Report By:

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

Report: Prelim Report

Function: Test, Adjust, & Balance

Date: 11/26/2024

Completed By: National TAB

PROJECT

11-25-24 PENN STATION ASHLAND, KY

1438 BOOTH QUILLEN RD

ASHLAND , KY 41102

Client

C&T DESIGN

4025 PORT UNION RD.

FAIRFIELD, OH 45014

National TAB

Project: 11-25-24 PENN STATION ASHLAND, KY

Table Of Contents

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) 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. Each outlet was then adjusted to within tolerance of the 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.

MUA (Make Up Air Unit) w/ PSP
Total flow for the MAU (Make-up Air Unit) unit was measured by readings taken at the discharge of the hood's perforated supply plenum. Readings taken with a velocity matrix were averaged and multiplied by a manufacturer's corrected area. Adjustments to the fan speed were made in order to bring the unit to within design tolerance. Any MUA'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.

CheckList List

- TECH - STEP 1: INITIAL WALKTHROUGH
- TECH - STEP 2: UNIT DATA AND EVAL
- TECH - STEP 3: TEST, ADJUST AND BALANCE
- TECH - STEP 4: FINAL TESTS
- TECH - STEP 5: FINAL DOCUMENTATION

11-25-24 PENN STATION ASHLAND, KY

CheckList Information

Name :	TECH - STEP 1: INITIAL WALKTHROUGH	**Status :**	Not Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	11/22/2024 - Brianna Biggs - National TAB		

CheckList Item Details

INITIAL SITE WALKTHROUGH

All diffusers and grilles are installed and match design?	Yes
Comment:	
All hood filters installed and accounted for?	
Comment:	
Hoods are wired and have power?	Yes
Comment:	
Hood is free of alarms?	Yes
Comment:	
Thermostats have power?	Yes
Comment:	
Have trades/general contractor been notified about any issues and are they created on FaciliBuild?	
Comment:	
Yes.	

11-25-24 PENN STATION ASHLAND, KY

CheckList Information

Name :	TECH - STEP 2: UNIT DATA AND EVAL	**Status :**	Not Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	11/22/2024 - Brianna Biggs - National TAB		

CheckList Item Details

UNIT DATA AND EVALUATION WHILE GATHERING UNIT DATA CHECK THE FOLLOWING:

RTU's/AHU's

Economizers are assembled and functional?

Comment:

Yes.

DCV Max damper opening position is set to minimum?

Comment:

Yes.

Free cooling enthalpy set point set for lowest setting (Typically "D")

Comment:

Yes.

Motors are all operating below the FLA rating?

Comment:

Yes.

Are belts tight?

Comment:

NA.

If direct drive unit is the speed controller working.

Comment:

Yes.

Is gas piping installed and valves turned on?

Comment:

Yes.

Unit free of noticeable noise and vibration

Comment:

Yes.

EF's

Rotation is correct?

Comment:

Yes.

Belts are tight?

Comment:

NA.

Grease cup installed on hood fan?

Comment:

Yes.

Hinge kit installed installed on hood fan?

Comment:

Yes.

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

Comment:

Yes.

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

Comment:

Yes.

There is no major leakage around base of fan?

Comment:

No.

Is the motor operating below the motor FLA rating?

Comment:

Yes.

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

Comment:

NA, ceiling mounted EF's installed in restrooms.

Unit free of noticeable noise and vibration?

Comment:

Yes.

MUA

Rotation is correct?

Comment:

Yes.

Gas piping is installed and valves are in on position?

Comment:

Yes.

Heater tested and is functional?

Comment:

Yes.

Internal motorized damper is fully opening?

Comment:

Yes.

Motor is operating below the FLA rating?

Comment:

Yes.

Unit free of noticeable noise and vibration?

Comment:

Yes.

HOODS

Kitchen equipment installed in proper places?

Comment:

Yes.

Can kitchen equipment be turned on for final smoke test?

Comment:

No.

DOCUMENTATION

Have trades/general contractor been notified about any issues and are they created on FaciliBuild?

Comment:

Yes.

11-25-24 PENN STATION ASHLAND, KY

CheckList Information

Name :	TECH - STEP 3: TEST, ADJUST AND BALANCE	**Status :**	Not Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	11/22/2024 - Brianna Biggs - National TAB		

CheckList Item Details

TEST, ADJUST, AND BALANCE ALL EQUIPMENT:

DURING TESTING MAKE NOTE OF THE FOLLOWING:

Is space free of drafting? Yes

Comment:

Is space comfortable in all areas?

Comment:

Is the space free of ventilation noise? Yes

Comment:

If deviations from design were necessary to resolve 1-3 what were they? Otherwise put "NA".

Comment:

NA.

11-25-24 PENN STATION ASHLAND, KY

CheckList Information

Name :	TECH - STEP 4: FINAL TESTS	**Status :**	Not Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	11/22/2024 - Brianna Biggs - National TAB		

CheckList Item Details

FINAL TESTS

HOOD CAPTURE TEST

List equipment turned on for testing

Comment:

None.

List smoke candle type used

Comment:

S-102 45 Second.

Smoke test capture - Perimeter of hood

Comment:

100%

Smoke test capture - Top of cooking surface

Comment:

100%

WITNESS

Date test was completed

Comment:

11/26/2024

TAB tech name / Firm

Comment:

Jordan Best

Site super name / Firm

Comment:

John Mullins / Frontier Construction

Owner representative name / Firm (if Applicable)

Comment:

NA

Building pressure at front & back doors (All Systems On)

Comment:

0.0008" -0.0002"

ADDITIONAL

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

Comment:

Yes.

PROGRAM THERMOSTATS

Occupied 7:15AM-10:15PM: 68 Heat/72 Cool (NOTE: 3 degree MAX setback)

Comment:

Yes.

Unoccupied 10:16PM-7:14AM: 65 Heat/75 Cool

Comment:

Yes.

11-25-24 PENN STATION ASHLAND, KY

CheckList Information

Name :	TECH - STEP 5: FINAL DOCUMENTATION	**Status :**	Not Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	11/22/2024 - Brianna Biggs - National TAB		

CheckList Item Details

FINAL DOCUMENTATION

Marked Data capture complete for all assets?

Comment:

Yes

Picture file sent to processing team or uploaded?

Comment:

Yes

Balance schedule complete and uploaded?

Comment:

Yes

Prelim report generated and reviewed?

Comment:

Yes

National TAB

Project: 11-25-24 PENN STATION ASHLAND, KY

- Open ASHLAND_PENN_STATION_COMPLETED_BALANCE_SCHED.xlsx

National TAB

Project: 11-25-24 PENN STATION ASHLAND, KY

System/Unit: AHU/RTU

Asset: RTU1 AREA:DINING

Unit Data		
	Design	**Actual**
MFG	CARRIER	INTERNATIONAL COMFORT PRODUCTS
Serial Num	-	P243836812
Model Num	48FCDM12A3M5-6W0A0	RGV120HE3A0
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	36"X20"
Num Final Filter 1	-	4
Final Filter Size 1	-	20"x20"X2"

Motor Data		
	Design	**Actual**
Phase	3	3
Rated Voltage	208	208
Rated Amperage	-	12.6

Test Data		
	Design	**Actual**
SF CFM	4000	3957
RA CFM	3120	3039
OA CFM	880	918
RL Voltage	-	217.1/215.3/216.4
RL Amperage	-	5.08/4.51/4.57
SF Rotation	-	CCW
SF System SetPt	-	7.43 VDC
Min OA Damper Position	-	5.5 VDC
Min OA Damper Type	-	MOTORIZED
OA Enthalpy Setpt	-	DEFAULT

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.79"
Fan Suction SP	-	-1.07"
Fan Discharge SP	-	0.51"
Total ESP	-	1.58"
Fan Total SP	-	1.3"

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

Completed By: Jordan Best on 11/26/2024

Unit Data - PHOTO LOG

11/26/2024

National TAB

Project:11-25-24 PENN STATION ASHLAND, KY

AHU/RTU

Diffuser Supply (GRD)

RTU1/DINING

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
SGRD1	DINING		10"	325	1	281	295	295	90.8
SGRD2	DINING		10"	325	1	333	355	355	109.2
SGRD3	DINING		10"	325	1	245	301	301	92.6
SGRD4	DINING		10"	325	1	282	313	313	96.3
SGRD5	DINING		10"	325	1	272	346	346	106.5
SGRD6	DINING		10"	300	1	322	289	289	96.3
SGRD7	DINING		10"	300	1	298	324	324	108.0
SGRD8	DINING		10"	325	1	292	334	334	102.8
SGRD9	DINING		10"	325	1	298	309	309	95.1
SGRD10	DINING		10"	300	1	249	274	274	91.3
SGRD11	DINING		10"	300	1	320	289	289	96.3
SGRD12	DINING		10"	325	1	272	335	335	103.1
SGRD13	HALLWAY		6"	100	1	125	91	91	91.0
SGRD14	RESTROOM		6"	50	1	164	53	53	106.0
SGRD15	RESTROOM		6"	50	1	154	49	49	98.0
Total				4000		3907	3957	3957	98.92%

Completed By: Jordan Best on 11/26/2024

National TAB

Project: 11-25-24 PENN STATION ASHLAND, KY

System/Unit: AHU/RTU

Asset: RTU2 AREA:KITCHEN

Unit Data		
	Design	**Actual**
MFG	CARRIER	INTERNATIONAL COMFORT PRODUCTS
Serial Num	-	C243607532
Model Num	48FCDM07A3M5-6W0A0	RGV072HEFA0
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	29"X15"
Num Final Filter 1	-	4
Final Filter Size 1	-	16"x16"x20"

Motor Data		
	Design	**Actual**
Phase	3	3
Rated Voltage	208	208
Rated Amperage	-	5.5

Test Data		
	Design	**Actual**
SF CFM	2400	2470
RA CFM	2040	2122
OA CFM	360	348
RL Voltage	-	216.2/215.4/217.5
RL Amperage	-	3.27/3.65/3.02
SF Rotation	-	CCW
SF System SetPt	-	8.6 VDC
Min OA Damper Position	-	4.5 VDC
Min OA Damper Type	-	MOTORIZED
OA Enthalpy Setpt	-	DEFAULT

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.68"
Fan Suction SP	-	-1.02"
Fan Discharge SP	-	0.50"
Total ESP	-	1.18"
Fan Total SP	-	1.52"

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

Completed By: Jordan Best on 11/26/2024

Unit Data - PHOTO LOG

11/26/2024

National TAB

Project:11-25-24 PENN STATION ASHLAND, KY

AHU/RTU

Diffuser Supply (GRD)

RTU2/KITCHEN

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
SGRD1	SERVING		8"	230	1	206	238	238	103.5
SGRD2	SERVING		8"	230	1	224	256	256	111.3
SGRD3	SERVING		8"	225	1	204	232	232	103.1
SGRD4	FRY HOOD	ACPSP	46X6	250	1.7	219	264	264	105.6
SGRD5	GRILL HOOD	ACPSP	68X6	465	2.5	302	448	448	96.3
SGRD6	KITCHEN		10"	350	1	356	353	353	100.9
SGRD7	KITCHEN		10"	325	1	348	337	337	103.7
SGRD8	KITCHEN		10"	325	1	284	342	342	105.2
Total				2400		2143	2470	2470	102.92%

Completed By: Jordan Best on 11/26/2024

National TAB

Project: 11-25-24 PENN STATION ASHLAND, KY

System/Unit: FAN - Exhaust

Asset: EF1 AREA:GRILL HD

Unit Data		
	Design	**Actual**
MFG	CAPTIVEAIRE	ECON-AIR
Model Num	DU85HFA	EDU85HFA
Serial Num	-	6314745
Type	UPBLAST	UPBLAST
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	**Actual**
Motor MFG	-	TELCO GREEN
Horsepower	0.750	0.750
Motor Rpm	-	1800
Phase	1	1
Voltage (rated)	115	115
Amperage (rated)	-	8.9

Test Data		
	Design	**Actual**
CFM	1120	1127
Fan RPM	1215	936
Fan Rotation	-	CCW
Motor RPM	-	936
System SetPt	-	52 %
RL Voltage	-	124.2
RL Amperage	-	3.08
Total ESP	1.150"	0.41"
Fan Inlet SP	-	-0.41"
Fan Discharge SP	-	ATM

Completed By: Jordan Best on 11/26/2024

Unit Data - PHOTO LOG

11/26/2024

National TAB

Project: 11-25-24 PENN STATION ASHLAND, KY

System/Unit: FAN - Exhaust

Asset: EF2 AREA:OVEN HD

Unit Data		
	Design	**Actual**
MFG	CAPTIVAIRE	ECON-AIR
Model Num	DU33HFA	EADU33HFA
Serial Num	-	6314745
Type	UPBLAST	UPBLAST
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	**Actual**
Motor MFG	-	TELCO GREEN
Horsepower	0.333	0.333
Motor Rpm	-	1800
Phase	1	1
Voltage (rated)	115	115
Amperage (rated)	-	4.3

Test Data		
	Design	**Actual**
CFM	600	579
Fan RPM	1360	1242
Fan Rotation	-	CCW
Motor RPM	-	1242
System SetPt	-	69%
RL Voltage	-	125.6
RL Amperage	-	2.34
Total ESP	0.600"	0.31"
Fan Inlet SP	-	-0.31"
Fan Discharge SP	-	ATM

Completed By: Jordan Best on 11/26/2024

Unit Data - PHOTO LOG

11/26/2024

National TAB

Project: 11-25-24 PENN STATION ASHLAND, KY

System/Unit: FAN - Exhaust

Asset: EF3 AREA:FRY HD

Unit Data		
	Design	**Actual**
MFG	CAPTIVEAIRE	ECON-AIR
Model Num	DU85HFA	EADU85HFA
Serial Num	-	6314745
Type	UPBLAST	UPBLAST
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	**Actual**
Motor MFG	-	TELCO GREEN
Horsepower	0.750	0.750
Motor Rpm	-	1800
Phase	1	1
Voltage (rated)	115	115
Amperage (rated)	-	8.9

Test Data		
	Design	**Actual**
CFM	850	884
Fan RPM	1144	882
Fan Rotation	-	CCW
Motor RPM	-	882
System SetPt	-	49%
RL Voltage	-	124.9
RL Amperage	-	2.46
Total ESP	1.150"	0.46"
Fan Inlet SP	-	-0.46"
Fan Discharge SP	-	ATM

Completed By: Jordan Best on 11/26/2024

Unit Data - PHOTO LOG

11/26/2024

National TAB

Project: 11-25-24 PENN STATION ASHLAND, KY

System/Unit: FAN - Exhaust

Asset: EF4 AREA:RESTROOM

Unit Data		
	Design	**Actual**
MFG	NA	COOK
Model Num	NA	GEMINI 140
Type	-	CEILING
Configuration	-	VERTICAL

Motor Data		
	Design	**Actual**
Motor MFG	-	QUEACE
Motor Rpm	-	1550
Phase	-	1
Voltage (rated)	-	115
Amperage (rated)	-	0.4

Test Data		
	Design	**Actual**
CFM	75	73
Fan Rotation	-	CCW
System SetPt	-	FIXED SPEED
RL Amperage	-	0.39
Fan Discharge SP	-	ATM

Completed By: Jordan Best on 11/26/2024

Unit Data - PHOTO LOG

11/26/2024

National TAB

Project: 11-25-24 PENN STATION ASHLAND, KY

System/Unit: FAN - Exhaust

Asset: EF5 AREA:RESTROOM

Unit Data		
	Design	**Actual**
MFG	NA	COOK
Model Num	NA	GEMINI 140
Type	-	CEILING
Configuration	-	VERTICAL

Test Data		
	Design	**Actual**
CFM	75	86
Fan Rotation	-	CCW
System SetPt	-	FIXED SPEED
RL Amperage	-	0.38
Fan Discharge SP	-	ATM

Motor Data		
	Design	**Actual**
Motor MFG	-	QUEACE
Motor Rpm	-	1550
Phase	-	1
Voltage (rated)	-	115
Amperage (rated)	-	0.4

Completed By: Jordan Best on 11/26/2024

Notes:
. Unit slightly above design. Unit not equipped with speed controller, unable to reduce flow.

Written By: Jordan Best on 11/26/2024

Unit Data - PHOTO LOG

11/26/2024

National TAB

Project: 11-25-24 PENN STATION ASHLAND, KY

System/Unit: Kitchen Hood Type I

Asset: HD1 AREA:GRILL

Unit Data		
	Design	**Actual**
MFG	CAPTIVEAIRE	ECON-AIR
Model Num	3650 ELPX 246 MISC ACPS ONLY	3650 ELPX 246 MISC ACPS ONLY
Job / Serial Num	-	6314745
Type	TYPE I CANOPY	TYPE I CANOPY
Hood length	72"	72"
Hood Width	36"	36"
Supply Plenum Type	-	ACPSP
Supply Plenum Width	14"	14"
Supply Plenum Length	72"	72"

Test Data Exhaust		
	Design	**Actual**
Filter Type	CAPTRATE SOLO	CAPTRATE SOLO
Filter Size 1	16X16	16X16
Filter Qty 1	4	4
Filter AK factor size 1	1.62	1.62
Filter Total AK Area	6.48	6.48
Filter1 FPM	-	176
Filter2 FPM	-	173
Filter3 FPM	-	176
Filter4 FPM	-	174
Filter Ave FPM(corr)	-	174
CFM	1120	1127

Cooking Equipment	
	Actual
Item 1	GRIDDLE

Test Data Supply		
	Design	**Actual**
Total AK Area	7	7
Kv factor (Vel)	0.89	0.89
Num of Readings	-	6
Reading1 FPM	-	154
Reading2 FPM	-	147
Reading3 FPM	-	164
Reading4 FPM	-	176
Reading5 FPM	-	160
Reading6 FPM	-	174
Ave FPM(corr)	-	162
CFM	1000	1009

Completed By: Jordan Best on 11/26/2024

Unit Data - PHOTO LOG

11/26/2024

National TAB

Project: 11-25-24 PENN STATION ASHLAND, KY

System/Unit: Kitchen Hood Type I

Asset: HD2 AREA:OVEN

Unit Data		
	Design	**Actual**
MFG	CAPTIVEAIRE	ECON-AIR
Model Num	4412 PS-OVN	4412 PS-OVN
Job / Serial Num	-	6314745
Type	TYPE II	TYPE II
Hood length	21.25"	21.25"
Hood Width	44"	44"

Test Data Exhaust		
	Design	**Actual**
Filter Type	SS BAFFLE	SS BAFFLE
Filter Size 1	20X10	20X10
Filter Qty 1	2	2
Filter AK factor size 1	-	1.27
Filter Total AK Area	-	2.54
Filter1 FPM	-	227
Filter2 FPM	-	228
Filter Ave FPM(corr)	-	227
CFM	600	579

Cooking Equipment	
	Actual
Item 1	Toaster

Completed By: Jordan Best on 11/26/2024

Unit Data - PHOTO LOG

11/26/2024

National TAB

Project: 11-25-24 PENN STATION ASHLAND, KY

System/Unit: Kitchen Hood Type I

Asset: HD3 AREA:FRYER

Unit Data		
	Design	**Actual**
MFG	CAPTIVEAIRE	ECON-AIR
Model Num	3650 ELPX 246 MISC ACPSP ONLY	3650 ELPX 246 MISC ACPSP ONLY
Job / Serial Num	-	
Type	TYPE I CANOPY	TYPE I CANOPY
Hood length	50"	50"
Hood Width	36"	36"
Supply Plenum Type	-	ACPSP
Supply Plenum Width	14"	14"
Supply Plenum Length	50"	50"

Test Data Exhaust		
	Design	**Actual**
Filter Type	CAPTRATE SOLO	CAPTRATE SOLO
Filter Size 1	16X16	16X16
Filter Qty 1	3	3
Filter AK factor size 1	1.62	1.62
Filter Total AK Area	4.86	4.86
Filter1 FPM	-	177
Filter2 FPM	-	183
Filter3 FPM	-	186
Filter Ave FPM(corr)	-	182
CFM	850	884

Cooking Equipment	
	Actual
Item 1	FRYER

Test Data Supply		
	Design	**Actual**
Total AK Area	4.86	4.86
Kv factor (Vel)	0.89	0.89
Num of Readings	-	4
Reading1 FPM	-	129
Reading2 FPM	-	146
Reading3 FPM	-	128
Reading4 FPM	-	112
Ave FPM(corr)	-	128
CFM	630	553

Completed By: Jordan Best on 11/26/2024

Unit Data - PHOTO LOG

11/26/2024