Report By:

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

Report: TAB

Function: Test, Adjust, & Balance

Date: 07/29/2024

PROJECT

07-22-24 WAWA #5422 OCALA, FL

2277 SW Hwy 484

OCALA, FL

Client

Wawa

260 West Baltimore Pike

Wawa, PA 19063

National TAB

Project: 07-22-24 WAWA #5422 OCALA, FL

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.

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.

Ceiling Exhaust Fans

The ceiling exhaust fans were measured using a flow hood. If speed adjustment was provided, the fan speed was adjusted to within design tolerance. 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 and that the pressure measurement coincides with the actual and design net airflow. Any deviations from these standards are noted throughout the report.

Issue List

- RTU-1 OA FILTER
- RTU-2 OA FILTER

Project Issue Information

Issue Name : RTU-1 OA FILTER

Description : OUTSIDE AIR FILTER HAS NOT BEEN INSTALLED ON RTU-1.

Created By : National TAB

Assigned To : National TAB - Will Turnbough

Status : Open

Priority : Medium

Asset Tag :

Originated Date : 07/22/2024 - Kristopher Passley - National TAB

Project Issue File Details

07/22/2024

Project Issue Information

Issue Name : RTU-2 OA FILTER

Description : RTU-2 OUTSIDER AIR FILTER IS NOT INSTALLED.

Created By : National TAB

Assigned To : National TAB - Will Turnbough

Status : Open

Priority : Medium

Asset Tag :

Originated Date : 07/22/2024 - Kristopher Passley - National TAB

Project Issue File Details

07/22/2024

NATIONAL TAB

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	RETAIL AREA	3400	3423	2790	2789	610	634	17.9%	18.5%						
RTU-2	FOOD SERVICE	5000	5035	4100	4130	900	905	18.0%	18.0%						
RTU-3	RETAIL AREA	3000	3047	2460	2501	540	546	18.0%	17.9%						
EF-1														1550	1554
TOTALS		11400	11505	9350	9420	2050	2085			0	0	0	0	1550	1554

NET BUILDING AIRFLOW CALCULATION

TOTALS	DESIGN	ACTUAL
TOTAL OA	2050	2085
TOTAL EXHAUST	1550	1554
NET AIRFLOW	500	531

DOOR TESTED	BUILDING PRESSURE MEASUREMENTS (IN. H20)
FRONT	0.0169"
SIDE	0.0018"
REAR	0.0093
AVERAGE	**0.0093**

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:

CheckList List

- TECH - SITE PICTURES
- TECH - STEP 1: RTU's/AHU's
- TECH - STEP 2: LENNOX SETUP PARAMETERS
- TECH - STEP 3: SENSOR WIRING (LENNOX)
- TECH - STEP 4: EF'S
- TECH - STEP 5: CLOSEOUT CHECKS

07-22-24 WAWA #5422 OCALA, FL

CheckList Information

Name :	TECH - SITE PICTURES	**Status :**	Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	07/22/2024 - Brianna Biggs - National TAB		
Completed Date :	07/29/2024 - Zack Eismin - National TAB		

CheckList Item Details

STORE FRONT

Comment:

07/25/2024

RTU-1

Comment:

07/25/2024

RTU-2

Comment:

07/25/2024

RTU-3

Comment:

07/25/2024

EF-1

Comment:

07/25/2024

EF-2

Comment:

07-22-24 WAWA #5422 OCALA, FL

CheckList Information

Name :	TECH - STEP 1: RTU's/AHU's	**Status :**	Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	07/19/2024 - Brianna Biggs - National TAB		
Completed Date :	07/29/2024 - Zack Eismin - National TAB		

CheckList Item Details

RTU's/AHU's

All diffusers and grilles are installed and match design?	Pass
Comment:	
Clean filters installed?	Pass
Comment:	
Economizers are assembled and functional?	Pass
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?	N/A
Comment:	
Condensate drains are installed?	Pass
Comment:	
Unit free of noticeable noise and vibration	Pass
Comment:	
Final outside air damper position is marked with permanent marker?	Pass
Comment:	
No alarms present?	Pass
Comment:	
Any noticeable duct leakage?	Pass
Comment: None	
Total supply and OA flows are balanced within +/-5% and supply & return diffusers within +/-10%?	Pass
Comment:	
IN TEST MODE, TEST THE FOLLOWING:	
Cooling mode is operational? Record EAT/LAT for each unit:	Pass
Comment:	
Heating mode is operational? Record EAT/LAT for each unit:	Pass
Comment:	
Dehumidification mode is operational? (Feel dehumidification coil with your hand. Is it hot?) Record EAT/LAT for each unit:	Pass
Comment:	

07-22-24 WAWA #5422 OCALA, FL

CheckList Information

Name :	TECH - STEP 2: LENNOX SETUP PARAMETERS	**Status :**	Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	07/19/2024 - Brianna Biggs - National TAB		
Completed Date :	07/29/2024 - Zack Eismin - National TAB		

CheckList Item Details

UNIT ID CONFIGURATIONS

BACNET CONFIGURATION: GO TO SETTINGS>GENERAL>CONFIGURATION ID1 POSITION 5 SET TO "N".	Pass
Comment:	
NETWORK CONFIGURATION: GO TO SETUP>NETWORK INTEGRATION, SET TO BACNET IP	Pass
Comment:	
CONTROL MODE: SET CONTROL MODE TO ROOM SENSOR: CO2, TEMP & HUMIDITY (PER UNIT, AS NEEDED).	Pass
Comment:	

INDIVIDUAL PARAMETER CONFIGURATIONS (MECHANICAL CONTRACTOR TO DEFINE / AS APPLICABLE):

PARAMETER 105 DEHUMID MODE: 7 NO CONDITIONS	Pass
Comment:	
PARAMETER 106 DEHUMID SETPOINT: 50, THIS IS A CENTERED SET POINT (+/-)	Yes
Comment:	
PARAMETER 107 DEHUMID DEADBAND: 3 (DEFAULT) THIS IS THE ACTUAL +/- VALUE	Pass

Comment:

PARAMETER 117 CO2 DAMPER MAX OPEN: 50%	Pass

Comment:

PARAMETER 118 CO2 START OPEN PPM: 1500	Pass

Comment:

PARAMETER 119 CO2 MAX OPEN PPM: 1500	Pass

Comment:

PARAMETER 137 OCCHET SET POINT: 68 (BACK UP)	Pass

Comment:

PARAMETER 131 SET TO THE SAME % AS THE MINMIUM OA DAMPER SETPOINT	Pass

Comment:

PARAMETER 139 OCC COOLING SET POINT: 72 (BACK UP)	Pass

Comment:

PARAMETER 154 OCC BLOWER MODE: ON-CONTINUOUS 1	Pass

Comment:

CFM VALUES / MSAV FAN SPEEDS (AIR BALANCER TO DEFINE / IF APPLICABLE):

OA DAMPER SET TO SAME POSITION IN ALL FAN SPEEDS?	Pass

Comment:

ALL FAN SPEEDS SET TO THE SAME CFM VALUE (ENTER SETPOINTS BELOW)	Pass

Comment:

RTU-1: 52% RTU-2: 73% RTU-3: 47%

HEAT CFM VALUE: PER THE HVAC SCHEDULE	Pass

Comment:

HIGH COOL CFM VALUE: THE HIGH COOL CFM VALUE	Pass
Comment:	
LOW COOL CFM VALUE: MATCH THE HIGH COOL CFM VALUE	Pass
Comment:	
VENTILATION CFM VALUE: MATCH THE HIGH COOL CFM VALUE	Pass
Comment:	

07-22-24 WAWA #5422 OCALA, FL

CheckList Information

Name :	TECH - STEP 3: SENSOR WIRING (LENNOX)	**Status :**	Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	07/22/2024 - Brianna Biggs - National TAB		
Completed Date :	07/29/2024 - Zack Eismin - National TAB		

CheckList Item Details

COMBINATION TEMPERATURE/HUMIDITY SENSOR

Sensors are installed where shown on the drawing?	Pass
Comment:	
2 conductor shielded cable has one wire landed to Vin, one to GND, and the shield wire is not connected.	Pass
Comment:	
For second shielded cable, one wire is landed to Vout and the shield wire is not connected.	Pass
Comment:	
Verify that the CORE or Prodigy controller is sensing a relative humidity (record the reading)	Pass
Comment:	

07-22-24 WAWA #5422 OCALA, FL

CheckList Information

Name :	TECH - STEP 4: EF'S	**Status :**	Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	07/22/2024 - Brianna Biggs - National TAB		
Completed Date :	07/29/2024 - Zack Eismin - National TAB		

CheckList Item Details

EF's

Rotation is correct?	Pass
Comment:	
Belts are tight (if applicable)?	N/A
Comment:	
Speed controller installed and functional (if applicable)?	Pass
Comment:	
There is no major leakage around base of fan?	Pass
Comment:	
Is the motor operating below the motor FLA rating?	Pass
Comment:	
Back draft damper installed and can it fully open?	Fail
Comment:	
BACK DRAFT DAMPER NOT INSTALLED. (SEE ISSUES)	

Unit free of noticeable noise and vibration?	Pass
Comment:	
Total exhaust flow balanced within +/-5% and grilles are within +/-10%?	Pass
Comment:	

07-22-24 WAWA #5422 OCALA, FL

CheckList Information

Name :	TECH - STEP 5: CLOSEOUT CHECKS	**Status :**	Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	07/22/2024 - Brianna Biggs - National TAB		
Completed Date :	07/29/2024 - Zack Eismin - National TAB		

CheckList Item Details

SPACE COMFORT

Is space free of drafting?	Pass
Comment:	
Is space comfortable in all areas?	Pass
Comment:	
Is the space free of ventilation noise?	Pass
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:	
FRONT DOOR- 0.0169" BACK DOOR- 0.0093" SIDE DOOR- 0.0018"	

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Project: 07-22-24 WAWA #5422 OCALA, FL

System/Unit: AHU/RTU

Asset: RTU1 AREA:RETAIL

Unit Data		
	Design	**Actual**
MFG	LENNOX ENLIGHT	LENNOX ENLIGHT
Serial Num	-	5623M03512
Model Num	LCT102H4E	LCT102H4EG1Y
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	14 3/8” X 24”
Num Final Filter 1	-	4
Final Filter Size 1	-	20”X25”X2”

Test Data		
	Design	**Actual**
SF CFM	3400	3423
SF RPM	-	1210
MOTOR RPM	-	1210
RA CFM	2790	2789
OA CFM	610	634
RL Voltage	-	208/209/209
RL Amperage	-	2.1/2.0/2.1
SF System SetPt	-	52%
OA Damper Position	-	70%
OA Damper Type	-	ECONOMIZER

Motor Data		
	Design	**Actual**
Motor MFG	-	EBMPAPST
Horsepower	3.75	3.8
Motor Rpm	-	2200
Phase	3	3
Rated Voltage	208	208-240
Rated Amperage	-	8.7

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.25"
Fan Suction SP	-	-0.57"
Fan Discharge SP	-	0.31"
Total ESP	0.5"	0.56"
Fan Total SP	-	0.88"

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

Unit Data - PHOTO LOG

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IMG_1932_1019134763.j..

Motor Data - PHOTO LOG

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Project:07-22-24 WAWA #5422 OCALA, FL

AHU/RTU

Diffuser Supply (GRD)

RTU1/RETAIL

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
SGRD1	RETAIL	LD1	10"	300	1	431	347	301	100.3
SGRD2	RETAIL	LD1	10"	300	1	497	375	317	105.7
SGRD3	RETAIL	LD1	10"	300	1	420	331	278	92.7
SGRD4	ASSOCIATE	CD1	8"	150	1	260	194	156	104.0
SGRD5	OFFICE	CD1	8"	150	1	280	2092	160	106.7
SGRD6	RETAIL	LD1	10"	300	1	503	377	278	92.7
SGRD7	RETAIL	LD1	10"	310	1	428	338	293	94.5
SGRD8	RETAIL	LD1	10"	310	1	435	341	316	101.9
SGRD9	RETAIL	LD1	10"	285	1	362	297	309	108.4
SGRD10	DELIVERY VESTIBULE	CD1	8"	200	1	222	171	220	110.0
SGRD11	RETAIL	LD1	10"	285	1	410	320	303	106.3
SGRD12	RETAIL	LD1	10"	285	1	339	273	267	93.7
SGRD13	WOMENS RR	CD3	6"	50	1	81	78	51	102.0
SGRD14	MENS RR	CD3	6"	75	1	90	81	79	105.3
SGRD15	REAR VESTIVBULE	CD3	6"	100	1	108	92	95	95.0
Total				3400		4866	5707	3423	100.68%

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Project: 07-22-24 WAWA #5422 OCALA, FL

System/Unit: AHU/RTU

Asset: RTU2 AREA:FOOD SERVICE

Unit Data		
	Design	**Actual**
MFG	LENNOX ENLIGHT	LENNOX ENLIGHT
Serial Num	-	5624B04847
Model Num	LCT150H4E	LCT150H4EN1Y
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	14 3/8" X 24"
Num Final Filter 1	-	4
Final Filter Size 1	-	20"X25"X2"

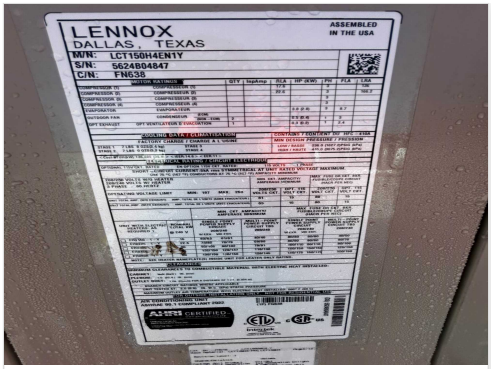
Test Data		
	Design	**Actual**
SF CFM	5000	5035
SF RPM	-	1617
MOTOR RPM	-	1617
RA CFM	4100	4130
OA CFM	900	905
RL Voltage	-	211/212/211
RL Amperage	-	3.9/3.9/3.8
SF System SetPt	-	73%
OA Damper Position	-	60%
OA Damper Type	-	ECONOMIZER

Motor Data		
	Design	**Actual**
Motor MFG	-	EBMPAPST
Horsepower	3.75	3.8
Motor Rpm	-	2200
Phase	3	3
Rated Voltage	208	208-240
Rated Amperage	-	8.7

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.39"
Fan Suction SP	-	-0.76"
Fan Discharge SP	-	0.34"
Total ESP	0.5"	0.73"
Fan Total SP	-	1.10"

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

Unit Data - PHOTO LOG



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Motor Data - PHOTO LOG

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Project:07-22-24 WAWA #5422 OCALA, FL

AHU/RTU

Diffuser Supply (GRD)

RTU2/FOOD SERVICE

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
SGRD1	FOOD SERVICE	LD1	12"	500	1	784	496	486	97.2
SGRD2	FOOD SERVICE	LD1	12"	500	1	487	561	550	110.0
SGRD3	FOOD SERVICE	LD1	12"	500	1	560	477	468	93.6
SGRD4	FOOD SERVICE	LD1	12"	500	1	433	467	458	91.6
SGRD5	FOOD SERVICE	LD1	12"	500	1	381	549	538	107.6
SGRD6	FOOD SERVICE	LD1	12"	500	1	794	503	493	98.6
SGRD7	WASH ROOM	CD1	12"	500	1	539	517	508	101.6
SGRD8	WASH ROOM	CD1	10"	375	1	403	375	368	98.1
SGRD9	WASH ROOM	CD1	12"	500	1	569	553	542	108.4
SGRD10	STAGING	CD1	6"	75	1	122	82	80	106.7
SGRD11	ELECTRICAL ROOM	CD1	12"	550	1	445	555	544	98.9
Total				5000		5517	5135	5035	100.7%

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Project: 07-22-24 WAWA #5422 OCALA, FL

System/Unit: AHU/RTU

Asset: RTU3 AREA:RETAIL

Unit Data		
	Design	**Actual**
MFG	LENNOX ENLIGHT	LENNOX ENLIGHT
Serial Num	-	5624B04845
Model Num	LCT092H4E	LCT092H4EG1Y
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	14 3/8” X 24”
Num Final Filter 1	-	4
Final Filter Size 1	-	20” X 25” X 2”

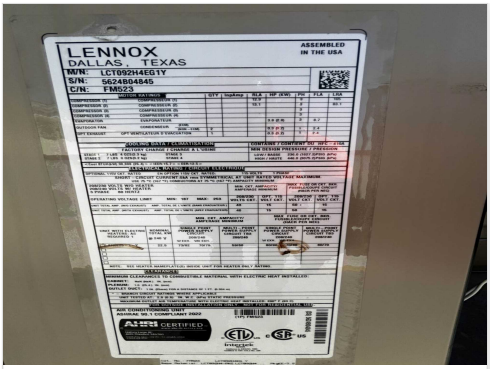
Motor Data		
	Design	**Actual**
Motor MFG	-	EBMPAPST
Horsepower	3.75	3.8
Motor Rpm	-	2200
Phase	3	3
Rated Voltage	208	208-240
Rated Amperage	-	8.7

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

Test Data		
	Design	**Actual**
SF CFM	3000	3047
SF RPM	-	924
MOTOR RPM	-	924
RA CFM	2460	2501
OA CFM	540	546
RL Voltage	-	211/212/212
RL Amperage	-	1.6/1.7/1.7
SF System SetPt	-	42%
OA Damper Position	-	55%
OA Damper Type	-	ECONOMIZER

Performance Data		
	Design	**Actual**
MA Plenum SP	-	0.15"
Fan Suction SP	-	-0.29"
Fan Discharge SP	-	-0.18"
Total ESP	0.5"	0.33"
Fan Total SP	-	0.47"

Unit Data - PHOTO LOG



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IMG_1932_1261460771.j..

Motor Data - PHOTO LOG

IMG_1911_1823137480.j..

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AHU/RTU

Diffuser Supply (GRD)

RTU3/RETAIL

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
SGRD1	FRONT VESTIBULE	CD2	12"	500	1	792	561	472	94.4
SGRD2	RETAIL	LD1	10"	350	1	497	518	385	110.0
SGRD3	RETAIL	LD1	10"	300	1	541	436	317	105.7
SGRD4	COFFEE/SPECIALTY BEVERAGE	LD1	10"	300	1	375	386	283	94.3
SGRD5	COFFEE/SPECIALTY BEVERAGE	LD1	10"	300	1	440	381	278	92.7
SGRD6	COFFEE/SPECIALTY BEVERAGE	LD1	10"	300	1	477	547	324	108.0
SGRD7	RETAIL	LD1	10"	300	1	446	454	320	106.7
SGRD8	RETAIL	LD1	10"	300	1	496	500	305	101.7
SGRD9	RETAIL	LD1	10"	350	1	658	429	363	103.7
Total				3000		4722	4212	3047	101.57%

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Project: 07-22-24 WAWA #5422 OCALA, FL

System/Unit: FAN - Exhaust

Asset: EF1 AREA:FOOD SERVICE

Unit Data		
	Design	**Actual**
MFG	GREENHECK	GREENHECK
Model Num	G-160	G-163
Type	DOWNBLAST	DOWNBLAST
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	**Actual**
Motor MFG	-	VARI-GREEN
Horsepower	3/4	3/4
Motor Rpm	-	300-1750
Phase	1	1
Voltage (rated)	120	115/208-230/277
Amperage (rated)	-	8.8/5.4/4.8

Test Data		
	Design	**Actual**
CFM	1550	1553
Fan RPM	700	1210
Fan Rotation	-	CORRECT
Motor RPM	-	1210
System SetPt	-	8.7
RL Voltage	-	118
RL Amperage	-	6.39
Total ESP	0.250"	0.47"
Fan Inlet SP	-	-0.47"
Fan Discharge SP	-	ATM

Unit Data - PHOTO LOG

IMG_1939_1566354805.j..

IMG_1940_1331888881.j..

IMG_1941_1874609914.j..

Motor Data - PHOTO LOG

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Test Data - PHOTO LOG

IMG_2008_1389601890.j..

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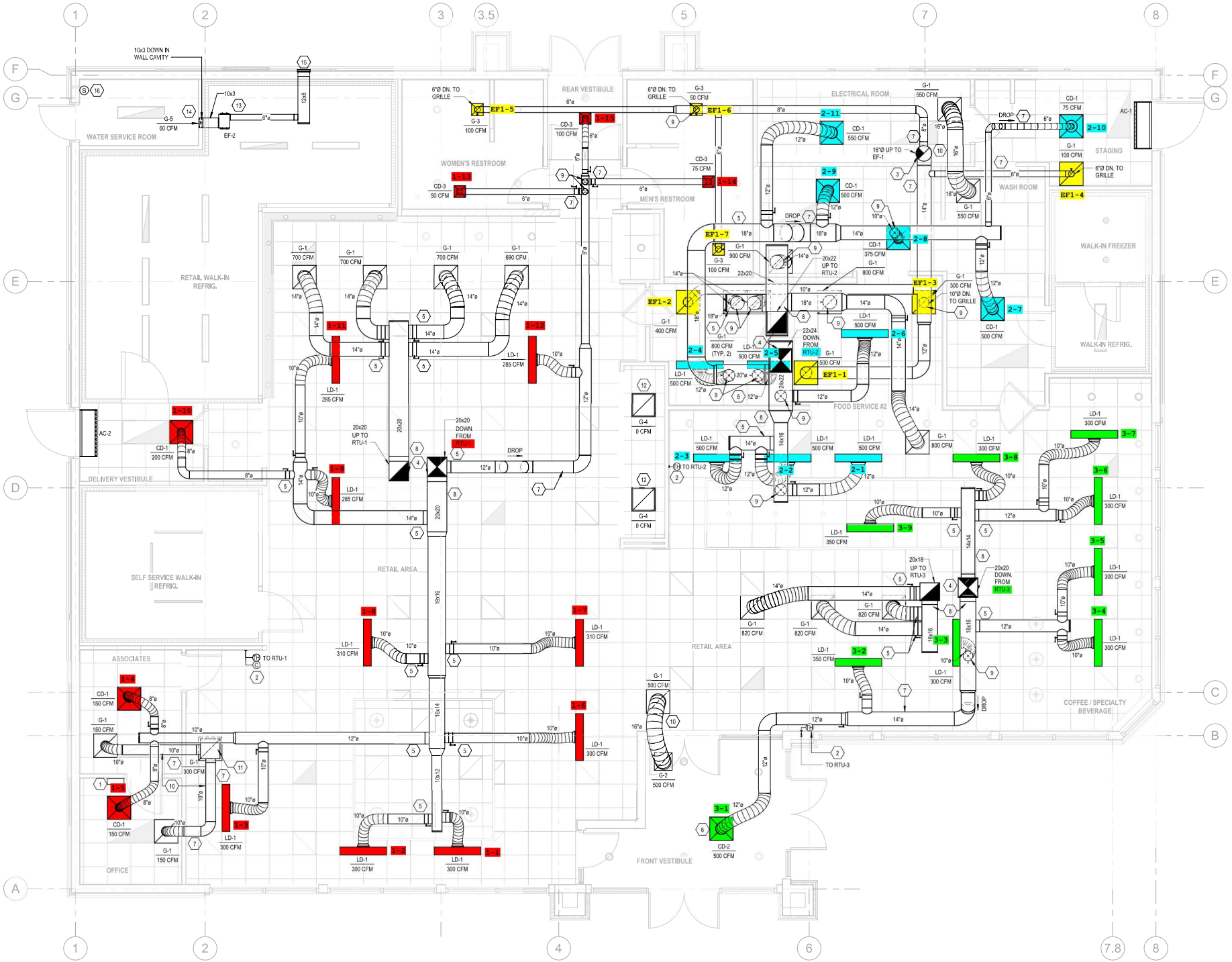
Project:07-22-24 WAWA #5422 OCALA, FL

FAN - Exhaust

Diffuser Ret/Exh (GRD)

EF1/FOOD SERVICE

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
EGRD1	FOOD SERVICE	G1	12"	500	1	440	547	476	95.2
EGRD2	FOOD SERVICE	G1	10"	400	1	369	451	392	98.0
EGRD3	FOOD SERVICE	G1	10"	300	1	455	357	310	103.3
EGRD4	STAGING	G1	6"	00	1	222	126	110	-
EGRD5	WOMENS RR	G3	6"	100	1	130	124	108	108.0
EGRD6	MENS RR	G3	6"	50	1	176	55	48	96.0
EGRD7	MENS RR	G1	6"	100	1	196	126	109	109.0
Total				1450		1988	1786	1553	107.1%



1 HVAC FLOOR PLAN
M1.0 1/4" = 1'-0"

Date: 7/29/2024