

Report By:

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



Report: TAB Report
Function: Test, Adjust, & Balance
Date: 09/15/2025
Completed By: National TAB

PROJECT

09-08-25 QT - #1123 GREENWOOD, SC

1138 BYPASS 72 NE

GREENWOOD, SC

Client

QUIKTRIP
4705 SOUTH 129TH EAST AVENUE
TULSA, OK 74134

National TAB

Project: 09-08-25 QT - #1123 GREENWOOD, SC

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National TAB

Project: 09-08-25 QT - #1123 GREENWOOD, SC
Function: Test, Adjust, & Balance

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.

Issue List

- EF 1 EGRD 4 too big
- Missing two new diffusers for RTU 3
- No RTU has their OA filters
- RTU 3 overramping at design

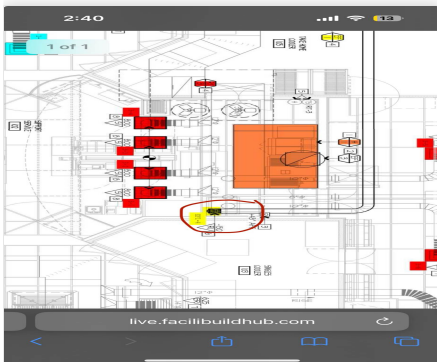


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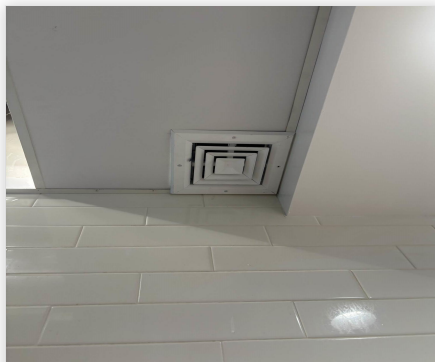
Project Issue Information

Issue Name : EF 1 EGRD 4 too big
Description : The diffuser for the combi oven exhaust is too large. The GC is aware of the problem and has ordered the correct one, CFM was still able to be taken.
Created By : National TAB **Assigned To :** National TAB - Dan Hertenstein
Status : Open
Priority : InfoOnly **Asset Tag :** EGRD4
Originated Date : 09/10/2025 - Christian Moller - National TAB

Project Issue File Details



09/10/2025



09/10/2025

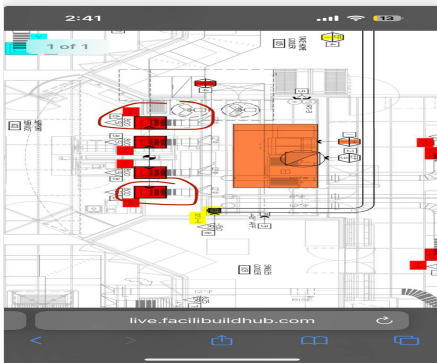


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Project Issue Information

Issue Name : Missing two new diffusers for RTU 3
Description : Two of the four new diffusers that go in front of the hood are not installed. GC is aware of the problem and has already ordered the new ones.
Created By : National TAB **Assigned To :** National TAB - Dan Hertenstein
Status : Open
Priority : InfoOnly **Asset Tag :** RT-3
Originated Date : 09/10/2025 - Christian Moller - National TAB

Project Issue File Details



09/10/2025



09/10/2025



09-08-25 QT - #1123 GREENWOOD, SC

Project Issue Information

Issue Name : No RTU has their OA filters
Description : None of the RTU's have their OA filters on the outside of the units. OA was still able to be set and marked.
Created By : National TAB **Assigned To :** National TAB - Dan Hertenstein
Status : Open
Priority : Medium **Asset Tag :**
Originated Date : 09/10/2025 - Christian Moller - National TAB

Project Issue File Details



09/10/2025



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09-08-25 QT - #1123 GREENWOOD, SC

Project Issue Information

Issue Name : RTU 3 overramping at design
Description : At design CFM the unit was overramping (55.8Hz, at 11.6 amps). Airflow was decreased to within FLA, with diffusers in front of hood balanced to +/- 10% of design besides SGRD 1.
Created By : National TAB **Assigned To :** National TAB - Dan Hertenstein
Status : Open
Priority : High **Asset Tag :** RT-3
Originated Date : 09/10/2025 - Christian Moller - National TAB

Project Issue File Details



09/10/2025

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	SALES	800	841	350	365				
RTU-2	SALES	800	862	350	350				
RTU-3	BOH/KITCHEN	800	827	350	354				
EF-1	RR/JANITOR					750	727	750	727
EF-3	HOOD					1350	1310	0	
TOTALS		2400	2530	1050	1069	2100	2037	750	727

HOODS ON

NET AIRFLOW CALCULATION

TOTALS	DESIGN	ACTUAL
TOTAL OA	2400	2530
TOTAL EXHAUST	2100	2037
NET AIRFLOW	300	493

DOOR TESTED	BUILDING PRESSURE MEASUREMENTS
FRONT	[1]
SIDE	
REAR	
AVERAGE	

HOODS OFF

NET AIRFLOW CALCULATION

TOTALS	DESIGN	ACTUAL
TOTAL OA	1050	1069
TOTAL EXHAUST	750	727
NET AIRFLOW	300	342

DOOR TESTED	BUILDING PRESSURE MEASUREMENTS
FRONT	[1]
SIDE	
REAR	
AVERAGE	

NOTES:

[1] ACCURATE BUILDING PRESSURE COULD NOT BE MEASURED DUE TO UNSEALED BUILDING / CONSTANT IN-OUT TRAFFIC; BUILDING POSITIVELY PRESSURIZED.

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 :** Completed

Assigned Organization : National TAB **Asset :**

Requesting Organization : National TAB

Created Date : 08/28/2025 - Trinity Dodds - National TAB

Completed Date : 09/10/2025 - Christian Moller - National TAB

CheckList Item Details

RTU's/AHU's

Evaporator coils are clean?	Pass
Comment:	
Condenser coils are clean?	Pass
Comment:	
Gas piping is installed and valves are turned on?	Pass
Comment:	
Unit free of noticeable noise and vibration	Pass
Comment:	



09-08-25 QT - #1123 GREENWOOD, SC

CheckList Information

Name : 02: Exhaust Fans **Status :** Completed
Assigned Organization : National TAB **Asset :**
Requesting Organization : National TAB
Created Date : 08/28/2025 - Trinity Dodds - National TAB
Completed Date : 09/10/2025 - Christian Moller - 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:



09-08-25 QT - #1123 GREENWOOD, SC

CheckList Information

Name : 03: Hoods **Status :** Completed

Assigned Organization : National TAB **Asset :**

Requesting Organization : National TAB

Created Date : 08/28/2025 - Trinity Dodds - National TAB

Completed Date : 09/11/2025 - Christian Moller - 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:



09-08-25 QT - #1123 GREENWOOD, SC

CheckList Information

Name : 04: Final Tests **Status :** Completed
Assigned Organization : National TAB **Asset :**
Requesting Organization : National TAB
Created Date : 08/28/2025 - Trinity Dodds - National TAB
Completed Date : 09/11/2025 - Christian Moller - National TAB

CheckList Item Details

FINAL CHECKS

HOOD CAPTURE TEST

List kitchen equipment turned on for testing

Comment:

NONE

List smoke candle type used

Comment:

S102 - 45 SECOND CANDLES

Smoke test capture % - Perimeter of hood

Comment:

100%

Smoke test capture % - Top of cooking surface

Comment:

100%

WITNESS

Date test was completed

09/11/2025

Comment:

TAB tech name / Firm

Comment:

CHRISTIAN MOLLER / NTAB

Site super name / Firm

Comment:

RYAN ABBOTT / QT PROJECT MANAGER

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)

N/A

Comment:

Official building pressure could not be taken as store is open, with multiple trades coming and going.



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Project: 09-08-25 QT - #1123 GREENWOOD, SC

System/Unit: AHU/RTU

Asset: RT-1

AREA:SALES FLOOR

Unit Data		
	Design	Actual
MFG	NA	AAON
Serial Num	-	202303-ANEK27895
Model Num	NA	RN-013-8-0-HA0A-152
Type	-	RTU
Num OA Filters 1	-	1
OA Filter Size 1	-	45X25

Motor Data		
	Design	Actual
Motor MFG	-	NL
Frame	-	NL
Horsepower	-	3
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	4450	4387
RA CFM	3650	3546
OA CFM	800	841
RL Voltage	-	208/209/210
RL Amperage	-	8.9/8.5/8.8
SF System SetPt	-	VFD/46.2Hz
RA Damper Position	-	3"
Min OA Damper Position	-	0.5"
Min OA Damper Type	-	ECON

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.73"
Fan Suction SP	-	-1.01"
Fan Discharge SP	-	0.89"
Total ESP	-	1.74"
Fan Total SP	-	1.9"

General	
	Actual
Unit Filters Clean	YES
Condensate Drain Installed	YES

Completed By: Christian Moller on 09/10/2025

Notes:

RTU balanced for total flow.

For 365 OA CFM, OA dampers set to 0.1", returns at 3.5"

Written By: Christian Moller on 09/10/2025

Unit Data - PHOTO LOG



09/10/2025



National TAB

Project: 09-08-25 QT - #1123 GREENWOOD, SC

System/Unit: AHU/RTU

Asset: RT-2

AREA:SALES FLOOR

Unit Data		
	Design	Actual
MFG	NA	AAON
Serial Num	-	202304-ANEK27896
Model Num	NA	RN-013-8-0-HA0A-152
Type	-	RTU
Num OA Filters 1	-	1
OA Filter Size 1	-	45X25

Motor Data		
	Design	Actual
Motor MFG	-	NL
Frame	-	NL
Horsepower	-	3
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	4233
RA CFM	3400	3371
OA CFM	800	862
RL Voltage	-	209/209/208
RL Amperage	-	7.4/7.0/7.0
SF System SetPt	-	VFD/43.2Hz
RA Damper Position	-	3.0"
Min OA Damper Position	-	0.5"
Min OA Damper Type	-	ECON

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.66"
Fan Suction SP	-	-0.85"
Fan Discharge SP	-	0.77"
Total ESP	-	1.51"
Fan Total SP	-	1.62"

General	
	Actual
Unit Filters Clean	YES
Condensate Drain Installed	YES

Completed By: Christian Moller on 09/10/2025

Notes:

RTU balanced for total flow.
For 350 OA CFM - OA dampers at 0.1", returns at 4.0".

Written By: Christian Moller on 09/10/2025

Unit Data - PHOTO LOG



09/10/2025



National TAB

Project: 09-08-25 QT - #1123 GREENWOOD, SC

System/Unit: AHU/RTU

Asset: RT-3

AREA:BOH/KITCHEN

Unit Data		
	Design	Actual
MFG	NA	AAON
Serial Num	-	202304-ANEK27897
Model Num	NA	RN-013-8-0-HA0A-152
Type	-	RTU
Num OA Filters 1	-	1
OA Filter Size 1	-	45X25

Motor Data		
	Design	Actual
Motor MFG	-	NL
Frame	-	NL
Horsepower	-	3
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	3361
RA CFM	3400	2534
OA CFM	800	827
RL Voltage	-	211/210/209
RL Amperage	-	10.6/10.6/10.5
SF System SetPt	-	VFD/50.8Hz
RA Damper Position	-	3.0"
Min OA Damper Position	-	0.5"
Min OA Damper Type	-	ECON

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.38"
Fan Suction SP	-	-0.56"
Fan Discharge SP	-	0.70
Total ESP	-	0.94"
Fan Total SP	-	1.26"

General	
	Actual
Unit Filters Clean	YES
Condensate Drain Installed	YES

Completed By: Christian Moller on 09/10/2025

Notes:

For OA at 354 CFM - OA dampers at 0.25", returns at 3.5".

At design CFM the unit was overramping (55.8Hz, at 11.6 amps). Airflow was decreased to within FLA, with diffusers in front of hood balanced to +/- 10% of design besides SGRD 1.

Written By: Christian Moller on 09/10/2025

Unit Data - PHOTO LOG



09/10/2025



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Project:09-08-25 QT - #1123 GREENWOOD, SC

AHU/RTU

Diffuser Supply (GRD)

RT-3/BOH/KITCHEN

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	SUPPORT SERVICE	SI	12"	800	1	700	766	766	95.8
SGRD2	SUPPORT SERVICE	SI	12"	800	1	570	740	740	92.5
SGRD3	SUPPORT SERVICE	SI	12"	800	1	681	734	734	91.8
SGRD4	SUPPORT SERVICE	SI	12"	800	1	309	545	545	68.1
SGRD5	WORKROOM	ES	10"	400	1	235	215	215	53.8
SGRD6	WORKROOM	ES	10"	400	1	118	185	185	46.3
SGRD7	WORKROOM 2	ES	8"	200	1	233	176	176	88.0
Total				4200		2846	3361	3361	80.02%



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Project: 09-08-25 QT - #1123 GREENWOOD, SC

System/Unit: FAN - Exhaust

Asset: EF1

AREA:RR/JANITOR

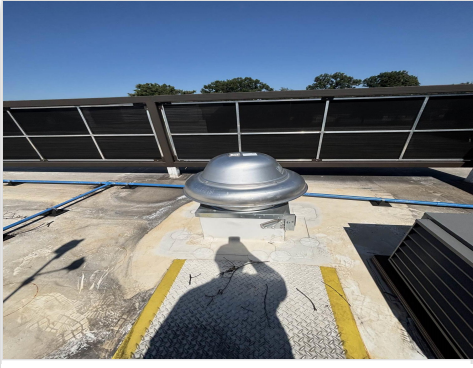
Unit Data		
	Design	Actual
MFG	NA	INTERTEK
Model Num	NA	DR50HFA
Serial Num	-	6169411
Type	-	UPBLAST
Configuration	-	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	CAPTIVEAIRE
Frame	-	NL
Horsepower	-	0.5
Motor Rpm	-	2000
Phase	-	1
Voltage (rated)	-	115
Amperage (rated)	-	8.4
Service Factor	-	NL

Test Data		
	Design	Actual
CFM	750	727
Fan Rotation	-	CCW
System SetPt	-	MEDIUM SPEED
RL Voltage	-	108
RL Amperage	-	5.8
Total ESP	-	0.56"
Fan Inlet SP	-	-0.56"
Fan Discharge SP	-	ATM

Completed By: Christian Moller on 09/10/2025

Unit Data - PHOTO LOG



09/10/2025



National TAB

Project:09-08-25 QT - #1123 GREENWOOD, SC

Diffuser Ret/Exh (GRD)

EF1/RR/JANITOR

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
EGRD4	KITCHEN	RI	8"	150	1	154	138	138	92.0
Total				150		154	138	138	92%



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Project: 09-08-25 QT - #1123 GREENWOOD, SC

System/Unit: FAN - Exhaust

Asset: EF3

AREA: KITCHEN HOOD

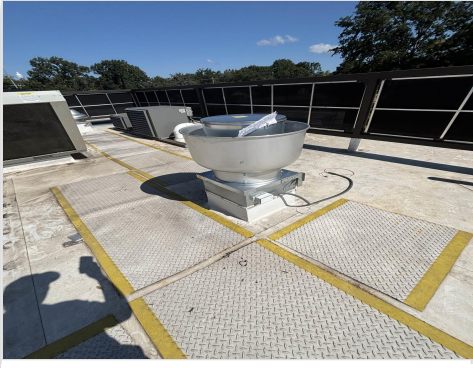
Unit Data		
	Design	Actual
MFG	NA	CAPTIVEAIRE
Model Num	NA	DU50HFA
Serial Num	-	7632503
Type	UPBLAST	UPBLAST
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	HSSA
Frame	-	48
Horsepower	1/2	1/2
Motor Rpm	-	1800
Phase	-	1
Voltage (rated)	-	115
Amperage (rated)	-	6.2
Service Factor	-	NL

Test Data		
	Design	Actual
CFM	1350	1310
Fan Rotation	-	CCW
System SetPt	-	HOOD HMI / 50.8Hz
RL Voltage	-	110
RL Amperage	-	5.4
Total ESP	-	0.75"
Fan Inlet SP	-	-0.75"
Fan Discharge SP	-	ATM

Completed By: Christian Moller on 09/11/2025

Unit Data - PHOTO LOG



09/10/2025



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Project: 09-08-25 QT - #1123 GREENWOOD, SC

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
Job / Serial Num	-	7632503
Type	TYPE I CANOPY	TYPE I CANOPY
Hood length	-	122"
Hood Width	-	60"

Test Data Exhaust

	Design	Actual
Filter Type	-	BAFFLE
Filter Size 1	-	20x16
Filter Qty 1	-	6
Filter AK factor size 1	-	2.08
Filter Total AK Area	-	12.48
Filter1 FPM	-	107
Filter2 FPM	-	108
Filter3 FPM	-	107
Filter4 FPM	-	98
Filter5 FPM	-	107
Filter6 FPM	-	107
Filter Ave FPM(corr)	-	105
CFM	1350	1310

Cooking Equipment

	Actual
Item 1	Oven
Item 2	Fryer

Completed By: Christian Moller on 09/11/2025

Unit Data - PHOTO LOG



09/10/2025



- 1] INSTALL NEW OWNER ARRANGED TYPE I T-RATED HOOD EXHAUST FAN FIRE ALARM DETECT AND ALL OTHER REQUIREMENTS FOR A TYPE I SYSTEM IN HOOD SENSORS) AND HANDED SENSORS) WITHIN HOOD UTILITY CABINET ACCORD TO INSTALLATION REQUIREMENTS.
- 2] INSTALL NEW OWNER-FURNISHED ROOF-MOUNTED EXHAUST FAN IN 12' 6"