidity control, we increased the outside air to an acceptable ratio to help bring the building closer to a positive state. The unit needs some maintenance as outlined in the Report below. According to staff, this unit maintains temperature in the dining room during hot weather. It

appears the unit also has Fresh Air Tempering as an installed option. Recommend this is enabled to prevent cold air from being driven into the space when unit operates in fan only during winter season.

RTU-2:

The Kitchen unit is supplying 3,503 cfm or 234 cfm/ton. 589 cfm of that 3,503cfm, is routed to the serving line diffusers, out of the kitchen. These diffusers are typically served by the dining room unit. Staff notes that it becomes hot in the kitchen, especially on the cookline, and during the current heatwave the kitchen is only able to maintain 80 degrees.

The unit is significantly low on airflow, operating at 66% of the airflow it should be providing. The unit could not be sped up during our visit because the motor sheave is locked and frozen in place, unable to be adjusted. There does not appear to be much adjustment left on the pulley, maybe 1 turn, and a pulley change is recommended to bring RTU-2 closer to an efficient airflow. The unit is mounted on a curb adapter, this could be inhibiting airflow, we often find these to be restrictive. The blower wheel was found to be very dirty, and cleaning this effectively will increase airflow.

If airflow on RTU-2 is substantially increased, we recommend some changes to the cookline area to help improve the distribution of air, improve comfort, and prevent any hood capture issues. Currently, there are three 4-way diffusers installed on the cookline. If airflow is increased to these diffusers, they will likely cause hood capture issues. We recommend these 4-ways are switched to perforated style, and three additional perforated diffusers, if possible, are installed on the cookline. This will allow more air to be distributed, and not be disruptive to hood capture. Note that the diffuser serving the office was found disconnected from the system with its flex laying in the ceiling.

Outside air on this unit was initially measured at 989 cfm. We increased this slightly to 1217 cfm, an acceptable ratio for a humiditrol RTU. If the airflow on this unit is increased, we will be able to slightly lower the ratio of outside air to supply air, while still increasing the total make-up air and bringing the building positive.

CONCLUSION

As a result of these changes, the building is now operating at around -0.006" W.C., which is within standard tolerance and a much-improved state. Further recommendations and issues are listed through the Report below. By increasing the total airflow on RTU-2 with the recommended changes, as well as addressing the other noted issues in the report, the building should become a much more comfortable, controlled, and positively pressurized environment. Recommend consulting National Tab if changes are made.

Issue List

- 01. HOOD EXHAUST FANS (PRV-2 AND PRV-3): Misaligned on Curb
- 02. RTU-2 (Kitchen): Low on Supply Airflow
- 03. COOKLINE DIFFUSERS
- 04. RTUs: In need of Cleaning / Maintenance
- 05. PRV-1 (RESTROOM EXHAUST): Not Functional
- 06. RTU-2: Office Diffuser NOT Attached
- 07. RTU-1: Condensate Drain Routing
- RTUs: Belt Tensioners Installed

06-17-24 CULVERS - STURTEVANT, WI (REIMAGE)

Project Issue Information

Issue Name : 01. HOOD EXHAUST FANS (PRV-2 AND PRV-3): Misaligned on Curb

Description : Exhaust fans are not centered over the grease exhaust duct / the duct is not centered in the curb. Appears this is from the original installation of the duct. Both exhaust fans are performing at design airflow, but require much higher than typical setpoints due to misalignment. Recommend curb is reconfigured so fan and grease duct properly align.

Created By : National TAB **Assigned To :** National TAB - Will Turnbough

Status : Open

Priority : High **Asset Tag :**

Originated Date : 06/20/2024 - Michael McDonnell - National TAB

Project Issue File Details



PRV_2_MISALIGNED
06/20/2024



PRV_3_MISALIGNED
06/20/2024

Project Issue Response Details

- **06/20/2024 National TAB - Michael McDonnell**
 - Both exhaust fans are set to much higher than typical setpoints. Once alignment is corrected, exhaust airflow will likely increase significantly. Recommend NTAB is consulted to readjust setpoints.



06-17-24 CULVERS - STURTEVANT, WI (REIMAGE)

Project Issue Information

Issue Name : 02. RTU-2 (Kitchen): Low on Supply Airflow
Description : RTU-2 is a 15 ton unit and is supplying 3503 cfm to the kitchen space. For performance and efficiency, blower should operate at around 350 cfm/ton, or 5250 cfm. Per Staff, kitchen is not achieving or maintaining set temp. The RTU is installed with a curb adapter, which may be restricting airflow. Recommend airflow is increased on this unit.

Created By : National TAB **Assigned To :** National TAB - Will Turnbough

Status : Open

Priority : High **Asset Tag :**

Originated Date : 06/20/2024 - Michael McDonnell - National TAB

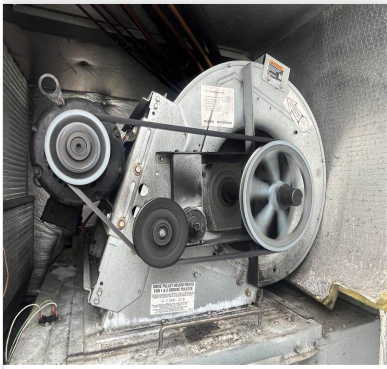
Project Issue File Details



RTU_2_kitchen_
06/20/2024

Project Issue Response Details

- **06/20/2024 National TAB - Michael McDonnell**
 - The motor sheave is frozen at 1-2 turns open and could not be adjusted to increase the speed of the fan. Recommend sheave is broken free and set to 1 turn open. Regardless, a pulley change will be required to bring the RTU closer to an efficient airflow. The motor is operating at 7.8 amps with an FLA rating of 14.6, so there is room to increase fan speed. Recommend pulley change is performed to increase airflow, consult NTAB.



RTU_2_DRIVE
06/20/2024

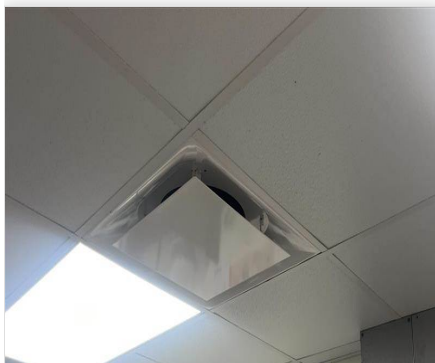


06-17-24 CULVERS - STURTEVANT, WI (REIMAGE)

Project Issue Information

Issue Name : 03. COOKLINE DIFFUSERS
Description : There are three 4-way diffusers installed on the cookline. Recommend these are replaced with perforated diffusers (especially if RTU-1 airflow is increased). Store reports high temps during operation. Recommend 3 additional perforated diffusers are installed on the cookline to increase airflow to cookline, while avoiding hood capture issues.
Created By : National TAB **Assigned To :** National TAB - Brianna Biggs
Status : Open
Priority : High **Asset Tag :**
Originated Date : 06/20/2024 - Michael McDonnell - National TAB

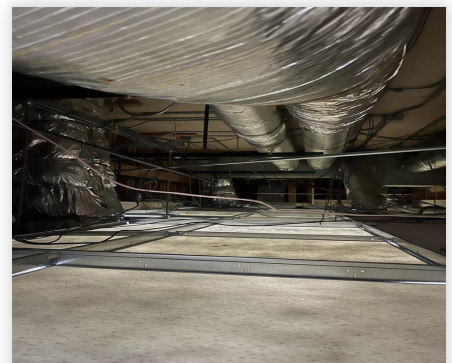
Project Issue File Details



4_way_diffuser
06/21/2024



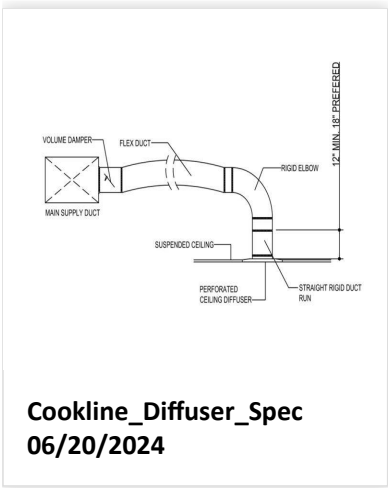
Recommended_Perforate..
06/21/2024



Cookline_Above_Ceilin..
06/20/2024

Project Issue Response Details

- **06/20/2024 National TAB - Michael McDonnell**
 - Anticipate increasing RTU-2 airflow will cause hood capture issues with 4-ways. Recommend replacing 4-ways with perforated and installing according to Culvers Cookline Diffuser Specification. This entails a rigid elbow and 12-18" of straight rigid duct between the elbow and diffuser. See detail attached.





06-17-24 CULVERS - STURTEVANT, WI (REIMAGE)

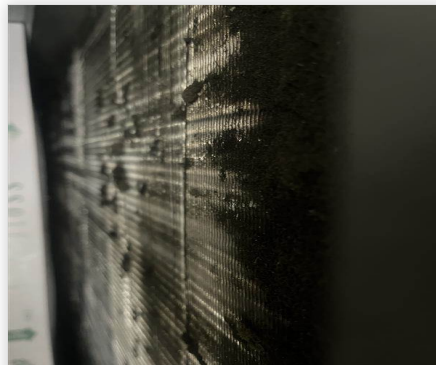
Project Issue Information

Issue Name : 04. RTUs: In need of Cleaning / Maintenance
Description : Both RTUs are in need of maintenance/cleaning. Evaporator coils, specifically on RTU-1, are in need of cleaning. Additionally, outside air filters need to be cleaned. See other items in need of attention below:
Created By : National TAB **Assigned To :** National TAB - Will Turnbough
Status : Open
Priority : High **Asset Tag :**
Originated Date : 06/20/2024 - Michael McDonnell - National TAB

Project Issue File Details



RTU_2_OA_FILTERS
06/20/2024



RTU_1_EVAP_COIL
06/20/2024



RTU_1_OA_FILTERS
06/20/2024

Project Issue Response Details

- **06/20/2024 National TAB - Michael McDonnell**
 - Insulation loose in RTU-2 blower compartment. Recommend it is affixed to prevent it from causing future issue.



RTU_2_Insulation_Loose
06/20/2024

• **06/20/2024 National TAB - Michael McDonnell**

- RTU blower wheels dirty. Recommend blower wheels, especially on RTU-2 are cleaned. This will likely increase airflow.



RTU_2_BLOWER_WHEEL
06/20/2024



RTU_1_BLOWER_WHEEL
06/20/2024

06-17-24 CULVERS - STURTEVANT, WI (REIMAGE)

Project Issue Information

Issue Name : 05. PRV-1 (RESTROOM EXHAUST): Not Functional
Description : PRV-1, the restroom exhaust fan, is not operational. Recommend the fan is serviced or replaced so that odor can be effectively removed from restrooms.
Created By : National TAB **Assigned To :** National TAB - Will Turnbough
Status : Open
Priority : High **Asset Tag :**
Originated Date : 06/20/2024 - Michael McDonnell - National TAB

Project Issue File Details



**PRV_1_RR_
06/20/2024**



**PRV_1_MOTOR
06/20/2024**



06-17-24 CULVERS - STURTEVANT, WI (REIMAGE)

Project Issue Information

Issue Name : 06. RTU-2: Office Diffuser NOT Attached
Description : Diffuser tapped off of RTU-2 and serving the office, is not connected, flex was found laying in the ceiling. Recommend flex duct is properly attached to diffuser.
Created By : National TAB **Assigned To :** National TAB - Brianna Biggs
Status : Open
Priority : Medium **Asset Tag :**
Originated Date : 06/20/2024 - Michael McDonnell - National TAB

Project Issue File Details



Office_Diffuser_Not_A..
06/20/2024



06-17-24 CULVERS - STURTEVANT, WI (REIMAGE)

Project Issue Information

Issue Name : 07. RTU-1: Condensate Drain Routing
Description : Condensate drain on RTU-1 is directed toward roof drain. However, drain is easily clogged and water is pooling on the roof. Recommend drain is routed directly into roof drain as with RTU-2 so water does not pool and potentially leak into store space. See photos below.

Created By : National TAB **Assigned To :** National TAB - Brianna Biggs

Status : Open

Priority : Low **Asset Tag :**

Originated Date : 06/20/2024 - Michael McDonnell - National TAB

Project Issue File Details



RTU_1_Condensate
06/20/2024



RTU_2_Condensate
06/20/2024

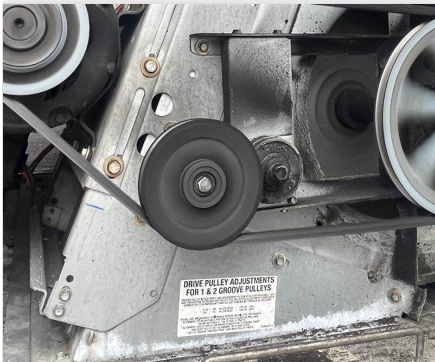


06-17-24 CULVERS - STURTEVANT, WI (REIMAGE)

Project Issue Information

Issue Name : RTUs: Belt Tensioners Installed
Description : Both RTUs have belt tensioners installed on their drives. While useful in maintaining belt tension, we find these tensioners break easily and cause belts to wear out faster. The tensioner is making considerable noise on RTU-2, and there is significant belt dust in both units. Recommend tensioners are realigned properly with pulleys, or removed.
Created By : National TAB **Assigned To :** National TAB - Brianna Biggs
Status : Open
Priority : InfoOnly **Asset Tag :**
Originated Date : 06/20/2024 - Michael McDonnell - National TAB

Project Issue File Details



RTU_2_BELT_TENSIONER...
06/20/2024

AIR BALANCE SCHEDULE

UNIT	AREA SERVED	HVAC SUPPLY		HVAC RETURN		HVAC OUTDOOR		OA %		HOOD MAKE-UP		HOOD EXHAUST		GENERAL EXH.	
		DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL
RTU-1	12.5 TONS DINING		4427	0	2941		1486	#DIV/0!	33.6%						
RTU-2	15 TONS KITCHEN		3503	0	2286		1217	#DIV/0!	34.7%						
PRV-1	RESTROOM														0
PRV 2	GRIDDLE												1506		
PRV 3	FRYER												1591		
TOTALS		0	7930	0	5227	0	2703			0	0	0	3097	0	0

NET BUILDING AIRFLOW CALCULATION

TOTALS	DESIGN	ACTUAL
TOTAL OA	0	2703
TOTAL EXHAUST	0	3097
NET AIRFLOW	0	-394

DOOR TESTED	BUILDING PRESSURE MEASUREMENTS (IN. H2O)
FRONT	-0.004
SIDE	-0.0058
REAR	-0.006
AVERAGE	-0.0053

FINAL CHECKS

- ACTUAL NET AIRFLOW COINCIDES WITH DESIGN: ✗
- MEASURED PRESSURES COINCIDES WITH ACTUAL NET AIRFLOW: ✓
- PRESSURE FALLS WITHIN IMC TOLERANCE OF +/-0.02" W.C. ✓

NOTES:

[1] PRV-1 (RR) Not operational at the time of balance. Typically this fan is scheduled for 300 cfm or -150 cfm per restroom.

CheckList List

- 00. SITE PICTURES
- 01. EF's
- 02. HOOD 1
- 03. HOOD 2
- 04. RTU's
- 05. FINAL TEST



06-17-24 CULVERS - STURTEVANT, WI (REIMAGE)

CheckList Information

Name : 00. SITE PICTURES **Status :** Not Completed
Assigned Organization : National TAB **Asset :**
Requesting Organization : National TAB
Created Date : 06/14/2024 - Wale Odofin - National TAB

CheckList Item Details

CULVERS

Comment:



Culvers_Sturtevant_WI..
06/21/2024

RTU-1

Comment:



**RTU_1_Dining_
06/21/2024**

RTU-2

Comment:



**RTU_2_kitchen_
06/21/2024**

PRV-1

Comment:



**PRV_1_RR_
06/21/2024**

PRV-2

Comment:



**PRV_2_GRIDDLE
06/21/2024**

PRV-3

Comment:



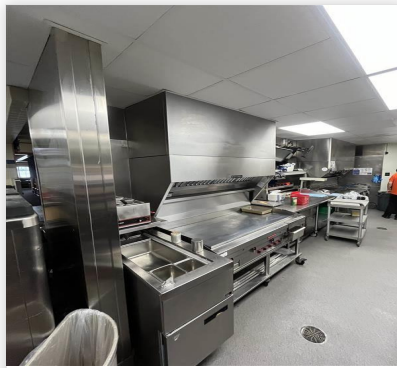
PRV_3_FRYER
06/21/2024

HOOD 1

Comment:



HD_1_right_
06/21/2024



HD_1
06/21/2024

HOOD 2

Comment:



**HD_2_Right_
06/21/2024**



**HD_2
06/21/2024**



06-17-24 CULVERS - STURTEVANT, WI (REIMAGE)

CheckList Information

Name : 01. EF's **Status :** Not Completed
Assigned Organization : National TAB **Asset :**
Requesting Organization : National TAB
Created Date : 06/17/2024 - Wale Odofin - National TAB

CheckList Item Details

EF's

Rotation is correct? Pass

Comment:

Belts are tight? N/A

Comment:

Direct Drive

Hinge kit installed installed on hood fan? Pass

Comment:

Lean fan back. Is grease duct installation adequate and is duct ran all the way to the base of the fan? Fail

Comment:

PRV-1 and 2 are misaligned on their curbs. It appears this is due to the grease duct installation; the duct is not centered.



PRV_2_MISALIGNED
06/20/2024



PRV_3_MISALIGNED
06/20/2024

Flex conduit is long enough so that fan can be completely tilted back?

Pass

Comment:

There is no major leakage around base of fan?

Pass

Comment:

Is the motor operating below the motor FLA rating?

Pass

Comment:

For restroom fan(s) is the back draft damper installed and can it fully open?

N/A

Comment:

Restroom fan is not operational.

Unit free of noticeable noise and vibration?

Pass

Comment:



06-17-24 CULVERS - STURTEVANT, WI (REIMAGE)

CheckList Information

Name : 02. HOOD 1 **Status :** Not Completed
Assigned Organization : National TAB **Asset :**
Requesting Organization : National TAB
Created Date : 06/17/2024 - Wale Odofin - National TAB

CheckList Item Details

HD-1

Is the hood powered and free of alarms? Pass

Comment:

Does hood label match submittal? Pass

Comment:

Do hood dimensions match submittal? Pass

Comment:

Is the hood hung Level? Pass

Comment:

Are hood lights installed and are they powered? N/A

Comment:

Are temperature Sensors installed? Pass

Comment:

Are the correct number and size of filters installed, and are they installed correctly? Pass

Comment:

Is the grease cup installed?

Pass

Comment:

Are side splashes/skirts installed and do they match the submittal?

Pass

Comment:

Is the backsplash installed and does it match the submittal?

Pass

Comment:

Are ceiling enclosures installed and do they match the submittal?

Pass

Comment:

Does the appliance line-up match the drawings on submittal?

Pass

Comment:

Document any other issues or discrepancies.

Comment:

HOOD CAPTURE TEST

List equipment turned on for testing:

Comment:

Griddle

Smoke Test Capture - Perimeter of Hood

Comment:

100%

Smoke Test Capture - Top of Cooking Surface

Comment:

100%

List smoke candle used:

Comment:

45 second smoke emitter



06-17-24 CULVERS - STURTEVANT, WI (REIMAGE)

CheckList Information

Name : 03. HOOD 2 **Status :** Not Completed
Assigned Organization : National TAB **Asset :**
Requesting Organization : National TAB
Created Date : 06/17/2024 - Wale Odofin - National TAB

CheckList Item Details

HD-2

Is the hood powered and free of alarms? Pass

Comment:

Does hood label match submittal? Pass

Comment:

Do hood dimensions match submittal? Pass

Comment:

Is the hood hung Level? Pass

Comment:

Are hood lights installed and are they powered? N/A

Comment:

Are temperature Sensors installed? Pass

Comment:

Are the correct number and size of filters installed, and are they installed correctly? Pass

Comment:

Is the grease cup installed?

Pass

Comment:

Are side splashes/skirts installed and do they match the submittal?

Pass

Comment:

Is the backsplash installed and does it match the submittal?

Pass

Comment:

Are ceiling enclosures installed and do they match the submittal?

Pass

Comment:

Does the appliance line-up match the drawings on submittal?

Pass

Comment:

Document any other issues or discrepancies.

Comment:

HOOD CAPTURE TEST

List equipment turned on for testing:

Comment:

Fryer

Smoke Test Capture - Perimeter of Hood

Comment:

100%

Smoke Test Capture - Top of Cooking Surface

Comment:

100%

List smoke candle used:

Comment:

45 second smoke emitter



06-17-24 CULVERS - STURTEVANT, WI (REIMAGE)

CheckList Information

Name : 04. RTU's **Status :** Not Completed
Assigned Organization : National TAB **Asset :**
Requesting Organization : National TAB
Created Date : 06/17/2024 - Wale Odofin - National TAB

CheckList Item Details

RTU's/AHU's

Thermostats installed and have power? Pass

Comment:

All diffusers and grilles are installed and match design? Fail

Comment:

No design. However, 4-way diffusers are installed on the cookline. It is standard for culvers cookline diffusers to be perforated. See issue.

Cookline diffusers have at 12-18" of straight duct out of the top of the diffusers and a rigid 90 degree fitting? Fail

Comment:

See issue.

Economizers are assembled and functional? Pass

Comment:

Motors are all operating below the FLA rating? Pass

Comment:

Are belts tight? Pass

Comment:

If direct drive unit is the speed controller working?

N/A

Comment:

Is gas piping installed and valves turned on?

Pass

Comment:

Unit free of noticeable noise and vibration

Fail

Comment:

Drive on RTU-2 making noise, likely due to belt tensioner. Recommend service.



06-17-24 CULVERS - STURTEVANT, WI (REIMAGE)

CheckList Information

Name : 05. FINAL TEST **Status :** Not Completed
Assigned Organization : National TAB **Asset :**
Requesting Organization : National TAB
Created Date : 06/17/2024 - Wale Odofin - National TAB

CheckList Item Details

FINAL CHECKS

When hoods are turned off, verify the economizers shut N/A

Comment:

System does not have interlocks installed. Operating on thermostat scheduled by owner. Occupancy is scheduled and OCP is wired to thermostat; functional.

When hoods are turned on, verify the economizers open to the minimum position Pass

Comment:

System does not have interlocks installed. Operating on thermostat scheduled by owner. Occupancy is scheduled and OCP is wired to thermostat; functional.

Is space free of drafting? Pass

Comment:

Is space comfortable in all areas? Fail

Comment:

Location is experiencing heat wave. Staff reports hot temps (80 F) during operational hours. RTU-2 low on airflow is significantly contributing to this issue. On day of TAB, weather was milder and store was maintaining temp and humidity.

Is the space free of ventilation noise? Pass

Comment:

HOOD CAPTURE TEST

List kitchen equipment turned on for testing

Comment:

Fryer / Griddle

List smoke candle type used

Comment:

45 second smoke emitter

Smoke test capture % - Perimeter of hood

Comment:

100%

Smoke test capture % - Top of cooking surface

Comment:

100%

WITNESS

Date test was completed

06/20/2024

Comment:

TAB tech name / Firm

Comment:

Michael McDonnell / National TAB

Site super name / Firm

Comment:

NA

Owner representative name / Firm (if Applicable)

Comment:

BUILDING PRESSURE

Do actual net building airflow, design net building airflow, and pressure coincide? If not why? (All three should either be positive or negative)

Pass

Comment:

National TAB

Project: 06-17-24 CULVERS - STURTEVANT, WI (REIMAGE)

System/Unit: AHU/RTU



Asset: RTU1

AREA:DINING

Unit Data		
	Design	Actual
MFG	NA	LENNOX
Serial Num	-	5618H09403
Model Num	NA	LGH150H4BH1Y
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	2
OA Filter Size 1	-	14.5X23
Num Final Filter 1	-	4
Final Filter Size 1	-	20X25X2

Motor Data		
	Design	Actual
Motor MFG	-	NIDEC (U.S. MOTORS)
Frame	-	184TZ
Horsepower	-	5.00
Motor Rpm	-	1765
Phase	-	3
Rated Voltage	-	208-230
Rated Amperage	-	13.80-13.00

Drive Data		
	Design	Actual
Motor Sheave Size	-	VP50
Motor Bore Size	-	1-1/8"
Motor Sheave SetPt	-	1-2 TURNS OPEN FROZEN
Fan Sheave Size	-	7.75"
Fan Sheave Bore	-	1"
Belt CL Distance	-	25"
Num of Belts	-	1
Belt Size	-	BX68
Belt Alignment	-	VERIFIED

Test Data		
	Design	Actual
SF CFM	-	4427
SF RPM	-	1060
RA CFM	-	2941
OA CFM	-	1486
RL Voltage	-	207/207/206
RL Amperage	-	9.3/9.2/9.6
SF Rotation	-	CCW, CORRECT
RA Damper Position	-	64%
Min OA Damper Position	-	44%
Min OA Damper Type	-	ECONOMIZER
OA Enthalpy Setpt	-	10.0 MA

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.61"
Fan Suction SP	-	-1.13"
Fan Discharge SP	-	0.72"
Total ESP	-	1.33"
Fan Total SP	-	1.85"

General		
	Design	Actual
Fan Rotation Correct	-	YES
Unit Filters Clean	-	YES
Condensate Drain Installed	-	YES

Completed By: Michael McDonnell on 06/20/2024

Notes:

- [1] EVAPORATOR COIL IN NEED OF CLEANING
- [2] OA FILTERS IN NEED OF CLEANING
- [3] BLOWER IN NEED OF CLEANING
- [4] RECOMMEND CONDENSATE DRAIN ROUTED TO ROOF DRAIN-WATER POOLING ON ROOF.

Written By: Michael McDonnell on 06/20/2024

National TAB

Project: 06-17-24 CULVERS - STURTEVANT, WI (REIMAGE)



System/Unit: AHU/RTU

Asset: RTU2

AREA:KITCHEN

Unit Data		
	Design	Actual
MFG	NA	LENNOX
Serial Num	-	5612E04248
Model Num	NA	LGH180H4B2SY
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	3
OA Filter Size 1	-	23.5 X13
Num Final Filter 1	-	6
Final Filter Size 1	-	24X24X2

Motor Data		
	Design	Actual
Motor MFG	-	BALDOR RELIANCE
Frame	-	184T
Horsepower	-	5.0
Motor Rpm	-	1750
Phase	-	3
Rated Voltage	-	200-230
Rated Amperage	-	14.6-13.6

Drive Data		
	Design	Actual
Motor Sheave Size	-	VP50
Motor Bore Size	-	1-1/8"
Motor Sheave SetPt	-	FROZEN 1-2 TURNS OPEN
Fan Sheave Size	-	MB98
Fan Sheave Bore	-	1-7/16"
Belt CL Distance	-	20.5"
Num of Belts	-	1
Belt Size	-	BX62
Belt Alignment	-	VERIFIED

Test Data		
	Design	Actual
SF CFM	-	3503
SF RPM	-	805
RA CFM	-	2286
OA CFM	-	1217
RL Voltage	-	206/207/207
RL Amperage	-	7.6/7.7/7.9
SF Rotation	-	CCW, CORRECT
Min OA Damper Position	-	3"
Min OA Damper Type	-	ECONOMIZER

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.52"
Fan Suction SP	-	-0.68"
Fan Discharge SP	-	0.34"
Total ESP	-	0.86"
Fan Total SP	-	1.02"

General		
	Design	Actual
Fan Rotation Correct	-	YES
Unit Filters Clean	-	YES
Condensate Drain Installed	-	YES

Completed By: Michael McDonnell on 06/20/2024

Notes:

- [1] UNIT LOW ON AIRFLOW-RECOMMEND PULLEY CHANGE
- [2] MOTOR SHEAVE FROZEN
- [3] EVAP COIL / OA FILTERS / BLOWER IN NEED OF CLEANING
- [4] SERVES SERVING LINE DIFFUSERS, ATYPICAL FOR CULVERS-USUALLY ON DINING UNIT.

Written By: Michael McDonnell on 06/20/2024

National TAB

Project: 06-17-24 CULVERS - STURTEVANT, WI (REIMAGE)

System/Unit: FAN - Exhaust



Asset: PRV2

AREA:HOOD 1

Unit Data		
	Design	Actual
MFG	ACCUREX	ACCUREX
Model Num	XCUE-140-VG	XCUE-140-VG
Serial Num	-	23179872
Type	UPBLAST	UPBLAST
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	VERI-GREEN
Horsepower	-	1.0
Motor Rpm	-	300-1750
Phase	1	1
Voltage (rated)	115	115
Amperage (rated)	-	11.5

Test Data		
	Design	Actual
CFM	1500	1506
Fan RPM	1725	1698
Fan Rotation	-	CW, CORRECT
Motor RPM	-	1698
System SetPt	-	9.7 V
RL Voltage	-	119
RL Amperage	-	5.1
Total ESP	1.801	1.28"
Fan Inlet SP	-	-1.28"
Fan Discharge SP	-	ATM

Completed By: Michael McDonnell on 06/20/2024

Notes:

[1] MISALIGNED ON CURB

Written By: Michael McDonnell on 06/20/2024

National TAB

Project: 06-17-24 CULVERS - STURTEVANT, WI (REIMAGE)

System/Unit: FAN - Exhaust



Asset: PRV3

AREA:HOOD 2

Unit Data		
	Design	Actual
MFG	ACCUREX	ACCUREX
Model Num	XCUE-140-VG	XCUE-140-VG
Serial Num	-	23179877
Type	UPBLAST	UPBLAST
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	VARI-GREEN
Horsepower	-	1.0
Motor Rpm	-	300-1750
Phase	1	1
Voltage (rated)	115	115
Amperage (rated)	-	11.5

Test Data		
	Design	Actual
CFM	1500	1591
Fan RPM	1365	1470
Fan Rotation	-	CW, CORRECT
Motor RPM	-	1470
System SetPt	-	8.4 V
RL Voltage	-	120
RL Amperage	-	3.5
Total ESP	1.00	0.78"
Fan Inlet SP	-	-0.78"
Fan Discharge SP	-	ATM

Completed By: Michael McDonnell on 06/20/2024

Notes:

[1] MISALIGNED ON CURB

Written By: Michael McDonnell on 06/20/2024

National TAB

Project: 06-17-24 CULVERS - STURTEVANT, WI (REIMAGE)

System/Unit: Kitchen Hood Type I



Asset: HD1

AREA:GRIDDLE

Unit Data		
	Design	Actual
MFG	ACCUREX	ACCUREX
Model Num	XGEP-64-S	XGEP-64-S
Job / Serial Num	-	23180253 1180
Type	TYPE I	TYPE
Hood length	64"	64"
Hood Width	23"	23"

Test Data Exhaust		
	Design	Actual
Filter Type	GREASE GRABBER	GREASE GRABBER
Filter Size 1	16X16	16X16
Filter Qty 1	4	4
Filter AK factor size 1	1.53	1.53
Filter Total AK Area	6.12	6.12
Filter1 FPM	-	254
Filter2 FPM	-	247
Filter3 FPM	-	240
Filter4 FPM	-	242
Filter Ave FPM(corr)	-	246
CFM	1500	1505

Cooking Equipment		
	Design	Actual
Item 1	-	GRIDDLE

Completed By: Michael McDonnell on 06/20/2024

National TAB

Project: 06-17-24 CULVERS - STURTEVANT, WI (REIMAGE)

System/Unit: Kitchen Hood Type I



Asset: HD2

AREA:FRYER

Unit Data		
	Design	Actual
MFG	ACCUREX	ACCUREX
Model Num	XXEP-83-S	XXEP-83-S
Job / Serial Num	-	23180252
Type	TYPE I	TYPE 1
Hood length	83"	83"
Hood Width	23"	23"

Test Data Exhaust		
	Design	Actual
Filter Type	XTRACTOR	XTRACTOR
Filter Size 1	16X16	16X16
Filter Qty 1	5	5
Filter AK factor size 1	1.53	1.53
Filter Total AK Area	7.65	7.65
Filter1 FPM	-	210
Filter2 FPM	-	198
Filter3 FPM	-	199
Filter4 FPM	-	204
Filter5 FPM	-	229
Filter Ave FPM(corr)	-	208
CFM	1500	1591

Cooking Equipment		
	Design	Actual
Item 1	-	FRYER

Completed By: Michael McDonnell on 06/20/2024