Report By:

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

Report: TAB

Function: Test, Adjust, & Balance

Date: 10/18/2025

Completed By: National TAB

PROJECT

10-06-25 QT #0518 DES MOINES, IA

1930 INDIANOLA AVE.

DES MOINES, IA

Client

QUIKTRIP

4705 SOUTH 129TH EAST AVENUE

TULSA, OK 74134

National TAB

Project: 10-06-25 QT #0518 DES MOINES, IA

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Project Summary

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)
Each of the RTU's was measured with a flow hood to establish total flow. The total flow was then adjusted via the VFD so that airflow fell within design tolerances. All diffusers on the kitchen RTU were balanced to the engineer's design flow. The diffusers on the sales floor were only adjusted when there were noticeable issues present like drafting or dampers that were found completely closed. The Hoods On outside air rate was set by first establishing the typical QT set point at the Emerson controller and then making manually adjustments on the roof. The hoods off airflow setpoint was found by adjusting the damper position at the Emerson controller until the design airflow was achieved. Outside air was measured by reading the intake air opening with a velocity grid and multiplying by the free area. After completion of TAB all overrides were released.

Kitchen Exhaust Hood & Associated Fans
The 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.

Restroom Exhaust Fans
The restroom exhaust fans were measured with a flow hood. The total flow was balanced for the fan with the exception of the new grille over the combi-oven, which was balanced to the listed design.

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 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.

NATIONAL TAB

AIR BALANCE SCHEDULE

UNIT	AREA SERVED	HOOD ON OA		HOOD OFF OA		HOOD ON EXHAUST		HOOD OFF EXHAUST	
		DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL
RTU 1	BOH	975	991	300	302				
RTU-2	SALES	1125	1093	300	316				
EF-1	RESTROOMS					300	289	300	289
EF-2	KITCHEN HD					1350	1373	0	0
EF-3	COMBI OVEN EXHAUST					150	151	0	0
TOTALS		2100	2084	600	618	1800	1813	300	289

HOODS ON

NET AIRFLOW CALCULATION

TOTALS	DESIGN	ACTUAL
TOTAL OA	2100	2084
TOTAL EXHAUST	1800	1813
NET AIRFLOW	300	271

DOOR TESTED	BUILDING PRESSURE MEASUREMENTS
FRONT	0.0015
SIDE	0.0025
REAR	0.0085
AVERAGE	**0.0042**

HOODS OFF

NET AIRFLOW CALCULATION

TOTALS	DESIGN	ACTUAL
TOTAL OA	600	618
TOTAL EXHAUST	300	289
NET AIRFLOW	300	329

DOOR TESTED	BUILDING PRESSURE MEASUREMENTS
FRONT	0.0332
SIDE	0.0197
REAR	0.0188
AVERAGE	**0.0239**

NOTES:

CheckList List

- 01: RTU’s/AHU’s
- 02: Exhaust Fans
- 03: Hoods
- 04: Final Tests

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CheckList Information

Name :	01: RTU’s/AHU’s	**Status :**	Not Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	09/05/2025 - Trinity Dodds - 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?	Pass
Comment:	
Economizer blank plate is installed below the ouside air intake (Trane only) (N/A = not applicable)	N/A
Comment:	
Economizers are assembled and functional?	Pass
Comment:	
Free cooling enthalpy set point set for lowest setting (Typically "D")	N/A
Comment:	
Motors are all operating below the FLA rating?	Pass
Comment:	
Are belts tight?	N/A

Comment:	
If direct drive unit is the speed controller working?	Pass
Comment:	
Is gas piping installed and valves turned on?	Pass
Comment:	
Unit free of noticeable noise and vibration	Pass
Comment:	
Final outside air damper position is marked with permanent marker?	Pass
Comment:	

10-06-25 QT #0518 DES MOINES, IA

CheckList Information

Name :	02: Exhaust Fans	**Status :**	Not Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	09/05/2025 - Trinity Dodds - National TAB		

CheckList Item Details

EF's

Hinge kit installed installed on hood fan?	Pass
Comment:	
Flex conduit is long enough so that fan can be completely tilted back?	Pass
Comment:	
No major leakage around the fan base	Pass
Comment:	
Unit is free of noise and vibration	Pass
Comment:	

10-06-25 QT #0518 DES MOINES, IA

CheckList Information

Name :	03: Hoods	**Status :**	Not Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	09/05/2025 - Trinity Dodds - National TAB		

CheckList Item Details

HOODS

Hood is free of alarms?	Pass
Comment:	
Hood is free of damage?	Pass
Comment:	
End panels are installed per prototype?	Pass
Comment:	

10-06-25 QT #0518 DES MOINES, IA

CheckList Information

Name :	04: Final Tests	**Status :**	Not Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	09/05/2025 - Trinity Dodds - National TAB		

CheckList Item Details

FINAL CHECKS

HOOD CAPTURE TEST

List kitchen equipment turned on for testing

Comment:

EF-2 & HOOD1

List smoke candle type used

Comment:

S102

Smoke test capture % - Perimeter of hood

Comment:

100% SMOKE CAPTURE

Smoke test capture % - Top of cooking surface

Comment:

100% SMOKE CAPTURE

WITNESS

Date test was completed	10/17/2025

Comment:

TAB tech name / Firm

Comment:

KALEN KEMP / NATIONAL TAB

Site super name / Firm

Comment:

JACKIE JACKSON / SENECA CONSTRUCTION

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: 10-06-25 QT #0518 DES MOINES, IA

System/Unit: AHU/RTU

Asset: RT-1 AREA:BOH

Unit Data		
	Design	**Actual**
MFG	NA	AAON
Serial Num	-	202311-ANEK29338
Model Num	NA	RN-013-8-0-HA0A-152
Type	-	RTU
Num OA Filters 1	-	1
OA Filter Size 1	-	22.5X45”

Motor Data		
	Design	**Actual**
Motor MFG	-	NA
Frame	-	NA
Horsepower	-	3.0
Motor Rpm	-	1760
Phase	-	3
Rated Voltage	-	208
Rated Amperage	-	10.6

Drive Data	
	Actual
Motor Sheave Size	DD
Motor Bore Size	DD
Motor Sheave SetPt	DD
Fan Sheave Size	DD
Fan Sheave Bore	DD
Belt CL Distance	DD
Num of Belts	DD
Belt Size	DD
Belt Alignment	DD

Test Data		
	Design	**Actual**
SF CFM	4200	4248
SF RPM	-	NA
RA CFM	3225	3257
OA CFM	975	991
RL Voltage	-	213
RL Amperage	-	7.77
SF Rotation	-	COUNTERCLOCKWISE
SF System SetPt	-	79% (47.3 Hz)
RA Damper Position	-	2.25” OPEN
Min OA Damper Position	-	46% (0.625” OPEN)
Min OA Damper Type	-	MOTORIZED
OA Enthalpy Setpt	-	NL

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.47”
Fan Suction SP	-	-1.00”
Fan Discharge SP	-	0.22”
Total ESP	-	0.69”
Fan Total SP	-	1.22”

General	
	Actual
Fan Rotation Correct	YES
Unit Filters Clean	NO
Condensate Drain Installed	YES

Completed By: Kalen Kemp on 10/27/2025

Notes:
-RTU balanced for total flow and diffusers balanced for comfort
-COULD NOT ACCESS DAMPERS FOR DIFFUSERS 1, 2, 7, 8, AND 9. UNABLE TO BALANCE SYSTEM.
-HOOD OFF OA: 302 CFM
-HOOD OFF OA DAMPER POSITION: 15% (0.0625” OPEN)

Written By: Kalen Kemp on 10/17/2025

Unit Data - PHOTO LOG

10/27/2025

10/27/2025

National TAB

Project: 10-06-25 QT #0518 DES MOINES, IA

System/Unit: AHU/RTU

Asset: RT-2 AREA:SALES FLOOR

Unit Data		
	Design	**Actual**
MFG	NA	AAON
Serial Num	-	202311-ANEL29339
Model Num	NA	RN-015-8-0-HAOA-152
Type	-	RTU
Num OA Filters 1	-	1
OA Filter Size 1	-	22X45”

Motor Data		
	Design	**Actual**
Motor MFG	-	NA
Frame	-	NA
Horsepower	-	5.0
Motor Rpm	-	1760
Phase	-	3
Rated Voltage	-	208
Rated Amperage	-	16.7

Drive Data	
	Actual
Motor Sheave Size	DD
Motor Bore Size	DD
Motor Sheave SetPt	DD
Fan Sheave Size	DD
Fan Sheave Bore	DD
Belt CL Distance	DD
Num of Belts	DD
Belt Size	DD
Belt Alignment	DD

Test Data		
	Design	**Actual**
SF CFM	5000	4782
SF RPM	-	NA
RA CFM	3875	3689
OA CFM	1125	1093
RL Voltage	-	214
RL Amperage	-	11.14
SF Rotation	-	COUNTERCLOCKWISE
SF System SetPt	-	82% (49.2 Hz)
RA Damper Position	-	2.625” OPEN
Min OA Damper Position	-	46% (0.875” OPEN)
Min OA Damper Type	-	MOTORIZED
OA Enthalpy Setpt	-	NL

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.50”
Fan Suction SP	-	-1.05”
Fan Discharge SP	-	0.19”
Total ESP	-	0.69”
Fan Total SP	-	1.24”

General	
	Actual
Fan Rotation Correct	YES
Unit Filters Clean	NO
Condensate Drain Installed	YES

Completed By: Kalen Kemp on 10/14/2025

Notes:
-RTU balanced for total flow and diffusers balanced for comfort
-HOOD OFF OA: 316
-HOOD OFF DAMPER POS: 19% (0.125” OPEN)

Written By: Kalen Kemp on 10/17/2025

Unit Data - PHOTO LOG

10/27/2025

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National TAB

Project: 10-06-25 QT #0518 DES MOINES, IA

System/Unit: FAN - Exhaust

Asset: EF1 AREA:RESTROOMS

Unit Data		
	Design	**Actual**
MFG	CAPTIVEAIRE	CAPTIVE-AIRE
Model Num	NA	DR33HFA
Serial Num	-	NL (JOB#: 6491032
Type	-	DOWNBLAST
Configuration	-	VERTICAL

Motor Data		
	Design	**Actual**
Motor MFG	-	TELCO GREEN
Frame	-	NL
Horsepower	-	0.33
Motor Rpm	-	1800
Phase	-	1
Voltage (rated)	-	115
Amperage (rated)	-	4.3
Service Factor	-	NL

Test Data		
	Design	**Actual**
CFM	300	289
Fan RPM	-	608
Fan Rotation	-	COUNTERCLOCKWISE
Motor RPM	-	608
System SetPt	-	33 Hz
RL Voltage	-	124
RL Amperage	-	0.34
Total ESP	-	NA
Fan Inlet SP	-	NA
Fan Discharge SP	-	ATM

Completed By: Kalen Kemp on 10/14/2025

Notes:
-COULD NOT ACCESS SP READINGS.

Written By: Kalen Kemp on 10/14/2025

Unit Data - PHOTO LOG

10/14/2025

National TAB

Project: 10-06-25 QT #0518 DES MOINES, IA

System/Unit: FAN - Exhaust

Asset: EF2 AREA:KITCHEN HD

Unit Data		
	Design	**Actual**
MFG	CAPTIVEAIRE	CAPTIVEAIRE
Model Num	DU50HFA	DU50HFA
Serial Num	-	NL (JOB #: 7606687
Type	UPBLAST	UPBLAST
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	**Actual**
Motor MFG	-	TELCO GREEN
Frame	-	NL
Horsepower	1/2	0.50
Motor Rpm	-	1800
Phase	-	1
Voltage (rated)	-	208
Amperage (rated)	-	3.8
Service Factor	-	NL

Test Data		
	Design	**Actual**
CFM	1350	1373
Fan RPM	-	NA
Fan Rotation	-	COUNTERCLOCKWISE
Motor RPM	-	NA
System SetPt	-	60.8 Hz
RL Voltage	-	211
RL Amperage	-	3.72
Total ESP	-	1.11”
Fan Inlet SP	-	-1.11”
Fan Discharge SP	-	ATM

Completed By: Kalen Kemp on 10/17/2025

Notes:
-UNABLE TO ADJUST FAN SPEEDS USING EMERSON. FAN SPEEDS SET USING HMI IN HOOD CONTROL PANEL.
-MIN AIRFLOW: 811 CFM
-MIN AIRFLOW FREQUENCY: 39.8 Hz
-AIRFLOW STAYING AT CONSTANT SPEED (1373 CFM). DOES NOT MODULATE TO LOW SPEED

Written By: Kalen Kemp on 10/17/2025

Unit Data - PHOTO LOG

10/17/2025

National TAB

Project: 10-06-25 QT #0518 DES MOINES, IA

System/Unit: FAN - Exhaust

Asset: EF3 AREA:COMBI OVEN EXHAUST

Unit Data		
	Design	**Actual**
MFG	CAPTIVEAIRE	CAPTIVEAIRE
Model Num	SIFIODD-SS	SIF10DD-SS
Serial Num	-	NL (JOB#: 8186303)
Type	INLINE	INLINE
Configuration	VERTICAL	HORIZONTAL

Motor Data		
	Design	**Actual**
Motor MFG	-	NA
Frame	-	NA
Horsepower	0.3	0.25
Motor Rpm	-	1800
Phase	1	1
Voltage (rated)	120	115
Amperage (rated)	-	2.9
Service Factor	-	NL

Test Data		
	Design	**Actual**
CFM	150	153
Fan RPM	-	683
Fan Rotation	-	NA
Motor RPM	-	683
System SetPt	-	40%
RL Voltage	-	NA
RL Amperage	-	NA
Total ESP	-	0.0751”
Fan Inlet SP	-	-0.0389”
Fan Discharge SP	-	0.0362”

Completed By: Kalen Kemp on 10/17/2025

Notes:
-COULD NOT SAFELY ACCESS VOLTAGE AND AMPERAGE READINGS.

Written By: Kalen Kemp on 10/17/2025

Unit Data - PHOTO LOG

10/17/2025

Test Data - PHOTO LOG

10/17/2025

National TAB

Project: 10-06-25 QT #0518 DES MOINES, IA

System/Unit: Kitchen Hood Type I

Asset: HD1 AREA:GRIDDLE

Unit Data		
	Design	**Actual**
MFG	CAPTIVEAIRE	CAPTIVEAIRE
Model Num	6030 ND-2-F	6030 ND-2-F
Job / Serial Num	-	7606687
Type	-	TYPE I - CANOPY
Hood length	-	108”
Hood Width	-	60”

Test Data Exhaust		
	Design	**Actual**
Filter Type	-	CAPTRATE-SOLO
Filter Size 1	-	16X20”
Filter Qty 1	-	6
Filter AK factor size 1	-	2.08
Filter Total AK Area	-	12.48
Filter1 FPM	-	114
Filter2 FPM	-	109
Filter3 FPM	-	114
Filter4 FPM	-	108
Filter5 FPM	-	107
Filter6 FPM	-	110
Filter Ave FPM(corr)	-	110
CFM	1350	1373

Cooking Equipment	
	Actual
Item 1	FRYER (2)
Item 2	PIZZA OVEN (2)

Completed By: Kalen Kemp on 10/17/2025

Notes:
-UNABLE TO ADJUST FAN SPEEDS USING EMERSON. FAN SPEEDS SET USING HMI IN HOOD CONTROL PANEL.
-MIN AIRFLOW CHECK: 811 CFM
-MIN AIRFLOW FREQUENCY: 39.8 Hz
-AIRFLOW STAYING AT CONSTANT SPEED (1373 CFM). DOES NOT MODULATE TO LOW SPEED.

Written By: Kalen Kemp on 10/17/2025

Unit Data - PHOTO LOG

10/17/2025