Report By:

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

Report: TAB Report

Function: Test, Adjust, & Balance

Date: 08/23/2023

PROJECT

08-07-23 WALGREENS #4721 - PUEBLO, CO

2900 W NORTHERN AVE

PUEBLO, CO 81005

Client

Walgreens

200 WILMOT RD

DEERFIELD, IL 60015

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

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.

Commissioning Activities

Equipment was inspected to ensure that the installation meets Walgreens requirements. Control and equipment setpoints were checked and after balancing was completed performance of each unit was verified. The full list of items that were verified along with any that failed are contained in the checklists in this report.

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 per Walgreens standards. Each outlet was then adjusted to within tolerance. 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. 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.

Issue List

- Gridpoint temperature setpoints
- RTU OA Damper minimum position

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Project Issue Information

Issue Name :	Gridpoint temperature setpoints		
Description :	Temperature setpoints do not match the chart. Notified Gridpoint but they would not change settings without authorization from Walgreens.		
Created By :	National TAB	**Assigned To :**	National TAB - Will Turnbough
Status :	Open		
Priority :		**Asset Tag :**	
Originated Date :	09/06/2023 - Will Turnbough - National TAB		

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Project Issue Information

Issue Name :	RTU OA Damper minimum position		
Description :	The outside air dampers for the RTU's could not be set lower than 20%. When set below 20%, the dampers fully shut. OA for RTU-1 and 2 above design as a result. The other RTU dampers were set manually to achieve design flow. Recommend servicing.		
Created By :	National TAB	**Assigned To :**	National TAB - Will Turnbough
Status :	Open		
Priority :		**Asset Tag :**	
Originated Date :	09/06/2023 - Will Turnbough - National TAB		

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	SALES	2975	2868	2422	2148	553	720	18.6%	25.1%						
RTU-2	SALES/OFFICE	2975	2927	2422	2242	553	685	18.6%	23.4%						
RTU-3	SALES	1750	1593	1650	1496	100	97	5.7%	6.1%						
RTU-4	SALES/BREAK	1750	1582	1650	1478	100	104	5.7%	6.6%						
RTU-5	PHARMACY	1400	1482	1400	1482	0	0	0.0%	0.0%						
RTU-6	RECEIVING	1400	1526	1300	1420	100	106	7.1%	6.9%						
EF-1	OFFICE													300	213
EF-2	EMPLOYEE RR													300	262
EF-3	MENS RR													250	242
EF-4	WOMENS RR													250	255
EF-5	PHOTO														
TOTALS		12250	11978	10844	10266	1406	1712			0	0	0	0	1100	972

NET BUILDING AIRFLOW CALCULATION

TOTALS	DESIGN	ACTUAL
TOTAL OA	1406	1712
TOTAL EXHAUST	1100	972
NET AIRFLOW	306	740

DOOR TESTED	BUILDING PRESSURE MEASUREMENTS (IN. H20)
FRONT	0.013
SIDE	0.015
REAR	0.012
AVERAGE	**0.0133**

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 - 01 RTU INSTALLATION CHECKLIST
- TECH - 02 EXHAUST FANS INSPECTIONS
- TECH - 03 START-UP CONTROLS PROGRAMMING
- TECH - 04 EMS/SENSOR VALIDATION
- TECH - 05 TAB CHECKLIST
- TECH - 06 FUNCTIONAL TESTS
- TECH - 07 TEMPERATURE SETPOINTS

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CheckList Information

Name :	TECH - 01 RTU INSTALLATION CHECKLIST	**Status :**	Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	08/03/2023 - Brianna Biggs - National TAB		
Completed Date :	08/11/2023 - Jordan Best - National TAB		

CheckList Item Details

General / Exterior Inspections

Verify all required equipment has been replaced per TA and BOM.	Pass
Comment:	
All units are installed in the proper locations	Pass
Comment:	
Units are labeled correctly	Pass
Comment:	
Asset tag installed	Pass
Comment:	
Roof is clear of debris.	Pass
Comment:	
Maintenance access for all unit access panels is acceptable and panels open freely.	Pass
Comment:	

Cabinet and general installation is complete.	Pass
Comment:	
Unit is secure to curb and level horizontally and vertically.	Pass
Comment:	
Access doors close tightly with no leaks	Pass
Comment:	
Condensate and gas piping is properly supported.	Pass
Comment:	
Costgaurd is installed per scope of work and piping unions are cemented.	Pass
Comment:	
Additional Comments	
Comment:	
Interior Inspections	
Fan rotation is correct	Pass
Comment:	
Pulleys are correctly aligned and both motor and fan sheave pins are tightened in place.	Pass
Comment:	
Return air and outside air dampers close tightly with no gaps	Pass
Comment:	
Cabinet and coils are not damaged and in like new condition.	Pass
Comment:	
Inside of unit is clean and clear of debris.	Pass

Comment:

Validate condesate is piped to splash block, draing, or roof drain per code requirements	Pass

Comment:

Verify filters are installed, clean and of proper size. Verify there is no air by-pass around filters.	Pass

Comment:

Curb is sealed with no air leakage.	Pass

Comment:

Additional Comments:

Comment:

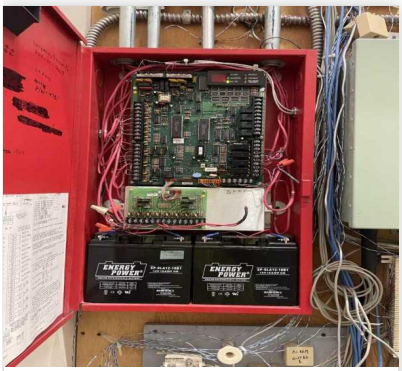
Fire/Smoke Alarm Systems

In duct smoke detectors are installed	Pass

Comment:

Fire alarm panel status (visual inspection where possible)

Comment:



IMG_1306
08/11/2023

Additional Comments:

Comment:

Electrical

Electrical wiring is complete with no visible damage	Pass

Comment:

Electrical connections are tight with sealtight around any unit penetrations.	Pass

Comment:

Disconnect switch is installed in accessible location near or on unit.	Pass

Comment:

Verify overcurrent protection is HACR type, installed and sized correctly and labeled in panel.	Pass

Comment:

Maintenance electrical outlet is installed and functional.	Pass

Comment:

Main distribution panel is labeled correctly.	Pass

Comment:

Unit ground wire is secured.	Pass

Comment:

Additional Comments:

Comment:

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CheckList Information

Name :	TECH - 02 EXHAUST FANS INSPECTIONS	**Status :**	Not Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	08/03/2023 - Brianna Biggs - National TAB		

CheckList Item Details

Fan rotation is correct	Pass
Comment:	
Pulleys are aligned and belts are tensioned properly	
Comment: NA	
Speed controller installed and functional (direct drive)	
Comment: NA	
Fan is secured to the curb	
Comment:	
Back draft damper is installed and functional	Pass
Comment:	
No exterior damage to the fan	Pass
Comment:	
No unusual noise or vibration	Pass

Comment:

Controls are functional	N/A

Comment:

Additional Comments:

Comment:

Fans are not equipped with speed controller so they are either on or off. EF-2 was cross ducted into a supply duct. Notified GC,

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CheckList Information

Name :	TECH - 03 START-UP CONTROLS PROGRAMMING	**Status :**	Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	08/03/2023 - Brianna Biggs - National TAB		
Completed Date :	08/10/2023 - Jordan Best - National TAB		

CheckList Item Details

Programming: SE 3.3, 3.4, 4.0

Controller-Network-Address: RTU number + 3	Pass
Comment:	
Controller-Network-FCBusMode = Wired Field Bus	Pass
Comment:	
Controller-Network-BaudRate = Auto	Pass
Comment:	
Controller-Network-Device ID = RTU number + 3	Pass
Comment:	
Details-Occ-OffDurUnocc = No	Pass
Comment:	
Details-Clg-Setup-Clg-En = Yes	Pass

Comment:	
Details-Clg-Setup-ClgAdapTunEn = Yes	Pass
Comment:	
Details-Htg-Setup-Htg-En = Yes	Pass
Comment:	
Details-Htg-Setup-#HtgStgs = 2 Stages	Pass
Comment:	
Details-Htg-Setup-HtgAdapTunEn = Yes	Pass
Comment:	
Details-Htg-Setup-#GasVlvs = 1 (Set to 0 for Hp and Elect Heat)	Pass
Comment:	
Details-Fan-Setup-Fan Ctl-Type = No VFD select "Single Speed", W/VFD select "Fixed Variable"	Pass
Comment:	
Details-Fan-Setup-FanOnOcc = Yes	Pass
Comment:	
Details-Fan-Setup-FanOnDlyHeat = 30s (Set to 0 for HP or Electric Heat)	Pass
Comment:	
Details-Fan-Setup-FanOnly-%Cmd = 50%	Pass
Comment:	
Details-Fan-Setup-1ClgStg-%Cmd = 70%	Pass
Comment:	
Details-Fan-Setup-2Clgstg-%Cmd = 100% (2stage Unit) or 80% (3 and 4 stage)	Pass

Comment:

Details-Fan-Setup-3ClStg-%Cmd = 100% (3 stage unit) or 90% (4 stage)	Pass

Comment:

Details-Fan-Setup-4ClStg-%Cmd = 100% (4 Stage unit)	Pass

Comment:

Details-Fan-Setup-1HtgStg-%Cmd = 100%	Pass

Comment:

Details-Fan-Setup-2HtgStg-%Cmd = 100%	Pass

Comment:

Details-Econ-Setup-Econ-En = Yes	Pass

Comment:

Details-Econ-Setup-Econ-MinPos = Set to minimum outside air requirements.	Pass

Comment:

Details-Econ-Setup-LowSpdFan-MinPos = Set minimum 1% above EconMinPos	Pass

Comment:

Details-Econ-Setup-FreeClg-Sel = Single Enthalpy	Pass

Comment:

Details-Econ-Setup-EconOAEnth-Sp 4= 24 Btu/lb	Pass

Comment:

Details-Econ-Setup-Dvent-Mode = Enable	Pass

Comment:

Details-Econ-Setup-DventMaxEconPos = 50%	Pass

Comment:

Details-Econ-Setup-DventIAP-Sp = 1000	Pass

Comment:

Details-Econ-Setup-EconFltDetectEn = Enable	Pass

Comment:

Additional Comments:

Comment:

Non ZR Units only:

Details-HGR-Setup-HGR-En = No	Pass

Comment:

Details-HGR-Setup-HGRAlt-En = No	Pass

Comment:

Details - HGR-Setup-HGRUnocc-En = No	Pass

Comment:

Details-HGR-Setup-Mode = No	Pass

Comment:

Additional Comments:

Comment:

ZR Units - Reheat Units only:

Details-HGR-Setup-HGR-En = Yes	Pass

Comment:

Details-HGR-Setup-HGRAlt-En = Yes	Pass

Comment:

Details - HGR-Setup-HGRUnocc-En = Yes	Pass

Comment:

Details-HGR-Setup-Mode = No	Pass

Comment:

Additional Comments:

Comment:

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CheckList Information

Name :	TECH - 04 EMS/SENSOR VALIDATION	**Status :**	Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	08/03/2023 - Brianna Biggs - National TAB		
Completed Date :	08/10/2023 - Jordan Best - National TAB		

CheckList Item Details

RTU supply air temp sensor location located per start-up binder.	N/A
Comment: NO START UP BINDER	
RTU return air temp sensor location located per start-up binder.	N/A
Comment: NO START UP BINDER	
RTU return air smoke detector (when applicable) is located per start-up binder.	N/A
Comment: NO START UP BINDER	
Space temperature sensor has been replaced and location meets requirements.	Pass
Comment:	
Space humidity sensor has been replaced and location meets requirements.	N/A
Comment:	
Unit is being controlled by a space temperature sensor or thermostat	Pass
Comment:	

EMS has been connected and validated with TOC or Gridpoint. Screen shot is available.	Pass

Comment:

No splicing of EMS/Sensor/Thermostat wiring is visible	Pass

Comment:

(If Applicable) 2 Stage Thermostat to SE Board Control Wiring meets detail in start-up binder.

Comment:

NA

(If Applicable) 2 Stage Thermostat to 4 Stage Unit meets detail in start-up binder.

Comment:

NA

(If Applicable) 4 Stage Thermostat to 4 Stage Unit meets detail in start-up binder.

Comment:

NA

(If Applicable) 3 Stage Thermostat wiring meets detail in start-up binder.

Comment:

NA

(If Applicable) 3 Stage Thermostat with Humidity sensor wiring meets detail in start-up binder.

Comment:

NA

(If Applicable) EH Thermostat with SCR control wiring meets detail in start-up binder.

Comment:

NA

Temperature setpoints are set for correction region and space (see ASHRAE / temperature setpoint chart in procedure)	Fail

Comment:

CALLED GRID POINT TO VERIFY SET-POINTS BUT THEY WOULD NOTCHANGE THEM TO MATCH WHAT IS ON MY CHART. ALL SET POINTS WERE WITHIN 1 TO 2 DEGRESS OF WHAT THE CHART CALLS FOR

Additional Comments:

Comment:

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CheckList Information

Name :	TECH - 05 TAB CHECKLIST	**Status :**	Not Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	08/03/2023 - Brianna Biggs - National TAB		

CheckList Item Details

Outside air damper set to minimum air flow requirement and damper position marked.	Pass
Comment:	
Total Supply, return, and outside air volumes meet design tolerances (+/-10%)	Pass
Comment:	
Enclosed area diffusers (Pharmacies, manager office, employee room, restrooms, electrical rooms) balanced within +/-10%?	Pass
Comment:	
Open area diffusers (Sales floor and stock room) balanced within +/-25% of design?	Pass
Comment:	
Store pressure meets tolerances (see formula in balance schedule). Make sure to account for existing exhaust fans airflows as shown on original drawings that are non-functioning.	Pass
Comment:	
Outside air and return air dampers modulate freely.	Pass
Comment:	
Start-up report from the installing contractor is reviewed and all information if filled out. All required measurements are within typical ranges.	N/A

Comment:

Did not receive startup report from office nor GC.

(If Applicable) VFD is set-up and operational. (N/A = not applicable)

Comment:

YES

Verify amp draw of motor is within unit specification, not operating in overamped condition. Pass

Comment:

Sales floor temperature and humidity measurement

Comment:

75.5 / 26.9% 01/16/2024: 68.8/13.1%

Pharmacy temperature and humidity measurement

Comment:

73.7 / 27% 01/16/2024: 70.6/13.8%

Stock Room temperature and humidity measurement

Comment:

76 / 26% 01/16/2024: 68.9/13.6%

Outdoor air temperature and humidity measurement

Comment:

96 / 15% 01/16/2024: 31.6/19.4%

Additional Comments:

Comment:

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CheckList Information

Name :	TECH - 06 FUNCTIONAL TESTS	**Status :**	Not Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	08/03/2023 - Brianna Biggs - National TAB		

CheckList Item Details

Cooling Functional Test

Overwrite the thermostat or sensor to put the unit into cooling mode.	Pass
Comment:	
Compressors enable.	Pass
Comment:	
If fan has VFD, the fan increases speed.	Pass
Comment:	
Document the discharge air temperature.	
Comment: NA	
After 10 minutes, Discharge air temperature is below 55 degrees.	Pass
Comment:	
Cooling mode is operational	Pass
Comment:	
Additional Comments:	

Comment:

Heating Functional Test

Overwrite the thermostat or sensor to put the unit into heating mode.	Pass

Comment:

Heat exchanger enables.	Pass

Comment:

If fan has VFD, the fan increases speed.	Pass

Comment:

Document the discharge air temperature.

Comment:

NR

After 10 minutes, Discharge air temperature is above 85 degrees.	Pass

Comment:

Heating mode is operational	Pass

Comment:

Additional Comments

Comment:

Dehumidification Functional Test

Overwrite the humidistat to put the unit into dehumidification mode.	Pass

Comment:

Compressors enable.	Pass

Comment:

Hot Gas Reheat Valve opens	Pass

Comment:

If fan has VFD, the fan increases speed.	Pass

Comment:

Document the discharge air temperature.

Comment:

NR

Dehumidification Mode is operational. (Pass/Fail/NA)

Comment:

Additional Comments:

Comment:

Economizer Functional Test

Overwrite the humidistat to put the unit into economizer mode.	Pass

Comment:

Economizer modulates from minimum position to 100% open. (Pass/Fail/NA)

Comment:

Fail - Unable to set minimum position on RTU's. Damper did open to 100%.

Additional Comments:

Comment:

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CheckList Information

Name :	TECH - 07 TEMPERATURE SETPOINTS	**Status :**	Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	08/03/2023 - Brianna Biggs - National TAB		
Completed Date :	08/10/2023 - Jordan Best - National TAB		

CheckList Item Details

Temperature setpoints must be set using provided charts are based on state and space that each RTU serves. Confirm with controls company that these are set correctly	Fail

Comment:

REACHED OUT TO GRID POINT TO CINFIRM TEMP SET POINTS. WHEN I ASKED THEM TO MAKE CHANGES THEY TOLD ME I WAS NOT AUTHORIZED TO DO SO AND THE WALGREENS ENGINEERING/CONSTRUCTION TEAM WOULD HAVE TO INITIATE A TICKET TO DO SO. TEMP SET POINTS CLOSELY REFLECTED CHART, BUT SOME WERE 1 TO 2 DEGREES OFF.

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

System/Unit: AHU/RTU

Asset: RTU1 AREA:SALES

Unit Data		
	Design	**Actual**
MFG	YORK	YORK
Serial Num	-	N2K2935428
Model Num	ZT102N18R4B5GCE2R1	ZT102N18R4B5GCE2R1
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	30” X 22”
Num Final Filter 1	-	4
Final Filter Size 1	-	20” X 24” X 2”

Test Data		
	Design	**Actual**
SF CFM	2975	2868
SF RPM	1089	984
RA CFM	2422	2148
OA CFM	553	720
RL Voltage	-	494
RL Amperage	-	3.1
SF Rotation	-	CW
RA Damper Position	-	80%
Min OA Damper Position	-	20%
Min OA Damper Type	-	ECON
OA Enthalpy Setpt	-	NA

Motor Data		
	Design	**Actual**
Motor MFG	-	BALDOR
Frame	-	56HZ
Horsepower	3	3
Motor Rpm	-	1750
Phase	3	3
Rated Voltage	460	460
Rated Amperage	-	8.3

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.32”
Fan Suction SP	-	-0.72”
Fan Discharge SP	-	0.59”
Total ESP	1.2	1.63"
Fan Total SP	-	1.31"

Drive Data		
	Design	**Actual**
Motor Sheave Size	-	4.5”
Motor Bore Size	-	0.875"
Motor Sheave SetPt	-	4 TURNS OUT
Fan Sheave Size	-	7”
Fan Sheave Bore	-	1”
Belt CL Distance	-	19.5”
Num of Belts	-	1
Belt Size	-	A54
Belt Alignment	-	GOOD

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

Completed By: Jordan Best on 08/30/2023

Notes:
Unable to decrease OA Flow. Damper does not react to anything below 20% change on units controller. Anything below 20% it fully closes. OA remains the same.

Written By: Dylan Crisman on 01/16/2024

National TAB

Project:08-07-23 WALGREENS #4721 - PUEBLO, CO

AHU/RTU

Diffuser Supply (GRD)

RTU1/SALES

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
SGRD1	CHECK OUT		12X6	265	1	193	286	286	107.9
SGRD2	CHECK OUT		12X12	475	1	521	410	410	86.3
SGRD3	COSMETICS		12X12	475	1	409	392	392	82.5
SGRD4	COSMETICS		12X12	475	1	382	421	421	88.6
SGRD5	CHECK OUTS		12X12	475	1	412	437	437	92.0
SGRD6	SALES		12X6	270	1	310	294	294	108.9
SGRD7	SALES		12X6	270	1	219	301	301	111.5
SGRD8	SALES		12X6	270	1	403	327	327	121.1
Total				2975		2849	2868	2868	96.4%

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

System/Unit: AHU/RTU

Asset: RTU2 AREA:SALES/ OFFICES

Unit Data		
	Design	**Actual**
MFG	YORK	YORK
Serial Num	-	N2F2609560
Model Num	ZT102N18R4B5GCA2R1	ZT102N18R4B5GCA2R1
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	30” X 22”
Num Final Filter 1	-	4
Final Filter Size 1	-	20” X 24” X 2”

Test Data		
	Design	**Actual**
SF CFM	2975	2927
SF RPM	1055	897
RA CFM	2422	2242
OA CFM	553	685
RL Voltage	-	495
RL Amperage	-	3.8
SF Rotation	-	CW
RA Damper Position	-	80%
Min OA Damper Position	-	20%
Min OA Damper Type	-	ECON

Motor Data		
	Design	**Actual**
Motor MFG	-	BALDOR
Frame	-	56HZ
Horsepower	3	3
Motor Rpm	-	1750
Phase	3	3
Rated Voltage	460	460
Rated Amperage	-	8.3

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.53”
Fan Suction SP	-	-0.73”
Fan Discharge SP	-	0.45”
Total ESP	1.2"	1.71"
Fan Total SP	-	1.18"

Drive Data		
	Design	**Actual**
Motor Sheave Size	-	4.5”
Motor Bore Size	-	0.875"
Motor Sheave SetPt	-	5 TURNS OUT
Fan Sheave Size	-	7”
Fan Sheave Bore	-	1”
Belt CL Distance	-	19.5”
Num of Belts	-	1
Belt Size	-	A54
Belt Alignment	-	GOOD

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

Completed By: Jordan Best on 08/10/2023

Notes:
Unable to decrease OA Flow. Damper does not react to anything below 20% change on units controller. Anything below 20% it fully closes. OA remains the same.

Written By: Dylan Crisman on 01/16/2024

National TAB

Project:08-07-23 WALGREENS #4721 - PUEBLO, CO

AHU/RTU

Diffuser Supply (GRD)

RTU2/SALES/ OFFICES

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
SGRD1	SALES		12X6	270	1	372	209	209	77.4
SGRD2	SALES		12X6	270	1	283	215	215	79.6
SGRD3	PHOTO		18X18	350	1	291	287	287	82.0
SGRD4	PASSAGE 2		9X9	335	1	395	402	402	120.0
SGRD5	OFFICE		12"	350	1	503	372	372	106.3
SGRD6	SALES		15X15	350	1	621	299	299	85.4
SGRD7	SALES		12X12	350	1	293	381	381	108.9
SGRD8	SALES		12X12	350	1	403	372	372	106.3
SGRD9	SALES		12X12	350	1	256	392	392	112.0
Total				2975		3417	2929	2929	98.45%

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

System/Unit: AHU/RTU

Asset: RTU3 AREA:SALES

Unit Data		
	Design	**Actual**
MFG	YORK	YORK
Serial Num	-	N2K2935596
Model Num	ZJ061N12D4B5GCB2R3	ZJ061N12D4B5GCB2R3
Type	RTU	RTU
Configuration	HORIZONTAL	HORIZONTAL
Num OA Filters 1	-	1
OA Filter Size 1	-	30” X 22”
Num Final Filter 1	-	4
Final Filter Size 1	-	20” X 24” X 2”

Test Data		
	Design	**Actual**
SF CFM	1750	1695
SF RPM	1051	722
RA CFM	1650	1585
OA CFM	100	110
RL Voltage	-	497
RL Amperage	-	3.3
SF Rotation	-	CW
RA Damper Position	-	85%
Min OA Damper Position	-	15%
Min OA Damper Type	-	ECON

Motor Data		
	Design	**Actual**
Motor MFG	-	MARATHON
Frame	-	56HZ
Horsepower	2	2
Motor Rpm	-	1725
Phase	3	3
Rated Voltage	460	460
Rated Amperage	-	6.6

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.24"
Fan Suction SP	-	-0.12"
Fan Discharge SP	-	0.34"
Total ESP	1.3"	0.58"
Fan Total SP	-	0.46"

Drive Data		
	Design	**Actual**
Motor Sheave Size	-	3.15”
Motor Bore Size	-	.875"
Motor Sheave SetPt	-	2 TURNS OUT
Fan Sheave Size	-	7”
Fan Sheave Bore	-	.0875"
Belt CL Distance	-	17.5”
Num of Belts	-	1
Belt Size	-	A48
Belt Alignment	-	GOOD

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

Completed By: Dylan Crisman on 01/16/2024

Notes:
CHANGED PULLEY TO REDUCE AIRFLOW TO DESIGN.

Written By: Will Turnbough on 09/06/2023

National TAB

Project:08-07-23 WALGREENS #4721 - PUEBLO, CO

AHU/RTU

Diffuser Supply (GRD)

RTU3/SALES

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
SGRD1	SALES		12X12	440	1	573	490	364	82.7
SGRD2	SALES		12X12	435	1	693	528	466	107.1
SGRD3	SALES		12X12	440	1	572	309	442	100.5
SGRD4	SALES		12X12	435	1	705	273	423	97.2
Total				1750		2543	1600	1695	96.86%

Completed By: Jordan Best on 08/10/2023

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

System/Unit: AHU/RTU

Asset: RTU4 AREA:SALES/BREAK ROOM

Unit Data		
	Design	**Actual**
MFG	YORK	YORK
Serial Num	-	N2K2935595
Model Num	ZJ061N12D4B5GCB2R3	ZJ061N12D4B5GCB2R3
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	30” X 22”
Num Final Filter 1	-	4
Final Filter Size 1	-	20” X 24” X 2”

Test Data		
	Design	**Actual**
SF CFM	1750	1589
SF RPM	1051	800
RA CFM	1650	1483
OA CFM	100	106
RL Voltage	-	497
RL Amperage	-	3.3
SF Rotation	-	CCW
RA Damper Position	-	85%
Min OA Damper Position	-	15%
Min OA Damper Type	-	ECON

Motor Data		
	Design	**Actual**
Motor MFG	-	MARATHON
Frame	-	56HZ
Horsepower	2	2
Motor Rpm	-	1725
Phase	3	3
Rated Voltage	460	460
Rated Amperage	-	6.6

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.16"
Fan Suction SP	-	-0.32"
Fan Discharge SP	-	0.35"
Total ESP	1.3"	0.51"
Fan Total SP	-	0.67"

Drive Data		
	Design	**Actual**
Motor Sheave Size	-	3.15”
Motor Bore Size	-	.875"
Motor Sheave SetPt	-	.5 TURNS OUT
Fan Sheave Size	-	7”
Fan Sheave Bore	-	.0875"
Belt CL Distance	-	18.5”
Num of Belts	-	1
Belt Size	-	A48
Belt Alignment	-	GOOD

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

Completed By: Dylan Crisman on 01/16/2024

Notes:
CHANGED PULLEY TO REDUCE AIRFLOW TO DESIGN. MOTOR SHEAVE MAXIMIZED. UNABLE TO INCREASE FURTHER.

Written By: Will Turnbough on 01/24/2024

National TAB

Project:08-07-23 WALGREENS #4721 - PUEBLO, CO

AHU/RTU

Diffuser Supply (GRD)

RTU4/SALES/BREAK ROOM

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
SGRD1	SALES		12x12	395	1	621	309	311	78.7
SGRD2	SALES		12x12	395	1	582	341	339	85.8
SGRD3	EMPLOYEE ROOM		12x12	170	1	215	157	161	94.7
SGRD4	SALES		12x12	395	1	612	373	374	94.7
SGRD5	SALES		12x12	395	1	388	402	404	102.3
Total				1750		2418	1582	1589	90.8%

Completed By: Jordan Best on 08/10/2023

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

System/Unit: AHU/RTU

Asset: RTU5 AREA:PHARMACY

Unit Data		
	Design	**Actual**
MFG	YORK	YORK
Serial Num	-	N2H2934799
Model Num	ZJ049N12D4B5BCB2R2	ZJ049N12D4B5BCB2R2
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	30” X 22”
Num Final Filter 1	-	4
Final Filter Size 1	-	20” X 24” X 2”

Test Data		
	Design	**Actual**
SF CFM	1400	1482
SF RPM	995	753
RA CFM	1400	1482
OA CFM	0	0
RL Voltage	-	500
RL Amperage	-	2.16
SF Rotation	-	CW
RA Damper Position	-	100%
Min OA Damper Position	-	0%
Min OA Damper Type	-	ECON

Motor Data		
	Design	**Actual**
Motor MFG	-	CENTURY
Frame	-	56HZ
Horsepower	1.50	1.5
Motor Rpm	-	1725
Phase	3	3
Rated Voltage	460	460
Rated Amperage	-	5

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.23”
Fan Suction SP	-	-0.33”
Fan Discharge SP	-	0.20”
Total ESP	1.2"	0.76”
Fan Total SP	-	0.53”

Drive Data		
	Design	**Actual**
Motor Sheave Size	-	4”
Motor Bore Size	-	.0875"
Motor Sheave SetPt	-	4 TURNS OUT
Fan Sheave Size	-	8.25
Fan Sheave Bore	-	1"
Belt CL Distance	-	17”
Num of Belts	-	1
Belt Size	-	A50
Belt Alignment	-	GOOD

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

Completed By: Jordan Best on 08/10/2023

National TAB

Project:08-07-23 WALGREENS #4721 - PUEBLO, CO

AHU/RTU

Diffuser Supply (GRD)

RTU5/PHARMACY

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
SGRD1	PHARMACY		12X12	350	1	617	370	370	105.7
SGRD2	PHARMACY		12X12	350	1	573	372	372	106.3
SGRD3	PHARMACY		12x12	350	1	493	367	367	104.9
SGRD4	PHARMACY		12X12	350	1	494	373	373	106.6
Total				1400		2177	1482	1482	105.86%

Completed By: Jordan Best on 08/10/2023

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

System/Unit: AHU/RTU

Asset: RTU6 AREA:RECEIVING

Unit Data		
	Design	**Actual**
MFG	YORK	YORK
Serial Num	-	N2H2934789
Model Num	ZJ049N12D4B5BCB2R2	ZJ049N12D4B5BCB2R2
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	30” X 22”
Num Final Filter 1	-	4
Final Filter Size 1	-	20” X 24” X 2”

Test Data		
	Design	**Actual**
SF CFM	1400	1526
SF RPM	995	1014
RA CFM	1300	1417
OA CFM	100	101
RL Voltage	-	497
RL Amperage	-	2.13
SF Rotation	-	CW
RA Damper Position	-	80%
Min OA Damper Position	-	20%
Min OA Damper Type	-	ECON

Motor Data		
	Design	**Actual**
Motor MFG	-	CENTURY
Frame	-	56HZ
Horsepower	1.50	1.5
Motor Rpm	-	1725
Phase	3	3
Rated Voltage	460	460
Rated Amperage	-	5

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.04”
Fan Suction SP	-	-0.12"
Fan Discharge SP	-	0.13"
Total ESP	1.2"	0.21"
Fan Total SP	-	0.25"

Drive Data		
	Design	**Actual**
Motor Sheave Size	-	3.875
Motor Bore Size	-	.875"
Motor Sheave SetPt	-	5 TURNS OUT
Fan Sheave Size	-	8.25"
Fan Sheave Bore	-	1"
Belt CL Distance	-	17.5”
Num of Belts	-	1
Belt Size	-	A50
Belt Alignment	-	GOOD

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

Completed By: Dylan Crisman on 01/16/2024

Notes:
CHANGED PULLEY TO REDUCE AIRFLOW TO DESIGN.

Written By: Will Turnbough on 09/06/2023

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

System/Unit: FAN - Exhaust

Asset: EF1 AREA:OFFICE

Unit Data		
	Design	**Actual**
MFG	GREENHECK	GREENHECK
Model Num	SP-250	SP-250
Serial Num	-	NA
Type	CEILING	CEILING
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	**Actual**
Motor MFG	-	NA
Frame	-	NA
Horsepower	121W	NA
Motor Rpm	-	NA
Phase	1	NA
Voltage (rated)	120	NA
Amperage (rated)	-	NA
Service Factor	-	NA

Test Data		
	Design	**Actual**
CFM	300	213
Fan RPM	890	NA
Fan Rotation	-	CW
Motor RPM	-	NA
System SetPt	-	NA
RL Voltage	-	NA
RL Amperage	-	NA
Total ESP	0.375"	NA
Fan Inlet SP	-	NA
Fan Discharge SP	-	NA

Completed By: Dylan Crisman on 01/16/2024

Notes:
SPEED DIAL IS AT MAXIMUM.

Written By: Will Turnbough on 01/24/2024

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

System/Unit: FAN - Exhaust

Asset: EF2 AREA:EMPLOYEE ROOM

Unit Data		
	Design	**Actual**
MFG	GREENHECK	GREENHECK
Model Num	SP-250	SP-250
Serial Num	-	NA
Type	CEILING	CEILING
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	**Actual**
Motor MFG	-	NA
Frame	-	NA
Horsepower	121W	NA
Motor Rpm	-	NA
Phase	1	NA
Voltage (rated)	120	NA
Amperage (rated)	-	NA
Service Factor	-	NA

Test Data		
	Design	**Actual**
CFM	300	311
Fan RPM	890	NA
Fan Rotation	-	CW
Motor RPM	-	NA
System SetPt	-	NA
RL Voltage	-	NA
RL Amperage	-	NA
Total ESP	0.375"	NA
Fan Inlet SP	-	NA
Fan Discharge SP	-	NA

Completed By: Dylan Crisman on 01/16/2024

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

System/Unit: FAN - Exhaust

Asset: EF3 AREA:MENS RR

Unit Data		
	Design	**Actual**
MFG	GREENHECK	GREENHECK
Model Num	SP-226	SP-226
Serial Num	-	NA
Type	CEILING	CEILING
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	**Actual**
Motor MFG	-	NA
Frame	-	NA
Horsepower	87W	NA
Motor Rpm	-	NA
Phase	1	NA
Voltage (rated)	120	NA
Amperage (rated)	-	NA
Service Factor	-	NA

Test Data		
	Design	**Actual**
CFM	250	242
Fan RPM	1000	NA
Fan Rotation	-	CW
Motor RPM	-	NA
System SetPt	-	NA
RL Voltage	-	NA
RL Amperage	-	NA
Total ESP	0.25"	NA
Fan Inlet SP	-	NA
Fan Discharge SP	-	NA

Completed By: Jordan Best on 08/10/2023

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

System/Unit: FAN - Exhaust

Asset: EF4 AREA:WOMENS RR

Unit Data		
	Design	**Actual**
MFG	GREENHECK	GREENHECK
Model Num	SP-226	SP-226
Serial Num	-	NA
Type	CEILING	CEILING
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	**Actual**
Motor MFG	-	NA
Frame	-	NA
Horsepower	81W	NA
Motor Rpm	-	NA
Phase	1	NA
Voltage (rated)	120	NA
Amperage (rated)	-	NA
Service Factor	-	NA

Test Data		
	Design	**Actual**
CFM	250	255
Fan RPM	1000	NA
Fan Rotation	-	CW
Motor RPM	-	NA
System SetPt	-	NA
RL Voltage	-	NA
RL Amperage	-	NA
Total ESP	0.25"	NA
Fan Inlet SP	-	NA
Fan Discharge SP	-	NA

Completed By: Jordan Best on 08/10/2023

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

System/Unit: FAN - Exhaust

Asset: EF5 AREA:PHOTO

Unit Data		
	Design	**Actual**
MFG	GREENHECK	GREENHECK
Model Num	CSP-260	CSP-260
Serial Num	-	NA
Type	UTILITY	NA
Configuration	VERTICAL	NA

Motor Data		
	Design	**Actual**
Motor MFG	-	NA
Frame	-	NA
Horsepower	385W	NA
Motor Rpm	-	NA
Phase	1	NA
Voltage (rated)	120	NA
Amperage (rated)	-	NA
Service Factor	-	NA

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

Test Data		
	Design	**Actual**
CFM	750	NA
Fan RPM	928	NA
Fan Rotation	-	NA
Motor RPM	-	NA
RL Voltage	-	NA
RL Amperage	-	NA
Suction ESP	-	NA
Discharge ESP	-	NA
Total ESP	0.25"	NA

Completed By: Jordan Best on 08/10/2023

Notes:
FAN REMOVED FROM PLANS PER MC

Written By: Jordan Best on 08/10/2023