Report By:

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

Report: TAB REPORT

Function: Test, Adjust, & Balance

Date: 09/28/2023

PROJECT

09-25-23 ARBY'S 1600 - ATOKA, OK

1600 S Mississippi

Atoka, OK 74525

Client

Flynn Restaurant Group

6200 Oak Tree Boulevard

Suite 250

Independence, OH 44131

National TAB

Project: 09-25-23 ARBY'S 1600 - ATOKA, OK

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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.

Issue List

- RTU-1 AND RTU-2 ECONOMIZERS NOT FUNCTIONAL
- RTU-2 NOT COOLING COMPLETELY

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Project Issue Information

Issue Name :	RTU-1 AND RTU-2 ECONOMIZERS NOT FUNCTIONAL		
Description :	THE ECONOMIZERS FOR RTU-1 AND RTU-2 ARE NOT FUNCTIONAL. ALARMS PRESENT ON EACH RTU FOR ECONOMIZER MODULATION. OUTSIDE AIR NOT SET ON EITHER RTU AS RESULT.		
Created By :	National TAB	**Assigned To :**	National TAB - Will Turnbough
Status :	Open		
Originated Date :	09/28/2023 - Bayley Morvant - National TAB		

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Project Issue Information

Issue Name :	RTU-2 NOT COOLING COMPLETELY		
Description :	RTU-2 APPEARS TO BE HAVING TROUBLE KEEPING UP WITH THERMOSTAT SETPOINT. THERMOSTAT IS SET TO 68 DEGREES, HOWEVER SPACE TEMP GETS HOTTER AS THE DAYS PROGRESS. BY 2:00 PM IT IS 77 IN THE KITCHEN AND 73 IN FRONT OF HOUSE. KITCHEN IS SET TO 68 AND THE FRONT OF HOUSE IS SET TO 70.		
Created By :	National TAB	**Assigned To :**	National TAB - Will Turnbough
Status :	Open		
Originated Date :	09/28/2023 - Bayley Morvant - National TAB		

CheckList List

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

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CheckList Information

Name :	SITE PICTURES	**Status :**	Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	09/06/2023 - Wale Odofin - National TAB		
Completed Date :	09/27/2023 - Bayley Morvant - National TAB		

CheckList Item Details

STORE FRONT

Comment:

ARBYS_ATOKA_STORE_FRO..
09/27/2023

RTU-1

Comment:

RTU_1
09/27/2023

RTU-2

Comment:

RTU_2
09/27/2023

EF-1 Yes

Comment:

EF_1
09/27/2023

EF-2	Yes

Comment:

EF_2
09/27/2023

HOOD-1	Yes

Comment:

HOOD_1
09/27/2023

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CheckList Information

Name :	TECH - STEP 1: INITIAL WALKTHROUGH	**Status :**	Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	09/06/2023 - Wale Odofin - National TAB		
Completed Date :	09/27/2023 - Bayley Morvant - National TAB		

CheckList Item Details

INITIAL SITE WALKTHROUGH

All diffusers and grilles are installed and match design?

Comment:

YES

All hood filters installed and accounted for?

Comment:

YES

Hoods are wired and have power?

Comment:

YES

Hood is free of alarms?

Comment:

YES

Thermostats have power?

Comment:

YES

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

Comment:

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CheckList Information

Name :	TECH - STEP 2: UNIT DATA AND EVAL	**Status :**	Not Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	09/06/2023 - Wale Odofin - 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:

ECONOMIZERS ARE INSTALLED BUT ARE NOT FUNCTIONAL.

DCV Max damper opening position is set to minimum?

Comment:

NA

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

Comment:

UNIT IS SET TO 60 DEGREES FOR FREE COOLING ENTHALPY

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, THE FAN IS SEALED.

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:

YES

Unit free of noticeable noise and vibration?

Comment:

YES

MUA

Rotation is correct?

Comment:

NA

Gas piping is installed and valves are in on position?

Comment:

NA

Heater tested and is functional?

Comment:

NA

Internal motorized damper is fully opening?

Comment:

NA

Motor is operating below the FLA rating?

Comment:

NA

Unit free of noticeable noise and vibration?

HOODS

Kitchen equipment installed in proper places?

Comment:

YES

Can kitchen equipment be turned on for final smoke test?

Comment:

YES

DOCUMENTATION

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

Comment:

YES

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CheckList Information

Name :	TECH - STEP 3: TEST, ADJUST AND BALANCE	**Status :**	Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	09/06/2023 - Wale Odofin - National TAB		
Completed Date :	09/27/2023 - Bayley Morvant - 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: YES	
Is space comfortable in all areas?	Yes
Comment: YES	
Is the space free of ventilation noise?	Yes
Comment: YES	
If deviations from design were necessary to resolve 1-3 what were they? Otherwise put "NA".	
Comment: NA	

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CheckList Information

Name :	TECH - STEP 4: FINAL TESTS	**Status :**	Not Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	09/06/2023 - Wale Odofin - National TAB		

CheckList Item Details

FINAL TESTS

HOOD CAPTURE TEST

- Open HOOD_1_SMOKE_TEST.mp4
09/28/2023

List equipment turned on for testing

Comment:

TWO FRYERS

List smoke candle type used

Comment:

45 SECOND CARTRIDGE

Smoke test capture - Perimeter of hood

Comment:

CAPTURED, 75% DUE TO DIFFUSERS IN FRON OF HOOD NOT BEING 3-WAY DIRECTIONAL. DIFFUSERS INSTALLED ARE 4-WAY DIRECTIONAL.

Smoke test capture - Top of cooking surface

Comment:

CAPTURED 100%

WITNESS

Date test was completed	09/28/2023

Comment:

TAB tech name / Firm

Comment:

Bayley Morvant / National TAB Intelligence

Site super name / Firm

Comment:

Bret Nichols / Zernco

Owner representative name / Firm (if Applicable)

Comment:

NA

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

Comment:

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:

Thermostats are programmed?

Comment:

OA maximum damper position in the Prodigy controller is set to the same as minimum for all RTU's?	N/A

Comment:

TRANE RTU'S WERE USED ON THIS JOB. NO PRODIGY BOARD PRESENT.

FAC (Fresh air cooling) is set to NO for all RTU's on the prodigy controller?	N/A

Comment:

TRANE RTU'S WERE USED ON THIS JOB. NO PRODIGY BOARD PRESENT.

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System/Unit: AHU/RTU

Asset: RTU1 AREA:DINING

Unit Data		
	Design	**Actual**
MFG	LENNOX	TRANE
Serial Num	-	232013680L
Model Num	LGH092H4B	YSJ090A3SAH02E000C1B100A1
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	36X14.5
Num Final Filter 1	-	2
Final Filter Size 1	-	18X24X2
Num Final Filter 2	-	2
Final Filter Size 2	-	16X24X2

Motor Data		
	Design	**Actual**
Motor MFG	-	*1
Frame	-	*1
Horsepower	-	0.70
Motor Rpm	-	*1
Phase	3	3
Rated Voltage	208	208
Rated Amperage	-	3.3

Drive Data		
	Design	**Actual**
Motor Sheave Size	-	DIRECT DRIVE
Motor Bore Size	-	DIRECT DRIVE
Motor Sheave SetPt	-	DIRECT DRIVE
Fan Sheave Size	-	DIRECT DRIVE
Fan Sheave Bore	-	DIRECT DRIVE
Belt CL Distance	-	DIRECT DRIVE
Num of Belts	-	DIRECT DRIVE
Belt Size	-	DIRECT DRIVE
Belt Alignment	-	DIRECT DRIVE

Test Data		
	Design	**Actual**
SF CFM	3000	3103
SF RPM	-	DIRECT DRIVE
RA CFM	2150	3103
OA CFM	850	0
RL Voltage	-	206/208/208
RL Amperage	-	2.5/2.5/2.5
SF Rotation	-	CCW
RA Damper Position	-	-
Min OA Damper Position	-	NOT FUNCTIONAL
Min OA Damper Type	-	SINGLE BLADE
OA Enthalpy Setpt	-	60 DEGREES

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.34"
Fan Suction SP	-	-0.60"
Fan Discharge SP	-	0.49"
Total ESP	1.0"	0.83"
Fan Total SP	1.44"	1.09"

General		
	Design	**Actual**
Fan Rotation Correct	-	YES
Unit Filters Clean	-	NO 50% LOADED
Condensate Drain Installed	-	YES

Notes:
*1 NO ACCESS TO FAN MOTOR FOR MOTOR DATA. MOTOR DATA ENTERED WAS TAKEN FRON RTU UNIT TAG.

AIR TEMPS THAT FOLLOW WERE RECORDED WHILE SPACE TEMPERATURE WAS 74. SUPPLY 59DB 56WB. RETURN 70DB 64WB.

UNIT FAN IS SET TO 60% FAN SPEED.

UNIT HAS AN ECONIMIZER MODULATION ALARM, UNIT ECONIMIZER IS NOT OPERATIONAL.

Written By: Bayley Morvant on 09/28/2023

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Project:09-25-23 ARBY'S 1600 - ATOKA, OK

AHU/RTU

Diffuser Supply (GRD)

RTU1/DINING

Asset							
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**CFM(1)**	**FINAL CFM**	**% to design**
SGRD1	FRONT ENTRY	D1	8"	175	95	183	104.6
SGRD2	DINING	D1	10"	300	259	330	110.0
SGRD3	DINING	D1	10"	300	351	292	97.3
SGRD4	DINING	D1	10"	300	281	310	103.3
SGRD5	DINING	D1	10"	300	334	303	101.0
SGRD6	DINING	D1	10"	300	294	318	106.0
SGRD7	DINING	D1	10"	300	293	328	109.3
SGRD8	DINING	D1	10"	300	268	311	103.7
SGRD9	DINING	D1	10"	300	279	322	107.3
SGRD10	SIDE ENTRY	D1	8"	175	46	159	90.9
SGRD11	MENS RESTROOM	D1	8"	125	97	124	99.2
SGRD12	WOMENS RESTROOM	D1	8"	125	102	123	98.4
Total				3000	2699	3103	103.43%

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Project: 09-25-23 ARBY'S 1600 - ATOKA, OK

System/Unit: AHU/RTU

Asset: RTU2 AREA:KITCHEN AREA

Unit Data		
	Design	**Actual**
MFG	LENNOX	TRANE
Serial Num	-	232013686L
Model Num	LGH092H4B	YSJ090A3SAH02E000C1B100A
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	36X14.5
Num Final Filter 1	-	2
Final Filter Size 1	-	18X24X2
Num Final Filter 2	-	2
Final Filter Size 2	-	16X24X2

Motor Data		
	Design	**Actual**
Motor MFG	-	*1
Frame	-	*1
Horsepower	-	0.70
Motor Rpm	-	*1
Phase	3	3
Rated Voltage	208	208
Rated Amperage	-	3.3

Drive Data		
	Design	**Actual**
Motor Sheave Size	-	DIRECT DRIVE
Motor Bore Size	-	DIRECT DRIVE
Motor Sheave SetPt	-	DIRECT DRIVE
Fan Sheave Size	-	DIRECT DRIVE
Fan Sheave Bore	-	DIRECT DRIVE
Belt CL Distance	-	DIRECT DRIVE
Num of Belts	-	DIRECT DRIVE
Belt Size	-	DIRECT DRIVE
Belt Alignment	-	DIRECT DRIVE

Test Data		
	Design	**Actual**
SF CFM	3000	2946
SF RPM	-	DIRECT DRIVE
RA CFM	2150	2946
OA CFM	850	0
RL Voltage	-	208/209/209
RL Amperage	-	2.8/2.9/2.9
SF Rotation	-	CCW
RA Damper Position	-	-
Min OA Damper Position	-	NOT FUNCTIONAL
Min OA Damper Type	-	SINGLE BLADE
OA Enthalpy Setpt	-	60 DEGREES

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.26"
Fan Suction SP	-	-0.56"
Fan Discharge SP	-	0.21"
Total ESP	1.0"	0.47"
Fan Total SP	1.44"	0.77"

General		
	Design	**Actual**
Fan Rotation Correct	-	YES
Unit Filters Clean	-	NO 50% LOADED
Condensate Drain Installed	-	YES

Notes:
*1 NO ACCESS TO FAN MOTOR FOR MOTOR DATA. MOTOR DATA ENTERED WAS TAKEN FRON RTU UNIT TAG.

UNIT FAN IS SET TO 52% FAN SPEED.

UNIT APPEARS TO NOT BE COOLING PROPERLY. AIR TEMPS THAT FOLLOW WERE RECORDED WHILE SPACE TEMPERATURE WAS 74. SUPPLY 68DB 64WB. RETURN 76DB 71WB.

UNIT HAS AN ECONIMIZER MODULATION ALARM, UNIT ECONIMIZER IS NOT OPERATIONAL.

Written By: Bayley Morvant on 09/28/2023

National TAB

Project:09-25-23 ARBY'S 1600 - ATOKA, OK

AHU/RTU

Diffuser Supply (GRD)

RTU2/KITCHEN AREA

Asset							
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**CFM(1)**	**FINAL CFM**	**% to design**
SGRD1	KITCHEN	D2	10"	350	512	338	96.6
SGRD2	KITCHEN	D2	10"	350	480	381	108.9
SGRD3	KITCHEN	D2	10"	300	129	302	100.7
SGRD4	KITCHEN	D2	10"	400	479	361	90.3
SGRD5	KITCHEN	D2	10"	400	499	397	99.3
SGRD6	KITCHEN	D2	10"	400	560	393	98.3
SGRD7	KITCHEN	D2	10"	400	470	382	95.5
SGRD8	KITCHEN	D2	10"	400	276	392	98.0
Total				3000	3405	2946	98.2%

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System/Unit: FAN - Exhaust

Asset: EF1 AREA:

Unit Data		
	Design	**Actual**
MFG	CAPTIVEAIRE	CAPTIVEAIRE
Model Num	DU50HFA	DU50HFA
Serial Num	-	5659218
Type	UPBLAST	UPBALST
Configuration	VERTICAL	VERTCAL

Motor Data		
	Design	**Actual**
Motor MFG	-	TELCO
Frame	-	NA
Horsepower	1/2	1/2
Motor Rpm	-	1800
Phase	1	1
Voltage (rated)	115	115
Amperage (rated)	-	6.3
Service Factor	-	NA

Test Data		
	Design	**Actual**
CFM	1000	1001
Fan RPM	1370	DIRECT DRIVE
Fan Rotation	-	CCW
Motor RPM	-	DIRECT DRIVE
System SetPt	-	70%
RL Voltage	-	121
RL Amperage	-	4.9
Total ESP	0.75"	1.33"
Fan Inlet SP	-	-1.33"
Fan Discharge SP	-	ATM

Completed By: Bayley Morvant on 09/27/2023

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Project: 09-25-23 ARBY'S 1600 - ATOKA, OK

System/Unit: FAN - Exhaust

Asset: EF2 AREA:

Unit Data		
	Design	**Actual**
MFG	CAPTIVEAIRE	CAPTIVEAIRE
Model Num	DR12HFA	DR12HFA
Serial Num	-	5659218
Type	DOWNBLAST	DOWNBLAST
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	**Actual**
Motor MFG	-	TECLO
Frame	-	NA
Horsepower	1/4	1/4
Motor Rpm	-	1800
Phase	1	1
Voltage (rated)	115	115
Amperage (rated)	-	2.9
Service Factor	-	NA

Test Data		
	Design	**Actual**
CFM	300	303
Fan RPM	0.25	1733
Fan Rotation	-	CCW
Motor RPM	-	1733
System SetPt	-	85%
RL Voltage	-	120
RL Amperage	-	2.0
Total ESP	0.25"	0.51"
Fan Inlet SP	-	-0.51"
Fan Discharge SP	-	ATM

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FAN - Exhaust

Diffuser Ret/Exh (GRD)

EF2/

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
EGRD1	MENS RESTROOM	G1	NA	150		98	198	165	110.0
EGRD2	WOMENS RESTROOM	G1	NA	150		72	143	138	92.0
Total				300		170	341	303	101%

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Project: 09-25-23 ARBY'S 1600 - ATOKA, OK

System/Unit: Kitchen Hood Type I

Asset: HD1 AREA:

Unit Data		
	Design	**Actual**
MFG	CAPTIVEAIRE	CAPTIVEAIRE
Model Num	5424-ND2	5424-ND2
Job / Serial Num	-	5659218
Type	TYPE I	TYPE I
Hood length	60"	60"
Hood Width	24"	54"

Test Data Exhaust		
	Design	**Actual**
Filter Type	BAFFLE	SS BAFFLE
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	-	185
Filter2 FPM	-	226
Filter3 FPM	-	207
Filter Ave FPM(corr)	-	206
CFM	1000	1001

Cooking Equipment		
	Design	**Actual**
Item 1	-	FRYER
Item 2	-	FRYER

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